

APPROPRIATE ASSESSMENT STUDY FOR THE ROMANIAN ENERGY STRATEGY 2019-2030, WITH PERSPECTIVES FOR 2050

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REGISTRATION CERTIFICATE

Pursuant to the provisions of the Government Emergency Ordinance no. 195/2005 on environmental protection, as approved with amendments and additions by Law 265/2006, as amended and supplemented, and the Order of the minister of environment no. 1026/2009 on the conditions to prepare environmental reports, environmental impact reports, environmental reviews, site reports, security reports and appropriate assessment studies,

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I. GENERAL INFORMATION

This paper is an **adequate evaluation study** of the potential impact on protected areas of community interest of **the Romanian Energy Strategy 2019-2030, with prospects for 2050**, promoted by the Ministry of Energy (as the holder of the Strategy). The study was developed in order to obtain the Environmental Approval for the Romanian Energy Strategy 2019-2030 with perspectives for 2050.

According to the letter no. 1837 / GLG / 24.07.2017 issued by the Ministry of Environment, RES 2019-2030, with perspectives for 2050 is subject to the environmental assessment procedure in accordance with the provisions of Government Decision no. 1076/2004 on establishing the appropriate assessment procedure, GEO 57/2007 on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna, Order 19/2010 for the approval of the Methodological Guide on appropriate assessment of the potential effects of plans or projects on protected natural areas of community interest.

The conclusions of this appropriate assessment study will be included in the Environmental Report.

The following elements were considered in the elaboration of this appropriate assessment study: the draft of the Romanian Energy Strategy 2019-2030, with perspectives for 2050, the limits of the sites of community importance and of the special bird protection areas in STEREO 70 projection system, available on the website of the Ministry of Environment, the standard forms for SCIs and SPAs in the year 2016, the management plans for protected natural areas, the specialized literature.

Name of Strategy	Romanian Energy Strategy 2019-2030, with perspectives for 2050
Location of the Strategy	The national territory of Romania
Strategy owner	Ministry of Energy Splaiul Independenței no. 202E, District 6, Bucharest, postal code 060023 Contact person - Marina Ghiță - senior adviser
Elaborator of the appropriate assessment study	SC KVB Consulting & Engineering SRL Str. Mitropolit Varlaam, no. 147, District 1, Bucharest Contact point: Anca Burghilea - project manager, anca.burghilea@kvb.ro , 0730.506.067 Roxana Olaru - environmental expert, roxana.olaru@kvb.ro , 0733.107.793

II. INFORMATION ON THE STRATEGY SUBJECT TO APPROVAL

II.1. GENERAL INFORMATION ON THE ROMANIAN ENERGY STRATEGY 2019-2030, WITH PERSPECTIVES FOR 2050

The Energy Strategy of Romania 2019-2030, with perspectives for 2050, subject to the assessment and approval procedure, hereafter referred to as RES 2019-2030, with perspectives for 2050, is a strategic document for the programming and reaching of the energy objectives.

RES 2019-2030, with perspectives for 2050 is promoted by the Ministry of Energy as a strategy holder, and was developed to meet Romania's development needs both in the national context and in the international context.

The vision of Romania's Energy Strategy 2019-2030 with prospects for 2050 is the growth of the energy sector in terms of sustainability. The development of the energy sector is part of Romania's development process. Energy system growth means: building new capacities, upgrading and refurbishing the production, transport and distribution capacities of energy, encouraging the increase of domestic consumption under conditions of energy efficiency, export. Thus, the national energy system will be stronger, more stable and safer.

The **overall objective** of the Strategy is to meet the necessary energy needs both in the short and medium term and long term, appropriate to a modern economy and an increased standard of living, respecting the national, European and global benchmarks that influence political determinations and decisions in energy field.

Major objectives of RES 2019-2030, with perspectives for 2050, are:

1. Clean energy and energy efficiency;
2. Ensuring access to electricity and heat for all consumers;
3. Vulnerable consumer protection and reduction of energy poverty;
4. Competitive energy markets, based on competitive economies;
5. Modernizing the energy governance system;
6. Increasing the quality of education in the field of energy and continuous training of the human resource;
7. Romania regional provider of energy security;
8. Increasing Romania's energy contribution to regional and European markets by exploiting primary national energy resources.

Romania's Energy Strategy 2019-2030, with perspectives for 2050, provides the development framework at country level.

II.2 GEOGRAPHICAL AND ADMINISTRATIVE LOCATION OF OBJECTIVES RES 2019-2030 WITH PERSPECTIVES FOR 2050

Romania is located at the contact of two regions of Europe, namely Central Europe and Southeast Europe, at approximately equal distances from three cardinal points (2800 km to the north, east and west) and about 1000 km to the most southern point.

Romania's area is relatively small, but characterized by a diversity of relief forms, arranged in the shape of an amphitheater to the Carpathian arch, both in their surrounding areas and in their centre. Thus, the area of the country is occupied about 28% by mountains, 42% by hills and plateaus and 30% by plains.

Due to the radial arrangement of the relief in steps, Romania's hydrographic network is very rich, most of the rivers converging towards the exterior of the Carpathian arch. Most rivers on the national territory are tributaries of the Danube basin, which has a length of approximately 1075 km on the national territory.

From biogeographical point of view, Romania presents the largest biological diversity in Europe, having 5 biogeographical regions on the national territory, namely: continental (most common), alpine (mountainous countries), Pannonian (both in Hungary and in neighbouring countries in the west), Black Sea (specific to Romania and Bulgaria), steppe (specific only to Romania).

Through the RES 2019-2030, with perspectives for 2050, Romania proposes 10 investment objectives in the energy production sector, as follows:

- ✓ Completion of groups 3 and 4 at Cernavoda nuclear power plant - this investment objective is located in the western extremity of Constanta County, in the Southeast development region, on the right bank of the Danube River;
- ✓ Realization of a new 600 MW power plant in Rovinari - this investment objective is located in Rovinari, Gorj county, in the South-West Oltenia Development Region, on the right bank of the Jiu;
- ✓ Realization of a new 400 MW power plant with ultra super critical parameters in Turceni - this investment objective is located in Turceni, Gorj county, in the South-West Oltenia Development Region, on the right bank of the Jiu;
- ✓ Realization of a new 200 MW CCGT - Craiova II power plant on gas, with flexible operation including storage of energy resources in the Ghercești underground storage - this investment objective is located in the northern part of Craiova, Dolj county, in the Southwest development region Oltenia;
- ✓ Realization of a new 400 MW CCGT gas plant with flexible operation Mintia, located in the town of Mintia, in the western part of Deva, Hunedoara County, the West Development Region;
- ✓ Realization of the Tarnița-Lăpuștești hydroelectric power plant with accumulation by pumping - this investment objective is located in Cluj County, along the Someșul Alb River, 30 km upstream of Cluj Napoca, in the North-West development region;
- ✓ Realization of the Turnu Magurele-Nicopole hydroelectric power station, 500 MW - this investment objective is located along the Danube, starting from Turnu Magurele, on the administrative territory of the counties on the Danube, which are part of the South, Southwest Oltenia and South-East development regions;
- ✓ Realization of the hydroelectric power plant Răstolița - 35 MW - this investment objective is located in the mountainous part of Mureș County, in the Central development region;
- ✓ Realization of hydroelectric power stations on the Jiu River with a power of 90MW - this investment objective is located along the Jiu River gorge sector and downstream of it, on the administrative territory of Bumbăști Jiu and Târgu Jiu localities in Gorj county, belonging to the South-West Oltenia development region;

- ✓ Realization of hydroelectric power plants on the Olt River with a capacity of 145 MW - this investment objective is carried out on the administrative territory of two counties in different development regions, namely Sibiu (development region Centre) and Vâlcea (development region Southwest).

Romanian also envisages 8 investments in the field of energy transmission :

- ✓ The new 400 kV dc OHL (with an equipped circuit) between existing stations Smârdan and Gutinaş, located on the territory of 3 counties and 24 territorial administrative units, as follows: Bacău (Rugineşti, Ştefan cel Mare, Căiuţi, Coţofăneşti, Urecheşti), Vrancea (Rugineşti, Păuneşti, Pufeşti, Moviliţa, Panciu, Mărăşeşti), Galaţi (Cosmeşti, Nicoreşti, Tecuci, Munteni, Drăgăneşti, Barcea, Umbrăreşti, Iveşti, Griviţa, Costache Negri, Pechea, Smârdan, Galaţi) from the South-East and North-East development units;
- ✓ New 400 kV dc LEA between the existing Cernavodă and Stâlpu stations with an inlet / outlet at the 400 kV Gura Ialomiţei station, located on the territory of 3 counties and 34 administrative-territorial units, as follows: Constanţa (Cernavodă), Ialomiţa (Seimeni, Topalu, Horia, Borduşani, Făcăeni, Vlădeni, Mihail Kogălniceanu, Gura Ialomiţei, Țândărei, Valea Ciorii, Scânteia, Griviţa, Miloşeşti), Buzău (Padina, Pogoanele, Smeeni, Gherăseni, Costeşti, Stâlpu) from the South-East and North-East development units;
- ✓ Expansion of the 220/110 kV Stâlpu station by building the 400/110 kV station situated in Buzău County, in the South-East development regions;
- ✓ 400 kV Porţile de Fier - Anina - Reşiţa OHL, located on the territory of 2 counties and 13 administrative territorial units, as follows: Caraş Severin (Ezeriş, Reşiţa, Caraşova, Anina, Bozovici, Prigor, Lăpuşnicel, Iablaniţa, Mehadia, Topleţ), Mehedinţi (Iloviţa, Brezniţa, Drobeta Turnu Severin) from the South-West and West development regions;
- ✓ new 400 kV d.c. OHL between the existing stations Reşiţa (Romania) and Pancevo (Serbia) located in Caraş Severin County on the territorial administrative territory of 11 localities: Reşiţa, Ezeriş, Lupac, Dognecea, Goruia, Ticvanu Mare, Berlişte, Ciudanoviţa, Grădinari, Vărădia, Vrania in the West development area;
- ✓ Switching to 400 kV of 220 kV d.c. Reşiţa-Timişoara-Săcălaz-Arad OHL, located on the territory of 3 counties, i.e. Caraş Severin, Timiş and Arad from the West development region;
- ✓ Expansion of the 220/110 kV Resita station by building the new 400/220/110 kV Resita station located in Caraş Severin county, Reşiţa from the West development region;
- ✓ Replacement of the 220/110 kV Timisoara station by construction of the new 400/220/110 kV station located in Timiş County, in Timişoara locality from the West development region.

Please note that the above projects (for which there is an approximate location), based on satellite images, have been taken into account in this appropriate assessment study.

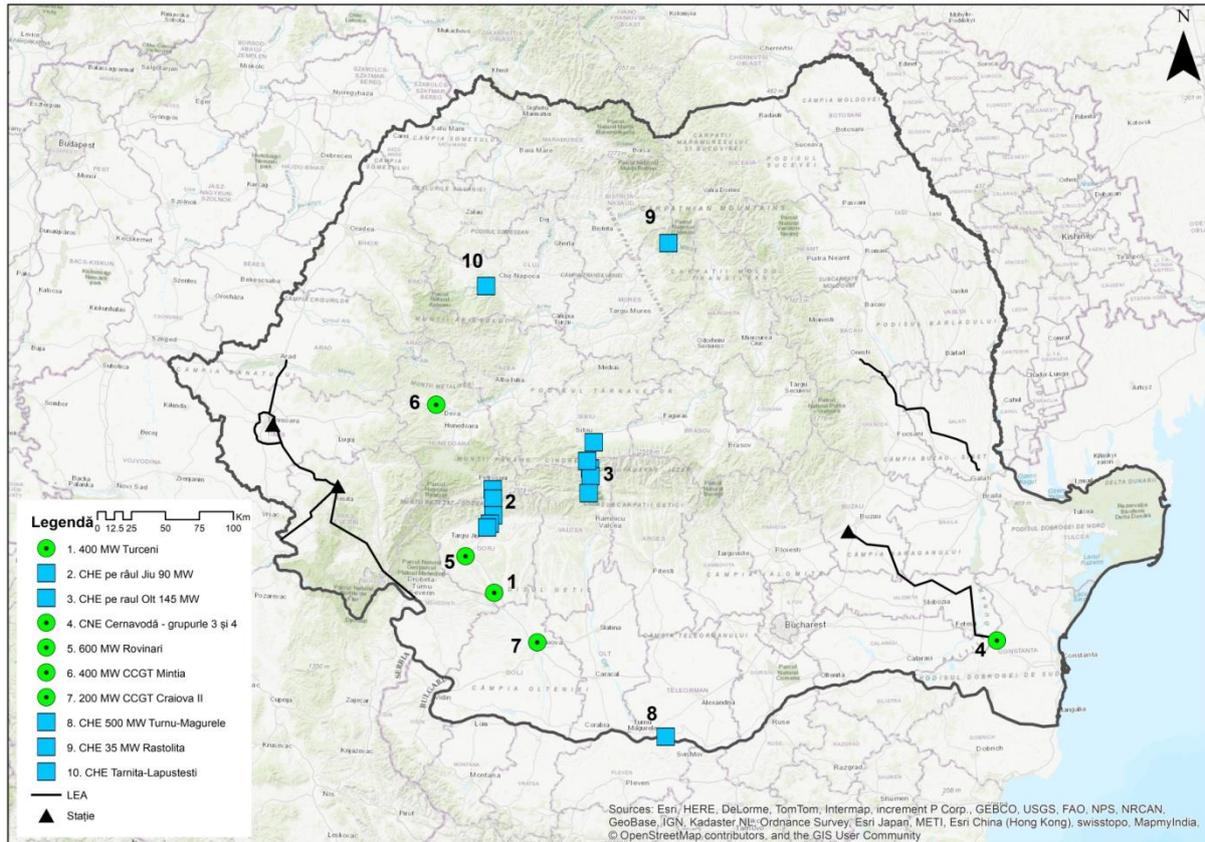


Figure 1 Investment objectives in the energy generation sector (Source: RES 2019-2030, with perspectives for 2050)

II.3 PHYSICAL CHANGES CAUSED BY THE IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050

The projects proposed in RES 2019-2030, with perspectives for 2050 are different in nature, being included in the following subsectors of energy production: nuclear, coal, gas, hydroenergy. The physical changes resulting from the implementation of these projects, mentioned in Chapter II.2 are varied, so they can be grouped according to the project categories for each energy sub-sector.

The physical changes resulting from the implementation of investment objectives in the energy sector involve construction works, while more detailed information on the types of works performed can be exemplified for the following 3 projects: completion of the Cernavoda 3rd and 4th unit, the realization of a new 600 MW power plant at Rovinari, the realization of the Tarnița - Lăpușești hydroelectric power plant with pumped accumulation and the execution of Turnu magurele-Nicopole hydroelectric power complex. Thus, for the construction of these investment objectives, the main categories of necessary works that can generate physical changes are: stripping, digging, felling, excavations, earthworks, dewatering, hydrotechnical works, works for environmental protection (in case of works on water provide corridors for fish migration).

Since the projects are part of different sub-sectors with a high degree of complexity but also by the current level of detail, at the time of the physical changes analysis they may not be described following their implementation. These are to be further detailed in the

environmental procedure for obtaining the environmental agreement (EIA procedure) for each investment objective in the electricity generation sector.

The physical changes that will be generated by the projects proposed by RES 2019-2030, with perspectives for 2050 provide construction works involving reversible and irreversible changes, in the short or long term, which may directly or indirectly affect the physical, hydrogeomorphological, as well as biological environment.

All physical changes were grouped according to the main impacts subject to review, as follows:

- ✓ Habitat loss: implementation of any investment objectives in the energy production sector can lead to long-term or irreversible changes to Natura 2000 habitats and species of Community importance (areas to be occupied by constructions);
- ✓ Habitats alteration: all activities carried out in the stage of construction that can affect in the short or medium term the optimal conditions for the development of habitats and species of community importance.

II.4 NATURAL RESOURCES REQUIRED FOR IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050

The implementation of investment objects in the power generation sector under RES 2019-2030, with perspectives for 2050, will involve the use of natural resources according to each type of project. At this stage of the Strategy, all the natural resources necessary for the implementation of the projects can be estimated without mentioning the relevant quantities. Taking into account the subsectors in the energy sector that will benefit from the implementation of the projects, we can render some possible resources to be used: water, coal, gas, uranium.

For each project, the types of resources and the quantities needed to implement them in the environmental impact assessment procedure will be listed, as they may vary from one type of project to another.

We would point out that under the RES 2019-2030, with perspectives for 2050 there will also be projects that will aim to protect natural resources, including resources from Natura 2000 sites, as well as the restoration of ecosystems outside these sites. At the stage of project, for objectives that use water as natural resource, the case of hydroenergy plans, corridors will be provided for the migration of the bird fauna, to prevent the fragmentation of habitats and the rehabilitation of ecosystems. For objectives that use coal as natural resource, streamlining projects for heat power plants are provided, by installing technologies with supercritical (Rovinari) and ultrasupercritical (Turceni) parameters. These will prevent emissions in the atmosphere and implicitly the deposit of suspended dusts/sedimented particles per species of flora from the natural protected areas located in the vicinity of these objectives.

II.5 NATURAL RESOURCES TO BE USED IN PROTECTED NATURAL AREAS OF COMMUNITY INTEREST IN THE IMPLEMENTATION OF RES 2019-2030 WITH PERSPECTIVES FOR 2050

The natural resources to be used for the implementation of investment objectives in the energy production sector under RES 2019-2030, with perspectives for 2050, within protected natural areas included in the Natura 2000 ecological network, the main resource is water, which will be used in hydroenergy plants, but which will be returned to the circuit after machining, followed by the ground surfaces that will be temporarily or permanently occupied by arrangement and / or construction activities. Migration corridors will be arranged for the fish fauna and the ecological flow shall be ensured in the river areas on which the future hydroelectric plants will be installed. Also, when designing them, the hydrogeomorphological regime of the river, especially on Danube, will be taken into account.

For the investment category "*Modernization and execution of the energy production capacities in the coal and natural gas-powered heat power plants*", we propose the overground exploitation so that the raw materials are procured outside protected natural areas, and the access roads from the quarry at the heat power plan is established so that it does not cross the protected natural areas.

Please note that activities related to the implementation of investment objectives in the electricity sector, such as work site or borrow pits, should be located outside the areas of the Natura 2000 ecological network in order to mitigate the impact on protected species and habitats.

II.6 EMISSIONS AND WASTE GENERATED BY THE STRATEGY AND THE METHOD TO REMOVE THEM

The projects to be implemented through RES 2019-2030, with perspectives for 2050, will cover four sub-sectors in the energy sector, which will have different time horizons, as follows: 2030 for the nuclear sub-sector, 2020 and 2035 for the coal-energy sub-sector and 2030 for the hydroenergy sub-sector. Please note that we have detailed only three of these investment objectives in the energy sector because there is sufficient data for them. At this time, a realistic timeframe can be estimated for the period of exploitation of those investments, of tens of years, i.e.: hydroelectric plants (from 40 – to 80 years), heat power plants (30-40 years), nuclear plants (more than 40 years).

The main types of emissions that could be generated as a result of the implementation of the investment objectives for electricity generation under RES 2019-2030, with perspectives for 2050 are:

- ✓ Emissions in water bodies;
- ✓ Emissions to the atmosphere;
- ✓ Emissions to soil.

Emissions in water bodies

Environmental objectives

At European level, the environmental objectives regarding water bodies are provided for in the Frame Water Directive (FWD), which is the main issue of this regulation. The purpose of the Directive is to provide long-term protection, a sustainable use of water.

The overall environmental objectives include the following elements:

- ❖ For surface water bodies: reaching a good ecological state and a good chemical state, respectively a good ecological potential and a good chemical state for highly modified and artificial water bodies;
- ❖ For underground water bodies: reaching a good chemical state and a good quantitative state;
- ❖ Progressive reduction of pollution with priority substances and gradual termination and removal of emissions, discharges and losses of hazardous priority substances from surface waters, by implementing the necessary measures;
- ❖ “preventing or limiting” the discharge of pollutants in underground waters by adopting measures;
- ❖ Inversing the tendencies of significant and sustainable growth of the concentrations of pollutants in underground waters;
- ❖ Non-deterioration of the state of surface and underground waters (art. 4.1.(a)(i), art. 4.1.(b)(i) of FWD);
- ❖ For protected areas: fulfilling the objectives set forth by the specific law.
- ❖ Water bodies are significantly affected by hydro-morphological alterations, but also by a significant number of projects aimed at providing protection against floods, power generation, navigation, at different stages of planning and implementation that contribute to the physical alteration of the water bodies. Please note that the implementation of these projects, pressures, lead to a deterioration of the status of water bodies, whether or not confirmed in the studies that are part of the environmental impact assessment procedure.
- ❖ A specific focus in this case will be placed on the energy sector where, a large quantity of water is used for cooling down installations. In 2017, aside from the volume of wastewater of 1890.8 million cubic meters discharged from various industrial installations, a quantity of 2905.16 million cubic meters is added, representing the cooling water discharged mainly from the energy industry. According to EUROSTAT, the quantities of water used in the energy industry to cool down installations in the period 2004-2015 are presented in Figure 2.

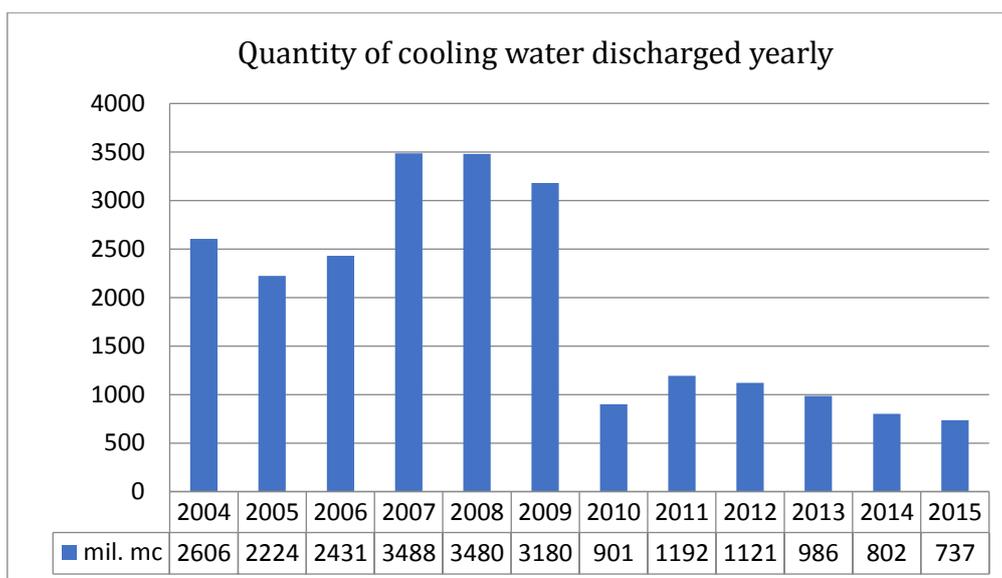


Figure 2 Quantities of samples water for cooling installations from the energy industry (source: EUROSTAT <https://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=ten00006&language=en>)

Aside from the discharge of the water used for cooling electricity production installations, wastewater is a category of water of energetic use. The intensity of the impact depends on two main features that wastewater has: the effluent flow and the volume of polluting substances. In this context, according to the information presented in the Summary of the quality of Romanian waters in 2017¹, nationwide, the following fields of economic activity were identified that have a significant contribution on building the potential of pollution:

- water abstraction and processing for the population;
- chemical processing;
- electricity and thermal energy;
- metallurgical industry and car building;
- extractive industry.

In the field of *Electricity and thermal energy* the following values registered in 2017 are important for this study:

- a total water volume that requires treatment of 546529,59 thousand cubic meters of which 127800.46 thousand cubic meters are not treated and 151.34 thousand cubic meters are improperly treated and 418577.79 thousand cubic meters are treated properly;
- a loading with the following quantities of chemical indicators: 1316,736 t CB05, 4313,563 t CCO-Cr, 6,572 t total nitrogen, 0,368 t total phosphorus, 320,169 t nitrides, 4,763 t nitrites, 28,585 t ammonium, 17265,571 t suspended particles, 99688,721 t fixed residue, 6561,974 t chlorinate 20954,728 t sulphates, 15005,529 t calcium, 2703,413 t magnesium, 28,248 t total iron, 0,389 t total manganese, 42,093 t sodium, 0,001 t aluminum, 0,007 t H₂S+ sulphates, 0,007 t phenols;

¹ Administrația Națională Apele Române, Sinteza calității apelor din România în anul 2017 (extras) (<http://www.rowater.ro/Lists/Sinteza%20de%20calitate%20a%20apelor/DispForm.aspx?ID=17&Source=http%3A%2F%2Fwww%2Erowater%2Ero%2FLists%2FSinteza%2520de%2520calitate%2520a%2520apelor%2FAllItems%2Easpx>)

- a loading with the following quantities of chemical indicators: 0,207 t synthetic detergents, 1886,777 t extractible substances, 0,296 t petroleum products, 0,0084 t arsenic and compounds, 0,00002 t copper, 0,00001 t cadmium and compounds, 0,001081 t mercury and compounds, 0,020947 t lead and compounds.

Impact on water bodies

For the subject of this study, one shall approach the objectives targeting nuclear energy, hydroenergy and thermal energy.

- **Nuclear energy**

In this category it is included the objective *Completion of the groups 3 and 4 from Cernavodă NPP*. The objective targets the existing site within Cernavodă NPP and it is in progress. From the perspective of location, Cernavodă NPP does not overlaps the European ecological network Nature 2000.

According to Environment agreement for the project *Continuation of the works of construction and completion of the Units 3 and 4 at Cernavodă NPP*, pursuant to the results and conclusions of the report related to environment impact, of additional documents submitted by the holder of the project between 2006-2013 and conclusions formulated in the final opinions of the states potentially affected by the project, it is stated that for each environment element one has identified and assessed the potential impacts due to the operation of the Units 3 and 4, as well as the impact cumulated for the simultaneous operation of the 4 nuclear units, not being identified a significant negative impact for normal operation.

Also, the outage of water with changed temperatures formed with the discharge of effluent from Cernavodă NPP in Danube does not present negative effects if the operation of the units 3 and 4 will be made with the observance of the conditions stipulated by the Water Rights Permit no. 54/2013 related to the *Continuation of the works of construction and completion of the Units 3 and 4 at Cernavodă NPP* issued by the National Administration Romanian Waters that updates the Water Rights Permit no. 35/2011 of *Cernavodă Nuclear Power Plant Units 3 and 4*, county Constanța². The conditions entail that the additional thermal input by discharge of effluent will be maximum 10°C on the temperature of Danube and, pursuant to crossing the mixing area, the water temperature will not exceed 35°C.

The impact on biodiversity pursuant to the discharge of cooling water was analysed in the proper study of evaluation, relying on the premise that the nuclear-electric power plant with 4 units is near some Natura 2000 sites. The stations for the special measurements on vertical (on water column) and transversal (left bank - canal - right bank) in the area of outage of water with changed temperatures were in number of 3 and, according to the summary of *Proper evaluation of environment impact of Units 3 and 4 of Cernavodă NPP - Impact on biodiversity* (INCDDD, 2012), were located as follows: P1 - 700 m downstream of waterway outfall for discharge of cooling water, P2 - 1,5 km

² Environment Agreement for the project *Continuation of the works of construction and completion of Units 3 and 4 at C.N.E. Cernavodă*

downstream of waterway outfall for discharge of cooling water and P3 - 2.5 km downstream of waterway outfall for discharge of cooling water.

The characterisation of effluent with temperatures changed discharged in Danube was quantified by Danube Delta- Tulcea³ Institute of Research Development by performing measurements during summer (July-August 2010), autumn (September-November 2010), winter (January-March 2011) and spring (April-May 2011) and some tests in laboratory of hydrochemical and hydrobiological samples of the cooling canal of Cernavodă NPP and stations established on the level of Rasova-Capidava sector, with site observations performed on the section Călărași-Hârșova. The conclusions resulted pursuant to the interpretation and correlation of results emphasized the following:

- ❖ During the periods characterised by the increase of river in Cernavodă by over 200 cm, mainly during summer and winter, the waters having as source the canal of discharge of cooling waters of the power plant flow on Danube on a distance of 3.5 km without mixing;
- ❖ On the contrary, during the periods when the Danube level is low in Cernavodă (under 200 cm - spring and autumn), the stratification phenomenon does no longer occur, the waters mixing from the first hundred of meters after discharging. Thus, the warm water outage presents a length of only 1.5-2 km;
- ❖ The dimensions of water outage changed are the following: variable width in the discharge area of 300-400 m reduced to approximately 50 m near the locality Șeimeni.

Among the most important conclusions of *Proper evaluation of environment impact of the Units 3 and 4 of Cernavodă NPP*, according to environment agreement, we mention:

- ❖ The impact of the projects of units 3 and 4 is insignificant, the simultaneous operation of 4 nuclear units in Cernavodă NPP not impairing the favourable maintenance status of habitats and species, including those of community interest present on the territories of the closest sites Nature 2000 (ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava and ROSPA0017 Canaralele de la Hârșova);
- ❖ No significant negative impact on the evolution of flora and fauna in the area has been identified in the area of influence of the project due to the discharges of technological warm water in Danube;
- ❖ In case of accident, the documentation of evaluation of impact on environment includes operation procedures, measures of intervention of the staff of nuclear power plant, and other authorities in charge;
- ❖ One has analysed the effects on natural succession and composition of reofil phytoplankton from Danube, on the conservation of the species of community interest (plants, invertebra, fish, amphibians, reptiles, birds, mammals) emphasized that the impact would be insignificant among them.

The potential impact was correlated with the changes that might occur in the future pursuant to commissioning the Units 3 and 4 of Cernavodă NPP considering the length

³ *Proper evaluation of environment impact of the Units 3 and 4 of C.N.E. Cernavodă* - Impact on biodiversity (INCDDD, 2012) - summary (http://www.mmediu.ro/beta/wp-content/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuinccddrezumatromana.pdf)

and width of outage of water with temperatures changed in the area of discharge of cooling waters⁴:

High levels of Danube (summer and winter)

There is the possibility that the water layer with changed temperatures covers a length of 4.5-6.5 km *.

*This depends on the increase of debit of discharged waters with the commissioning of another 2 units within Cernavodă NPP, as well as the difference between the temperature of water coming from the discharge canal and the temperature of Danube waters upstream of the outfall of the canal of discharge of cooling waters.

Low levels of Danube (autumn and spring)

There is the possibility that the water outage has a length of 3-3.5 km *.

*This depends on the increase of debit of discharged waters and the difference between the temperature of water coming from the discharge canal of cooling waters and the temperature of Danube waters upstream of the outfall of the canal of discharge of cooling waters.

As for the width of water outage changed, with the doubling of the debit of cooling water by commissioning the units 3 and 4, it is possible that it increases up to 450 m.

○ **Hydroenergy**

According to the *Report on environment condition in Romania, year 2017*⁵, the following activities/pressures were discovered on the water bodies with potential impact on water bodies:

Pressure	Effects
Works of transversal retaining situated on the water body	The effects generated by this kind of works have an impact on the hydrologic regime, bed stability, transport of sediments and biota migration, causing the fragmentation/interruption of longitudinal connectivity of water body.
Works along the river	The effects generated by this kind of works have an impact on the vegetation from the flood plain, of the areas of reproduction and longitudinal river profile, sublayer and biota structure, this leading to the loss of lateral connectivity.
Sampling and returns/derivations Main and secondary captures	The effects thereof influence the level of minimum flow, bed and biota stability. The effects caused by such works may have an impact on the downstream hydrogeomorphological regime of power plant.
Navigable canal	Effects on the stability of bed and biota.

⁴ *Evaluare adecvată a impactului de mediu a Unităților 3 și 4 ale C.N.E. Cernavodă* – Impactul asupra biodiversității (INCDDD, 2012) – rezumat (http://www.mmediu.ro/beta/wp-content/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuinccddrezumatromana.pdf)

⁵ Report on environment condition in Romania, year 2017 (<http://www.anpm.ro/documents/12220/2209838/Raport+stare+mediu+anul+2017.pdf/12fc7560-32e3-4540-8c36-2432fe7674ae>)

The majority of all these pressures are hydrotechnical and mutually dependent for a good operation of an investment in the field of hydroenergy.

The production of hydroenergy and activities prior to this process presents a range of positive and negative features, although it is associated to a green, clean energy, without carbon discharges and which uses a renewable resource for the production of electricity. Pursuant to specialised studies, the following issues have been identified:

Positive

- *In order to obtain hydroenergy, the driving force is the gravitational force, the water used in this process being a renewable resource (Abbasi and Abbasi, 2011);
- *Hydroenergy does not affect the air quality and, implicitly, does not pollute the air we are breathing, as it is not a source of atmospheric emissions (Yüksel, 2010);
- *Considering that hydroenergy replaces part of power production by burning of fossil fuels, it may be stated that it positively influences the issue of occurrence of smog and acid rains (Abbasi and Abbasi, 2011; Yüksel, 2010).

Negative

- *The retaining of waterways influences, on long term, the terrestrial ecological systems and biodiversity widely, the river flow regime, migration of aquatic bodies and it is also determining the occurrence of greenhouse gas emissions and change of ecological condition of water bodies (The Report of the World Commission on Dams, November 2000);
- *The process of production of hydroenergy influences the flow of rivers, the migration of aquatic bodies and the transport of nutrients and sediments (Bratrich et al, 2004);
- *The hydroelectric stations have major impact on all kinds of habitats identified where located, on the outfall of river in the sea for big electric stations, on the banks of rivers where located (Abbasi and Abbasi, 2000).

As for the potential impact of big hydrotechnical constructions, as the case of the objective *SER Performance of power plant Turnu Măgurele - Nicopole 500 MW*, according to Bergkamp and collab. (2000) there are three impact orders as follows:

Impact order	Upstream effects	Downstream effects	Observations
I	*Changes of thermal regime of water; *Change of water quality; *Accumulation of sediments in containers.	*Change of water flow regime; *Morphological changes; *Changes of water temperature; *Reduction of the quantity of sediments.	The effects are immediate or shortly after the start of constructions.
II	*Modification of biotic and non-biotic elements; *Changes of the structure of ecological systems, mainly aquatic;	* Modification of biotic and non-biotic elements; * Changes of the structure of ecological systems, mainly aquatic;	The second impact order is the result of modifications caused by the impacts included in the first

Impact order	Upstream effects	Downstream effects	Observations
	*Modification/Occurrence of imbalances on level of primary productivity, mainly on level of aquatic ecosystems.	* Modification/Occurrence of imbalances on level of primary productivity, mainly on level of aquatic ecosystems.	order. This order is associated to a longer period of time, the effects being noticed few years after the construction of power plant. Bergkamp and collab. (2000) state that the main modifications are emphasized among the riparian vegetation, of the increase rate of macrophytes, plankton and periphyton.
III	*Effects on level of bodies (ichthyofauna, avifauna, invertebrate and mammals) of target ecological systems.	* Effects on level of bodies (ichthyofauna, avifauna, invertebrate and mammals) of target ecological systems; * Downstream impact appears including on the level of discharge of the river in the sea, and on the level of the sea.	The impacts included in the third order are the results of the two orders. These are obvious after a longer period of time opposite to the second order of impact, before reaching a new ecological balance.

○ **Thermal energy**

The element incriminated for the potential occurrence of negative impact in case of energy coming from non-renewable sources is represented by the burning of these resources, in this case, burning of carbon and natural gas.

The effects of combustion are multiple and have, on its turn, visible secondary effects present on all levels of organisation of organised matters. The compounds generated by the burning of fossil fuels often remain in the air in the form of polluting particles or reach the ground or waterways with the acid rains that it forms. The main effects of acid rains are the acidification of water or soils and influence on growth or foliar degradation of trees, mainly on high heights.

According to the *National Strategy and Plan of Action for Conservation of Biodiversity 2010-2020*⁶, the exploitation of carbon on surface often needs the uncovering of wide areas, this causing the pollution of surface waters used in floating. For underground

⁶ *National Strategy and Plan of Action for Conservation of Biodiversity 2010-2020*
(<http://biodiversitate.mmediu.ro/implementation/legislaie/politici/strategia-nationala-si-planul-de-actiune-pentru-conservarea-biodiversitatii/>)

exploitations, the acid mine waters and containing heavy metals reach surface causing several ecological misbalances.

The potential impact associated to the production of energy from non-renewable resources, in this case by burning carbon and natural gas, must be analysed from several perspectives: impact caused by the exploitation of resources, transport of it and actual use.

For the two kinds of resources, the main potential effects in the detriment of biodiversity are the following⁷:

Exploitation	Transport	Burning
<ul style="list-style-type: none"> - Occurrence and aggravation of erosion; - Phonic pollution; - Atmospheric pollution; - Degradation and fragmentation of species' habitats, manly by stubbing different areas of forest, and facilitation of entry of invasive species; - Damage of water quality; - Esthetical alteration of landscape; - Topography changes. 	<ul style="list-style-type: none"> - Accentuation of the impact due to mine exploitation by increase of the concentrations of polluting emissions from mobile sources. 	<ul style="list-style-type: none"> - Increase of atmospheric pollution concentrations due to increased emissions of carbon dioxide, nitric oxide, sulphur and methane dioxide generated by burning, affecting the health of bodies; - contribution to occurrence of photochemical smog, of acid rains and accentuation of the effects of climatic changes.

Also, the high volumes of cooling waters of the installations discharged in the surface water bodies have often a negative impact due to the occurrence of eutrophising causing major structural modifications, including physical chemical and functional, of aquatic ecological systems.

Emissions to the atmosphere

The energy sector is one of the sectors with the greatest influence on air quality, materialized by the following effects:

- Increase in greenhouse gas emissions;
- Environmental pollution with hydrocarbons;
- Air pollution due to long-term storage of mining waste (uncovered landfills);

Energy activity is responsible for the presence of pollutants above 50% of methane and carbon monoxide emissions, about 70% of sulphur dioxide emissions, about 50% of

⁷ Center for Biological Diversity
(https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/coal/index.html)

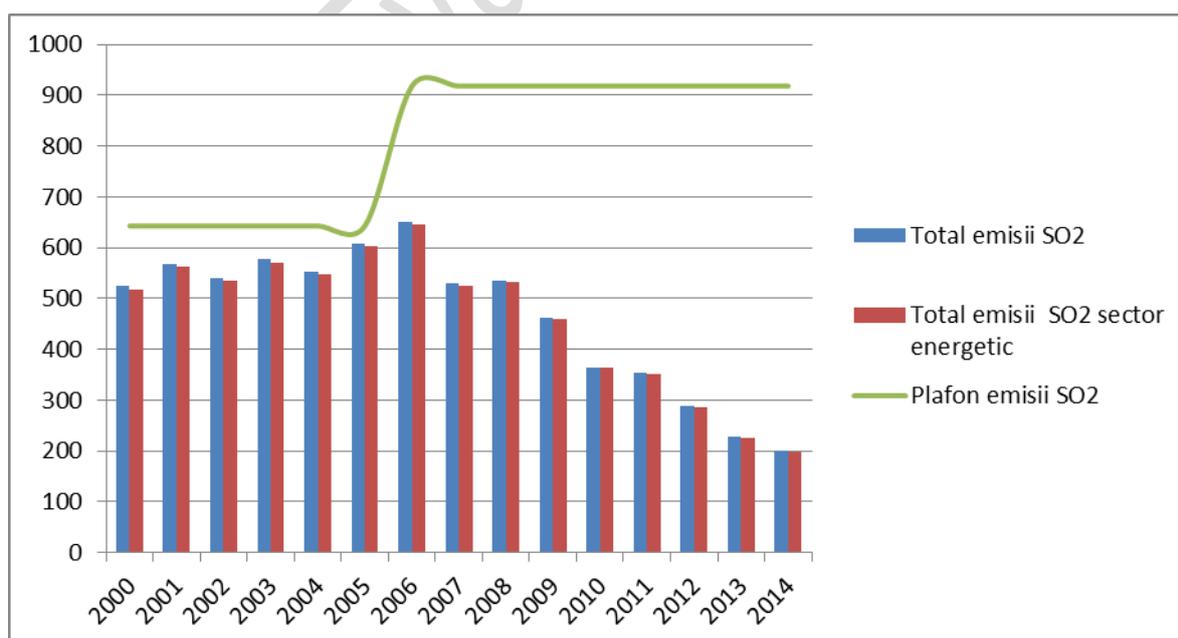
nitrogen oxide emissions, about 80% of the amount of particulate matter discharged into the atmosphere and about 80% of carbon dioxide emissions.

As a Member State of the European Union and as part of the UNECE⁸ / CLRTAP⁹ Convention, Romania publishes annual estimates of emissions of air pollutants covered by the national emissions ceiling Directive 2001/81 / EC (transposed into national legislation by GD 283/2017 for the amendment of GD 1856/2005 on national emission ceilings for certain atmospheric pollutants) and the protocols of the abovementioned Convention.

Another responsibility of the Member States is compliance with the Gothenburg Protocol emission ceilings by adopting measures to reduce the impact of anthropogenic activities on the environment. Thus, Romania has the obligation to reduce the annual limits of acidifying and eutrophying gases and ozone precursors below 918 kt for sulphur dioxide (SO₂), 437 kt for nitrogen oxides (NO_x), 523 kt for volatile organic compounds (NMVOCs) and 210 kt for ammonia (NH₃).

Below we will present the dynamics of the main pollutants (SO₂, NO_x) estimated for the period 2000-2015, as well as the presentation of the main pollutants.

Sulphur oxides (especially SO₂ - sulphur dioxide) come mainly from stationary and mobile sources by combustion of fossil fuels. Sulphur dioxide is a colourless, choking and penetrating gas which is transported over long distances by being lightly fixed to the dust particles, and in reaction with water vapor forms sulfuric acid or sulphurous acid, resulting in the occurrence of acid rain. For the 2010-2014 time horizon, of the total SO₂ emissions at national level resulted from 5 industrial activities. Thus, the largest contribution was in the energy sector: about 95% of thermal power plants and other combustion plants, followed by oil and gas refineries with about 2.5%, the cement and lime industry, the production of iron and steel and non-ferrous metal smelting amounts to approximately 2.25% (Source: Report on the state of the environment in Romania for the years 2010-2016).



⁸ The Aarhus Convention;

⁹ 1979 Convention on long-range transboundary air pollution, done at Geneva on 13 November 1979.

Figure 3 SO₂ emissions dynamics in the energy sector, relative to total emissions for the period 2000-2014 (Source: eea.europa.eu)

From the above figure it can be noticed that the SO₂ emissions both total and the energy sector, did not exceed the allocated ceilings for the reviewed period, namely 2005 and 2010. A decrease in SO₂ emissions can be noticed, however, from 2008. Also, SO₂ emissions from the energy sector have the largest share of total emissions for the whole reviewed period.

Nitrogen oxides (NO_x) result from combustion processes in stationary and mobile sources or from biological processes. Nitrogen monoxide is the most common nitrogen oxide resulting from the combination of nitrogen and oxygen at high temperatures. The main “supplier” of NO_x emissions is the energy industry, transport, combustion in the manufacturing industry, and production processes.

For the 2010-2016 time horizon, of the total NO_x emissions at national level resulted from 13 industrial activities. Thus, the largest contribution was in the energy sector: about 67% of thermal power plants and other combustion plants, followed by the cement or lime and cement industry in rotary kilns by about 13%, the phosphorous, nitrogen and potash fertilizer industry by approximately 6%, pig iron plants by about 5%, petroleum refineries and gas by about 2.5% (Source: Report on the state of the environment in Romania for the years 2010-2016).

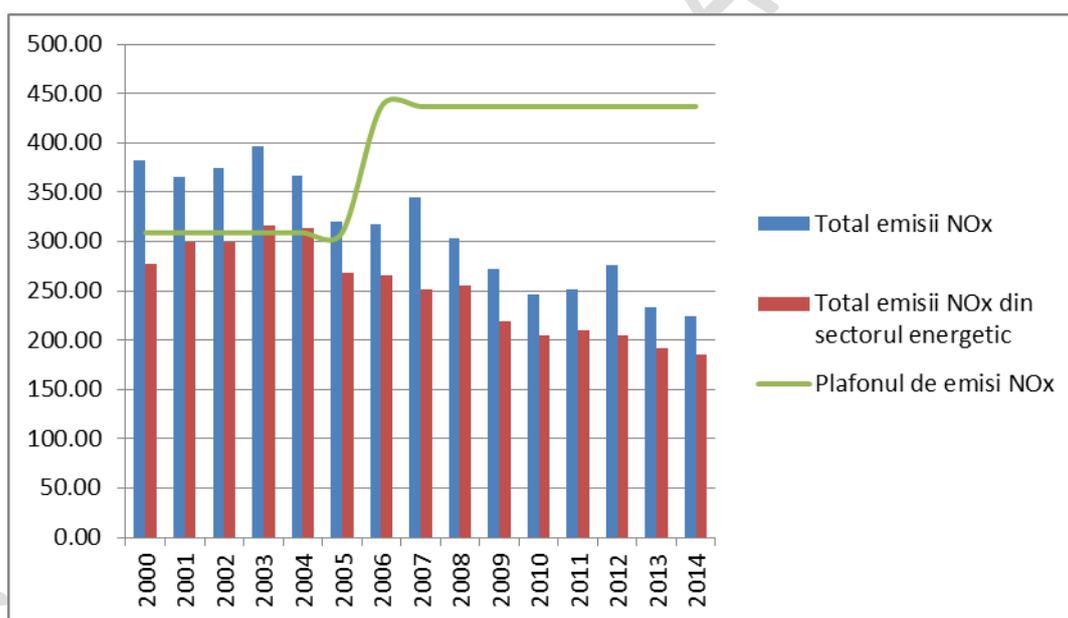
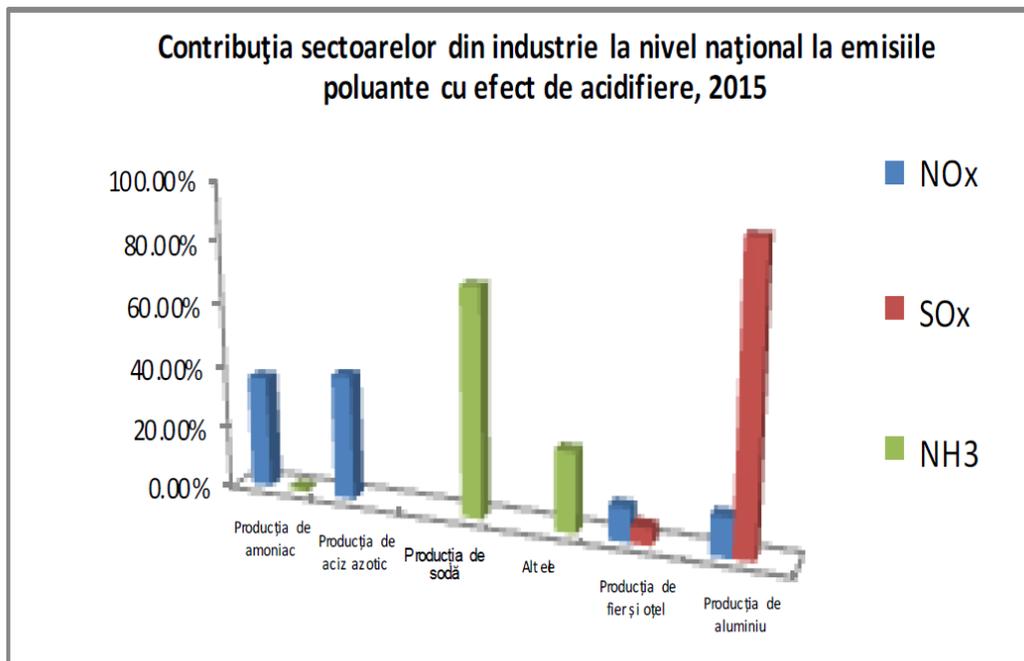


Figure 4 Dynamics of NO_x emissions from the energy sector, relative to total emissions for the period 2000-2014 (Source: eea.europa.eu)

From the above figure it can be seen that for the period under review the NO_x emissions for the period 2000-2005, the total emissions exceeded the ceiling set in the Gothenburg Protocol, while those in the energy sector are below this. For the period 2006-2014, both the total and the energy sector emissions did not exceed the allocated ceilings for the reviewed time periods. For the period 2008-2014 there is a decrease in NO_x emissions from the energy sector, even if total emissions fluctuate variably.

At national level, the acidification effect of pollutants comes mainly from the energy sector, for carbon dioxide and nitrogen oxides and from agriculture for ammonia.

At 2015, emissions of most acidifying substances with the largest share come from the sectors of activity are the aluminium production with significant sulphur dioxide values, followed by the production of nitric acid with significant figures for nitrogen oxides.



Contribution of industry sectors at national level to the acidifying polluting emissions, 2015

Figure 5 Contribution of industry sectors at national level to pollutant emissions with acidifying effect for 2015 (Source: Report on the state of the environment in Romania, 2016, ANPM)

Productia de amoniac – ammonia production

Productia de acid azotic – nitric acid production

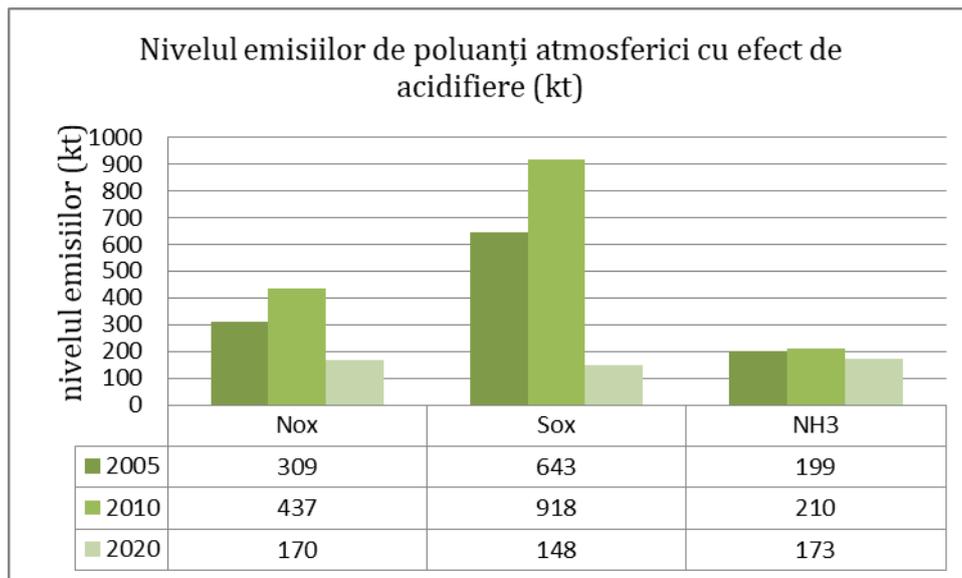
Productia de soda – soda production

Altele – others

Productia de fier si oțel – iron and steel production

Productia de aluminiu – aluminium production

Taking into account the 2010 ceilings and the revised Gothenburg Protocol on the reduction of air pollutant emissions, commitments to be achieved by 2020, it is noted that the evolution of acidifying pollutants at national level throughout the reviewed period follows a downward trend towards the threshold imposed in the revised Gothenburg Protocol.



Level of acidifying atmospheric pollutant emissions (kt)

Figure 6 Emission level of atmospheric pollutants with acidifying effect according to the ceilings of the Gothenburg Protocol 2010 (Source: Report on the state of the environment in Romania, 2016, ANPM)

With the National Transition Plan, in 2016 there were 33 large combustion plants covered by Chapter III of Directive 2010/75 / EU on industrial emissions.

RES 2019-2030, with perspectives for 2050, presents the energy mix for 2020, 2030 and 2050, i.e.:

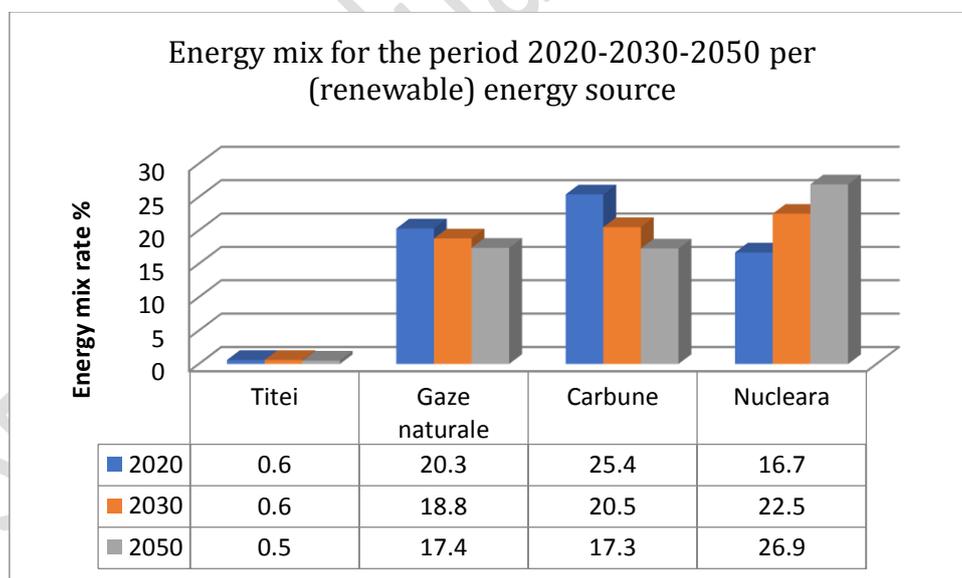


Figure 7 Energy mix for 2020-2030-2050 per source of (renewable) energy according to RES 2019-2030, with perspectives for 2050

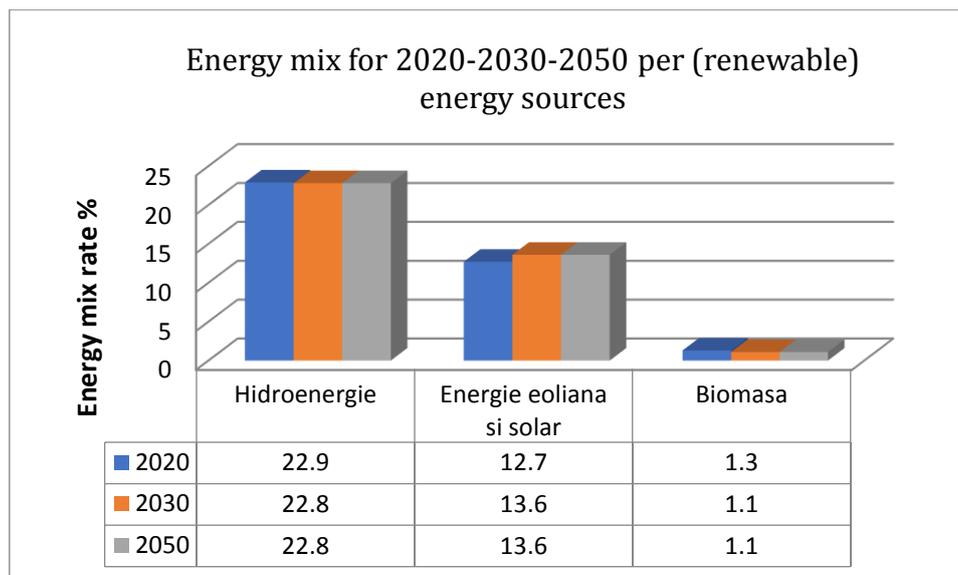


Figure 8 Energy mix for the period 2020-2030-2050 per (renewable) energy source according to RES 2019-2030, with perspectives for 2050

According to Figure 7, which contains the energy sources and their rate in the energy mix for the time periods 2020-2030-2050, we can see a decrease of the rate of coal in the energy mix, which will also result in a decrease of greenhouse gas. We can also see a decrease of the rate of natural gas in the energy mix, which will result in the decrease of compounds (CO₂, CO, NO₂, SO₂ etc.) resulting from combustion.

According to Figure 8, which contains the energy sources and their rate in the energy mix for the periods 2020-2030-2050, we notice an increase of components from renewable sources in the energy mix for the period 2020-2030 and a retention for the period 2030-2050.

Emissions to soil

The quality of soils is affected by different degrees of pollution produced by different industrial activities. In the field of soil protection, pollution means any disruption that affects their quality in terms of quality and / or quantity.

The main economic sectors with a significant impact on the soil come from: mining and metallurgy (through waste processing and storage, tailing ponds and tailings dumps), chemical industry (chemical, petrochemical and drugstore waste disposal sites, sites that are abandoned), the oil industry (through soil pollution with hydrocarbons and heavy metals), old pesticide deposits and other large-scale activities (metalworking, non-compliant domestic waste dumps, military sites, woodworking industry, coal power plants, transport activities, service activities, etc.).

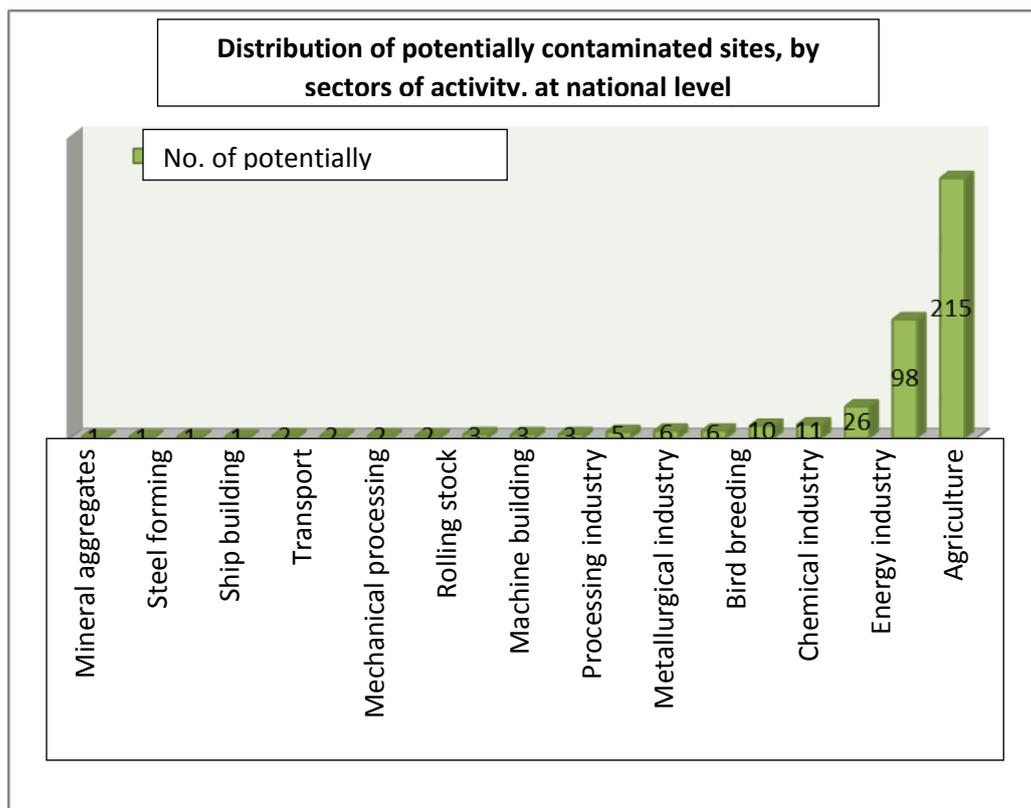


Figure 9 Distribution of potentially contaminated sites by sector at national level (Source: National Strategy and National Action Plan for the management of contaminated sites in Romania, taken from ANPM)

The information used to carry out the *distribution of potentially contaminated sites by sector at national level* was taken from the preliminary national inventory of potentially contaminated sites carried out by ANPM in 2008-2009. For these sites, there is information about the activities that have been carried out, but there is no environmental documentation for the risk assessment, i.e. the level I and / or II environmental review and / or the risk assessment report. After making these documentations, it can be determined whether the sites are contaminated or uncontaminated. From the analysis of the figure above, it can be seen that the energy industry has a number of 5 potentially contaminated sites. Also, most potentially contaminated sites are in the oil extraction industry, 215, this being also the most widespread economic activity at national level.

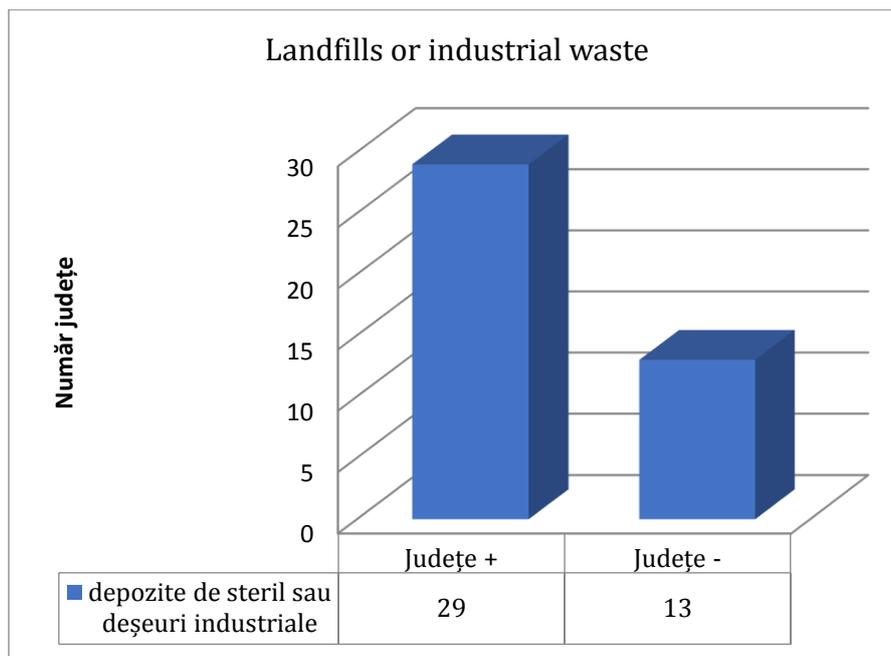


Figure 10 Representation of the counties where warehouses and/or industrial waste exist (Source: Ministry of Economic, Report - Inventory and visual inspection of landfills and ashponds in Romania, September 2017)

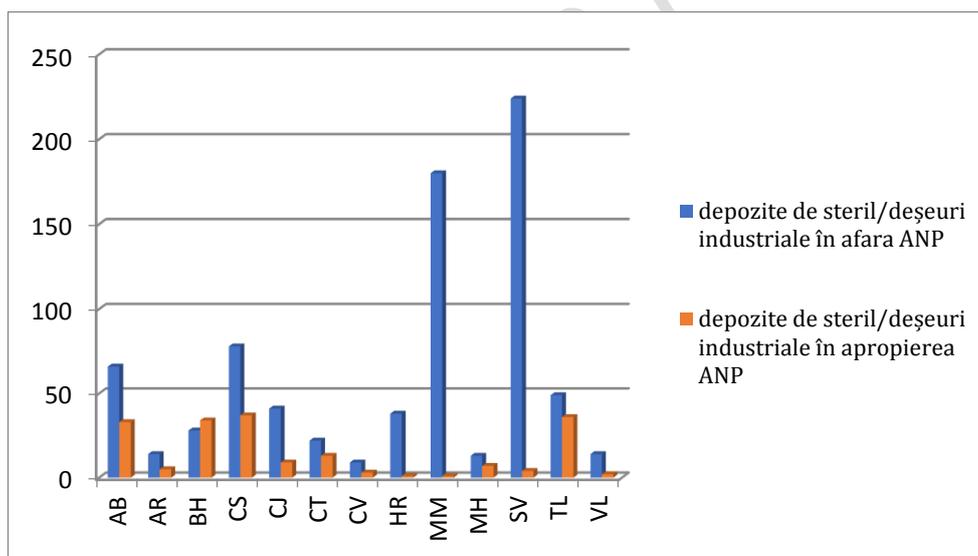


Figure 11 Representation of landfills and/or industrial waste landfills in relation to the protected natural areas (Source: Ministry of Economic, Report - Inventory and visual inspection of landfills and ashponds in Romania, September 2017)

The above figure shows the landfills and/or industrial waste landfills at the level of counties. Figure 10 presents "counties +", the counties where such landfills exist, and "Counties -" are the counties where such landfills exist. Figure 11 shows the counties where landfills and/or industrial waste exist in the vicinity of protected natural areas. Therefore, from a total of 29 counties with landfills and/or industrial waste, only 13 have such landfills situated in the vicinity of protected natural areas. Please note that no all landfills and/or industrial waste landfills come from the energy sector.

Waste

Industrial waste presents the highest annual quantities compared to other types of waste produced, such as municipal waste or agricultural waste. They can be classified into hazardous and non-hazardous waste and, depending on the resulting process, can be classified as follows:

- Wastes from the extractive sector, in this category including mining tailings or quarries;
- Waste from thermal processes carried out in the production of thermal energy / thermal power plants, in this category having mainly the ashes;
- Wastes from the metallurgical industry, such as slag and ash, dust, refractory materials, cores or crumbs;
- Ferrous or non-ferrous metal waste;
- Industrial sludges.

According to the Environment state report for the year 2016, the evolution of the non-hazardous waste quantities from the main economic activities during 2011-2015 is represented in Figure where it can be seen that the production, transport and distribution of electricity and heat, gas and water represent the sector with the largest quantities of waste generated annually. From the preliminary data of the report, the amount of waste from this sector in the year 2015 was 7,444.84 thousand tonnes, 12% more than in 2011.

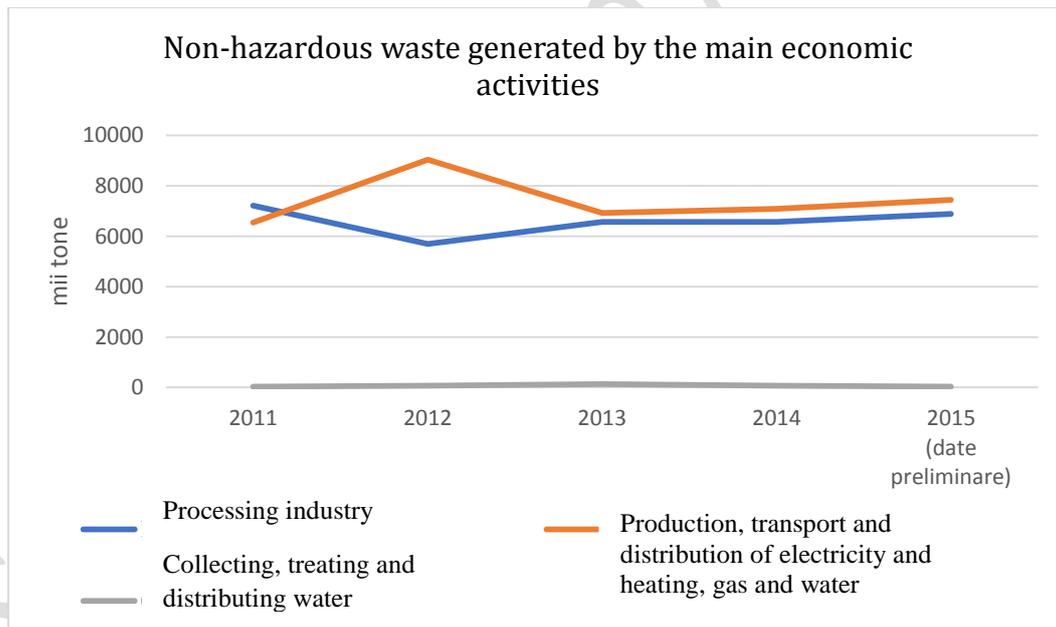
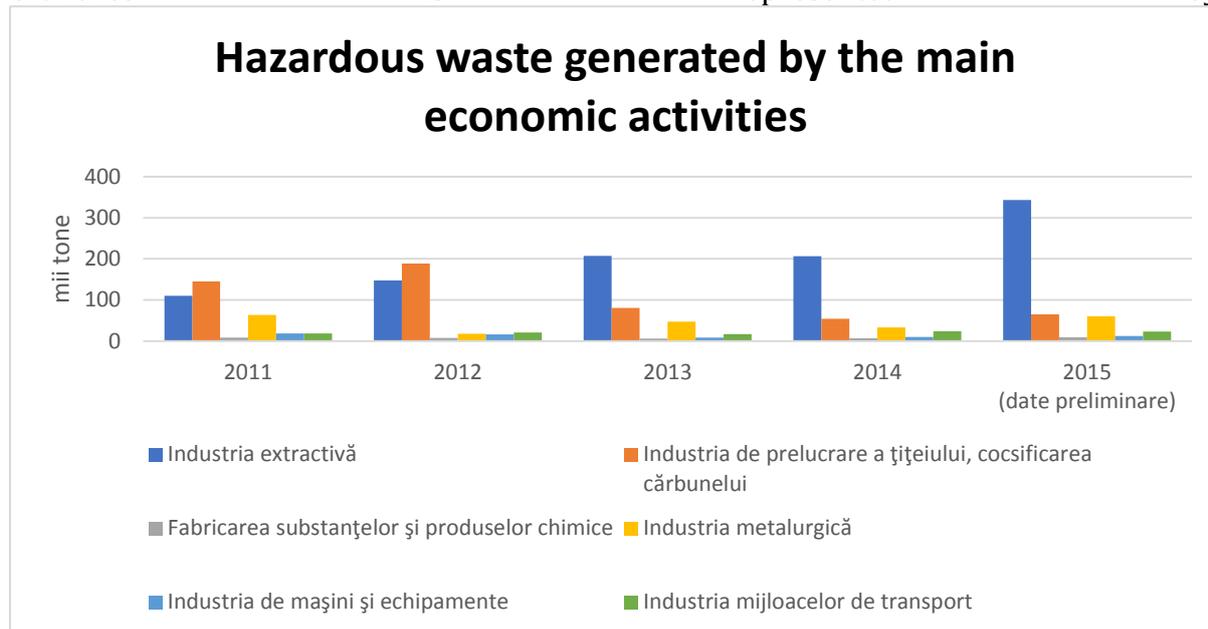


Figure 12 Evolution of the quantities of non-hazardous waste generated by the main economic activities during 2011-2015 at national level (Source: Environmental status report, 2016, ANPM)

The situation of the quantities of hazardous waste generated by the main economic branches is represented by



. The mining sector is remarkable by the largest quantities of hazardous waste generated during the period 2013-2015. The quantity of 343.37 thousand tonnes corresponding to 2015 is about 68% higher than that generated in 2011. The extractive industry is followed by the crude oil processing industry and coal coking industry for which, according to national data, a decrease in the amount of hazardous waste generated during the period 2011-2015 has been observed. Thus, the quantity of waste from the crude oil processing industry and the coking of coal in 2015 is 64.89 thousand tonnes, 55.3% less than that generated in 2011.

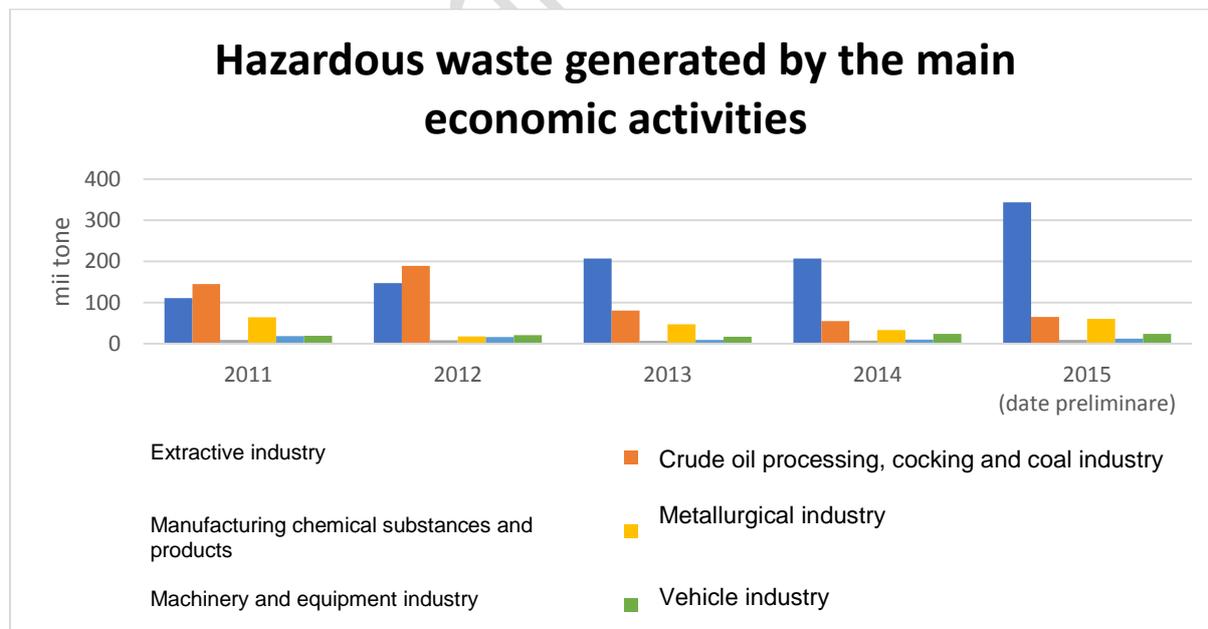


Figure 13 Evolution of the quantities of hazardous waste generated by the main economic activities during 2011-2015 at national level (Source: Environmental status report, 2016, ANPM)

In order to efficiently manage waste from the economic sectors, the European Union has adopted a series of policies aimed at reducing the impact of waste on the environment and health, as well as improving energy efficiency. The main long-term objective implemented at European Union level is to reduce the amount of waste generated and, where this may not be avoided, to use it as a resource to achieve higher levels of recycling and safe disposal.

According to the National Waste Management Plan (PNGD), non-hazardous industrial waste management is carried out in own facilities for recovery or disposal, as well as in authorized installations to which the transport is carried out either by authorized collectors or by generators. The situation of authorized economic operators for the recovery of industrial non-hazardous waste in the year 2016 is presented in *Table 1*.

Table 1 Number of authorized economic operators for the recovery of non-hazardous industrial waste at the level of 2016 by development regions (Source: PNGD 2017)

Development region	Number of authorized operators for the recovery of industrial non-hazardous waste
N-E	126
S-E	197
S	116
S-W	76
V	48
N-W	174
Center	142
Bucharest - Ilfov	7
TOTAL	886

The evolution of the quantities of industrial waste generated, recovered and disposed of in the period 2010-2014, with the main source of provenance from the manufacturing and thermal processes, is presented in Figure 14. It is noted that most of the waste from the processing industry is being recovered and that most of the waste resulting from the production and supply of energy is eliminated.

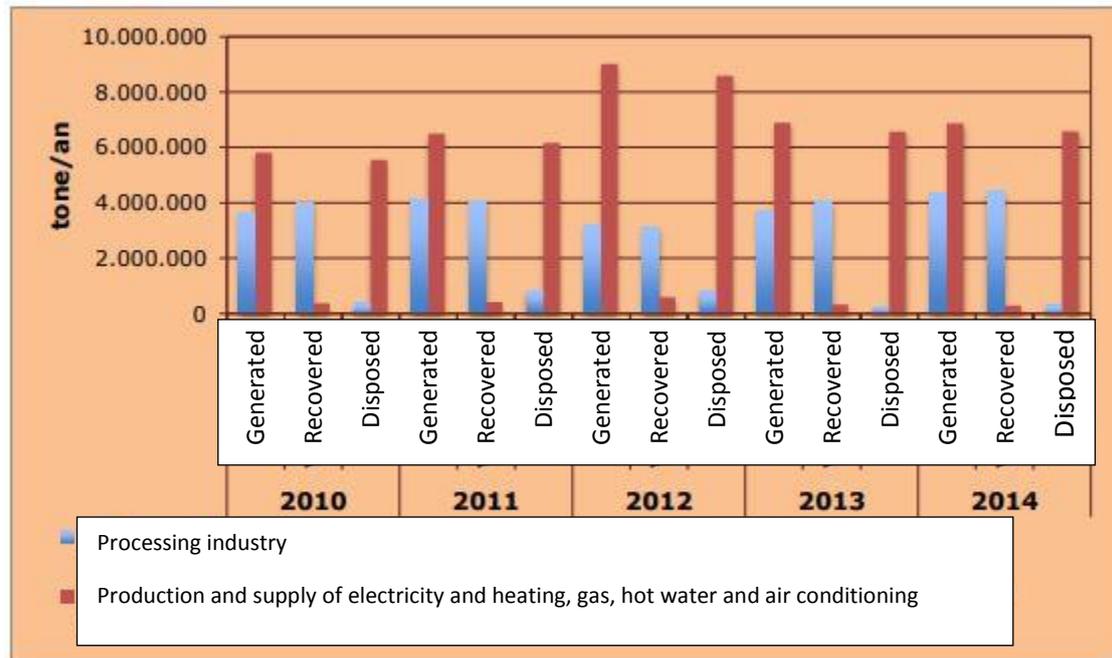


Figure 12 Generation, recovery and disposal of industrial waste in the period 2010-2014 at national level (image taken from PNGD; data source: ANPM)

Of the total amount of the recovered non-hazardous industrial waste, the highest share is energy-used waste (R1 - mainly used as a fuel or other energy source) and recycling / recovery of organic substances (R3). In both recovery cases mentioned above, the main category of wastes is the waste from wood processing (sawdust, shavings, chips, chipboard and veneer). In their case, energy recovery is achieved by using as fuel in thermal power plants.

Concerning the category of waste resulting from the production of electric and thermal energy, only about 4% (300.851 tonnes) of the total quantity was recovered in 2014. Of the total amount recovered, approximately 76% was recovered by operation R12 (the exchange of waste for exposure to any of the R1-R10 operations). In the case of hearth ash and fly ash (codes 10 01 01 and 10 01 02), the recovery operation was R5 (recycling / recovery of other inorganic materials), and in the case of wastes from gas scrubbing (code 10 01 19) the recovery operation used was R1 (energy recovery). The share of capitalization operations is represented in *Figure 13*.

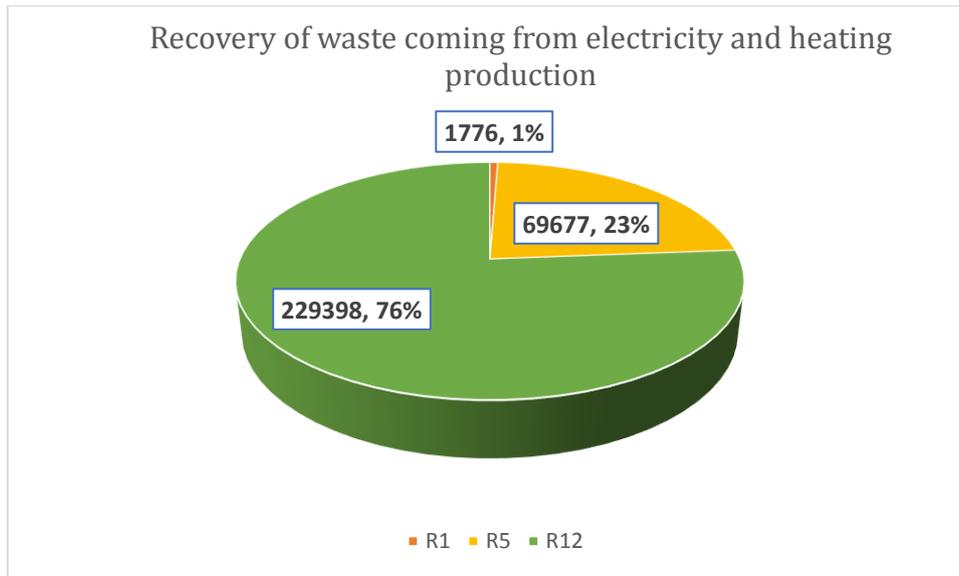


Figure 13 The share of the quantities of waste from the production of electricity and thermal energy utilized by recovery operations R1, R5 and R12 (source: PNGD ver. 5, 2017)

Noise

Noise is one of the stress factors for wild fauna species.

By implementing the investment objectives in the energy generation sector under RES 2019-2030, with perspectives for 2050, noise can be generated in both building and operating phases. The noise levels mentioned in SR 10009/2017 on the admissible noise level limits shall be taken into account. Considering the fact that the investments are different, but also that there is not a high level of detail at the time of elaboration of this study, please note that the noise level may not be estimated for each proposed type of objective / project. This analysis will be carried out in the environmental agreement issuance procedure (environmental impact assessment) for each type of project.

All activities involving the existence of noise sources located in the vicinity or inside protected natural areas may generate a potential negative impact on fauna species. The types of investment objectives in the electricity generation sector under RES 2019-2030, with perspectives for 2050, that could generate a significant noise source, belong to the coal-producing sub-sector whose negative effects can be felt on large distances (e.g. by affecting areas of breeding and nesting of bird species).

According to the literature for the energy sector there is no data on the effects of noise on the species of Community importance within the Natura 2000 ecological network in Romania. Please note that the noise produced by the energy objectives is intermittently caused for short periods of time or can be permanent in the case of actual operation of some installations. In order to avoid potential adverse effects on species of Community importance, it is advisable to maintain the following distances: 200 meters for medium impact activities or 500 meters for high impact ones.

Noise-generating sources are also generating vibrations, in most of the cases. Please note that all activities involving human presence on the ground are generating

vibrations, most of which can be felt by animals, depending on species and distances from generating sources.

II.7 REQUIREMENTS RELATING TO LAND USE, NECESSARY FOR IMPLEMENTING THE STRATEGY

RES 2019-2030, with perspectives for 2050 aims to implement the proposed energy investment objectives in 7 development regions (Southeast, South, Southwest, West, Northwest, Central and Northeast Development Region) and surrounding areas, with the role of addressing, managing and solving the problems identified in several energy sub-sectors.

In order to identify the land use categories covered by RES 2019-2030, with perspectives for 2050, the approximate limits of the projects whose status is a strategic one and which will not be achieved on existing sites were considered in the analysis.

Corine Land Cover 2012 was used to determine the areas and land use categories.

The energy production subsector corresponds to the values shown in Table 2 .

Table 2 Land plots by land use types that will be occupied permanently and temporarily with the achievement of the RES objectives

Code and category of land use		Surface (ha)
Code	Name	
112	Localities - Discontinuous built areas	190.4
121	Industrial or commercial areas	46.1
123	Ports	44.4
131	Mining operations	52.3
211	Non-irrigated arable areas	341.4
221	Vineyards	38.1
231	Grazing land	1389.5
242	Complex cultivation patterns	914.2
243	Areas occupied mostly by agriculture with significant surfaces of natural vegetation	1125.6
311	Broadleaf forests	9667.7
312	Coniferous forests	1691.4
313	Mixed forests	530.4
321	Natural grasslands	1154.8
324	Transition areas between forests and shrubs	336.0
331	Beaches	10.2

Code and category of land use		Surface (ha)
Code	Name	
332	Rocks and grooves	22.9
411	Swamps	8.9
511	Rivers	2388.5
512	Lakes	93.7

The localization of access and technological roads, gutters and supporting walls or other constructive elements connected to the objectives related to the investment categories proposed by RES 2019-2030, with perspectives for 2050, is proposed, as far as it is possible, to be made outside the protected area, these will be fitted according to the internal zoning of that protected natural area, mentioned in the management plan.

For the energy transport subsector, information on the land plots occupied by the implementation of the RES objectives is presented in Table 3.

Table 3 Corresponding information to objectives belonging to the energy transport subsector

No.	RES objective	According to the Environmental Agreement
1	The new 400 kV dc OHL (with an equipped circuit) between existing stations Smârdan and Gutinaș	Of the length of 138 km of LEA, about 3.483 km cross forest lands, on the territory of which, in the stage of ecological construction and reconstruction, a 54 m wide corridor will be gutted, resulting in the area of 18.8084 ha of deforested land, from which: On the territory of Bacău County - 8.6086 ha of broadleaf forest, of which 0.2731 ha is on ROSCI0162 territory; On the territory of Vrancea County - 5.6778 ha of deciduous forest and 575 m away from the LEA intersects a plantation of walnut and acacia with the height of the specimens of 3 - 6 m; On the territory of Galati county - 4.5219 ha of deciduous forest, of which 0.1080 ha of poplar plantation in the form of a curtain in the Cosmesti area, an area in which the territories ROSCI0162 and ROSPA0071 Lunca Siretului Inferior overlap territorially.
2	New 400 kV dc OHL between the existing Cernavodă and Stâlpu stations with an inlet / outlet at the 400 kV Gura Ialomiței station	In order to realize the 400 kV Cernavodă - Stâlpu LEA and to connect to Gura Ialomiței station, it is necessary: to remove from the forest area the surface of 65129 sq. m., of which 1837 sq. m permanent occupation and 63292 sq. m temporary occupation; deforesting an area of 64920 sq. m. of which 1837 sq. m. permanent deforestation and 63083 sq. m. temporary deforestation; deforesting an area of 0.0598 ha (598 sqm) from ROSCI0022 Canaralele Dunarii. For deforested areas, replanting in other areas is required, in agreement with Forest Directorates and custodians in the affected areas, in a ratio of 1/1 and with the same species that will be deforested. Total deforested areas are the areas to be occupied by the pillars, and the temporarily deforested areas are those necessary for the construction of work and safety corridors.

No.	RES objective	According to the Environmental Agreement																								
		<p>The surfaces necessary for the corridors are to be mostly repopulated with species similar to the deforested ones. With the exception of the Danube meadow areas and the Borcea branch, the LEA route avoids areas with forests. In the crossing area of ROSCI0290 Ialomita Corridor, there are no meadow forests but only grassy vegetation. In the maintenance phase of the 400 kV Cernavoda-Stalpu LEA, no deforestation will be carried out, but only tree dressing, to avoid reaching the active conductors by the high crowns or extending the trees into the passageways and safety corridors. Only those trees and shrubs that pose a real danger of falling over electric lines or supporting posts during storms will be cut.</p>																								
3	400 kV Porțile de Fier - Anina - Reșița OHL	<p>The total area required for the project through deforestation is 148.1270 ha. Of this, 80.4370 ha (54.3%) are located on the surface of protected natural areas as follows:</p> <table border="0"> <tr> <td>ROSCI0206</td> <td>Porțile de Fier</td> <td>0.0325%</td> </tr> <tr> <td>ROSCI0198</td> <td>Platoul Mehedinți</td> <td>0.0189%</td> </tr> <tr> <td>ROSCI0069</td> <td>Domogled - Valea Cernei (RN Iardașița)</td> <td>0.0012%</td> </tr> <tr> <td>ROSCI0226</td> <td>Semenic - Cheile Carașului</td> <td>0.0069%</td> </tr> <tr> <td>ROSCI0031</td> <td>Cheile Nerei-Beușnița</td> <td>0.0662%</td> </tr> <tr> <td>ROSPA0080</td> <td>Munții Almăjului - Locvei</td> <td>0.0345%</td> </tr> <tr> <td>ROSPA0086</td> <td>Munții Semenic - Cheile Carașului</td> <td>0.0071%</td> </tr> <tr> <td>ROSPA0020</td> <td>Cheile Nerei - Beușnița</td> <td>0.0618%</td> </tr> </table>	ROSCI0206	Porțile de Fier	0.0325%	ROSCI0198	Platoul Mehedinți	0.0189%	ROSCI0069	Domogled - Valea Cernei (RN Iardașița)	0.0012%	ROSCI0226	Semenic - Cheile Carașului	0.0069%	ROSCI0031	Cheile Nerei-Beușnița	0.0662%	ROSPA0080	Munții Almăjului - Locvei	0.0345%	ROSPA0086	Munții Semenic - Cheile Carașului	0.0071%	ROSPA0020	Cheile Nerei - Beușnița	0.0618%
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ROSPA0086	Munții Semenic - Cheile Carașului	0.0071%																								
ROSPA0020	Cheile Nerei - Beușnița	0.0618%																								

II.8 ADDITIONAL SERVICES REQUIRED BY THE IMPLEMENTATION OF THE STRATEGY

The implementation of investment objectives in the energy sector for the production of electricity may require the provision of additional services such as decommissioning / relocating of objectives, constructions, additional occupation of land plots in the vicinity of the sites, which requires identifying the ways in which such additional services could affect areas in the area of protected natural sites of Community interest, if they overlap or are in their immediate vicinity.

Note that at the time of the study, it is difficult to estimate the type and / or amount of additional services, taking into account both the diversity of projects, and the degree of detail of the projects included in RES 2019-2030, with perspectives for 2050. These services could arise in projects involving the construction of new power generation units, water accumulations for hydroelectric facilities or the creation of new underground gas storage facilities etc.

The works that will be carried out for the construction/modernization/streamlining of the objectives proposed in RES 2019-2030, with perspectives for 2050 must consider first the regulation of the protected natural area. Insofar as it is possible, avoid constructions in areas where priority species and habitats exist. An example in this

sense is the execution of water accumulations for hydroenergy fittings that may affect the protected natural areas by reducing the water flow that priority species and/or habitats need, by changing the hydrogeomorphological dynamics of the bed etc.

We recommend that these issues should be considered at project level, on a case-by-case basis, in the environmental agreement procedure (environmental impact assessment), in more advanced details.

In terms of the impact on the elements that make the Natura 2000 ecological network we consider it appropriate for any other additional activity deriving from the implementation of the proposed investment objectives in the proposed electricity sector to be reviewed in relation to them.

II.9 DURATION OF THE CONSTRUCTION, OPERATION, DECOMMISSIONING OF THE STRATEGY AND SCHEDULING THE PERIOD OF IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050

RES 2019-2030, with perspectives for 2050, is based on the implementation of energy investment objectives for power generation. Their vision of development has as target date the timeframes 2019-2030, with the prospect of 2050.

Thus, for 4 of the investment objectives, time horizons for their implementation are defined, while for the rest neither the implementation manner, the exact location or the implementation timetable are specified. Below we present the four investment objectives for which there is a timetable for implementation:

- Completion of groups 3 and 4 at Cernavoda nuclear power plant - the time horizon of 2030 is foreseen for the completion and commissioning of the two nuclear units and also the capacity of electric power generation will be increased by 1440 MW;
- Achieving a new 600 MW power plant at Rovinari - provided with the time horizon of 2035 for the realization of a new lignite thermoelectric power plant with supercritical parameters, corresponding to the technology of capture, transportation and geological storage of CO₂;
- The construction of the hydroelectric power plant with Tarnița - Lăpuștești with accumulation by pumping does not have a clear time horizon for this type of investment, but there will be the prerequisites for including the energy produced by this type of investment at the level of 2030;
- The construction of Turnu-Măgurele-Nicopole hydrotechnical complex - there is no clear period for this type of investment, but this should fall into the period of RES, i.e. 2019-2030.

Please note that in the absence of a detailed implementation schedule for all investment objectives in the energy sector that envisage the generation of electricity proposed by RES 2019-2030, with perspectives for 2050, the present study could not take into account the temporal dynamics of the forms of impact. A series of monitoring indicators and the competent supervisory authorities, as well as the monitoring frequencies were identified without knowing the time period for them.

II.10 ACTIVITIES TO BE CARRIED OUT AS A RESULT OF THE IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050

RES 2019-2030, with perspectives for 2050, has 10 projects as main investment objectives in the energy sector to produce electricity.

The types of activities that will be generated as a result of the implementation of the investment types proposed by RES 2019-2030, with perspectives for 2050 may differ depending on the energy sub-sector. The table below presents the types of activities that can be generated as a result of the implementation of proposed investment types on energy sub-sectors.

Table 4 Types of activities that may be generated as a result of the implementation of the investment objectives proposed under RES 2019-2030, with perspectives for 2050

Types of investments / projects	Possible activities resulting from the implementation of proposed types of objectives
Nuclear subsector	
Completion of groups 3 and 4 at Cernavoda nuclear power plant	Water quality protection activities to eliminate or mitigate any adverse impacts on surface and underground waters (for the construction and erection phase as well as for the testing / operation phase); Appropriate management of the types of waste resulting both in the construction phase and in the operational phase; Electricity generation, connection to the electricity transmission and distribution network;
Coal subsector	
Realization of a new 600 MW power plant in Rovinari	Activities for preventing the generation of waste and the adequate management of the types of waste resulting in the stage of construction and in the stage of operation/closing/post-closing of the activity: Water quality protection activities to eliminate or mitigate any adverse impacts on surface and underground waters (for the construction and erection phase as well as for the testing / operation phase); Soil and subsoil protection activities to protect it from surface exploitation to provide raw material; Electricity generation, connection to the electricity transmission and distribution network;
Realization of a new 400 MW power plant with ultra supercritical parameters in Turceni	
Gas subsector	
Realization of a new 200MW CCGT - Craiova II energy group, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești	Prevention of waste generation and appropriate management of the types of waste resulting both in the construction phase and in the operational/closing/post-closing phase; Electricity generation, connection to the electricity transmission and distribution network;
Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia	
Hydropower subsector	
Realization of the pumped-accumulation hydroelectric	Electricity and thermal energy production activities from renewable resources;

Types of investments / projects	Possible activities resulting from the implementation of proposed types of objectives
power plant in Tarnița-Lăpuștești	Electricity and thermal energy production activities from renewable resources; Maintenance of equipment (e.g. turbine, boiler, auxiliary, steam collector, electric motors, fans, etc.); Connection to electricity transmission and distribution network, electricity generation capacities from renewable resources; Activities to monitor the transport and distribution of electricity safely.
Realization of hydroelectric power plant Turnu Magurele - Nicopole 500MW	
Realization of a hydroelectric power plant 35 MW at Rostolița	
Realization of hydroelectric power plants on the Jiu River 90 MW	
Realization of hydroelectric power plants on the Olt River 145 MW.	

II.11 EXISTING, PROPOSED OR APPROVED PP FEATURES WHICH MAY HAVE A CUMULATIVE IMPACT ON THE STRATEGY THAT IS IN THE ASSESSMENT PROCEDURE AND MAY AFFECT THE PROTECTED NATURAL AREAS OF COMMUNITY INTEREST

The Energy Strategy of Romania 2019-2030, with perspectives for 2050, aims to develop a number of energy objectives for an extended time horizon, i.e. by 2050. Basically, it will include a number of different projects, namely:

- Completion of groups 3 and 4 at Cernavoda nuclear power plant;
- Realization of a new 600 MW power plant in Rovinari;
- Realization of a new 400 MW power plant with ultra supercritical parameters in Turceni;
- Realization of a new 200 MW CCGT-Craiova II power plant, on gas with flexible operation including the storage of energy resources in the Ghercești underground deposit;
- Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia;
- Achieving CHEAP Tarnița - Lăpuștești;
- Realization of hydroelectric power plant Turnu Magurele - Nicopole 500 MW;
- Realization of CHE Rostolita - 35 MW;
- Realization of hydroelectric power plants on Jiu - 90 MW;
- Realization of hydroelectric power plants on Olt - 145 MW.

The types of projects cover several subsectors in the energy sector (nuclear, hydro, gas, or coal), but those potentially impacting cumulatively with other existing, proposed or approved PPs that may affect the protected natural areas of Community interest are those which involve construction works.

At this stage, it is difficult to carry out a detailed analysis to quantify the potential cumulative impact of the projects proposed by RES 2019-2030, with perspectives for 2050 with other proposed / approved / existing plans or projects, following the current spatial detail of both types of interventions / projects of RES 2019-2030, with perspectives for 2050, as well as of the rather vague spatial information on the location

of the proposed projects. Also, at the time of this study, no other types of projects proposed in the objective implementation area are known.

We can identify a few examples of cumulative general impact, as follows: the fragmentation, alteration or loss of the habitats corresponding to protected natural areas. We mention that a cumulative impact can be identified on the Danube by implementing the strategic objectives for the *execution of Turnu-Magurele-Nicopole hydroenergy complex* and the execution of the FAST DANUBE project. The types of cumulative impact can be mentioned after the execution of two adequate evaluation studies at the level of the project.

The types of cumulative impact for the two projects mentioned above can be grouped as follows:

- ✓ Identification of the environmental components and factors that can be affected by the two projects; the environmental factors likely to be affected are: water, biodiversity, etc.;
- ✓ Identification of the potential impacts of the identified objects on each component / environmental factor; the location and characteristics of the existing projects (occupied territory, production and technology process, operating condition, polluting substances, if applicable; these impacts will be exemplified in the project, as for the strategic objective achievement of the Turnu-Magurele-Nicopole hydro-energy complex, at the time of this study, there is no technical data to refer to.

All types of projects, as mentioned above, require the implementation of appropriate project-based measures based on appropriate assessment studies to reduce potential negative impacts on species and habitats, part of the Natura 2000 ecological network. Such measures should avoid the possible cumulative effects generated by the implementation of RES 2019-2030, with perspectives for 2050.

III. INFORMATION ABOUT NATURAL PROTECTED AREAS OF COMMUNITY INTEREST AFFECTED BY THE IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050

III.1 GENERAL INFORMATION REGARDING NATURA 2000 NETWORK IN ROMANIA

General presentation of the Natura 2000 ecological network in Romania and its legislative framework

The Natura 2000 network was established in 1992 and is the largest ecological network of protected natural areas in the world, including sites of Community importance (SCIs designated for the protection of habitats and species in Annex I and II of the Habitats Directive), and special bird protection sites (SPAs designated for the protection of bird species in Annex I of the Birds Directive). The creation of the Natura 2000 network has established a special protection regime for natural habitats and wild flora and fauna species as well as for wild bird species existing within the European Union that are considered rare, have a restricted or highly fragmented area or are threatened with extinction, while protecting other species and natural habitats not found in Annex I or II of the Habitats Directive or Annex I of the Birds Directive. The Natura 2000 ecological network was established not only for the protection of wild flora and fauna and natural habitats, but also for their preservation, maintenance of natural capital diversity, promotion of traditional activities and long-term sustainable development.

Two EU Directives have been the basis for the establishment of the Natura 2000 network, which regulate the selection, designation and protection of habitats, species and sites:

- Birds Directive - Council Directive 79/409 / EEC on the conservation of wild birds, repealed and replaced in 2009 with Directive 2009/147 / EC, contains 7 Annexes, Annex I lists species for which special measures for the conservation of their habitats are required, in order to ensure their survival and breeding in the area of distribution;
- Habitats Directive - Council Directive 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora includes 6 annexes, Annex I lists the types of natural habitats of Community interest (including priority ones) for whose conservation it is necessary to designate special areas of conservation, while Annex II lists species of wild fauna and flora of Community interest (including priority ones) for the conservation of which special areas of conservation are required.

The two European Directives have been transposed into Romanian legislation by GEO no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild flora and fauna, approved with amendments and additions by Law no. 49/2011, as subsequently amended and supplemented by Law no. 73/2015 regarding the approval of Government Ordinance no. 20/2014 for the amendment of GEO no. 57/2007 on the regime of natural protected areas, the preservation of natural habitats, wild flora and fauna, which besides the species listed in the directives, which are found on the territory of our country, also those species considered important for Romania, which

require a special protection regime. Also, GEO no. 57/2007 contains an additional annex (Annex 4B) in which species of national interest requiring strict protection are presented.

III.2 DATA ON PROTECTED NATURAL AREAS OF COMMUNITY INTEREST WHICH MAY BE AFFECTED BY RES 2019-2030, WITH PERSPECTIVES FOR 2050

The identification of Natura 2000 sites potentially affected by the implementation of the projects foreseen in the *Romanian Energy Strategy 2019-2030, with prospects for 2050*, was carried out by an analysis in which the following data were used:

- Proposed projects in the energy sector, i.e. in the two subsectors: energy production and transport. Their placement was made using geospatial information vectored by the Provider pursuant to the Beneficiary's indications. In the case of LEA targets, information from environmental agreements was used;
- The boundaries of the protected natural areas and Natura 2000 sites in Romania in shp format (updated on 29.08.2017), available on the website of the Ministry of Environment ¹⁰ ;
- Standard Forms of Natura 2000 sites in Romania (updated on 29.08.2017), available on the website of the Ministry of Environment ¹¹;
- Management plans for protected natural areas (with the sources mentioned in chapter VIII Bibliography).

The analysis was carried out through two approaches:

- Identifying the specific elements of the RES objectives intersecting Natura 2000 sites;
- Identify objectives that do not intersect Natura 2000 sites but which are located less than 1 km away from them.

We consider it necessary to point out that there are several objectives for which no concrete data on their location and on the areas of the land temporarily or permanently occupied by their realization were available. This is due to the strategic stages of the objectives. From this point of view, the projects were classified as follows:

- projects that target existing sites and will be deployed within them, these being the only projects that have a concrete location;
- projects for which spatial location was made by different methods: 1) By georeferencing and digitizing existing images with project location ¹² ; 2) For projects where site boundaries are not exactly known, surfaces were approximated by creating buffers around point-based vectors.

¹⁰ <http://www.mmediu.ro/articol/date-gis/434>

¹¹ <http://www.mmediu.ro/articol/natura-2000/435>

¹² In the case of the objective *Realization of the hydroelectric power plant Tarnița-Lăpuștești with accumulation by pumping*, the location of the project was made by georeferencing the image regarding the localization of the HidroTarnița project, based on the indications of the Beneficiary (<http://www.hidrotarnita.ro/localizare/>)

Identification and localization of the objectives under RES 2019-2030, with perspectives for 2050 in relation to the Natura 2000 Network

Following the detailed analysis of *Romania's Energy Strategy 2019-2030, with perspectives for 2050*, the following objectives were identified (Table 5):

Table 5 Objectives identified and targeted by Romania's Energy Strategy 2019-2030, with perspectives for 2050

It. no.	Objectives RES 2019-2030, with perspectives for 2050
Power generation	
1	Completion of groups 3 and 4 at Cernavoda nuclear power plant
2	Realization of a new 600 MW power plant in Rovinari
3	Realization of a new 400 MW power plant with ultra supercritical parameters in Turceni
4	Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești
5	Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia
6	Realization of a hydroelectric power plant with accumulation by pumping at Tarnița-Lăpuștești
7	Realization of a hydroelectric power plant at Turnu Magurele - Nicopole 500 MW
8	Realization of a hydroelectric power plant 35 MW at Rostolița
9	Realization of hydroenergy power plants on the Jiu River 90 MW
10	Realization of hydroenergy power plants on the Olt River - 145 MW
Energy transport	
11	The new 400 kV dc LEA (with an equipped circuit) between existing stations Smârdan and Gutinaș
12	New 400 kV dc LEA between the existing Cernavodă and Stâlpu stations with an inlet / outlet at the 400 kV Gura Ialomiței station
13	Expansion of the 220/110 kV Stâlpu station by building the 400/110 kV station
14	LEA 400 kV Porțile de Fier - Anina - Reșița
15	New 400 kV dc LEA between existing stations Resita (Romania) and Pancevo (Serbia)
16	Switching to 400 kV of LEA 220 kV dc Reșița-Timișoara-Săcălaz-Arad
17	Expansion of the 220/110 kV Resita station by building the new 400/220/110 kV Resita station;
18	Replacement of the 220/110 kV Timisoara station by construction of the new 400/220/110 kV station.

Their location and the procedure for locating each unit will be shown in the following figures.

ENERGY PRODUCTION

❖ *Completion of groups 3 and 4 at Cernavoda nuclear power plant*

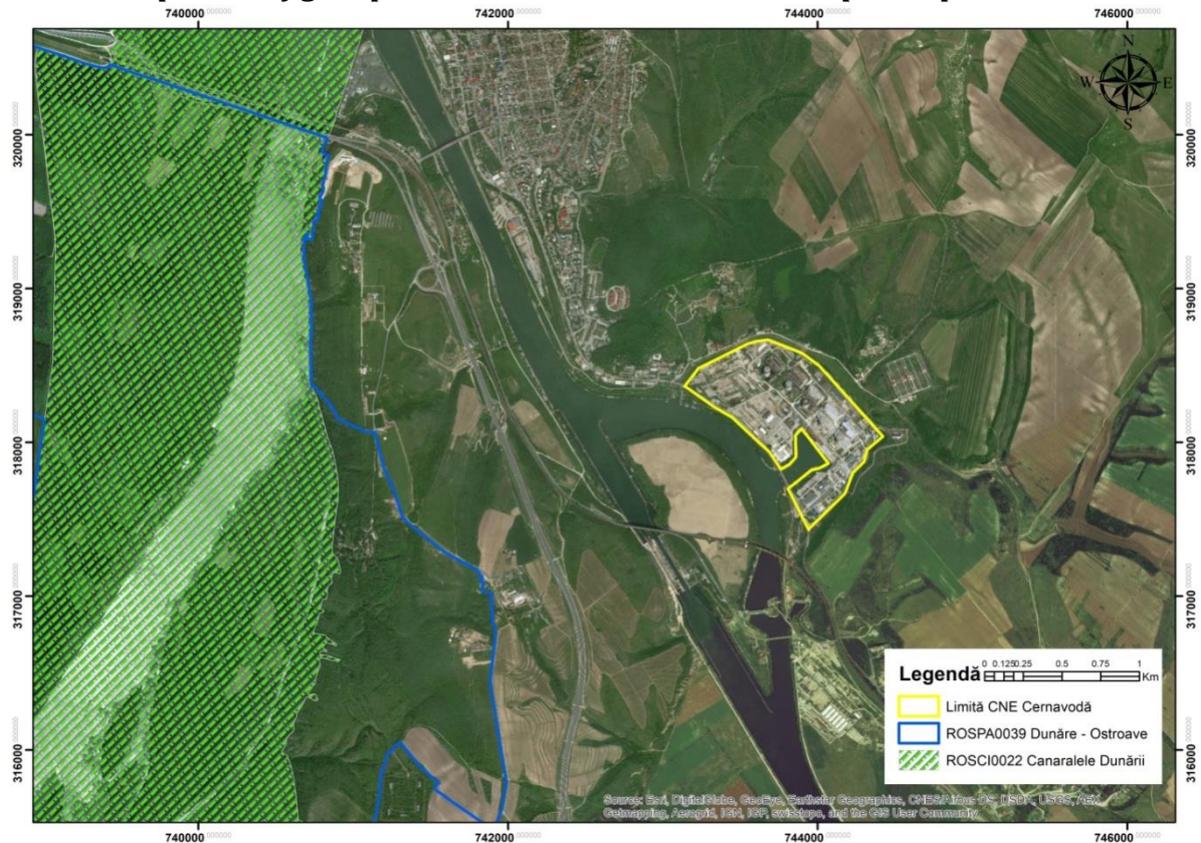


Figure 14 Locating the objective "Completion of Groups 3 and 4 at Cernavoda NPP"

The location of the objective was made taking into account the fact that it refers to the existing site of Cernavoda NPP that does not intersect Natura 2000 sites.

We mention that "The completion of groups 3 and 4 at Cernavoda NPP" has an Environmental permit approved by Government Decision no. 737/25.09.2013.

The impact on biodiversity as a result of the discharge of cooling water was reviewed within the appropriate assessment study, starting from the assumption that a 4-unit nuclear power plant is in the vicinity of some Natura 2000 sites. The stations for special measurements made vertically (on the water column) and in cross-section (left bank - mid-channel - right bank) in the water surface area with modified temperatures were 3 and, according to the summary to the Appropriate assessment of the environmental impact of Units 3 and 4 of the C.N.E. Cernavoda - Impact on biodiversity (INCDDD, 2012), were located as follows: P1 - 700 m downstream from the outlet of the cooling water discharge channel, P2 - 1.5 km downstream from the outlet of the cooling water discharge channel and P3 - 2.5 km downstream from the outlet of the cooling water discharge channel.

Among the most important conclusions for the appropriate assessment of the environmental impact of Units 3 and 4 of the C.N.E. Cernavoda, according to the Environmental Agreement, please note:

- ❖ The impact of the project of Units 3 and 4 is insignificant, the simultaneous operation of the 4 nuclear units on the site of C.N.E. Cernavoda not affecting the favourable conservation status of habitats and species, including those of community interest present in the territories of the nearest Natura 2000 sites (ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava și ROSPA0017 Canaralele de la Hârșova);
- ❖ There was no significant negative impact identified on the evolution of flora and fauna in the influence area of the project due to the process hot water discharges in the Danube;
- ❖ In the event of accidents, the environmental impact assessment documentation provides for operating procedures, measures for the intervention of the nuclear power plant personnel, as well as other responsible authorities;
- ❖ The effects on the natural succession and composition of the reophyll phytoplankton from the Danube were reviewed, on the conservation status of the species of community interest (plants, invertebrates, fish, amphibians, reptiles, birds, mammals), emphasizing that the impact will be insignificant among them. .

The potential impact was correlated with the changes that may occur in the future as a result of commissioning Units 3 and 4 of the C.N.E. Cernavoda, taking into account the length and width of the water surface area with modified temperatures in the cooling water discharge area¹³ :

High levels of the Danube (summer and winter)

There is a probability that the water layer with modified temperatures will extend on a length of 4.5-6.5 km*.

*This depends on the increase of the discharged water flow with the commissioning of another 2 units within C.N.E. Cernavoda, as well as the difference between the temperature of the water from the drainage channel and the temperature of the Danube waters upstream of the outlet of the cooling water discharge channel.

Low levels of the Danube (autumn and spring)

There is a probability that the water surface area will have a length of 3-3.5 km*.

*This depends on the increase of the flow of discharge water and the difference between the temperature of the water from the cooling water discharge channel and the temperature of the Danube waters upstream of the outlet of the cooling water discharge channel.

The potential impact is described in section IV.2. of the present study.

¹³ Evaluare adecvată a impactului de mediu a Unităților 3 și 4 ale C.N.E. Cernavodă – Impactul asupra biodiversității (INCDDD, 2012) – rezumat (http://www.mmediu.ro/beta/wpcontent/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuinceddrezumatromana.pdf)

❖ **Realization of a new 600 MW power plant in Rovinari**

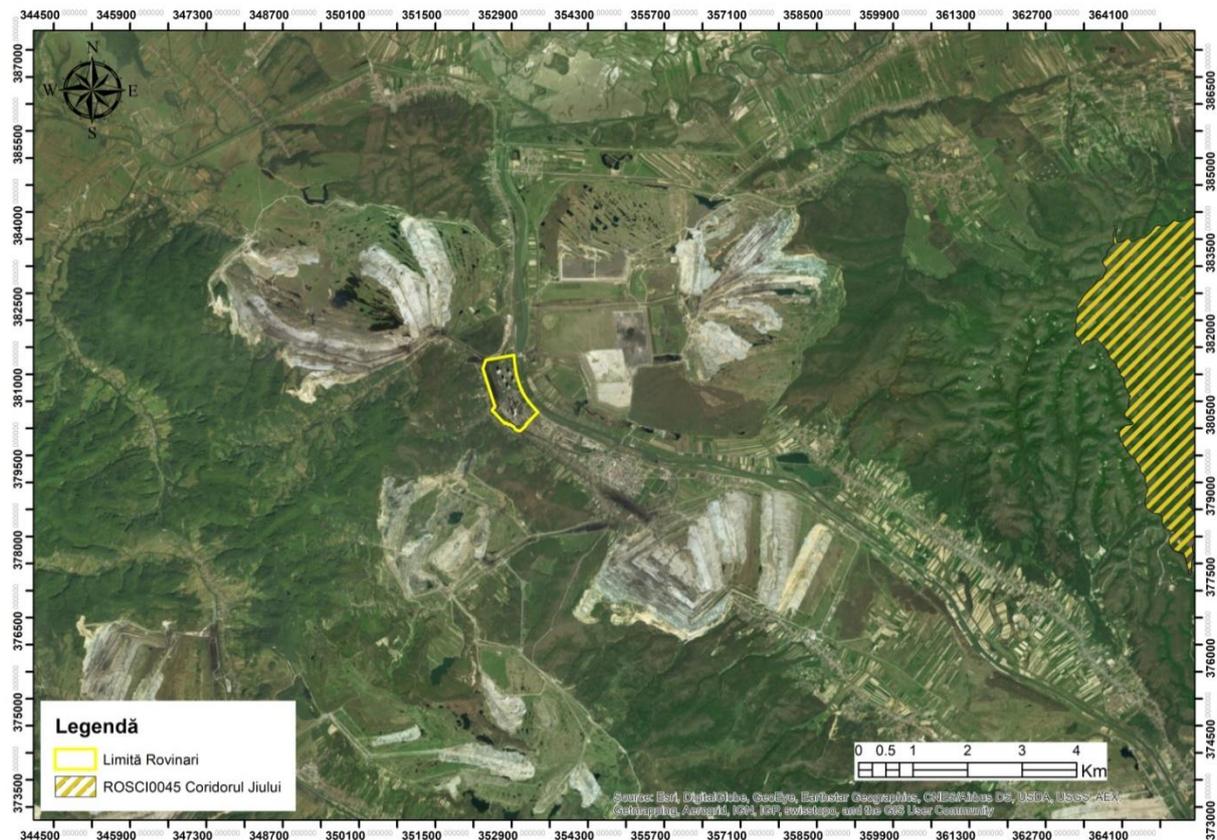


Figure 15 Locating the "Realization of a new 600 MW power plant in Rovinari"

The objective concerns the existing site that does not intersect Natura 2000 sites. According to RES, the 600 MW new energy group in the Rovinari area, expected to be commissioned in early 2021, will use as the basic fuel the lignite supplied from the quarries in the immediate vicinity of the investment objective.

The project was adopted in September 2015 on the basis of the Feasibility Study and the Assessment Report on the contribution in kind of the Company Complexul Energetic Oltenis SA. El se va desfășura în partea de sud a actualului Complex energetic pe o suprafață totală de 141.885 mp¹⁴

Furthermore, please note that the current Energy Complex from Rovinari holds the Integrated Environmental Permit with no. 07/25.09.2018 issued by the Gorj Environmental Protection Agency.

The potential impact associated with the generation of energy from non-renewable sources, in this case through the burning of coal and natural gas, must be considered for several reasons: the impact caused by the exploitation of resources, their transport and their actual use.

¹⁴ Conform adresei nr. 130289/02.07.2019 înregistrată la Ministerul Energiei (adresă transmisă de către Societatea Complexului Energetic Oltenis SA).

For the two types of resources, the main potential effects produced to the detriment of biodiversity are the following: ¹⁵ :

Exploitation	Transport	Burning
<ul style="list-style-type: none">- occurrence or increase of erosion;- sound pollution;- air pollution;- degradation and fragmentation of species habitats, in particular by clearing certain parts of the forest, and facilitating the penetration of invasive species;- deterioration of water quality;- aesthetic alteration of the landscape;- topography changes.	<ul style="list-style-type: none">- enhancing the impact due to mining by increasing concentrations of pollutant emissions from mobile sources.	<ul style="list-style-type: none">- increasing concentrations of atmospheric pollutants due to the increased emissions of carbon dioxide, nitrogen dioxide, sulphur dioxide and methane emitted following combustion, with effects on the health of the organisms;- contribution to the appearance of photochemical smog, acid rain and increasing the effects of climate change.

The potential impact associated with the generation of energy from non-renewable sources is described in section IV.2. of the present study.

¹⁵ Center for Biological Diversity
(https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/coal/index.html)

❖ **Realization of new 400MW power plant with ultrasupercritical parameters in Turceni**



Figure 16 Localization of the "Realization of a new energy group of 400 MW with ultra super critical parameters in Turceni"

The location of the objective was made taking into account that it targets the existing site. We consider it necessary to emphasize that the 400 MW Turceni new power plant with ultra super critical parameters, based on the latest European emissions technologies for pollutants, will contribute to the reduction of CO₂ emissions through the highest level of energy efficiency.

Please note that the current Branch of the Turceni Power Plant has the Integrated Environmental Permit no. 1/10.03.2014, valid until 10.03.2024 issued by the Gorj Environmental Protection Agency.

The site is located less than 1 km from the site ROSCI0045 Jiu Corridor.

The potential impact associated to the production of energy from renewable sources is presented in section IV.2. of this study.

❖ **Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești**

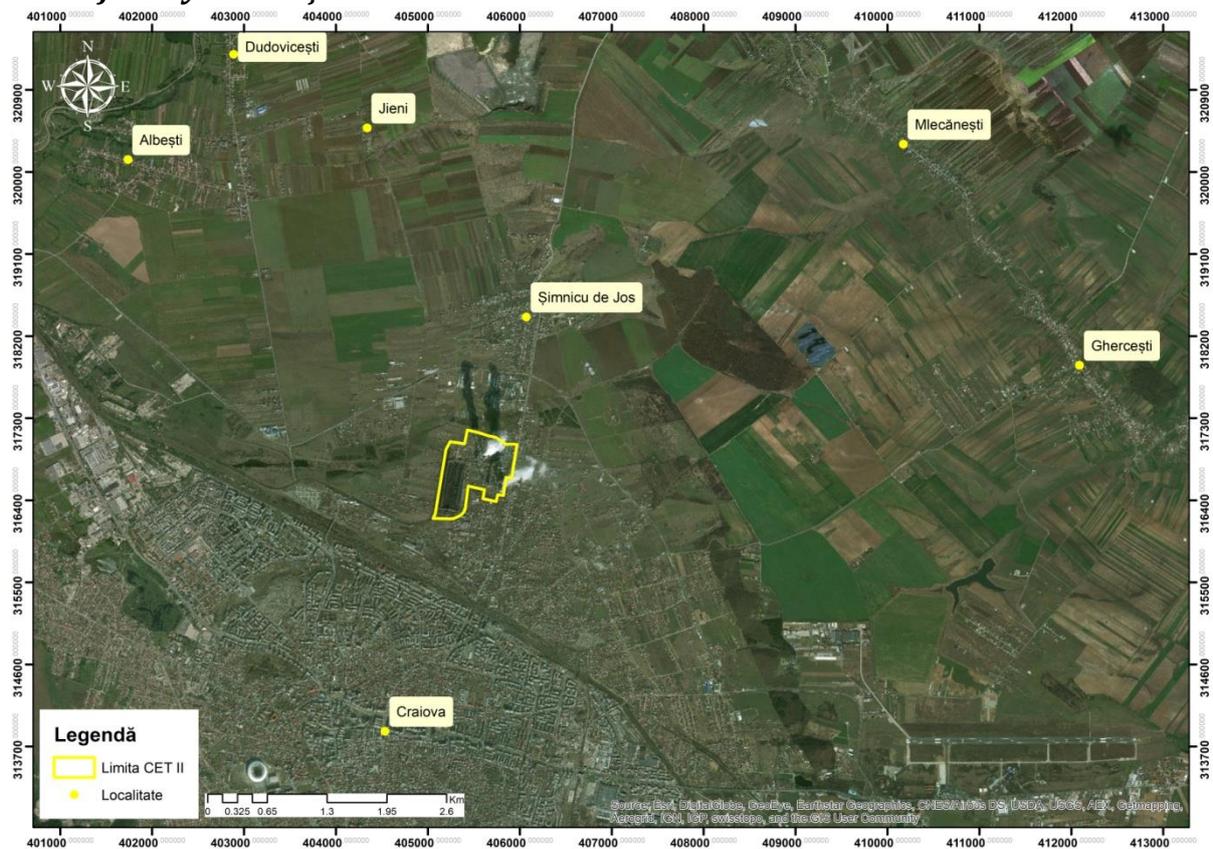


Figure 17 Localization of the objective "Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești"

The objective "Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești" targets the existing site of the Craiova II thermal power plant and the existing underground storage site in Ghercești. They do not overlap with the Natura 2000 network.

Please note that for the current activity of the Craiova II Power Plant Branch, the Integrated Environmental Permit no. 74/07.07.2016 os issued by Dolj Environmental Protection Agency.

The potential impact associated to the production of energy from renewable sources is presented in section IV.2. of this study.

❖ **Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia**

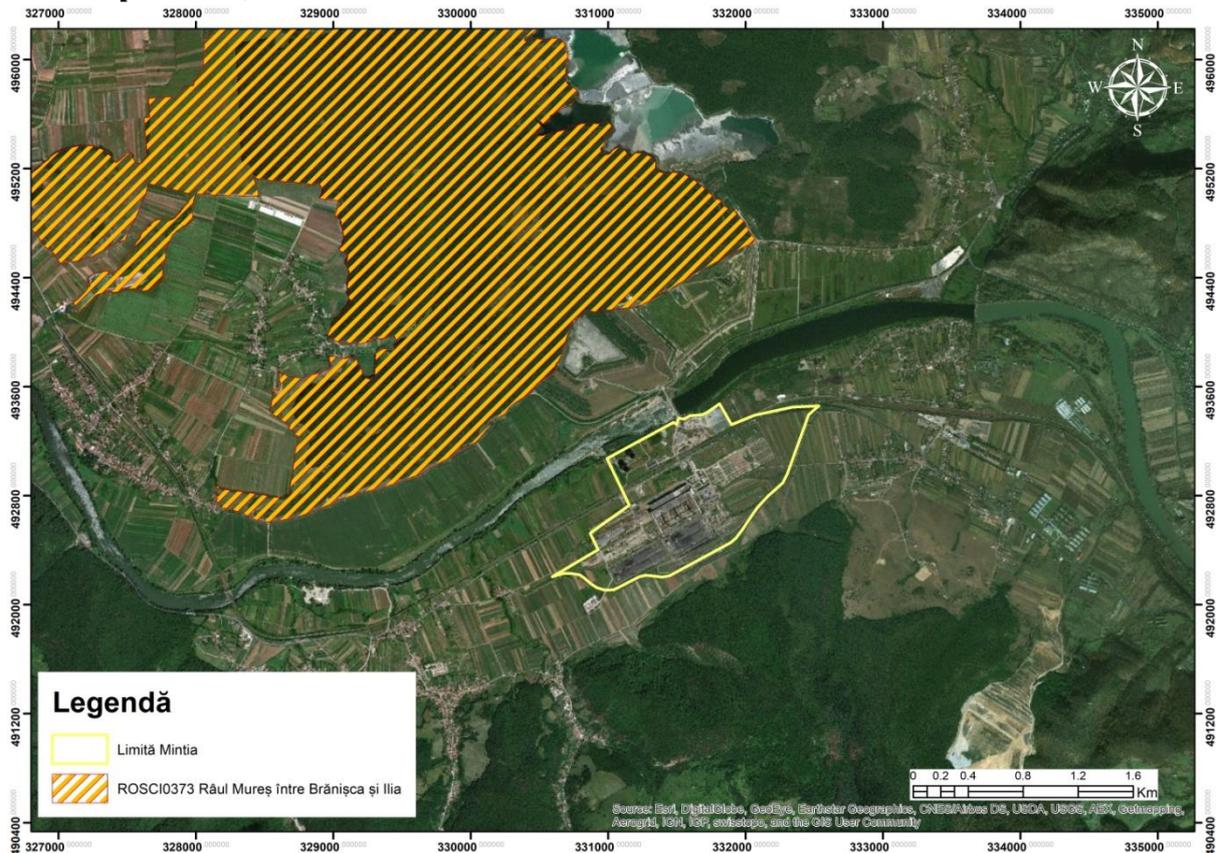


Figure 18 Locating the objective “Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia ”

This objective relates to the existing site and the transition of the two functional groups on coal to gas. The main advantage of the objective is to clearly reduce the amount of pollutant emissions, especially particulate matter (PM₁₀ and PM_{2.5}).

The site is located less than 1 km away from the site ROSCI0373 Mureș River between Brănișca and Ilia.

According to the information provided by the Company Complexul Energetic Hunedoara SA ¹⁶, the location of the proposed objective will be in the vicinity of the Group no. 6 on an area of at least 1.3 ha. The choice of site was made on the basis of 4 (pre) feasibility studies conducted by foreign entities, as well as national entities. Finally, it was chosen the Japanese project whose feasibility study was developed by Kansai Electric Power and the ROMGAZ Project with a feasibility study developed by ISPE. Thus, the proposed objective will meet the following requirements: capacity of 350MWc 43Gcal/h, operation on methane gas, state-of-the-art technology and ensuring the operation in high efficiency conditions, high operating flexibility, ensuring continuity and safety in the supply of electricity and heat, compliance with environmental and economic legislation in terms of life cycle cost.

¹⁶ According to the Letter no. 130293/02.07.2019 submitted by Societatea Complex Energetic Hunedoara to the Ministry of Energy.

The potential impact associated to the production of energy from renewable sources is presented in section IV.2. of this study.

Studiu Evaluare Adecvată

❖ **Realization of hydroelectric power plant with pumping accumulation (CHEAP) Tarnița-Lăpuștești**

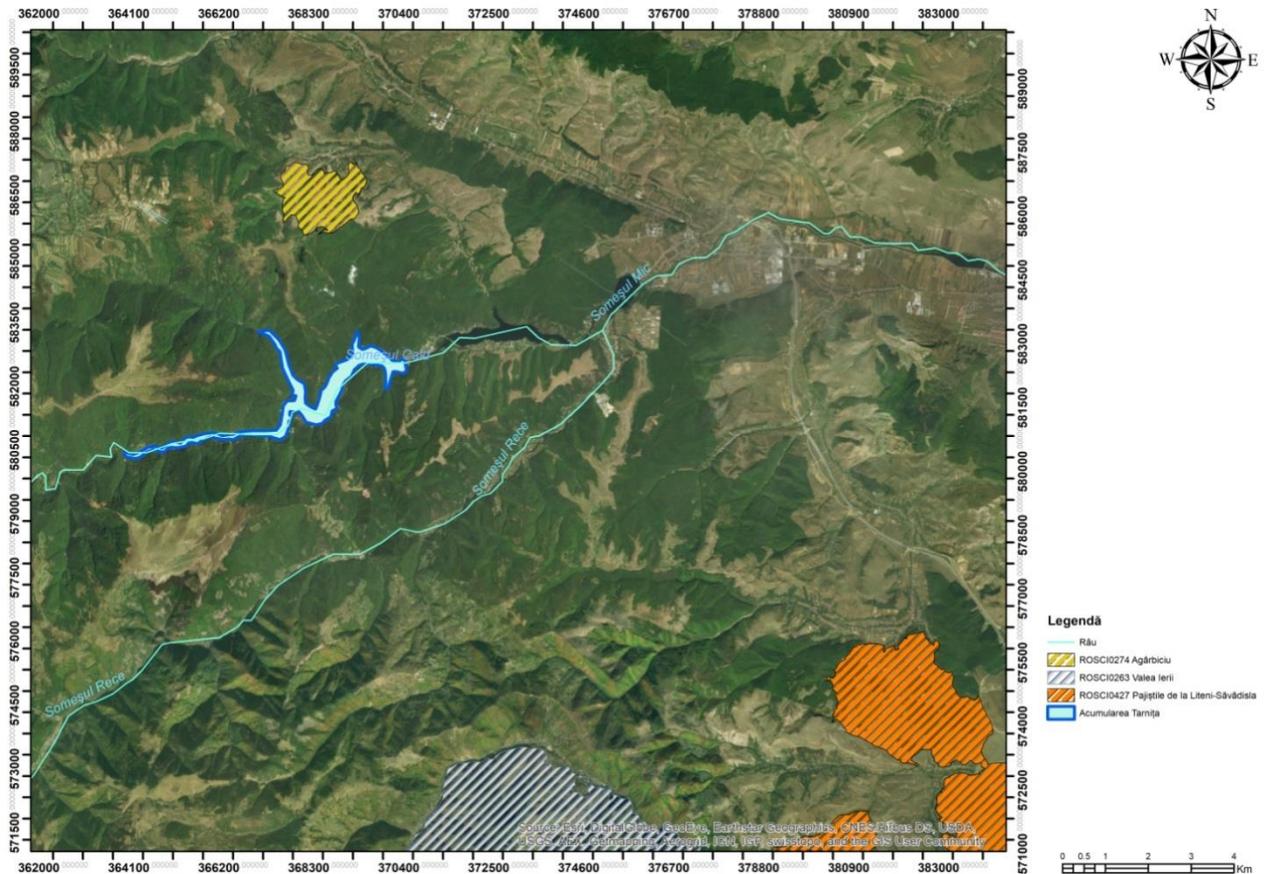


Figure 19 Localization of the objective “Realization of hydroelectric power plant with pumping accumulation (CHEAP) Tarnița-Lăpuștești”

The Tarnița-Lăpuștești CHEAP placement will be carried out in the Someșul Cald river basin, on the valley of Someșul Cald river, in the left slope adjacent to the existing Tarnița accumulation, on the administrative territory of the Rașca, Căpușu Mare, Mărișel and Gilau communes including the Dângăul Mare, Dealu Mare, Lăpuștești, Someșul Cald, mostly in their outlying area¹⁷.

The delineation of the area targeted by this objective was achieved by georeferencing the project location image taken from the project web page. Thus, after the limit of the project was obtained, two Natura 2000 sites, namely ROSCI0263 Valea Ierii and ROSCI0427 Pajiștile de la Liteni-Săvădisla, were intersected.

History of the CHEAP Tarnița-Lăpuștești project ¹⁸ :

- ✓ Period 1975-1985: ISPH conducts reviews, site studies and schematic studies for a CHEAP-type project;
- ✓ Period 1985-1988: Choosing the current location (existence of the lower lake and the consumption centre);

¹⁷ Source: <http://www.hidrotarnita.ro/localizare/>

¹⁸ Datele furnizate sunt în conformitate cu Studiu de fundamentare – Centrala cu Acumulare prin Pompaj Tarnița- Lăpuștești, Anexa 1 elaborat de de către Comisia Națională de Strategiei și Prognoză, București, 2019;

- ✓ Period 1988-1994: Calls for tenders for the main energy equipment of CHEAP Tarnița-Lăpuștești, received from internationally renowned competitors in the field, such as Ansaldo GIE (Italy), Toshiba (Japan), Alstom-Neyrpic (France), Hitachi (Japan), Mitsubishi (Japan), are requested and reviewed;
- ✓ 1993: I.S.P.H. and GEOTEC carry out the geotechnical and hydrogeological study; ISPH conducts the Economic assessment study of CHEAP functions in SEN; ISPH carries out the Pre-feasibility Study for CHEAP Tarnița - Lăpuștești, fit-out variant 4 x 250 MW; The study was approved by the Ministry of Environment;
- ✓ 1994: ISPH conducts the Feasibility Study for the Hydroelectric Power Station with Pumping Accumulation (CHEAP) Tarnița - Lăpuștești, fit-out variant 4 x 250 MW;
- ✓ 1995: Preparing the documentation studies regarding the energetic equipment and the operating regime; Elaboration of Specifications for equipment;
- ✓ Period 1999-2000: Specialized Institute Electric Power Development Co. (EPDC) from Japan conducted, based on a grant from the Japanese government, a study based on the technical data from previous documentation developed by ISPH, a study prepared with Toshiba;
- ✓ 2003: ISCE and ISPH have developed a feasibility study for the realization of a CHEAP in Tarnița - Lăpuștești in which a fit-out variant with three groups of 330 MW was reviewed;
- ✓ 2007: The consultant IPA / Verbund / Poyry develops a feasibility study under the World Bank's SEEREM 2005 programme, funded by the IBRD. The analysis is based on the previous solutions and the layout scheme proposed by ISPH and EPDC, with small changes useful for achieving the objective;
- ✓ 2008: ISPH has updated the feasibility study, according to the provisions of GD 28/2008 (regarding the content of feasibility studies for projects funded from public funds);
- ✓ 2009: The Government of Romania has approved a Memorandum on the achievement of the investment objective of the Hydroelectric Power Plant with Accumulation by Pumping Tarnița-Lăpuștești, a memorandum which no longer has legal effects;
- ✓ 2010: A consultant (consortium) was hired to prepare the process for attracting investors, with Deloitte Consultanta SRL as its leader. Banca Comerciala Romana and HydroChina ZhongNan were also part of the consortium, and the subcontractors were Mușat&Asociații Sparl, Herbert Smith, Knight Piesold and Tempo Advertising. In February 2014, the contract made with this consortium came to an end and was no longer extended by the contracting parties;
- ✓ 2013: The Government of Romania has approved several memoranda regarding the investment objective of the Hydroelectric Power Plant with Accumulation by Pumping Tarnița-Lăpuștești, with reference being the Memorandum of 4 September 2013, the Memorandum of 16 October 2013 and the Memorandum of 31 July 2014. In November, based on the provisions of the Memorandums approved by the Government, the project company HIDRO TARNIȚA SA was set up in order to implement the Project; According to the Memorandum of 4 September 2013, the project company Hidro Tarnița SA is initially set up with a

shareholding formed by Romanian companies in the field of energy and aims to attract foreign investors with a competitive profile. The project company was established by Electrica SA and Complexul Energetic Hunedoara SA (companies where the state was a sole shareholder) with a share capital of 2 million euros. Subsequently, following the division of Electrica SA and other capital operations between the shareholders, the share capital of the company Hidro Tarnița SA is 99.358% owned by the Company for the Management of State Investments in Energy - Societatea de Administrare a Participațiilor Statului în Energie (SAPE SA) and 0.642% by the Complex Energetic Hunedoara SA;

- ✓ 2014: In March, ISPH updated the Feasibility Study it had developed in 2008 in terms of technical solutions, requirements from the opinions obtained and cost estimates. In July, HIDROELECTRICA SA sold to HIDRO TARNIȚA SA the ongoing investment, consisting of the technical, economic and other documents, prepared to substantiate, promote, approve, authorize, award and execute the project, as well as from the approvals and authorizations obtained for project with the transfer agreement of Hidroelectrica;
- ✓ Period 2015-2018: The project company Hidro Tarnița SA has carried out specific activities to prepare the documentation, notices, agreements and regulatory documents necessary for the implementation of the project, the value of these activities being added to the ongoing investment purchased in 2014 from Hidroelectrica SA. As of 31.12.2018, the carrying amount of investments in progress registered in the assets of the project company Hidro Tarnița SA, on the current investment objective "CHEAP Tarnița - Lăpuștești" is 13,278,628.47 RON

Comparison of relevant studies for the CHEAP Tarnița -Lăpuștești project:

Description	SF EPDC 1999 4x250 MW	SF ISCE- 2003 4x250MW	SF ISPH 2008 4x250MW	SF ISPH 2014 4x250 MW
Comparison	SF EPDC Japan	SF ISCE	SF ISPH 2008	SF ISPH 2014
Best site	Tarnița- Lăpuștești	Tarnița- Lăpuștești	Tarnița- Lăpuștești	Tarnița- Lăpuștești
Installed power (MW)	1000	1000	1000	1000
Reversible turbine fit-out	Francis	Francis	Francis	Francis
Pumping cycle	weekly	weekly	weekly	weekly
Lăpuștești upper tank - mNNR elevation	1085	1085	1085	1085
Tarnita lower tank - mNNR elevation	521,5	521,5	521,5	521,5
Upper tank height	45	45	40	40
Dam elevation-mNNR	1088	1088	1086,5	1086,5
Storage capacity - mil. cubic meters	10	10	10	10
Outlet - 'polygonal' type - units	1	1	1	2
Underground station (m)	L=157,	L=120,	L=120,	L=120,

Description	SF EPDC 1999 4x250 MW	SF ISCE- 2003 4x250MW	SF ISPH 2008 4x250MW	SF ISPH 2014 4x250 MW
	W=22, H=45	W=23, H=47	W=23, H=48	W=23, H=48
Transformer room	L=126, W=15, H=20	L=117, W=19, H=25	L=117, W=19, H=48	L=117, W=19, H=48
High pressure gallery - linear meters	1100	1100	1100	2 threads x 1100
High pressure gallery diameter - linear meters	6	6	6	4.3
Spillway tunnel - linear meters	2x1350	2x1350	2x1350	2x1350
Spillway tunnel diameter - linear meters	6,2	6,2	6,2	6,2

The potential impact associated with hydroenergy is presented in section IV.2. of this study.

❖ **Realization of a hydroelectric power plant at Turnu Magurele - Nicopole 500 MW**

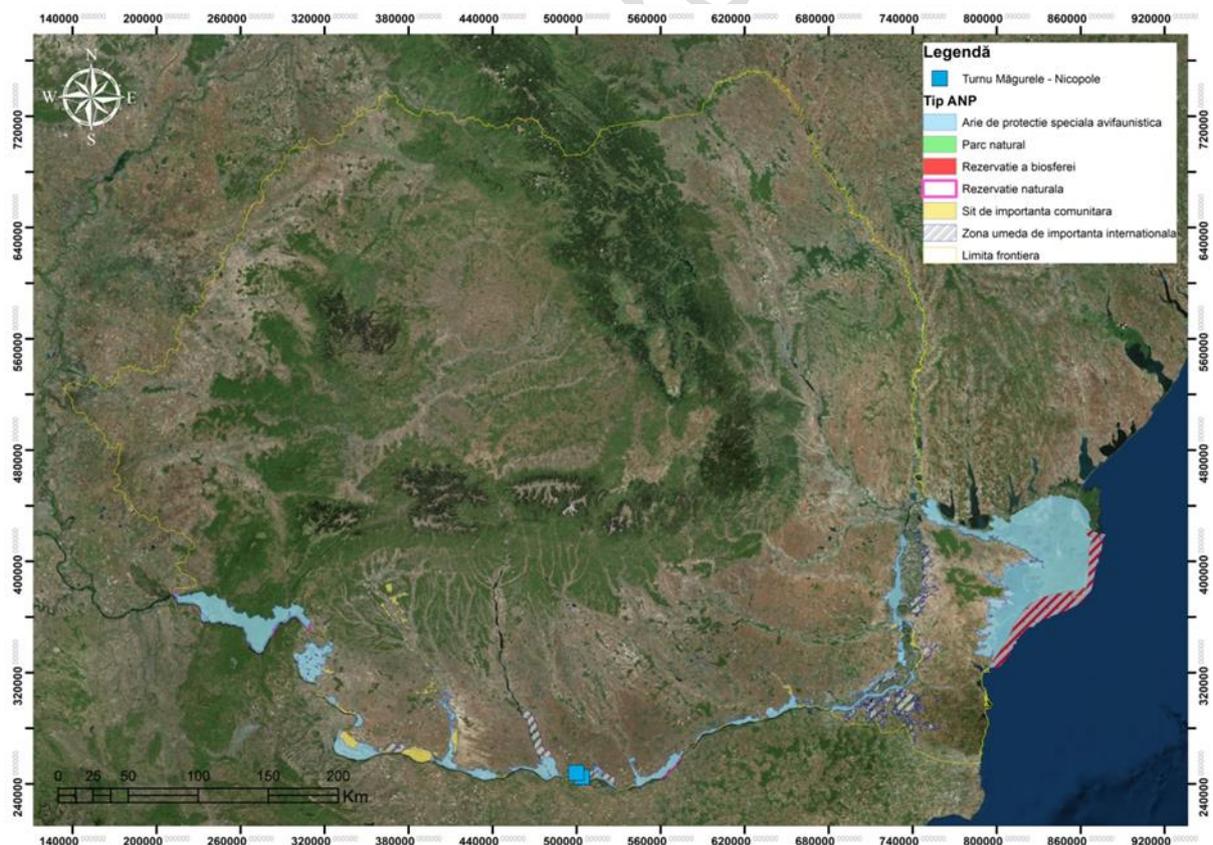


Figure 20 Location of the objective "Realization of hydroelectric power plant at Turnu Măgurele - Nicopole 500 MW"

In the case of this objective, Natura 2000 sites intersected or potentially affected by its implementation have been obtained by setting up buffer zones according to the methodology discussed and presented in Section III.2. The hydroelectric power plant area overlaps with the protected natural areas ROSCI0044 Corabia-Turnu Magurele and with RORMS0012 Suhaia.

According to the mailing between the Ministry of Energy and the National Commission for Strategy and Forecasting, for the objective “Turnu Măgurele - Nicopole 500 MW hydroelectric power plant”, the foundation study has not been started, thus no technical data are available.

As a strategic objective of a very large scale involving regularization works carried out all over the Danube, but whose specific location is not known, Natura 2000 sites whose vulnerabilities are increased have been obtained by creating a buffer zone (50 m) that targeted the Romanian riverbank area. Following the analysis, the following protected natural areas Natura 2000 were intersected (Table 6) to which are added 8 nature reserves of national interest, including a natural park (the Natural Park Portile de Fier with Ramsar site status, Balta Nera-Dunăre, Gura Văii-Vârciorova, Dealul Varanic, Cazanele Mari and Cazanele Mici, Locul fosilifer Șvinița, Cracul Crusii, Fața Virului) and 7 natural reserves of international interest - Ramsar sites (National Park Porțile de Fier, Bistreț, Confluența Olt-Dunăre, Suhaia, Blahnița, Calafat-Ciuperceni-Dunăre and Confluența Jiu-Dunăre).

Table 6 Natura 2000 sites potentially affected by the achievement of the objective “Realization of a hydroelectric power plant at Turnu Magurele - Nicopole 500 MW”

Code	Name	Type of protected natural area
ROMAB0003	Rezervația Biosferei Delta Dunarii	Biosphere reserve
RONPA0014	Parcul Natural Porțile de Fier	Natural park
RONPA0017	Parcul Natural Balta Mică a Brăilei	Natural park
RONPA0316	Balta Nera - Dunăre	Natural reserve
RONPA0614	Gura Văii - Vârciorova	Natural reserve
RONPA0625	Dealul Varanic	Natural reserve
RONPA0626	Cazanele Mari și Cazanele Mici	Natural reserve
RONPA0627	Locul fosilifer Șvinița	Natural reserve
RONPA0641	Cracul Crucii	Natural reserve
RONPA0642	Fața Virului	Natural reserve
RONPA0898	Ostrovul Gâsca	Natural reserve
RONPA0942	Cama - Dinu - Pășărica	Natural reserve
RORMS0001	Delta Dunării	Wetland of international importance
RORMS0002	Parcul Natural Balta Mică a Brăilei	Wetland of international importance
RORMS0006	Parcul Natural Porțile de Fier	Wetland of international importance
RORMS0009	Bistreț	Wetland of international importance
RORMS0011	Confluence Olt - Danube	Wetland of international importance
RORMS0012	Suhaia	Wetland of international importance
RORMS0013	Blahnița	Wetland of international importance
RORMS0014	Brațul Borcea	Wetland of international importance
RORMS0015	Calafat - Ciuperceni - Danube	Wetland of international importance

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Code	Name	Type of protected natural area
RORMS0016	Canaralele de la Hârșova	Wetland of international importance
RORMS0017	Ostroavele Dunării - Bucgeac - Iortmac	Wetland of international importance
RORMS0018	Confluence Jiu - Danube	Wetland of international importance
RORMS0019	Dunărea Veche - Brațul Măcin	Wetland of international importance
ROSCI0006	Balta Mică a Brăilei	Site of community importance
ROSCI0022	Canaralele Dunării	Site of community importance
ROSCI0039	Ciuperceni - Desa	Site of community importance
ROSCI0044	Corabia - Turnu Măgurele	Site of community importance
ROSCI0045	Coridorul Jiului	Site of community importance
ROSCI0065	Delta Dunării	Site of community importance
ROSCI0088	Gura Vedei - Șaica - Slobozia	Site of community importance
ROSCI0131	Oltenița - Mostiștea - Chiciu	Site of community importance
ROSCI0173	Padurea Stârmina	Site of community importance
ROSCI0206	Porțile de Fier	Site of community importance
ROSCI0278	Bordușani - Borcea	Site of community importance
ROSCI0299	Dunărea la Gârla Mare - Maglavit	Site of community importance
ROSCI0306	Jiana	Site of community importance
ROSCI0319	Mlaștina de la Fetestei	Site of community importance
ROSPA0005	Balta Mică a Brăilei	Important bird area
ROSPA0011	Blahnița	Important bird area
ROSPA0012	Brațul Borcea	Important bird area
ROSPA0013	Calafat - Ciuperceni - Danube	Important bird area
ROSPA0017	Canaralele de la Hârșova	Important bird area
ROSPA0021	Ciocănești - Dunăre	Important bird area
ROSPA0023	Confluence Jiu - Danube	Important bird area
ROSPA0024	Confluence Olt - Danube	Important bird area
ROSPA0026	Danube - Baziaș - Portile de Fier course	Important bird area
ROSPA0031	Delta Dunării și Complexul Razim - Sinoie	Important bird area
ROSPA0038	Dunăre - Oltenița	Important bird area
ROSPA0039	Dunăre - Ostroave	Important bird area
ROSPA0046	Gruia - Gârla Mare	Important bird area
ROSPA0074	Maglavit	Important bird area
ROSPA0080	Almăjului - Locvei Mountains	Important bird area
ROSPA0090	Ostrovu Lung - Gostinu	Important bird area
ROSPA0102	Suhaia	Important bird area
ROSPA0108	Veeda - Dunăre	Important bird area
ROSPA0135	Sands from Dăbuleni	Important bird area
ROSPA0136	Oltenița - Ulmeni	Important bird area

The potential impact from upstream and downstream caused by large hydrotechnical constructions is presented in section IV.2. of this study.

The figure and table below show the list of Natura 2000 sites possibly affected by the implementation of the "Turnu Măgurele - Nicopole 500 MW hydroelectric power plant" project in Bulgaria and Hungary.

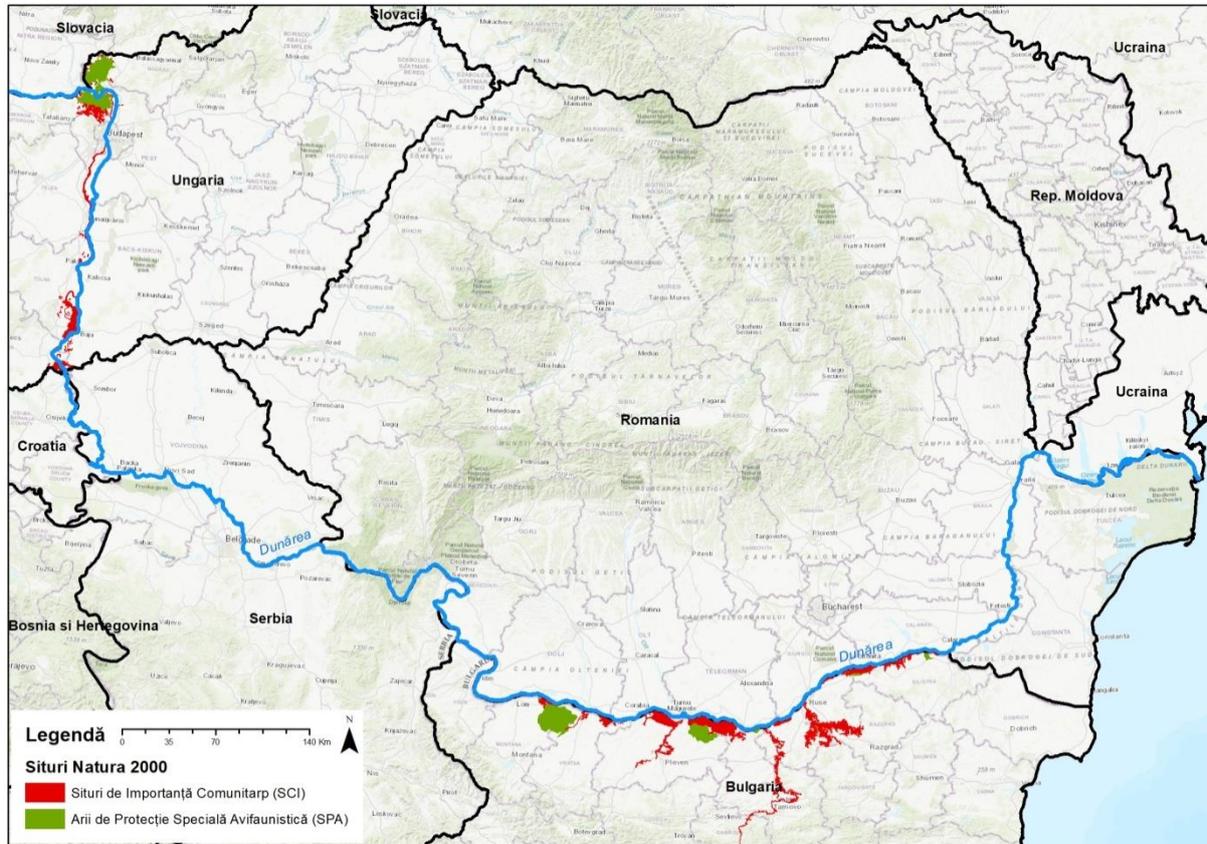


Figure21 Natura 2000 sites in Bulgaria and Hungary likely to be affected by the achievement of the objective "Realization of a hydroelectric power station at Turnu Magurele - Nicopole 500 MW"

Table 7 Natura 2000 sites in Bulgaria and Hungary likely to be affected by the achievement of the objective "Realization of a hydroelectric power station at Turnu Magurele - Nicopole 500 MW"

It. no.	Country	Natura 2000 code	Natura 2000 name	Type	It. no.	Country	Natura 2000 code	Natura 2000 name	Type
1	Bulgaria	BG0002104	Tsibarsko Blato	SPA	22	Bulgaria	BG0000334	Ostrov	SCI
2	Bulgaria	BG0002091	Ostrov Lakat	SPA	23	Bulgaria	BG0000241	Srebarna	SCI
3	Bulgaria	BG0002074	Nikopolsko plato	SPA	24	Bulgaria	BG0000241	Srebarna	SPA
4	Bulgaria	BG0002065	Blato Malak Preslavets	SPA	25	Bulgaria	BG0000232	Ostrov Pozharevo	SCI
5	Bulgaria	BG0002064	Garvansko blato	SPA	26	Bulgaria	BG0000232	Batin	SCI
6	Bulgaria	BG0002030	Kompleks Kalimok	SPA	27	Bulgaria	BG0000199	Tsibar	SCI
7	Bulgaria	BG0002025	Lomovete	SPA	28	Bulgaria	BG0000181	Reka Vit	SCI
8	Bulgaria	BG0002024	Ribarnitsi	SPA	29	Bulgaria	BG0000377	Kalimok	SCI

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It. no.	Country	Natura 2000 code	Natura 2000 name	Type	It. no.	Country	Natura 2000 code	Natura 2000 name	Type
			Mechka					Brashlen	
9	Bulgaria	BG0002018	Ostrov Vardim	SPA	30	Hungary	HUDI20039	Pilis és Visegrádi-hegység	SCI
10	Bulgaria	BG0002017	Kompleks Belenski ostrovi	SPA	31	Hungary	HUDI20034	Duna és ártere	SCI
11	Bulgaria	BG0002009	Zlatiyata	SPA	32	Hungary	HUDI20008	Börzsöny	SCI
12	Bulgaria	BG0000614	Reka Ogosta	SCI	33	Hungary	HUDI10002	Börzsöny és Visegrádi-hegység	SPA
13	Bulgaria	BG0000610	Reka Yantra	SCI	34	Hungary	HUDD1004	Béda-Karapanca	SPA
14	Bulgaria	BG0000608	Lomovete	SCI	35	Hungary	HUDD20032	Gemenc	SCI
15	Bulgaria	BG0000576	Svishtovska gora	SCI	36	Hungary	HUDD20023	Tolnai Duna	SCI
16	Bulgaria	BG0000534	Ostrov Chayka	SCI	37	Hungary	HUDD20045	Béda-Karapanca	SCI
17	Bulgaria	BG0000530	Pozharevo - Garvan	SCI	38	Hungary	HUDD20032	Gemenc	SCI
18	Bulgaria	BG0000529	Marten - Ryahovo	SCI					
19	Bulgaria	BG0000528	Ostrovska step - Vadin	SCI					
20	Bulgaria	BG0000396	Persina	SCI					
21	Bulgaria	BG0000335	Karaboaz	SCI					

In addition to these Natura 2000 sites, other protected natural areas overlapped on these sites in Bulgaria and Hungary, as well as the Djerdap National Park in Serbia, may be affected.

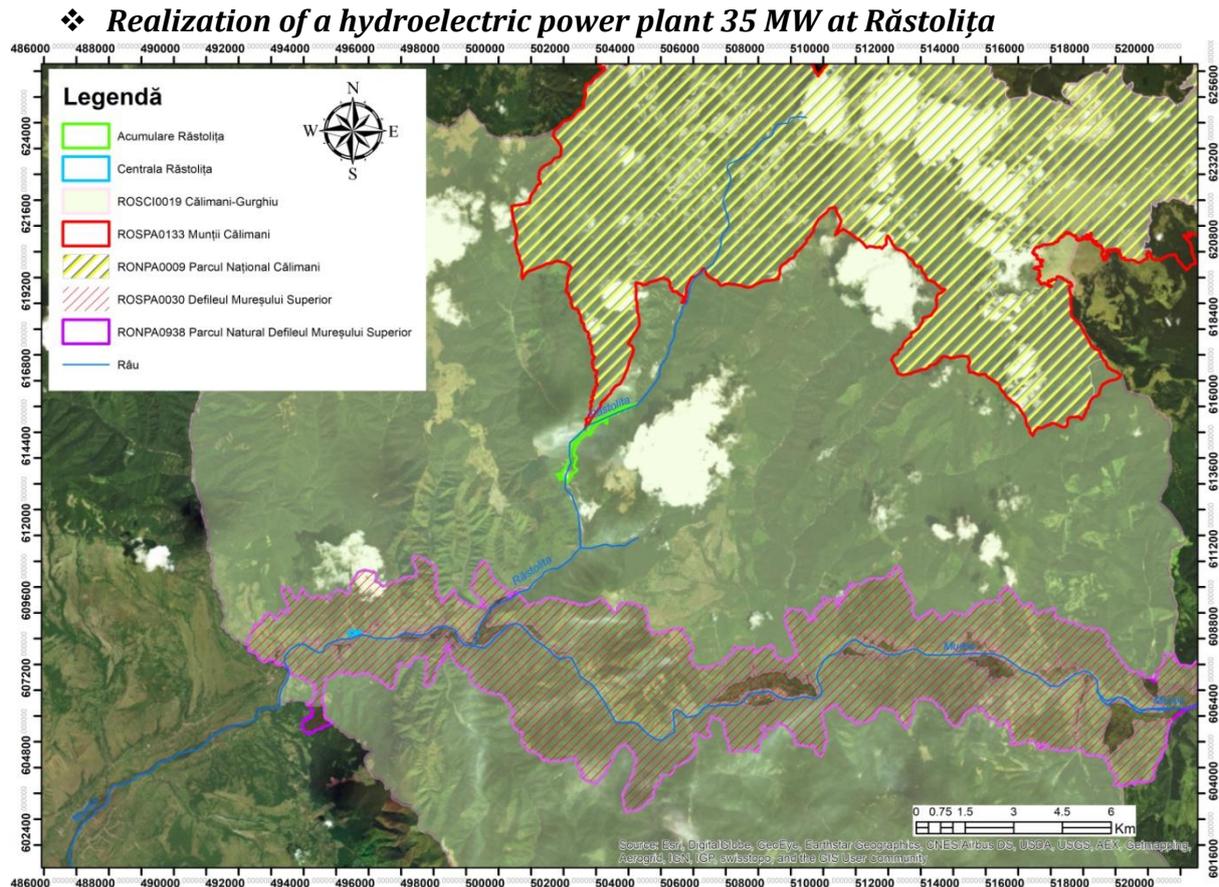


Figure 22 Localization of the project "Realization of a hydroelectric power plant 35MW at Răstolița"

The location of the project was made using the indications given by the Beneficiary. Based on these, a polygon vector was built, which delimits the Rostolița accumulation zone. Also, on the basis of satellite images, the land area was identified, at which the temporary and permanent areas where the works were started were identified.

For the mentioned objective, there are regulatory documents in the field of environmental protection and in the field of water protection issued by competent institutions¹⁹ for the works performed, as follows:

- ✓ Environmental agreement no. 12 / 07.11.1990 regarding the PE "Răstolița Hydropower Development";
- ✓ Water management agreement no. 39 / 07.06.1990 "Regarding flood protection for the social camp ACTH - Tarnița located in Lunca Garii - Răstolița, county of Mureș";
- ✓ Notice no. 5956 / 02.10.1990 flow rates, made at the Waters Directorate Tg. Mureș;
- ✓ Water management notice no. 16 / 16.04.1992 for the work "Regularization of the Mureș River in the area of Vălenii de Munte" Mureș County;
- ✓ Water management notice no. 363 / 30.03.2012 for the investment "Regularization downstream of the dam - AHE Răstolița. Răstolița dam".

¹⁹ Conform adresei nr. 74905.1 din 01.07.2019 trimisă de către SPEEH Hidroelectrica SA către Ministerul Energiei.

The accumulation of Rostolita completely overlaps the Natura 2000 site ROSCI0019 Călimani-Gurghiu and is also located at the limit of ROSPA0133 Călimani Mountains overlapped on the natural reservation RONPA0009 Călimani National Park.

According to the aforementioned letter to the investment objective "Realization of the 35 MW Răstolița hydroelectric power station", the following works will be carried out, staged on objectives, as follows:

- ✓ Stage I- minimum energy level 720mdM
- ✓ Objective I - Răstolița dam: procurement and erection of AMC dam; execution of lighting installations and breakwater on the dam crest; regularization works downstream of the dam; close the water diversion gallery; lake basin cleaning; completion of building and erection works at MHC located on the circuit of the bottom discharge gallery of the dam; completion of assembly works at the bottom discharge outlet; completion of electrical part works at bottom discharge;
- ✓ Objective II - Main adduction: arrangement of valve house platform, energy outlet from the level 765.50 mdM; completion of building and erection works at the outlet valve house (flat valve and cofferdam); supply the outlet valve house platform loads;
- ✓ Objective III - Pressure node: mounting butterfly valve operating plant; exterior design works on the platform of pressure node; completion of building and erection works at the butterfly valve house;
- ✓ Objective IV - Răstolița station: completion of interior and exterior finishing works; completion of execution of installations for spraying, fire extinguishing, ventilation; completion of auxiliary installations (mechanical part) related to HA1 and HA2; purchase and installation of primary and secondary electrical equipment; supply the internal service loads;
- ✓ Objective V - 110 kV station: completion of installation work on the electrical part at the cable house; completion of connection works on 110 kV with SDEE Transilvania Sud power station;
- ✓ Objective VI - Compensating basin: completion of installation works of valve operating plant for compensating basin bottom discharge;
- ✓ Objective VIII - West branch adduction and secondary captures: execution of works for the secondary captures related to the West branch Visa, Gălăoaia Mare and Gălăoaia Mică;
- ✓ Infrastructure works: execution of the lake contour road and execution of the connection road between the dam crest and the outlet valve house; execution of planning and environmental protection works;
- ✓ Stage II - final elevation 760 mdM:
- ✓ Objective I - Răstolița Dam: completion works for the final elevation of the dam; completion works for high-water discharger final elevation;
- ✓ Objective VII - East Branch adduction and secondary captures: execution of works for the secondary captures Bradu and Ilva Mare; excavation and concrete works of the East branch adduction;
- ✓ Objective VII - West Branch adduction and secondary captures: execution of works for the secondary capture Bistra; excavation and concrete works of the Bistra - Gălăoaia Mare adduction;
- ✓ Infrastructure works: execution of environmental planning and protection works

The potential impact associated with hydroenergy is presented in section IV.2. of this study.

❖ **Realization of hydroenergy power plants on the Jiu River 90 MW**

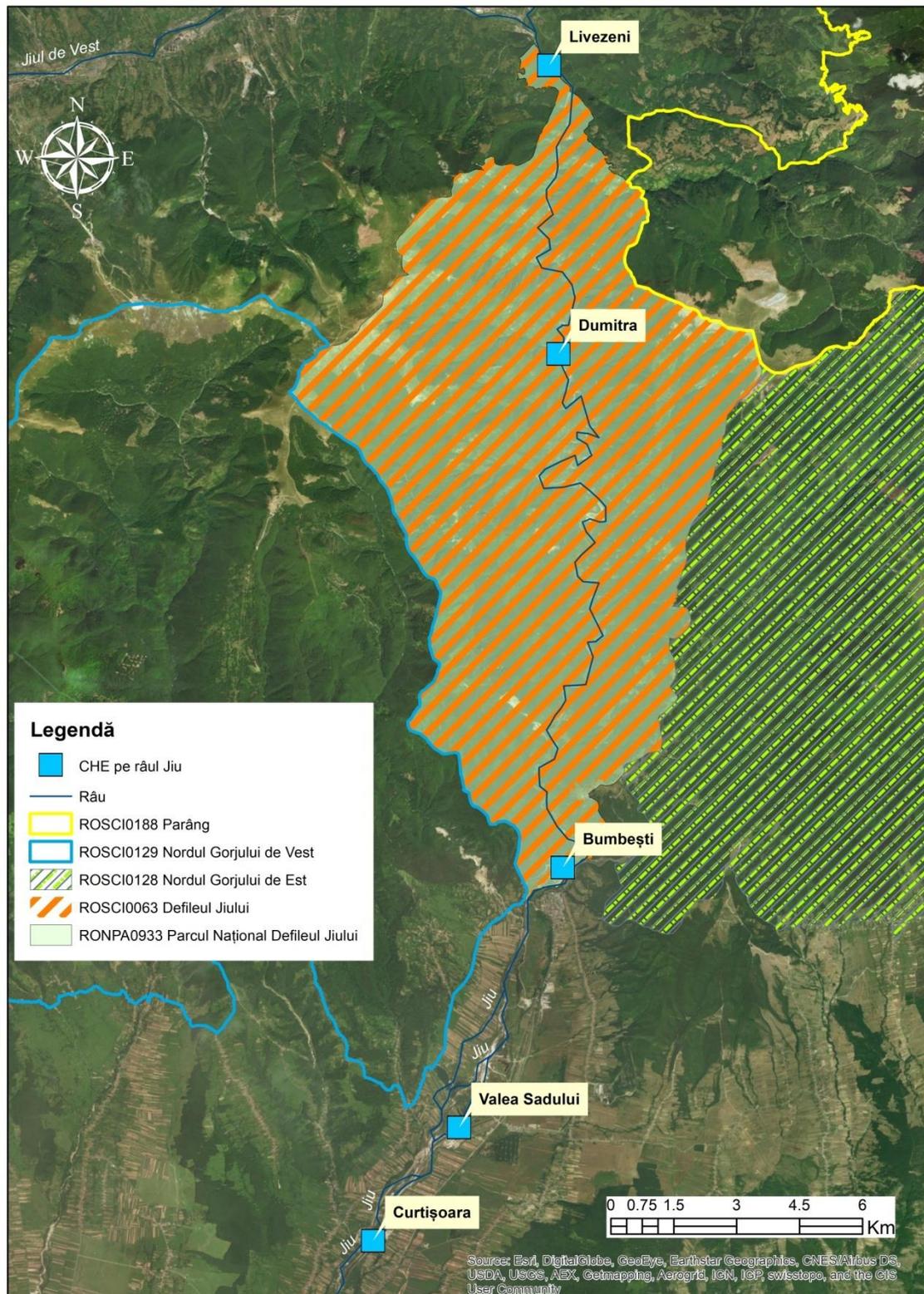


Figure 23 Localization of the objective "Realization of hydroenergy power plants on the Jiu River 90 MW"

The objective of the RES "Realization of hydroenergy power plants on the Jiu 90 MW" aims at the realization of 5 hydroenergy power plants represented in Figure 23 : Livezeni, Dumitra, Bumbesti, Valea Sadului and Curtisoara. Of these, Livezeni, Dumitra and Bumbesti are 85% completed and are located within or near the Natura 2000 site ROSCI0063 Jiu Gorge overlapped with the National Park Defileul Jiului (see Figure 24, Figure 25, Figure 26). Valea Sadului and Curtisoara are built 100% and do not overlap or are not close to any Natura 2000 site.



Figure 24 Localization of the objective "Realization of hydroelectric power stations on the Jiu 90 MW" - detail Livezeni

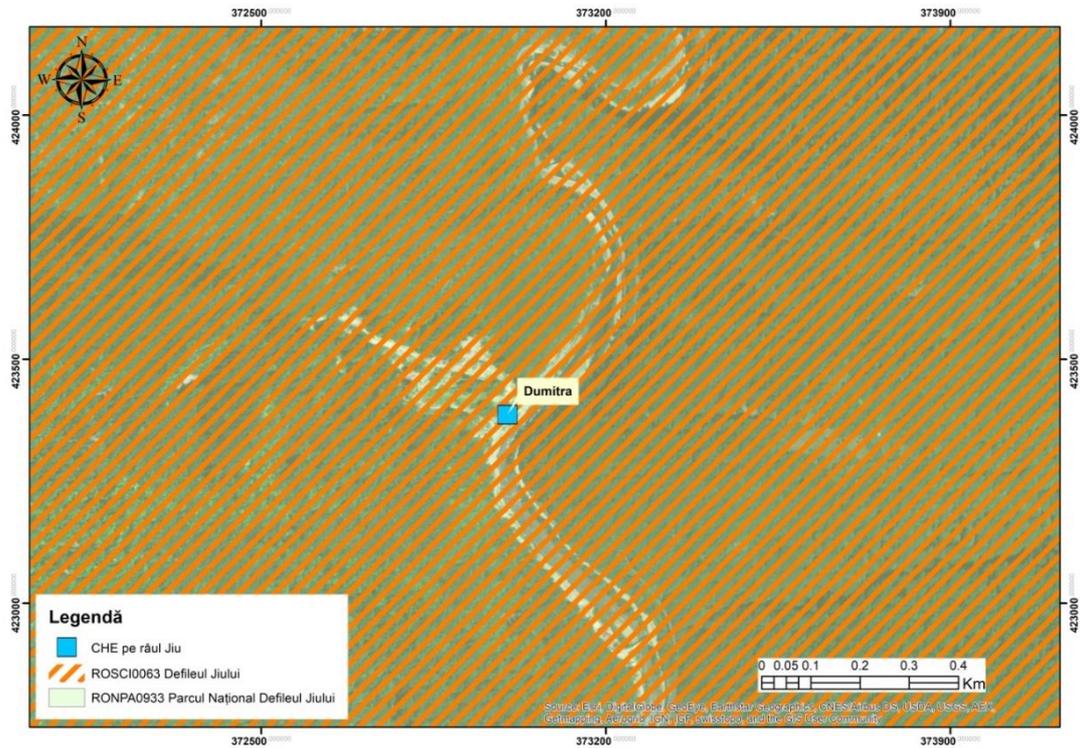


Figure 25 Localization of the objective "Realization of hydroelectric power plants on the Jiu 90 MW" - detail Dumitra

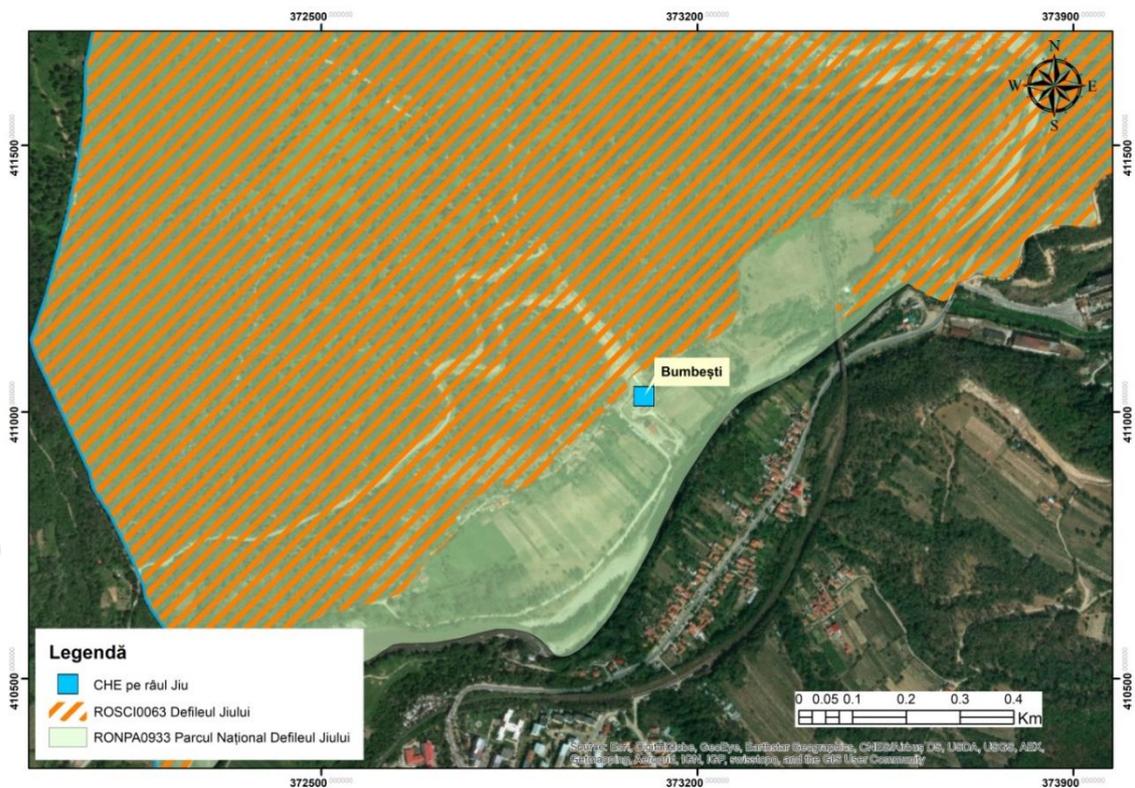


Figure 26 Localization of the objective "Realization of hydroelectric power plants on the Jiu 90 MW" - detail Bumbesti

For the mentioned objective, there are regulatory documents in the field of environmental protection and in the field of water protection issued by competent institutions ²⁰ for the works performed, as follows:

- ✓ Environmental agreement no. GJ -51 of 18.04.2003 on “Hydropower development of the Jiu river on the Livezeni-Bumbești sector”;
- ✓ Water management notice no. 188/14.02.2003 on “Hydropower development of the Jiu river on the Livezeni-Bumbești sector”;
- ✓ Water management notice no. 410/15.08.2005 on “Hydropower development of the Jiu river on the Livezeni-Bumbești sector”;

According to the aforementioned letter to the investment objective “Hydropower development of the Jiu River in the Livezeni-Bumbești Sector”, the following works will be carried out, as follows: Conform adresei menționate anterior la obiectivul de investiție „Amenajarea Hidroenergetică a râului Jiu pe sectorul Livezeni-Bumbești” se vor realiza următoarele lucrări, astfel:

- ✓ Livezeni dam: technological platform development, Livezeni lake basin arrangement, AMC - completion of erection; steps for the migration of fish fauna;
- ✓ MHC Livezeni: superstructure - roof completion; interior and exterior finishes; indoor installations;
- ✓ Livezeni - Dumitra adduction: Livezeni platform and access road development; Murga Mică platform development;
- ✓ CHE Dumitra: floors, finishes, metallic items, exterior fittings, platforms, fences and gutters; bridge over the stilling basin - asphaltting and railings;
- ✓ Block of intervention Dumitra: earthworks, strength structure; masonry; flooring; roof; plywood and finishing; joinery; installations and lightning rods;
- ✓ Dumitra - Bumbești adduction: markings and finishes Valea Rea downstream; markings and finishes Bratcu upstream; Bratcu injections upstream 2 + 400 - 3 + 000, Valea Rea window intersection, Bratcu window intersection; concreting stopper at intersection Valea Rea; concreting stopper at intersection Bumbești castle; Bratcu well injections; concreting Bratcu watertight gate;
- ✓ Bumbești pressure node: valve house - concreting, architecture, installations and AMC, equipment installation; forced pipe: completion of assembly, AMC;
- ✓ CHE Bumbești: masonry, floors, finishes, carpentry and metallic confections, installations and lightning rods, installation of equipment, exterior fittings, platforms, fences and gutters, concreting the stilling basin, 110 kV station - terraces and construction;
- ✓ Bumbești intervention block: floor, plywood and finishes; completion facilities;
- ✓ Bumbești spillway tunnel: downstream concrete;
- ✓ Jiu capture: diversion stage II, excavations stage II, concreting, steps for the migration of fish fauna; installation of equipment, capture pipe Jiu - section II, III and IV; bank protection;
- ✓ Dumitra capture: excavations, fillings and slopes protection; stilling basin concreting, equipment installation;
- ✓ Road to CHE: superstructure;
- ✓ Road to CHE Dumitra: infrastructure, superstructure;
- ✓ Jiu access road: slopes, bridges, superstructure protection;
- ✓ Access road over the massif M3 to CHE Bumbești: superstructure, gutters.

²⁰ Idem ⁴⁰

Please note that for the works listed above, SPEEH Hidroelectrica SA is in the stage of carrying out the environmental impact assessment.

The potential impact associated with hydroenergy is presented in section IV.2. of this study.

Studiu Evaluare Adecvată

❖ **Realization of hydroelectric power plants on the Olt River 145 MW**

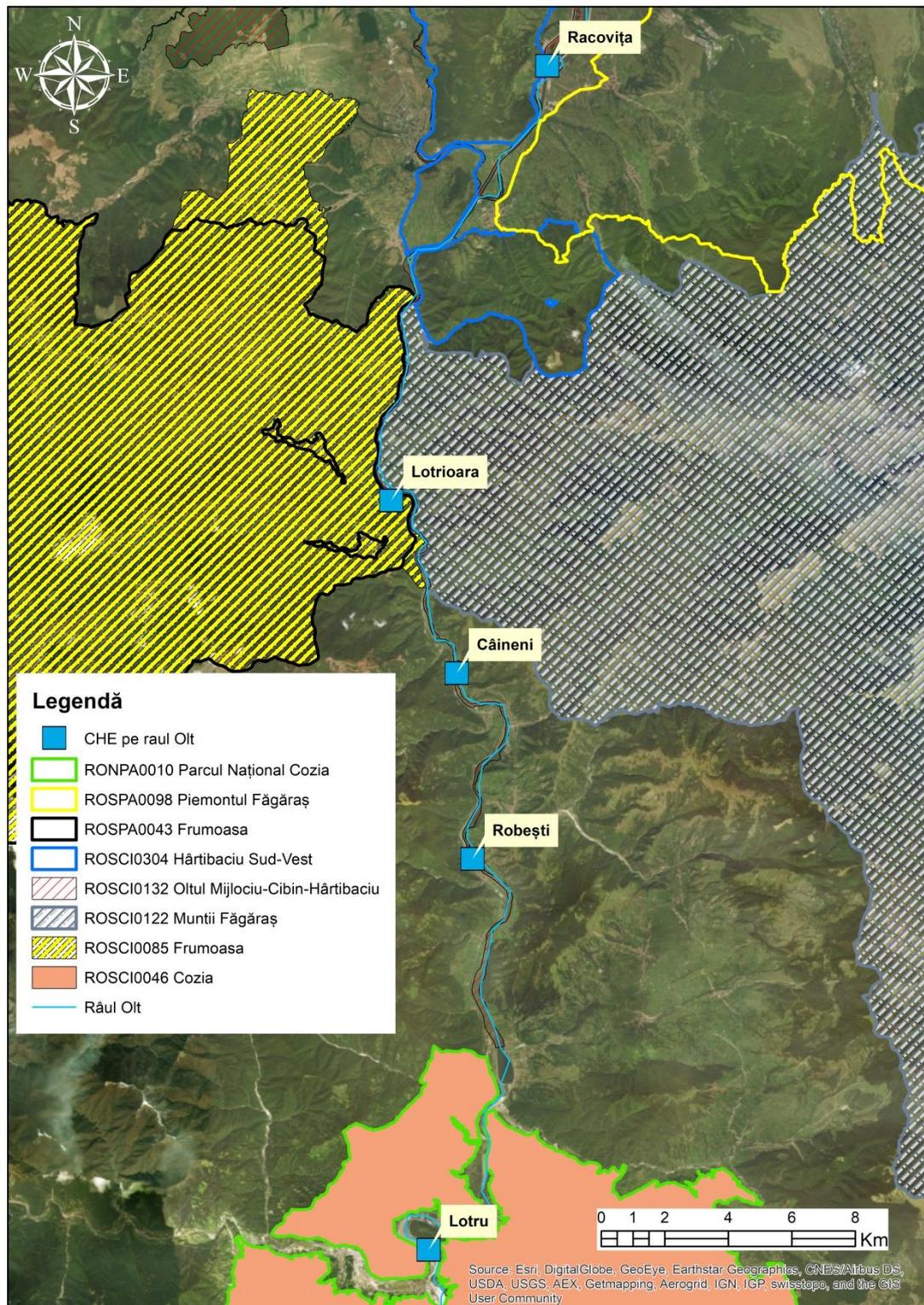


Figure 27 Localization of the objective "Realization of hydroelectric power plants on the Olt river 145 MW"

The objective targets 5 hydroenergy power plants located on the Olt River: Racovița, Lotrioara, Căineni, Robești and Lotru (Figure 27). All five plants are 100% built and do not directly intersect Natura 2000 sites but are less than 1km away from the following: ROSCI0304 Hârtibaciu Sud-Vest, ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu,

ROSPA0043 Frumoasa, ROSCI0085 Frumoasa and ROSCI0122 Făgăraș Mountains (Figure 28, Figure 29, Figure 30, Figure 31, Figure 32).

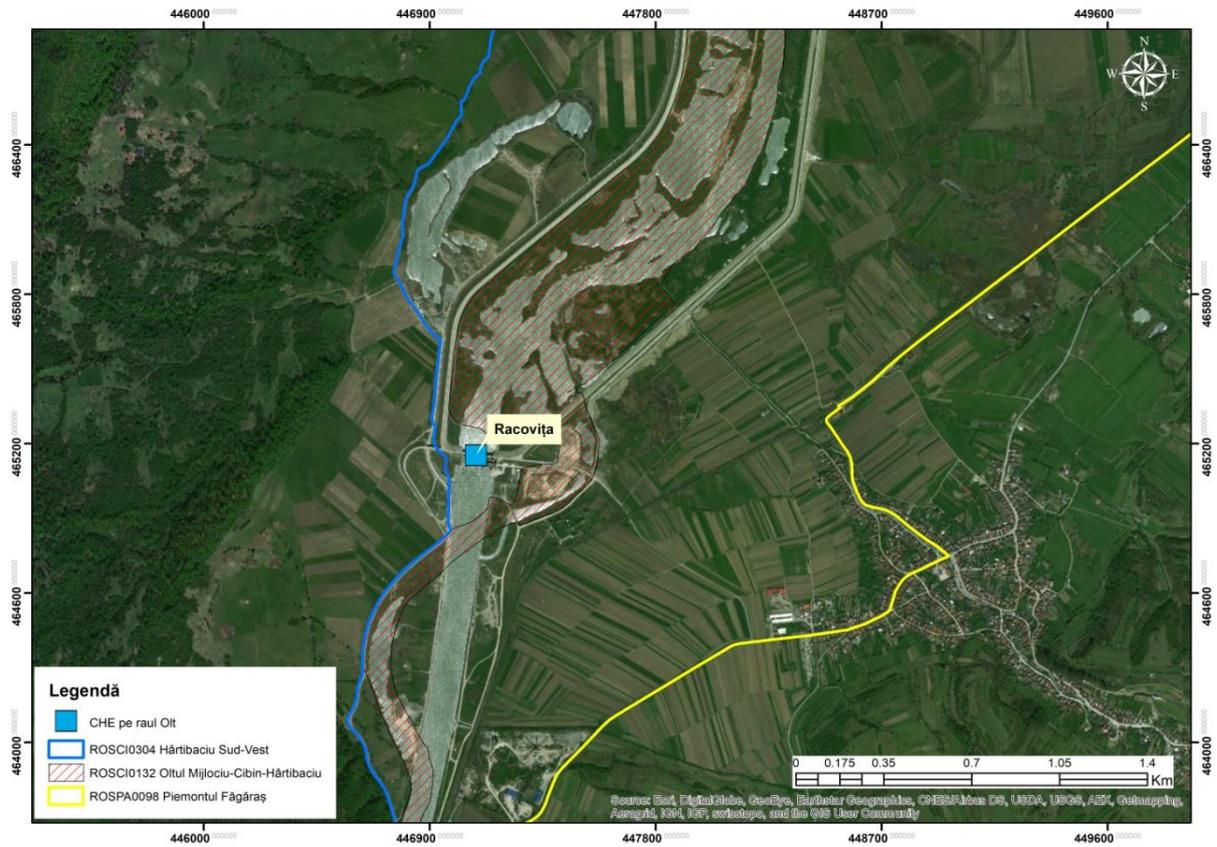


Figure 28 Localization of the objective "Realization of hydroelectric power plants on the Olt 145 MW" - detail Racovița

Studiu Evaluare



Figure 29 Localization of the objective "Realization of hydroelectric power plants on the Olt 145 MW" - detail Lotrioara



Figure 30 Localization of the objective "Realization of hydroelectric power plants on the Olt River 145 MW" - detail Căineni



Figure 31 Localization of the objective "Realization of hydroelectric power plants on the Olt river 145 MW" - detail Robești



Figure 32 Localization of the objective "Realization of hydroelectric power plants on the Olt river 145 MW" - detail Lotru

For the mentioned objective, there are regulatory documents in the field of environmental protection and in the field of water protection issued by competent institutions²¹ for the works performed, as follows:

- ✓ Authorization for performance of works no. 65 / 06.08.1990 issued by the Prefecture of Sibiu County in the town of Avrig-Racovița, for the investment objective, the CHE Racovița and CHE Lotrioara stages;
- ✓ Authorization for performance of works no. 83 / 17.04.1990 issued by the Prefecture of Valcea County in the town of Caineni-Racovița, for the investment objective, the CHE Racovița and CHE Cornetu stages;
- ✓ Authorization for performance of works no. 98 / 126.05.1989 issued by the People's Council of Valcea County in the town of Caineni-Robesti, for the investment objective, the CHE Robesti and CHE Caineni stages;
- ✓ Environmental agreement no. SB 10 of 27.05.2005 issued by APM Sibiu for PATZ of the investment objective - Hydropower development on the Olt river in the Avrig - Cornetu sector;
- ✓ Water Management Notice no 87 / 03.05.2015, on the Zonal Territory Development Plan - Avig, Tălmaciu, Racovița, Turnu Roșu, Căineni - Sibiu and Vâlcea counties. Hydropower development on the river Olt Superior Cornetu - Avrig.
- ✓ Permit for execution of works no 15 / 11.12.2018, issued by the Town Hall of Turnu Roșu commune, county of Sibiu, for the purpose of Execution of the works of discharge on Sebeș brook (railway protection bridge)

According to the aforementioned letter to the investment objective "Hydropower development of the Jiu River in the Livezeni-Bumbești Sector", the following works will be carried out, as follows:

✓ Robesti spillway

Works executed in proportion of 99%. The power plant has been in operation since 2012. The rest to be executed is represented by: acquisition of land affected by the development (by applying Law 255/2010); execution of LEA N110KV Robești-Sibiu South, necessary to evacuate the power of the Robești, Căineni and Lotrioara power stations. Operating licence - all permits valid.

✓ Racovita spillway

Works executed in proportion of 95%. Completed the Acceptance at the Completion of the Works and the Acceptance at Commissioning. Can operate at a capacity of max. 60%, due to the restrictions given by the protection of railway bridges crossing the spillway tunnel. Remaining works required to reach the NNR level in upstream: 373.5 mdMB**

- DMD upstream of Bradu Bridge 3rd entrancement
- DMS 3rd entrancement
- Mârșa and Avrig streams closure
- railway bridge protection Mârșa and Avrig

Works needed to reach the final elevation of the spillway tunnel:

- setting up of the Sebeș stream discharge works

²¹ Ibidem⁴⁰

- demolish road bridge downstream
- deepening and widening the spillway tunnel: Phase I: downstream level 362 mdMB, Phase II: downstream level 358 md

*Depending on the solution of solving the protection of the downstream railway bridges.

** The execution of the remaining works to be executed is compulsory to reach the designed indicators.

The land acquisition is continued only by the application of Law 225/2010 on the expropriation for public utility, the necessity of approving the Expropriation corridor for the completion of the works.

Under licensing. The procedures for obtaining the Water Management Permit and the Environmental Permit were started.

✓ Caineni spillway

Works executed in proportion of 20%. The works were stopped in 2012.

Remaining works to be executed to complete the investment:

Caineni escape dam:

- dam superstructure concreting;
- arrangement of the plant-dam crest;
- concreting the left wall downstream on missing sections (2 sections);
- concreting the right wall upstream on missing sections (3 sections);
- concreting the missing energy spread teeth (3 pcs)

Hydroelectric power station:

- concreting the infrastructure (approx. 50%) and all the superstructure;
- stilling basin approx. 20%.

Left bank and right bank dams:

- the entire left bank dam: fillings, surface and depth seals, counter-channel;
- the entire left bank dam: fillings, surface and depth seals, counter-channel (from this a small part adjacent to the node is executed (work platform, 200 m Kelly-type screen, 2 sections of counter-channel raft).

Spillway tunnels and high waters:

- excavations on approx. 60% of its length;
- concrete protections on the left bank.

Access roads and bridges on site - in full

Site organization - 50% restoration.

Notices were obtained from the Custodians of Natura 2000 Sites.

On 11.06.2019, the Draft Decision of the Classification Stage was displayed. The procedure continues with the issuance of the Guideline as per Law no. 292/2018. Obtaining the Environmental Notice is subject to obtaining the SGA Opinion.

✓ Lotrioara spillway

Works executed in proportion of 1%.

- NH execution site - is made entirely on the left bank, in the vicinity of the railway;
- Escape dam - the first blades of the raft were concreted on the two escape fields on the left bank (openings 3 and 4) and the separating pier (in the middle of the escape dam);
- Technological and social organization - one concrete platform remaining;
- Notices were obtained from the Custodians of Natura 2000 Sites;
- On 11.06.2019, the Draft Decision of the Classification Stage was displayed. The procedure continues with the issuance of the Guideline as per Law no. 292/2018.

Obtaining the Environmental Notice is subject to obtaining the SGA Opinion..

The potential impact associated with hydroenergy is presented in section IV.2. of this study.

ENERGY TRANSPORT

RES 2019-2030, with perspectives for 2050, targets the following projects for the development of energy transport infrastructure:

- The new 400 kV dc OHL(with an equipped circuit) between existing stations Smârdan and Gutinaş
- New 400 kV dc OHL between the existing Cernavodă and Stâlpu stations with an inlet / outlet at the 400 kV Gura Ialomiţei station
- Expansion of the 220/110 kV Stâlpu station by building the 400/110 kV station
- LEA 400 kV Porţile de Fier - Anina - Reşiţa
- New 400 kV dc OHL between existing stations Resita (Romania) and Pancevo (Serbia)
- Switching to 400 kV of OHL220 kV dc Reşiţa-Timişoara-Săcălaz-Arad
- Expansion of the 220/110 kV Resita station by building the new 400/220/110 kV Resita station;
- Replacement of the 220/110 kV Timisoara station by construction of the new 400/220/110 kV station.

✓ **Project 138 “Black Sea Corridor”**

The “Black Sea Corridor” project is part of the electricity corridor: “North-South interconnections on electricity from Central and South-East Europe (“ NSI East Electricity”) and has the role of strengthening the electricity transmission corridor along the Black Sea coast (Romania - Bulgaria) and between the coast and the rest of Europe.

The components of the project are the following:

- **New 400 kV DC LEA between the existing stations Cernavodă and Stâlpu with an incoming / outgoing circuit at the 400 kV Gura Ialomiţei station;**

The works consist in making two sections of 400 kV LEA with double circuit:

- section I 400 kV double circuit Cernavoda - Gura Ialomiţei;

- section II 400 kV Gura Ialomiței - Stâlpu, complete with 400 kV line panels with simple circuit, which allow the connections to the Gura Ialomiței Station, according to the investment requirements.

Overhead power line (LEA) Cernavodă – Stâlpu, about 160 km, will be made as a double circuit line, a circuit will be input - output at the Gura Ialomița station, and the second circuit will be continuous until Stâlpu Station..

- **Stage:** works procurement procedure - pending a dispute submitted by a bidder;
 - **Obtained regulatory documents:** the expropriation GD no. 805 / 08.11.2017 and the Environmental agreement updated on 23.04.2019;
 - **Location:** the route of the overhead power line is through the unincorporated area of 34 communes from the range of Constanța, Ialomița and Buzău counties and will cross the Danube river and the Borcea branch..
- **Upgrade of the 220/110/20 kV Stâlpuși station, construction of the 400 kV Stâlpu Station.**
- **Stage:** in the works tender procedure - evaluation of bids;
 - **Regulatory documents obtained:** not applicable;
 - **Location:** Transformer substation 220/110/20 kV Stâlpu is located in Stâlpu commune, Buzău county.
- **The new 400 kV DC LEA (with an equipped circuit) between existing stations Smârdan and Gutinaș;**
- **The works consist in** construction of a new line that will consist of two distinct sections: a section of underground electric line (in cable) 440 kV between the station 400 kV Gutinaș and the terminal pole no. 1, having a length of approx. 2,0 km and a section of 400 Kv BETWEEN POST NO. 445 from Smârdan Station, with a length of approx. 138 km. In order to connect this LEA, it is also necessary to extend Gutinaș Station and Smârdan Station, respectively, with two line cells.
 - **Stage: design in progress;**
 - **Regulatory documents pending issuance:**
 - Pending revision of the Environmental Agreement necessary to obtain the G.D. for forest removal;
 - The inter-ministerial circuit of GD approval for transfer of right of administration of the public patrimony of the state on the route of LEA was initiated for the lands;
 - Documentation in preparation for obtaining the GD for removal from the agricultural circuit;
 - The financing contract is negotiated following the approval of the financing application under the Large Infrastructure Operational Programme in April 2019;
 - **Regulatory documents obtained: GD no. 840 / 22.09.2017 of expropriation;**
 - Location: LEA 400 kV d.c. Gutinaș - Smârdan will be located on 26 administrative territories belonging to the counties of Bacău (5 UAT), Vrancea (5 UAT) and Galați (16 UAT), the length of the line: 140 km;
- ✓ **Project 144 “Mid Continental East Corridor”**

The “Mid Continental East Corridor” project is part of the electricity priority corridor: “North-south interconnections on electricity from Central and South-Eastern Europe (“NSI East Electricity”) and leads to an increase of exchange capacity on the borders between Romania - Hungary - Serbia. It intensifies the North-South European corridor from North-East Europe to South-East Europe through Romania, allowing for stronger market integration and increased security of consumption in the South-East Europe area.

The components of the project are the following:

- **New 400 kV dc LEA between existing stations Resita (Romania) and Pancevo (Serbia);**
 - **Investment objective completed on 30.03.2018.**
- **New 400 kV d.c. LEA to existing station 200 kV Portile de Fier and the new 400 kV station Resita;**
- **Switching to 400 kV of LEA 220 kV dc Reșița – Timișoara – Săcălaz – Arad;**
- **Expansion of the 220/110 kV Resita station by building the new 400/220/110 kV Resita station;**
- **Revamping of the 220/110 kV Timisoara station by construction of the new 400/220/110 kV station.**

Stage I: Extension of 400 kV Portile de Fier station; 400 kV LEA Portile de Fier - Reșița; 400 kV Resita station;

The works consist of:

Extension of the 400 kV Portile de Fier Station consisting of equipping a LEA cell in the Portile de Fier Station and replacing the command, control and protection system in the 400/220 kV Portile de Fier Station;

- **Stage:** investment objective completed in 2016;

Realization of a new LEA 400 kV Portile de Fier - Anina, rehabilitation of LEA 400 kV Anina - Reșița;

- **Stage:** execution of works in progress;
- **Regulatory documents obtained:** Expropriation GD no. 917/2016, Forestry GD no. 353/2019 and environmental agreement no. 6 / 21.11.2013;
- **Location:** The works will be carried out in 13 UATs: 10 UATs in Caraș-Severin county and 3 UATs in Mehedinți county;

Realization of the 400/220/110 kV Reșița station by creating a new 400 kV station and refurbishing the old 220/110 kV station;

- **Stage:** execution of works in progress the component of secondary equipment and related services and in the tender procedure - evaluation of bids for the supply of primary equipment and associated services;
- **Regulatory documents obtained:** considering that the works for the construction of the new 400 kV station and the refurbishment of the old 220/110 kV station in Reșița require the purchase of additional land, because the 400/220/110 kV station in Reșița cannot be included in the existing 220/110 kV station site, GD no. 934/2016 for

approving the site and initiating the procedure for expropriation of private property real estate was obtained;

- **Location:** Soceni, DN 58 Reșița - Caransebeș;

Stage II: LEA 400 kV D.C. Reșița – Timișoara – Săcălaz + 400 kV Timișoara station, 110 kV Timișoara station;

The works consist of:

Realization of 400 kV LEA double circuit Reșița - Timișoara, Reșița - Săcălaz

- **Stage:** pending design;
- **Regulatory documents obtained:** pending the environmental agreement;
- **Site:** the works will be carried out within the counties of Caraș-Severin and Timiș counties;

Revamping of the 220/110 kV Timisoara station and construction of the 400 kV station.

- **Stage:** execution of works in progress;
- **Regulatory documents obtained:** not applicable;
- **Location:** Calea Moșniței, no. 40, Timișoara Municipality.

Stage III: LEA 400 kV d.c. Timisoara - Săcălaz - Arad + Station 400/110 kV Săcălaz + Extension of Station 400 kV Arad;

The works consist of:

Realization of the 400 kV LEA section Timișoara - Săcălaz - Arad;

- **Stage:** design services for developing SF, PT + CS in progress.
- **Regulatory documents obtained:** after the completion of the design, the stage of obtaining the Environmental Agreement will be initiated.
- **Location:** the works will be carried out within the counties of Timis and Arad;

400 kV Săcălaz station and refurbishment of the 110 kV Săcălaz Station;

- **Stage:** in preparation the Tender Specification for the procurement of the design services.
- **Regulatory documents obtained:** after completion of the design, the stage of obtaining the Environmental Agreement will be initiated.
- **Location:** DN 59A Timișoara-Jimbolia at km 4.

Extension of the 400 kV Arad Station and the refurbishment of the 110 kV Arad Station;

- **Stage:** in preparation the Tender Specification for the procurement of the design services.
- **Regulatory documents obtained:** after completion of the design, the stage of obtaining the Environmental Agreement will be initiated.
- **Location:** DJ 709 Arad - Șiria km 1.

Their location is represented in Figure 33 on the basis of the environmental agreements and the site and delimitation plans made available by the Beneficiary.

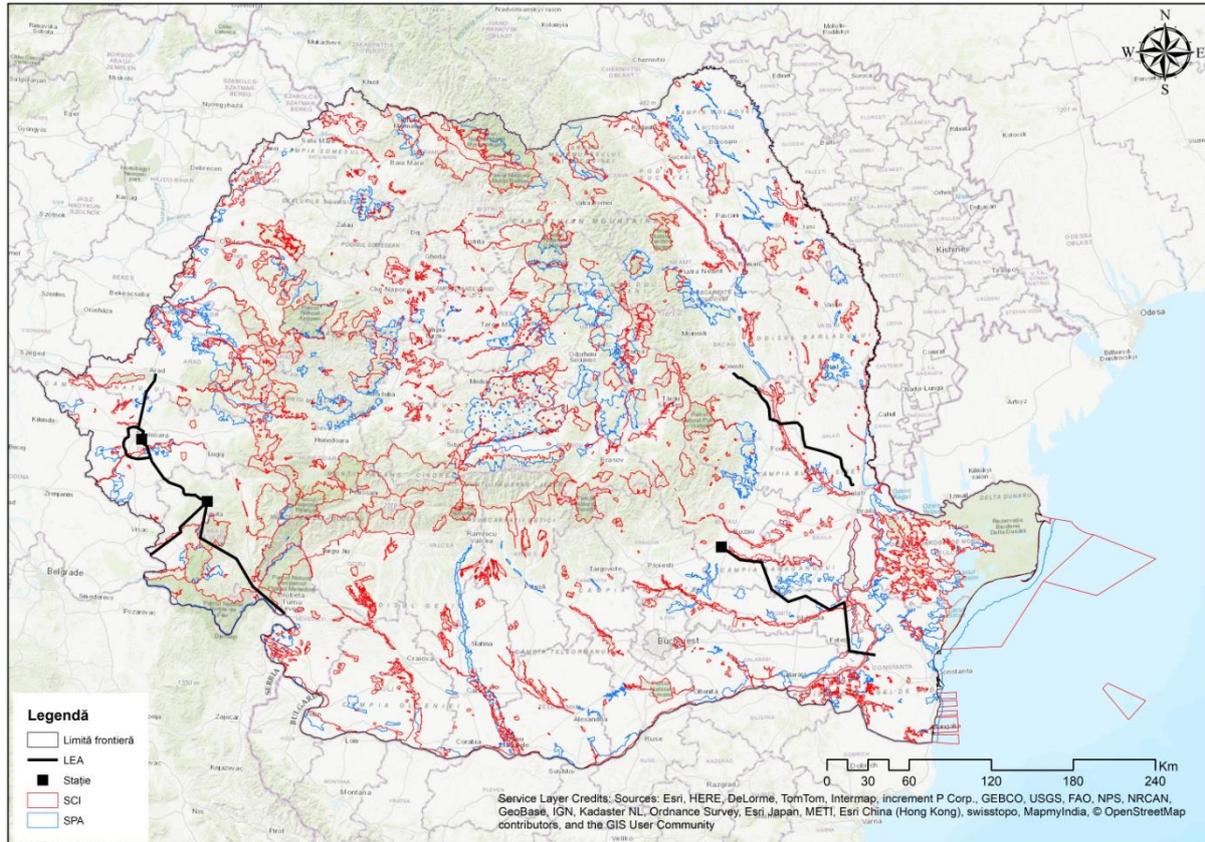


Figure 33 Objectives under RES 2019-2030, with perspectives for 2050, in the field of energy transport

Brief description of Natura 2000 sites intersected by RES 2019-2030, with perspectives for 2050

ROSCI0045 Jiu Corridor

The site is located on the territory of two counties, namely Gorj (25%) and Dolj (75%), joining fully in the continental biogeographic region. The surface of the site is 71362 ha and the average altitude is 102 m.

According to the site's standard Form, the following habitat classes and their coverage are found: sand beaches (0.26%), rivers, lakes (11.54%), marshes, peatlands (9.3%), crops - arable land (18.33%), pastures (9.48%), other arable land (1.72%), deciduous forests (45.78%), vineyards and orchards (0.26%), other artificial lands (0.46%), forest habitats (2.73%).

The site was designated for the protection of 18 habitat types of which 4 are priority habitats (1530 * - Pannonian saline swamps and steppes, 6120 * - Xeric and calciphile grasslands on sands, 91E0 * - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno -Padion*, *Alnion incanae*, *Salicion albae*), 91I0 * - Eurosiberian sturgeon sylvan steppe with *Quercus* spp), 2 mammalian species, 3 amphibian and reptile species, 13 fish species, 5 invertebrate species and 2 plant species listed in Annexes I and II to Directive 92/43 / EEC.

The territory located along the middle and lower course of Jiu includes one of the rarest and most representative relict samples of a slightly altered European meadow. Located between 23°30'02" and 24°14'05' east longitude and between 43°42'01" and 44°54'55"

north, with a length of the direction NNW-SSE of about 129 km, this area crosses 4 and 27%, respectively, of the 15 ecoregions (Getic Plateau, Gavanu-Burdea Plains, Romanian Plain sylvan steppe, Danube Meadow) of Romania's continental biogeographical region, on a 355-meter difference between 50 and 405 m altitude. Out of the total area of 147,540 ha, 34,979 ha (24%) belong to the forest area, out of which the forests have 33,543 ha (23%) and they contain a complex of ecosystems, which are predominantly natural, with considerable diversity and local abundance of 764-5,000 times higher than the average values specific to the Romanian forest, which gives it an exceptional biogeographical personality.

ROSCI0373 Mureş River between Brănişca and Ilia

The site is located entirely on the area of Hunedoara County and in the Continental biogeographic region. The surface of the site is 1855 ha, the average altitude in the site being 250 m.

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (8.63%), arable land (4.25%), pastures (30.53%), other lands arable (1.09%), deciduous (52.56%), vines and orchards (1.22%), other artificial lands (1.73%).

The site has been designated for the protection of one mammalian species, 5 species of amphibians and reptiles, 6 fish species and 3 invertebrate species listed in Annexes I and II to Directive 92/43 / EEC.

It is among the few sites designated for *Castor fiber*. Of high importance also for amphibian species *Bombina variegata*, *Triturus cristatus* and the indigenous subspecies *Triturus vulgaris ampelensis*. Important for protecting *Aspius aspius*.

ROSCI0263 Valea Ierii

The site is located entirely on the territory of Cluj County and in the Alpine biogeographic region. The surface of the site is 6289 ha and the average altitude is 1162 m.

According to the site's standard form, the following habitat classes and their coverage are found: natural meadows, steppes (0.44%), pastures (5.37%), other arable land (0.64%), deciduous forests (18.60%), coniferous forests (58.29%), mixed forests (8.51%), forest habitats (8.15%).

The site was designated for the protection of 6 types of habitats, one of which is a priority (91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)), 4 mammalian species, 2 species of which are priority (1352 * *Canis lupus*, 1354 * - *Ursus arctos*), 2 species of amphibians and reptiles, 4 fish species and 2 invertebrate species listed in Annexes I and II to Directive 92/43 / EEC. In addition, the site also hosts 12 mammalian species, 2 amphibian and reptile species, 1 fish species, 1 invertebrate species, and 3 plant species.

The feature of this site is the presence of rare mammals and bird species who are vulnerable to anthropogenic pressure, including a large part of the spreading area of these species, specific to forest habitats in the hill and mountain area.

ROSCI0427 Liteni-Săvădisla Meadows

The site is hosted on the territory of two biogeographical regions, namely alpine (1.25%) and continental (98.75%). Site surface is 2424 ha.

According to the site's standard form, the following habitat classes and their coverage are found: arable land - crops (24.52%), pastures (40.04%), other arable land (8.10%), deciduous forests (21.65%), other artificial land (0.82%), forest habitats (4.86%).

The site was designated for the protection of 5 habitats of which one priority habitat (40A0 * Peripannonian subcontinental scrub), 1 amphibian species and reptiles and 3 invertebrate species listed in Annexes I and II of Directive 92/43 / EEC.

ROSCI0044 Corabia - Turnu Măgurele

Protected natural area ROSCI0044 Corabia - Turnu Magurele is an area that extends over the counties of Olt (33%) and Teleorman (67%), totally overlapping the Continental biogeographical region. The altitude varies from 3 m (minimum altitude) to 47 m (maximum altitude) and has an area of 8,354 ha. The site partially overlaps with ROSPA0024 Confluence of Olt - Danube.

The area's perimeter is characterized by the following major habitats: sandy beaches with a coverage of 4.95%, rivers, lakes (35.17%), marshes, peatlands (2.11%), crops, arable land (2, 06%), pastures (15,12%), deciduous forests (26,62%), artificial lands (0,59%) and transitional forests (13,30%).

The site was declared for 5 types of habitats of community interest of which a priority habitat (91E0 * alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salcion albae*) and 17 species: 2 mammalian species, 2 amphibian species and 13 fish species.

The Corabia - Turnu Magurele sector is located in the Lower Danube Meadow and has a special ecological value due to the present habitats of community interest. From a geological point of view, the area is characterized as an area where alluvial deposits consist of fine or coarse sands, small, large and very large gravel, boulders, banks and clays with well-represented variable thicknesses. In this lower sector of the Danube, the habitats that remained natural and semi-natural due to the transformations that took place in the last 20 years in the Danube meadow are the soft-wood forests, the shallow and poplar parks of special ecological importance, being also habitats of Community interest. They are interdependent with the hydrological regime of the river and preserve their bio-geochemical and ecological functions, while being of major importance in terms of biodiversity, especially birds, being a nesting area of many species of birds of Community interest mentioned in the annex to the Birds Directive: ciocîntors (*Recurvirostra avosetta*), stilt (*himantopus himantopus*), tern (*Sterna hirundo*), small tern (*Sterna albifrons*), night egret (*Nycticorax nycticorax*), yellow egret (*Ardeola ralloides*), small egret (*Egretta garzetta*), large egret (*Egretta alba*), spoonbill (*Platalea leucorodia*).

Following the proposal by the Tulcea Danube Delta Research and Development Institute, this site obtained the favourable opinion of the Romanian Academy - Commission for the Protection of Natural Monuments (no.1114 / CJ / 02.05.2006) regarding its declaration as a natural reserve.

ROSCI0019 Călimani-Gurghiu

The site is located in the territory of 3 counties, as follows: Mureş (89%), Suceava (8%), Harghita (3%) and two biogeographical regions: Alpine (99.39%) and Continental (0.61%). The surface of the site is 135257 ha and the average altitude in the site is 1131 m.

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (0.12%), bushes, shrubs (2.51%), natural grasslands, steppes (1.81%), pastures (5.98%), other arable land (0.52%), deciduous forests (18.44%), coniferous forests (20.48%), mixed forests (41.08%), other artificial lands (0.53%), forest habitats (8.5%).

The site has been designated for the protection of 25 habitats, of which 7 are of priority (4070 * - *Pinus mugo* and *Rhododendron hirsutum* shrubs (*Mugo-Rhododendretum hirsuti*), 6230 * - Species-rich *Nardus* meadows on mountainous silicate substrates (and sub-mountainous, in continental Europe), 6240 * - Sub-Pannonian steppe grasslands, 7110 * - active cambered marshes, 7240 * - Alpine pioneer formations of *Caricion bicoloris-atrofuscae*, 9180 * - *Tilio-Acerion* forests on steep slopes, detritus and clough, 91E0 * - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)), 12 species of mammals, 2 of which are priority species (1352 * - *Canis lupus*, 1354 * - *Ursus arctos*), 4 species of amphibians and reptiles, 6 species of fish, 13 species of invertebrates, 4 of which are priority species (1078 * *Callimorpha quadripunctaria* , 4039 * - *Nymphalis vaualbum* , 1084 * - *Osmoderma eremita* , 1087 * - *Rosalia alpina*), 10 plant species of which one is a priority species (4070 * - *Campanula serrata*) listed in Annexes I and II to Directive 92/43 / EEC. In addition, the site also hosts 6 mammalian species, 5 amphibian and reptile species, 5 invertebrate species and 79 plant species.

The existence of compact natural forests (over 100 000 ha) has contributed to the existence of a remarkable and representative biological diversity for volcanic mountains in the Carpathians. Having human settlements, only in the Mures defile, the area was not significantly altered by the anthropic activity and the natural diversity of the habitats and species was preserved. In this region there is one of the most important populations and genetic centres for carnivorous in the Carpathians - bear, wolf and lynx, and a significant concentration of species of flora and fauna protected by national law and EU Directives.

ROSPA0133 Călimani Mountains

The site is located on the territory of Suceava (53%), Harghita (9%) and Mureş (38%) belonging totally to the Alpine biogeographical region. The surface of the site is 29160 ha and the average altitude in the site is 1512 m.

According to the standard site Form, the following habitat classes and their coverage are found: bushes, scrub (12.44%), natural grasslands, steppes (1.19%), pastures (7.42%), coniferous forests (57.96%), mixed forests (11.08%), rock, low-vegetation areas (0.15%), other artificial lands (1.30%), forest habitats (8.40% %).

The site has been designated for the protection of 106 bird species according to Annex I of Directive 2009/147 / EC.

The most important areas of the national park in terms of birds are the extensive, compact and slightly disturbed forests of spruce, and of beech - fir - spruce. They host

nationally important nesting nurseries of 4 species in Annex I. The mountain eagle is also present in the proposed area, it preferring steep cliffs for nesting.

ROSCI0063 Jiu defile

The site is located in Hunedoara (4%) and Gorj (96%), belonging to two biogeographical regions: Alpine (99.92%) and Continental (0.08%). The surface of the site is 10927 ha, the average altitude is 880 m, and the two extremes, respectively, minimum 299 m and the maximum one is 1688 m.

According to the standard site form, the following habitat classes and their coverage are found: rivers, lakes (2.54%), natural meadows, steppes (6.34%), other arable land (0.48%), 87.26%), coniferous forests (1.64%), mixed forests (0.41%) and forest habitats (1.32%).

The site has been designated for the protection of 21 habitats, including 4 priority habitats (40A0 * Peri-Pannonian subcontinental bush, 7220 * - *travertin-forming* petrified springs (Cratoneurion), 9180 * *Tilio-Acerion* forests on steep slopes, clough and scrubs, 91E0 * - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion alba*)), 10 species of mammals of which two species of priority (1352 * - *Canis lupus* and 1354 * - *Ursus arctos*), 2 amphibians, 8 species of invertebrate of the 3 species are of priority (1093 * - *Austropotamobius torrentium*, 1084 * - *Osmoderma eremita*, 1087 * - *Rosalia alpina*) and 2 species of plants, out of which one is of priority (4070 * - *Campanula serrata*), listed in Annexes I and II to Directive 92/43 / EEC. Besides, the site also hosts 8 mammalian species, 15 amphibian and reptile species and 19 invertebrate species.

The existence of disappeared virgin forests in the rest of Europe with specific biological abundance and diversity, along with scenic mountain meadows, rocks, steeples, gorges, Jiu with its meanders and adjoining islets, unspoiled streams, caves with unseen nature arts, lizards, Balkan beech forests with hornbeam and lime, thermophilic elements under the influence of the sub-Mediterranean climate, with characteristic habitats and rich flora and fauna.

ROSCI0085 Frumoasa

The site is located in the territory of 4 counties, as follows: Alba (19%), Hunedoara (2%), Sibiu (60%), Valcea (19%) from the Alpine biogeographic region, in a proportion of 100%. The surface of the site is 137256 ha, the average altitude is 1448 m, the maximum is 2254 m and the minimum 350 m.

According to the standard site form, the following habitat classes and their coverage are found: rivers, lakes (1,15%), bushes, scrub (3,18%), natural grasslands, steppes (11,39%), pasture (1.94%), other arable land (0.40%), deciduous forest (7.98%), coniferous forests (0.74%), mixed forest (68.70% forests habitats (4.37%).

The site was designated for the protection of 16 habitat types, 5 of which are priority (4070 * - Scrubs with *Pinus mugo* and *Rhododendron myrtifolium*. 40A0 * - Peri-Pannonian sub-Continental scrubs, 6230 * - mountainous *Nardus* grasslands rich in species on siliceous substrates, 7110 * - Active turbaries * 91E0 - Alluvial forests with *Alnus glutinose* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)), 4 species of mammals, 2 of which are priority species (1352 * - *Canis lupus* and 1354 * - *Ursus arctos*), 2 species of amphibians, 4 species of fish, 11 species of invertebrates, 4 of which are priority species (1078 * - *Callimorpha quadripunctaria* , 4039 * - *Nymphalis*

vaualbum , 4024 * - *Pseudogaurotina excellens* , 1087 * - *Rosalia alpina*), 6 plant species of which one is a priority species (4070 * - *Campanula serrata*) listed in Annexes I and II of Directive 92/43 / EEC. In addition, the site hosts 15 species of amphibians and reptiles, a species of invertebrates and 32 plant species.

In this area, 10 types of habitats of community interest were identified, covering over 80% of the total area, of which the most representative are the peri-alpine spruce forests, the alpine and subalpine juniper and pastures. Some of the forests are virgin or quasi-virgin, polarizing a large terrestrial biological diversity. Many of the existing forests, pure or mixed, have average ages of over 120 and even 160 years, being excellent habitats for viable populations of bear, wolf and lynx.

ROSPA0043 Frumoasa

The site is located in the territory of 3 counties, namely Alba (18%), Sibiu (62%) and Valcea (20%) in the Alpine biogeographic region in a proportion of 100%.

According to the standard site form, the following habitat classes and their coverage are found: rivers, lakes (1,20%), bushes, scrubs (3,24%), natural grasslands, steppes (10,82%), pastures (1,70%), deciduous forests (7,81%), coniferous forests (0,78%), mixed forests (69,81%), forest habitats (4,47%).

The site has been designated for the protection of 11 bird species according to Annex I of Directive 2009/147 / EC.

The site hosts important species of species: *Tetrao urogallus*, *Bonasa bonasia*, *Dryocopus martius*, *Dendrocopos leucotos*, *Picoides tridactylus*, *Strix uralensis*, *Aegolius funereus*, *Glaucidium passerinum*, *Ficedula parva* and *Ficedula albicollis*.

ROSCI0122 Făgăraș Mountains

The site is located in the territory of four counties, namely Sibiu (13%), Braşov (22%), Alba (54%) and Valcea (11%) included in the Alpine biogeographic region in a proportion of 100%. The surface of the site is 198620 ha, the average altitude is 1407 m, the maximum is 2526 m and the minimum is 347 m.

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (0.55%), bushes, scrubs (11.84%), natural grasslands, steppes (9.64%), pastures (0.97%), other arable land (0.17%), hardwoods (17.60%), coniferous forests (25.10%), mixed forest (28.94% forests (1.90%), rock, low-vegetation areas (3.25%).

The site was designated for the protection of 28 habitats, of which 5 are priority (4070 * - Scrubs with *Pinus mugo* and *Rhododendron myrtifolium*, 6230 * - *Nardus* mountain pastures rich in species on siliceous substrate, 7240 * - Alpine pioneer formations of *Caricion bicoloris-atrofuscae*, 9180 * - Forest from *Tilio-Acerion* on steep slopes, detritus and clough 91E0 * - Alluvial forests *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion alba*)), 12 species of mammals of which 2 are the priority species (1352 * - *Canis lupus* and 1354 * - *Ursus arctos*), 4 species of amphibians, 5 species of fish, 13 invertebrate species of which 3 are priority (1078 * - *Callimorpha quadripunctaria* , 1084 * - *Osmoderma eremita* , 1087 * - *Rosalia alpina*) and 7 plant species of which one is of priority (4070 * - *Campanula serrata*) listed in Annexes I and II to Directive 92/43 / EEC. In addition, the site hosts 16 species of mammalian species,

16 amphibian and reptile species, 3 fish species, 3 invertebrate species, and 218 plant species.

The proposed site includes the highest and safest sector of the Romanian Carpathians with one of the largest extensions of the glacial and periglacial relief, with specific ecological conditions due to the geological, pedological and climatic diversity reflected in the very high biodiversity of this area. In this mountain there are representative fragments of virgin and quasi-virgin natural forests - today practically vanished in Europe - which polarize a special terrestrial biological diversity. The Fagaras Mountains offer excellent habitats for viable populations of bear, wolf, lynx and black goat.

ROSCI0304 Hârtibaciu Sud Vest (southwest)

The site is located entirely on the territory of Sibiu County and overlaps with two biogeographical regions, i.e. Alpine (8.54%) and Continental (91.46%). The surface of the site is 22840 ha, the average altitude in the site is 499 m, the maximum height is 1233 m and the minimum height is 361 m.

According to the site standard form, the following habitat classes and their coverage are found: marshes, peatlands (0.11%), arable crops (3.19%), pastures (31.15%), other arable land (12.60%), broadleaf forests (48.39%), mixed forests (0.10%), vines and orchards (1.00%), other artificial land (0.20%), habitats of forests (3.25%).

The site has been designated for the protection of 13 habitats, of which 3 are of priority (40A0 * - Peri-Pannonian subcontinental bush, 6110 * - Calcareous or basifil rupicola grasslands from *Alyso-Sedion albi*, 9110 * - Euro-Siberian sylvan steppe vegetation with *Quercus* spp), 10 mammalian species of which 2 are priority species (1352 * - *Canis lupus* and 1354 * - *Ursus arctos*), 5 species of amphibians and 1 invertebrate species listed in annexes I and II of Directive 92/43 / EEC. In addition, the site hosts 17 species of amphibians and reptiles.

A site of major importance for large resident carnivores, *Canis lupus* and *Ursus arctos*. The site is a habitat characteristic of the two species in the Continental biogeographical region and, together with the other sites proposed, would ensure the protection of a representative percentage in this bioregion. In the SW side of the site are the largest wolves of the continental bioregion. The south-western part of the site (between Tâlmăciu and Boița in the West and Turnu Rosu in the East) would connect with the alpine area. In order for this potential corridor to work, it is important that in this area construction (especially linear) is not carried out so that animal movements are not restricted (especially because in the area the national road between Sibiu and Brasov passes through). Important site designated for the 91Y0 forest habitat. A site of high importance for listed species of bats. It is among the few sites designated for *Emys orbicularis*. Of high importance also for *Lutra lutra*, *Castor fiber* and *Bombina* and *Triturus* amphibian species.

ROSCI0132 Oltul Mijlociu - Cibin- Hârtibaciu

The site is located in three counties: Sibiu (66%), Brașov (25%) and Valcea (9%), overlapping on two Alpine (12.27%) and Continental biogeographical regions (87.73%). The surface of the site is 2910 ha, the average altitude in the site is 416 m, the maximum is 568 m and the minimum height is 314 m.

According to the standard site Form, the following habitat classes and their coverage are found: sandy beaches (0.25%) rivers, lakes (36.14%), swamps, peatlands (7.71%),

crops - arable land (10,48%), pastures (6,70%), other arable land (7,58%), deciduous forest (25,46%), vineyards and orchards (1,04%), other artificial lands (1.07%), forest habitats (3.56%).

The site was designated for the protection of 2 habitats, 2 mammalian species, 5 invertebrate species and 11 fish species listed in Annexes I and II to Directive 92/43 / EEC. Besides, the site also hosts 9 species of fish.

An important area for the conservation of *Unio crassus*, *Chilostoma banaticum*, *Rhodeus sericeus*. Although the area reflects the effects of the long-standing anthropic impact, manifested in the decades 7 to 9 of the 20th century, there are still some wetlands that have retained their appearance and remaining communities, fragments of the original structures. Numerous populations have been isolated in these relatively remote areas, forming in a restrictive sense metapopulations and metacommunities. Although small in size, they are potential sources of regeneration and witnesses to the specific diversity of the past, representative for flora, fauna and the Transylvanian landscape.

ROSCI0162 Lunca Siretului Inferior

The site is located in Bacău (2%), Vrancea (42%), Galați (49%) and Brăila (7%), belonging to the biogeography regions Steppe (70.68%) and Continental (29.32%). The surface of the site is 24980,60 ha, the average altitude is 47 m and the maximum altitude is 302 m and overlaps with the Natura 2000 site ROSPA0071 Lunca Siretului Inferior.

According to the site standard form, the following habitat classes and their coverage are found: sandy beaches (0.20%), rivers, lakes (24.78%), swamps, peatlands (5.79%), grasslands (0.47%), crops (arable land) (5.38%), pastures (18.21%), deciduous forests (29.80%) and habitats of forests (forests in transition) (8.12%).

The site has been designated for the protection of 8 habitats, 2 of which are priority habitats, such as: (9110 * Eurosiberian sylvan steppe vegetation with *Quercus* spp., 91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), next to habitats such as, water courses in the plain areas, mountain vegetation in *Ranunculion fluitantis* and *Callitricho-Batrachion* (20%), alluvial grasslands of *Cnidion dubius* (5%), Riparian forests mixed with *Quercus robur*, *Ulmus laevis*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the large rivers (*Ulmion minoris*) (0.5%), marshy rivers with *Chenopodion rubri* and *Bidention vegetation* (0.5%), *Salix alba* and *Populus alba* parks (9%).

Among these, the most representative habitat, both as area occupied in the site is the habitat of Water courses in the plains to the mountain courses, with vegetation of *Ranunculion fluitantis* and *Callitricho-Batrachion* (20%). The site protects 3 mammalian species, 2 amphibian species, 11 fish species, 2 invertebrate species, and 1 reptile species.

ROSPA0071 Lunca Siretului Inferior

The site is located in the counties of Vrancea (29%), Galați (66%), Braila (5%), belonging to the biogeographic regions Steppe (79,48%) and Continental (20,52%). The

surface of the site is 37479.50 ha, an average altitude of 33 m and a maximum altitude of 302 m.

The site overlaps with two other Natura 2000 sites ROSCI0072 Sand dunes at Hanul Conachi, ROSCI0162 Lunca Siretului Inferior.

According to the standard site form, the following habitat classes and their coverage are found: rivers, lakes (16.91%), marshes and turbary (5.65%), natural meadows, steppes (0.34%), crops (arable land) (28.88%), pastures (12.94%), other arable land (4.93%), deciduous forests (20.83%), vineyards and orchards (2.47%), other artificial lands (1.23%), forest habitats (5.81%).

The site has been designated for the protection of 58 bird species according to Annex II of Directive 92/43 / EEC.

The low floodable meadow flora is heavily represented by specific plant associations from the genres *Pragmites*, *Thyph*, *Nymphoides*, *Scirpus* and others. It is an area in the migrating path of the many species of aquatic birds: ardeidae (*rdeola ralloides*, *Egretta garzetta*, *Egreta alba*, *Ardea purpurea*), threskiornithide (*Plegadis falcinellus*, *Platalea leucorodia*), anatid (*Cygnus olor*, *Anser anser*, *Anas querquedula*, *Anas clypeata* , *Aythya ferina*, *Aythya nyroca*), ralde (*Gallinula chloropus*, *Fulica atra*), charidriiforme (*Himantopus himantopus* , *Recurvirostra avosetta*, *Vanellus vanellus*, *Limosa limosa*, *Tringa totanus*, *Tringa ochropus*), laride (*Larus ridibundus* , *Sterna hirundo*, *Chlidonias hybridus*), hirundinide (*Riparia riparia*, *Hirundo rustica*), sylviide (*Acrocephalus* sp.)

ROSCI0022 Canaralele Dunării

The site is located in Ialomita (22%), Constanța (51%) and Călărași (27%) belonging totally to the Steppe biogeographical region. The surface of the site is 26109 ha, the average altitude is 14 m and the maximum height is 133 m.

According to the site standard form, the following habitat classes and their coverage are found: rivers, lakes (31.74%), swamps, peatlands (5.33%), natural meadows, steppes (1.40%), crops - arable land (1.37%), pastures (1.37%), other arable land (1.37%), deciduous forests (50.57%), mixed forests (0.12%), vineyards and orchards (0.42%), other artificial lands (0.18%), habitats of forests (5.76%).

The site was designated for the protection of 12 habitats and 3 priority habitats (40C0 * - Ponto-Sarmatian deciduous scrubs, 62C0 * - Ponto-Sarmatian steppes, 9110 * - Euro-Siberian sylvan steppe vegetation with *Quercus* spp.) and 3 mammalian species, 4 species of amphibians, 17 species of fish, 2 invertebrate species and 2 plant species listed in Annexes I and II to Directive 92/43 / EEC. In addition, the site also hosts 15 other plant species.

Among these habitats, the most representative, both as surface occupied on the site (30%) and at national level (11%) is the habitat 92A0 *Salix alba* and *Populus alba* parks. It includes important areas of stands excluded, since formation, from forest interventions, which can be considered as virgin forests (located mainly on islands), as well as stands with secular trees (especially poplars) on areas of tens of hectares (e.g. Ostrovul Turcesc).

The second most important site is 62C0 * Ponto Sarmatian steppe, which represents about 2.5% of the national area of the habitat, represented on some areas by primary

steppes, including petrophiles on calcareous reefs, with many threatened species included in the list national red (Oltean et al., 1999).

The habitat 40C0 * Ponto Sarmatian broadleaf scrubs, includes two rare associations at national level of high conservative value, namely *Rhamno catharticae*, *Jasminietum fruticantis* and *Paliuretum spinae christi*, endemic for Dobrogea (Sanda, Arcu, 1999).

ROSPA0012 Brațul Borcea

The site is located on the territory of the Ialomița (61%) and Călărași (39%) counties belonging totally to the Steppe biogeographical region and overlaps with another 3 Natura 2000 sites ROSCI0022 Canarele Dunarii, ROSCI0278 Bordușani - Borcea ROSCI0319 Mlastina de la Fetesti. The site's surface is 13299.20 ha, the average altitude is 11 m and the maximum altitude is 64 m.

The site has been designated for the protection of 34 bird species according to Annex I of Directive 2009/147 / EC and 45 species of birds with regular migration not mentioned in Annex I of Council Directive 2009/147 / EC.

The site overlaps with other 3 Natura 2000 sites, such as ROSCI0022 Canarele Dunarii, ROSCI0278 Borduani - Borcea, ROSCI0319 Mlastina de la Fetesti.

According to the standard site form, the following habitat classes and their coverage are found: rivers and lakes (24,50%), marshes, peatlands (1,68%), natural grasslands, steppes (3,06%), crops (arable land) (26,10%), pastures (8,91%), other arable land (2,15%), deciduous forests (31,60%), vineyards and orchards 0.11%), other artificial lands (1.89%).

This site hosts important livestock of protected bird species. The site is important for nesting populations of the following species: *Aytya nyroca*, *Milvus migrans*, *Haliaetus albicilla*, *Falco vespertinus* and *Coracias garrulus*; colonies of *Ardeidae* and *Threskiornithidae*. The site is important during the migration period for the species: *Ciconia alba* și *Ciconia nigra*, *Plegadis falcinellus*, *Platalea leucorodia*, *Sterna hirundo*, goose and ducks.

In winter, both wetlands and agricultural areas within the site are habitats of great importance for the feeding and resting of *Branta ruficollis*. During the migration period, the site hosts more than 20,000 birds, and is a possible candidate as a RAMSAR site.

ROSCI0290 Coridorul Ialomiței

The site is located in the counties of Prahova (28%), Ialomița (72%), belonging to biogeographical regions Steppe (72,10%), Continental (27,90%). The surface of the site is 27109.20 ha, the average altitude is 62 m and the maximum attitude is 175 m.

The site overlaps with another 3 Natura 2000 sites: ROSPA0044 Grădiștea – Căldărușani – Dridu, ROSPA0120 Kogălniceanu - Gura Ialomiței, ROSPA0017 Canaralele de la Hârșova.

According to the site standard form, the following habitat classes and their coverage are found: rivers, lakes (6.68%), swamps and peatlands (0.54%), crops (arable land) (8.09

%), pastures (8,42%), other arable land (2,26%), deciduous forests (69,48%), other artificial land (1,40%), forest habitats (forests in transition) (3.08%).

The site has been designated for the protection of 8 habitats, of which 2 are priority: (91I0 * Euro-Siberian sylvan steppe vegetation with *Quercus* spp., 40C0 * Ponto-Sarmatian scrubs), 3 mammalian species, 2 amphibian species and one reptile species. The predominant habitat in this site is Dacian forests of oak and hornbeam (20.78%), followed by the habitat Zăvoaie with *Salix alba* and *Populus alba* (12.48%).

The site is particularly important in terms of the habitats specific to the meadows of the great rivers that it shelters - meadows with pedunculate oak, poplar and shallow ponds, vegetation of water courses and banks, hygrophilic herb communities, low altitude meadows, but also with vegetation specific to steppe terraces bordering the meadow - Ponto-Sarmatian scrubs, steppe meadows, etc., as well as by the fauna species existing here - beaver, etc.

The site is the most important ecological corridor that crosses Bărăgan, which develops from West to East, linking the Sub-Carpathians and the Campia Ploiestiului de Dunare, Ialomița being the only allochthonous river in the Baragan Plain. In this way, Ialomita and its main tributaries - Prahova and Teleajen - connect the Danube meadow with the forest and hill area, crossing the country's driest area - Baragan Plain.

ROSPA0120 Kogălniceanu-Gura Ialomiței

The site is entirely located on the territory of Ialomița County, belonging to the Steppe biogeographical region. The site has an area of 7087.60 ha, with an average altitude of 7 m and a maximum altitude of 18 m.

The site overlaps with two other Natura 2000 sites, such as ROSCI0389 Sărăturile de la Gura Ialomiței - Mihai Bravu and ROSCI0290 Coridorul Ialomiței.

According to the site's standard form, the following habitat classes and their coverage are found: rivers, lakes (1.57%), crops (arable land) (79.71%), pastures (8.80%), other arable land (0.44%), deciduous forests (9.18%), other artificial land (0.25%).

The site has been designated for the protection of 25 bird species listed in Annex I of Council Directive 2009/147 / EC and 3 species of regularly migratory birds not listed in Annex I of Council Directive 2009/147 / EC.

The site is located in the Bărăgan Plain. To the south it is bordered by the Ialomița River, to the west by the localities of Tandarei and Mihail Kogălniceanu, north of Gura Ialomiței and to the east by Bratul Borcea. It includes farmland and deciduous forests.

The site qualifies for the species: *Sylvia nisoria*, *Circus macrourus*, *Coracias garrulus*, *Himantopus himantopus* and *Falco columbarius*, *Falco vespertinus*, *Limosa limosa*.

ROSPA0006 Balta Tataru

The site is located in the counties of Braila (86%) and Ialomița (14%), belonging totally to the Steppa biogeographical region. The surface of the site is 9959.80 ha, the average altitude is 42 m and the maximum altitude is 56 m.

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (5.19%), swamps, peatlands (1.96%), crops (arable land) %,)

pastures (29.5%), other arable land (0.18%), deciduous forest (7.12%), other artificial land (0.10%), forest habitats (forests in transition) (0.80%).

The site has been designated for the protection of the 96 species of birds referred to in Article 4 of Directive 2009/147 / EC, the species listed in Annex II to Directive 92/43 / EEC and the site evaluation for them.

The site is of particular importance through the presence of colonies of: *Himantopus himantopus*, *Recurvirostra avosetta*, *Glareola pratincola* and *Falco vespertinus*. In both summer and migration periods, large agglomerations of *Ciconia ciconia* are recorded in the agricultural areas and the leafy meadows in this site (non-mature specimens that are still not nesting can be seen in the summer). During migration, important species are seen: *Branta ruficollis*, *Anser albifrons*, *Recurvirostra avosetta*, *Philomachus pugnax*, *Plegadis falcinellus* and *Platalea leucorodia*. As lakes freeze harder due to higher salinity, agglomerations of aquatic bird species are seen.

The climate is characterized by extremely hot, dry summers and harsh winters. In the site's perimeter we find the following lakes: Tătaru (Dudești and Roșiori communes), Plașcu and Chioibășești (Ciocile commune) and Colțea and Tătaru forests. All three lakes are salty and have a low depth.

ROSCI0206 Poțile de Fier

The protected area ROSCI0206 Portile de Fier, with an area of 125 502 ha, is located in the Caras-Severin (59%) and Mehedinti (41%) counties, the continental biogeographic region. The area is in connection with ROSPA0026 Danube - Baziaș - Portile de Fier course and with ROSPA0080 Almăjului - Locvei Mountains. The altitude varies from 28 m (minimum altitude) to 972 m (maximum altitude).

The main classes of habitats present on the territory and their percentage coverage are: rivers, lakes (7.50%), natural meadows, steppes (1.94%), crops, arable land (5.93%), pastures (10.49%), deciduous forests (67.20%), mixed forests (0.50%), vineyards and orchards (0.98%), rocks, poor vegetation areas (0.22%), artificial land (1.08%) and transition forests (4.08%).

The site was declared due to a number of 29 habitat types, of which 7 priority habitats (6110 * Calcareous communities or basifil meadows of *Alyso-Sedion albi*, 40A0 * Peri-Pannonian subcontinental bush, 6210 * Semi-natural dry meadows and scrub facies on limestone (*Festuco Brometalia*), 91E0 * alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salcion alba*), 9530 * sub-Mediterranean forest vegetation with the endemite *Pinus nigra* ssp. *banatica* 9180 * forests of *Tilio-Acerion* on steep slopes, groves and cloughs, 6120 * Xeric meadows on calcareous substrate), and 64 species: 16 species of mammals, one of which is a priority species (*Canis lupus*), 4 species of reptiles and amphibians, 13 species of fish, 18 invertebrate species among which 4 priority species (*Austropotamobius torrentium*, *Callimorpha quadripunctaria*, *Osmoderma eremita*, *Rosalia alpina*) and 13 plant species.

The geology of Portile de Fier site is particularly complex, since it overlaps with the orogenic unit of the Carpathian Mountains. The area is of particular importance due to the high diversity of habitats, with 171 habitats, of which 26 are unique for Romania. At the same time, the perimeter of the site comprises four wetlands, two in the reservoir (Ostroavele - Moldova Veche and Calinova Island) and on the left bank of the river (Nera

- Danube and Pojejena - Divici swamp). Wetlands provide favourable conditions for the breeding of a large number of migratory species due to the optimal feeding possibilities in the warm season of this biocenotic complex and because the species of aquatic birds nest here, with nests located almost exclusively in the habitat of reeds and broods.

The importance of the area is given by the importance of preserving flora in the area of the Danube Gorge (especially Cazanele and Ostrovul Moldova Veche) considered natural reservations and the Cazanele de la Dunare with the forest and vegetation of the rocks, where the presence of the species *Tulipa hungarica* and *Campanula crassipies* (today included in the list of rare and endangered species) and the Portile de Fier - Gura Văii reservations with the species *Prangos carinata* and *Dianthus serbicus* can be noticed. The forest dominates the general landscape, the naturalness index calculated for the Portile de Fier site having frequent values of 80%.

A significant proportion of mammals is given by microchiroptera, species of community interest represented by members of two families: Vespertilionidae and Rhinolophidae. Carnivores are represented by both large species (*Ursus arctos*, *Canis lupus*, *Lynx lynx*) and small species such as mustelids. Also, there are herbivores represented by the species *Cervus elaphus* or *Capreolus capreolus*. Of the 4873 species of invertebrates reported in the site, there are 4 species of gastropods (*Theodoxus transversalis*, *Anisus vorticulus*, *Herilla dacica*, *Helix pomatia*) and 5 representatives of the Insecta class with a special status (*Lucanus cervus*, *Eriogaster catax*, *Lycaena dispar rutilus*, *Parnassius mnemosyne wagneri* and *Kirinia roxelana*). The site is also of particular importance due to the impressive number of plant species present in the site (1668), of which 14 are endemic for Romania.

The ROSCI0206 Portile de Fier site is also in contact with natural areas of national interest, namely: the Peștera cu Apă din Valea Polevii, Cheile Nerei - Beusnita National Park, the Portile de Fier Natural Park (Ramsar site declared on January 18, 2011), Mehedinti Plateau Geopark and the Valea Mare Natural Park, Nera - Danube swamp, Râpa cu lăstuni din Valea Divici, Baziaș, Gura Văii - Vârciorova, Valea Oglănicului, Dealul Vărănic, Cazanele Mari și Cazanele Mici, Locul fosilifer Svinița, Locul fosilifer Bahna, Cracul Găioara, Cracul Crucii, Fața Virului.

ROSCI0198 Platou Mehedinți

The site is located in Gorj (4%) and Mehedinti (96%), totally belonging to the Continental biogeographical region. The surface of the site is 53555.90 ha, the average altitude is 574 m and the maximum altitude is 1452 m.

According to the standard site form, the following habitat classes and their coverage are found: rivers, lakes (0.24%), pastures (24.96%), other arable lands (20.40%), deciduous forests (39.22%), coniferous forests (0.46%), mixed forests (8.04%), vineyards and orchards (0.51%), rocks, poor vegetation areas (0.23%), other artificial lands (1.81%), forest habitats (4.13%).

The site has been designated for the protection of 10 habitats, of which 3 are priority: (40A0 * peri-Pannonian subcontinental bushes, 9180 * *Tilio-Acerion* forests on steep slopes, groves and cloughs, 6210 * Semi-natural dry meadows and scrubs on limestone substrates (*Festuco Brometalia*), 13 mammalian species of which two are priority species (1352 * *Canis lupus* (Lup), 1354 * *Ursus arctos* (Urs), 2 species of amphibians, 3 fish species, 7 invertebrate species (1093 * *Austropotamobius torrentium*), 2 reptile

species and 2 plant species of which one is of priority (4070 * *Campanula serrata*). Other protected species of flora and fauna: 13 mammalian species, 6 amphibian species, one invertebrate species, 25 plant species.

The temperate continental climate with sub-Mediterranean influences and varied relief has created conditions for many rare plant and animal species. The unique geological structure of this area has led to the emergence of numerous geological and speleological formations. Much of these values are protected in 17 nature reserves.

The calcareous rocks contain sub-Mediterranean bush species, known as boulders. The floral composition of the meadows is abundant in southern elements, and forests preserve mixtures of beech, fir and pine not affected by cuttings. Within the vegetal carpet, due to the diversity of life, there is a rich and heterogeneous fauna of different origins, but mostly of the southern elements.

ROSCI0069 Domogled - Valea Cernei

The site is located in Caraş-Severin (39%), Gorj (48%), Mehedinţi (13%), belongs to the biogeographical regions Alpine (52,03%) and Continental (47,97%). The surface of the site is 62121,30 ha, the average altitude is 1017 m and the maximum altitude is 2284 m. The site overlaps with another Natura 2000 site, ROSPA0035 Domogled - Valea Cernei.

According to the site standard form, the following habitat classes and their coverage are found: sandy beaches (0.27%), rivers, lakes (0.41%), bushes, hedges (1.52%), grasslands, steppe (13.82%), pastures (2.62%), other arable lands (1.74%), deciduous forests (39.83%), coniferous forests (3.70%), mixed forests (33.36%), rocks, poor vegetation areas (0.40%), forest habitats (transition forests) (2.23%).

The site has been designated for the protection of 35 habitats, of which 7 are priority (8160 * - Medio-European limestone groves of hill and mountainous hills, 9530 * Sub-Mediterranean forest vegetation with *Pinus nigra* ssp. *Banatica* endemic , 7220 * Travertin-forming rock springs (*Cratoneurion*), 40A0 * peri-Pannonian sub-continental hedges, 9180 * *Tilio-Acerion* forests on steep slopes, groves and cloughs, 6210 * Semi-natural dry meadows and facies on calcareous substrate (*Festuco Brometalia*). The site protects 15 mammalian species, 1 amphibian species, 7 species of fish, 22 species of invertebrates, including 5 priority species (1093* *Austropotamobius torrentium*, 1078* *Callimorpha quadripunctaria*, 4039* *Nymphalis vaualbum*, 1084* *Osmoderma eremite*, 1087* *Rosalia alpine*) 3 plant species, a reptile species. Other important flora and fauna species: 16 mammalian species, 19 amphibian species, 1 species of fish, 10 invertebrate species, 49 species of plants.

The geographic analysis of the flora in the site shows that along with the Mediterranean species with a number of 110 species (10%) we see 106 alpine species (9.6%), 45 carpathian species (4%), 75 Dacian species (6.7%), 37 Balkan-Carpathian species (3.3%); 17 moesic species (1.5%), 14 anatholian species (1.0%), 509 species of Eurasian, Central European and European species, (about 45.9%). In the Domogled-Valea Cernei site of the 30 associations described, 9 are absolutely endemic.

Natural features and diversity of habitats (freshwater habitats, grasslands, meadows and shrubs, scrubs, forests, rocks, caves) of which 10 habitats of community interest. The Domogled-Valea Cernei site is endowed with a series of undeniable natural values that give rise to typical landscapes such as:

- Calcareous hills with Banat Black Pine (endemic species);
- Creeks with high fluctuating springs;
- Limestone peaks with sub-Mediterranean vegetation
- Large beech forests with old trees;
- Alpine gaps with juniper.

ROSCI0226 Semenik - Cheile Caraşului

The site is located on the territory of Caraş-Severin County, totally belonging to the Continental biogeographical region. The surface of the site is 7458.7 ha, the average altitude is 822 m and the maximum altitude is 1445 m.

The site overlaps with 2 other Natura 2000 sites, such as: ROSPA0020 Cheile Nerei - Beuşniţa and ROSPA0086 Munţii Semenik - Cheile Caraşului.

According to the site's standard form, the following habitat classes and their coverage are found: natural meadows, steppes (2.28%), crops (arable land) (0.17%), pastures (5.57%), other arable land (0.28%), deciduous forest (78.47%), coniferous forests (4.02%), mixed forests (3.40%), vineyards and orchards (1.26%), other artificial land (0.19%), forest habitats (forests in transition) (4.33%).

The site has been designated for the protection of 24 habitats, of which 6 are priorities: (6110 * Calcareous communities or basifying meadows of *Alyso-Sedion albi*, 7110 * Active peatlands, 7220* Travertin-forming rock springs *Cratoneurion*, 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion* , *Alnion incanae* , *Salicion albae*), 6210 * Semi-natural dry meadows and facies on limestone (*Festuco Brometalia*), 9180 * *Tilio-Acerion* forests on steep slopes, groves and cloughs. The site protects 14 mammalian species, 1 amphibian species, 4 fish species, 11 invertebrate species and one plant species. Other important flora and fauna species: 9 mammalian species, 3 amphibian species, 2 fish species, 5 invertebrate species, 3 reptile species and 30 plant species.

Extremely varied conditions in the Banat Mountain area have led to the onset of a flora rich in species, both in terms of the lower plants, but especially in terms of cormorant species. An essential characteristic of this area, reflected in the structure of flora and vegetation, is the existence of many thermophilous species of Mediterranean, Balkan, Balkan-Illyric, Balkan-Pannonian and Moesic origin.

The most well-researched species is the *Cormophyta* group, represented by a number of 1277 species, spread in different biotopes characteristic of the perimeter of the Semenik - Cheile Caraşului site. The great abundance of Saxic species is the result of the presence of the karst relief, which gives a note of the site. The subxerophilic forests of cer and hornbeam are poorly represented, but in the grassy layer there have been preserved meridian elements such as *Orchis simia*, *Himantoglossum hircinum*, *Lithospermum purpureo-coeruleum*, *Arabis turrita*, *Helleborus odoratus*, *Lychnis coronaria*, *Ruscus aculeatus* species of European and national interest.

ROSCI0031 Cheile Nerei - Beuşniţa

The site is located entirely on the territory of Caraș-Severin County, belonging to the Continental biogeographical region. The total area of the site is 37720.90 ha, the average altitude is 618 m and the maximum altitude is 1162 m.

The site overlaps with another 4 Natura 2000 sites: ROSPA0020 Cheile Nerei - Beușnița, ROSPA0086 Munții Semenic - Cheile Carașului, ROSPA0149 Depresiunea Bozovici, ROSPA0080 Munții Almăjului - Locvei.

According to the standard site form, the following habitat classes and their coverage are found: natural grasslands, steppes (1,67), pastures (5,95%), other arable land (1,72%), forests deciduous trees (80.69%), mixed forests (3.50%), vines and orchards (1.26%), forest habitats (transition forests) (6.31%).

The site has been designated for the protection of 21 habitats, of which 6 are priorities: (6110 * Calcium alluvial communities or meadows from *Alyso-Sedion* white, 6210 * Semi-natural dry meadows and facies on limestone substrate (*Festuco Brometalia*), 40A0 * Peri-Pannonian sub-Continental scrubs, v 91E0 * Alluvial forests *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion alba*), 7220 * Petrifying springs forming travertine (*Cratoneurion*), 9180 * Forests of *Tilio-Acerion* on steep slopes, grooves and cloughs). The site protects 16 mammalian species, 1 amphibian species, 10 fish species, 13 invertebrate species including 4 priority species (1093 * *Austropotamobius torrentium*, 1078 * *Callimorpha quadripunctaria*, 4039 * *Nymphalis vaualbum*, 1087 * *Rosalia alpine*) and one plant species. Other important flora and fauna species: 20 mammalian species, 18 amphibian species, 2 fish species, 5 invertebrate species, 44 species of plants.

The terrestrial fauna is represented by 313 taxa, 29 endemisms, 45 rare species, of which 119 species are protected and strictly protected by Romanian and international legislation. Cave fauna comprises 273 invertebrate species and subspecies as well as vertebrates. The flora is represented by a number of 1086 species of which, protected species are only in the context of the protection of habitats. The cultural - historical sites in the site are 6 at the surface, 24 underground and 30 at the surface in the adjacent area.

The habitats of the forest in this unique park in Europe have a great biological, aesthetic and mediogenic genotypic importance, being among the few beauties that have been preserved in virginity. Following the researches, 1086 superior plant species were identified in the area, belonging to 98 families. The vegetation is of particular scientific importance, with a number of rare species, including endemisms and southern species, some close to the northern boundary of the European area. Here are typical vegetal associations for the southwestern part of the country, with affinities with the sub-Mediterranean vegetation south of the Danube. Among the most characteristic are the Turkish beechwoods, the lilac, mojdrean, and pristine hedges with many saxical companion species, the rocky meadows and the limestone pioneer associations.

ROSPA0080 Munții Almăjului - Locvei

ROSPA0080 The Almaj - Locvei Mountains, with an area of 117,770 ha, are located in the Caras-Severin (59%) and Mehedinti (41%) counties, in the Continental biogeographical region. The altitude varies from 37 m (minimum altitude) to 972 m (maximum altitude).

The area is linked to three sites of community interest: ROSCI0206 Porțile de Fier, ROSCI0198 Platoul Mehedinți and ROSCI0031 Cheile Nerei – Beușnița, as well as with the following protected natural areas of national interest:

Scientific reservation Peștera cu Apă din Valea Polevii;

Cheile Nerei – Beușnița National Park, Platoul Mehedinți Geopark;

Natural reservations: Valea Mare, Balta Nera – Dunăre, Râpa cu lăstuni din Valea Divici, Baziaș, Gura Văii – Vârciorova, Valea Oglănicului, Dealul Duhovnei, Dealul Vărănic, Cazanele Mari și Cazanele Mici, Locul fosilifer Svinița, Locul fosilifer Bahna, Cracul Găioara, Cracul Crucii, Fața Virului.

The habitats classes present at the site level are: rivers, lakes (0.25%), natural meadows, steppes (2.07%), crops, arable land (6.67%), pastures (11.03% deciduous trees (71.60%), mixed forests (0.53%), vines and orchards (1.21%), rocks, poor vegetation areas (0.24%), artificial lands (2.01%), transition forests (4.36%).

has been designated for 36 species of birds whose presence has been reported on the site, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43 / EEC. According to the standard site form, 3 of the 36 species have medium or low conservation status, 16 species have a good conservation status, one species is classified as having a very good conservation status, and for the rest of the species there is no assessment. There are also 12 other important species whose presence has been reported at the site, including *Capreolus capreolus*, *Martes martes*, *Meles meles*, *Sciurus vulgaris* or *Sus scrofa*.

The Almaj and Locvei Mountains, as major relief units, are part of the Portile de Fier Natural Park, a park that was established on the basis of the Order of the Ministry of Waters, Forests and Environmental Protection no. 84 / 30.01.1998, in the area of the Danube Gorge between Baziaș and Gura-Văii, with a total length of 134 Km, in the counties of Caras-Severin and Mehedinți. The site hosts important flocks of protected bird species, namely: one globally endangered species and major populations of 12 species threatened at Community level.

ROSPA0086 Munții Semenici - Cheile Carașului

The site is located entirely on the territory of Caraș-Severin County, belonging to the Continental biogeographical region. The surface of the site is 36213,50 ha, the average altitude is 834 m and the maximum altitude is 1445 m.

The site overlaps with another 2 Natura 2000 sites: ROSCI0031 Cheile Nerei – Beușnița, ROSCI0226 Semenici - Cheile Carașului.

According to the standard Site Form, the following habitat classes and their coverage are found: natural meadows, steppes (2.36%), pastures (4.76%), deciduous forests (79.81%), coniferous forests (4.16%), mixed forest (3.51%), vines and orchards (1.20%), other artificial land (0.19%), forest habitats (forests in transition) (3.96%).

The site has been designated for the protection of the 19 species of birds listed in Article 4 of Directive 2009/147 / EC, listed in Annex II to Directive 92/43 / EEC. The site also protects other important flora and fauna species: 4 mammalian species, 5 amphibian species, 3 fish species, 2 invertebrate species and 7 plant species.

The site shows features such as limestone walls, slopes with chasmophytic vegetation, grooves, caves in slopes and valleys, beech areas alternating with unused pastures and hayfields of plum plantations.

Major populations of threatened species in the European Union – 7 species of peregrine falcon (*Falco peregrinus*), serpent eagle (*Circaetus gallicus*), owl (*Bubo bubo*), white-backed pecker (*Dendrocopos leucotos*), grizzle woodpecker (*Picus canus*), ruffed fly catcher (*Ficedula albicollis*), small fly catcher (*Ficedula parva*).

The proposed area is the Semenic-Cheile Carasului national park. It consists of a very large compact forest area, which hosts many characteristic species, some of which are significant. Thus, two species of crickets and two of fly catchers are important species for Romania. In the park we can find many gorges and other rocky formations, altered with slightly disturbed forests and meadows that serve as hunting grounds for species of raptors, of which two (the serpent eagle and the peregrine falcon) and owl have significant national stocks.

ROSPA0020 Cheile Nerei - Beușnița

The site is located entirely on the territory of Caraș-Severin County, belonging to the Continental biogeographical region. The surface of the site is 40300.80 ha, the average altitude is 597 m and the maximum altitude is 1162 m.

The site overlaps with another 3 Natura 2000 sites: ROSCI0206 Porțile de Fier, ROSCI0031 Cheile Nerei - Beușnița, ROSCI0226 Semenic - Cheile Carasului.

According to the site standard form, the following habitat classes and their coverage are found: natural meadows, steppes (2,65%), crops (arable land) (0,58%), pastures (7,14%), other arable land (2.36%), deciduous forests (78.15%), coniferous forests (0.22%), mixed forests (2.52%), vineyards and orchards (0.27%), forest habitats (forests in transition) (6,10%).

The site has been designated for the protection of the 98 species of birds listed in Article 4 of Directive 2009/147 / EC, listed in Annex II to Directive 92/43 / EEC. The site also protects other important flora and fauna species: 2 mammalian species, 5 amphibian species, 2 fish species, 2 invertebrate species and 8 plant species.

The reservation provides favourable conditions for the reproduction of a large number of migratory species due to the optimal feeding possibilities during the warm season of this biocenotic complex. Also, the reservation offers less favourable conditions for the wintering of that category of birds nesting in it, especially those from the amphibian habitat that disappears during this period, as well as those from the terrestrial habitat where the possibilities for ensuring the conditions of food and shelter are greatly reduced.

Major populations of threatened species in the European Union - 10 species: golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), serpent eagle (*Circaetus gallicus*), owl (*Bubo bubo*), fern owl (*Caprimulgus europaeus*), white-backed pecker (*Dendrocopos leucotos*), grizzle woodpecker (*Picus canus*), silvie porumbacă (*Sylvia nisoria*), small fly catcher (*Ficedula parva*), garden bunting (*Emberiza hortulana*).

Other species with significant effects are those characteristic to beech forests: 2 species of woodpecker and small fly catcher. The meadows support an important flock of field

crislet and serve as a feeding area for raptors. In the eastern and western parts of the proposed area, in the open fields of the Nerei valley we find remarkable densities of garden bunting, and in the western part the dubravence are nesting.

ROSCI0226 Semenik - Cheile Caraşului

The site is located entirely on the territory of Caraş-Severin County, belonging to the Continental biogeographical region. The surface of the site is 37458,70 ha, the average altitude is 822 m, the maximum altitude is 1445 m.

The site overlaps with another 2 Natura 2000 sites: ROSPA0020 Cheile Nerei – Beusniţa, ROSPA0086 Munţii Semenik - Cheile Caraşului.

According to the site's standard form, the following habitat classes and their coverage are found: natural meadows, steppes (2.28%), crops (arable land) (0.17%), pastures (5.57%), other arable land (0.28%), deciduous forest (78.47%), coniferous forests (4.02%), mixed forests (3.40%), vineyards and orchards (1.26%), other artificial lands (0.19%), forest habitats (forests in transition) (4.33%).

The site has been designated for the protection of 24 habitat types, of which 6 are priority habitats: (6110 * Calcareous communities or basifying meadows of *Alyso-Sedion albi*, 7110 * Active peatlands, 7220* Travertin-forming rock springs (*Cratoneurion*), 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), 6210 * Semi-natural dry meadows and facies on limestone (*Festuco Brometalia*), 9180 * *Tilio-Acerion* forests on steep slopes, groves and cloughs).

The site also protects important species: 14 mammalian species, 1 amphibian species, 6 fish species, 11 invertebrate species, and 1 plant species. Other important flora and fauna species: 20 mammalian species, 14 amphibian species, 5 fish species, 10 invertebrate species, 60 plant species.

Extremely varied conditions in the Banat Mountain area have led to the onset of a flora rich in species, both in terms of the lower plants, but especially in terms of cormorant species. An essential characteristic of this area, reflected in the structure of flora and vegetation, is the existence of many thermophilous species of Mediterranean, Balkan, Balkan-Illyric, Balkan-Pannonian and Moesic origin.

The most well-researched species is the Cormophyta group, represented by a number of 1277 species, spread in different biotopes characteristic of the perimeter of the Semenik - Cheile Caraşului site. The great abundance of Saxic species is the result of the presence of the karst relief, which gives a note of the site. The subxerophilic forests of cer and hornbeam are poorly represented, but in the grassy layer there have been preserved meridian elements such as *Orchis simia*, *Himantoglossum hircinum*, *Lithospermum purpureo-coeruleum*, *Arabis turrita*, *Helleborus odorus*, *Lychnis coronaria*, *Ruscus aculeatus*, species of European and national interest.

ROSCI0277 Becicherecu Mic

The site is entirely located on the territory of Timis County, belonging totally to the Pannonian biogeographical region. The surface of the site is 2087.20 m, the average altitude of 88 m and the maximum altitude of 95 m.

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (2.71%), crops (arable land) (12.52%), pastures (84.47%), other artificial lands (0.28%).

The site was designated for the protection of a single type of habitat, namely 1530 * Pannonian and Ponto-Sarmatian meadows and salt marshes, which is also a priority habitat. The site protects 2 mammalian species, 1 amphibian species, 1 invertebrate species and other important flora and fauna species: 16 plant species.

The site is located in the Low Plain of Banat (Campaia joasa a Banatului). The vegetation is characteristic to the poor soils from the South-Western part of Romania and has a pronounced mosaic character, reflecting the existence of edafic conditional microbiotopes. Vegetable associations characteristic to poor soils (*Hordeetum hystricis* (Soo 1933) Wendelbg. 1943, *Camphorosmaetum annuae* (Rapaics 1927) Soo 1933, *Artemisio-Festucetum pseudovinae* (Magyar 1928) Soo, *Puccinellietum limosae* Rapaics 1927, *Pholiuro-Plantaginetum tenuiflorae* (Rapaics 1927) Wendelbg 1943) are present in the form of variable-surface enclaves at the edge of agricultural crops and drainage channels in localities with poor grounds.

Sometimes, plant associations develop on solitary grounds of excessive accumulations of salts that appear on the surface as white spots. The soil is poorly structured, dusty in the upper horizon and compact in the lower horizons, with strong alkalinity (pH 9.0-10.55) and high concentrations of cations and anions. The content of organic matter and biological activity are reduced

ROSCI0109 Lunca Timișului

The site is located entirely on the territory of the Timiș county, belonging to the biogeographical regions Pannonian (66,23%) and Continental (33,77%). The surface of the site is 10172.60 ha, an average altitude of 94 m and a maximum altitude of 127 m.

The site overlaps with another 2 Natura 2000 sites: ROSPA0128 Lunca Timișului, ROSPA0095 Pădurea Macedonia.

According to the standard site form, the following habitat classes and their coverage are found: rivers and lakes (13.66%), crops (arable land) (7.15%), pastures (15.99%) , other arable land (4.89%), hardwoods (53.73%), other artificial land (0.24%), forest habitats (forests in transition) (4.31%).

The site has been designated for the protection of 6 types of habitats, important flora and fauna species: 3 mammalian species, 1 amphibian species, 12 fish species, 5 invertebrate species, and 2 plant species.

The site was designated due to the presence of a habitat of interest in it: 92A0 - It is called *Salix alba* and *Populus alba*, but also due to the presence of a species of amphibians: 1188 - *Bombina bombina* (Red-bellied bittern), of 10 species of fish: 1130 - *Aspius aspius* (Avat); 1149 - *Cobitis taenia* (Zvârlug); 1124 - *Gobio albipinnatus* (Porcuor de nisip); 2511 - *Gobio kessleri* (Petroc); 2555 - *Gymnocephalus baloni* (river ruff); 1145 - *Misgurnus fossilis* (Țipar); 1134 - *Rhodeus sericeus amarus* (Boare); 1146 - *Sabanejewia aurata* (Dunariță); 1160 - *Zingel streber* (Fusar); 1159 - *Zingel zingel* (Pietrar), but also a species of invertebrate: 1032 - *Unio crassus* (River shell).

ROSPA0128 Lunca Timișului

The site is located entirely on the territory of the Timiș county, belonging to the biogeographical regions Pannonian (72,12%) and Continental (27,88%). The surface of the site is 13513.50 ha, an average altitude of 98 m and a maximum altitude of 127 m.

The site overlaps with another Natura 2000 site, namely ROSCI0109 Lunca Timișului.

According to the site standard form, the following habitat classes and their coverage are found: rivers and lakes (5.91%), crops (arable land) (31.28%), pastures (14.71%), other arable land (5.96%), deciduous forests (38.76%), vineyards and orchards (0.46%), other artificial land (0.55%), forest habitats (forests in transition) (2.37%).

The site has been designated for the protection of the 30 species of birds referred to in Article 4 of Directive 2009/147 / EC, listed in Annex II to Directive 92/43 / EEC.

The site is located in the Pannonian biogeographic region, being located in the Plain of Timis. It includes farmland, meadow forests, pastures and wetlands. The climate is temperate continental moderate, characteristic of the south-eastern part of the Pannonian Depression, with some submediterranean influences (the Adriatic variant). The dominant air masses during spring and summer are the temperate, of oceanic origins that bring significant rainfall. Frequently, even in winter, wet air masses arrive from the Atlantic, bringing heavy rains and snow, rarely waves of cold.

The site includes forests, meadows, farmland, pastures and wetlands, being important for nesting populations of *Coracias garrulus* and *Aythya nyroca* flocks that appear during migration. Part of this site is declared AIA. The declaration of the latter proved the importance of the downstream forest from Șag and the adjacent arable land mainly for *Falco vespertinus* and *Coracias garrulus*.

ROSPA0047 Hunedoara Timișană

The site is located in the counties of Arad (77%) and Timiș (23%), belonging totally to the Pannonian biogeographical region. The surface of the site is 1527.30 ha, the average altitude is 129 m and the maximum altitude is 168 m.

According to the site's standard form, the following habitat classes and their coverage are found: crops (arable land) (2.16%), pastures (41.82%), other arable land (0.54%), vineyards and vineyards (3.24%), other artificial lands (2.24%).

The site has been designated for the protection of 18 species of birds referred to in Article 4 of Directive 2009/147 / EC, listed in Annex II to Directive 92/43 / EEC.

The plain area of the private agricultural parcels crossed by a sewer located near Hunedoara Timisana.

Plain region with agricultural areas and arid pastures, the typical habitat of the two priority species. Both species use these areas as hunting grounds. The kestrel colony is located in bird nests of three acacia clusters, which are somewhat affected by human intervention (tree cutting and disturbing the colony by hunters during nesting). It is the most important Romanian kestrel species and the second largest in the Carpathian Basin, where a Life project for the salvation of the species is being carried out.

ROSCI0039 Ciuperceni - Desa

The site Ciuperceni-Desa, of Community importance, with an area of 39 560 ha, is located in Dolj county, in the Continental biogeographic region. The altitude varies from 2 m (minimum altitude) to 65 m (maximum altitude). It is partially overlapped with ROSPA0013 Calafat - Ciuperceni - Danube.

According to the site standard Form (version 11.08.2017), the main habitats of the site are: rivers, lakes with a coverage of 8.28% of the total area of the site, marshes, peatlands (11.74%), natural grasslands, steppes (6,81%), crops, arable land (25,7%), pastures (2,02%), deciduous forests (28,07%), vineyards and orchards (5,14%), artificial lands (2.65%) and transitional forest habitats (9.58%).

The site was declared for 13 habitats of Community interest, of which 3 priority (6120 * xeric meadows on limestone substrate, 9110 * Eurosyberian silviculture vegetation with *Quercus* spp., 1530 * Pannonian and Ponto-Sarmatian meadows) and 22 species, respectively: 2 mammalian species, 3 reptile and amphibian species, 10 fish species, 4 invertebrate species and 3 plant species all listed in Annex II of Council Directive 92/43 / EEC.

As to the importance of the site, it is distinguished by habitats of *Salix alba* and *Populus alba*. Ciurumela Forest is located on the site of a former nursery and is famous for its huge acacia specimens reaching diameters of 70-80 cm and 30-35 m heights, far exceeding the sizes naturally reached in the North American country of origin. The acacia is meant to fix the moving sand, which in southern Oltenia was a real calamity in the past. The acacia forests are associated with a vegetation characterized by a rare species - *Mollugo cerviana*.

ROSCI0173 Pădurea Stârmina

Protected natural area ROSCI0173 Stârmina Forest has an area of 2,779 ha and is located in the Continental biogeographical region in Mehedinți County. The altitude varies from 32 m (minimum altitude) to 241 m (maximum altitude). At the same time, the site is in connection with the special bird protection area ROSPA0011 Blahnița.

The land cover at the site level is represented by the following habitats: marshes, peatlands (5.78%), crops, arable land (9.45%), pastures (1.32%), deciduous trees (66.12%), vineyards (7.05%) and transition forests (10.28%).

The site was declared following the identification of 4 habitat types characterized by a good conservation status and 10 species of which one mammal species, 4 reptile and amphibian species, 2 fish species and 3 invertebrate species. Of these, *Testudo hermanni* species have excellent conservation status and the rest of the species are classified as having good conservation status.

The site preserves natural habitats and important forest-like species, the value of this reserve being due to compact acoustic surfaces (*Ruscus aculeatus*) and mixed broadleaf trees. Landscape valences are no different, the most interesting area being the one in the vicinity of Dunarea Mica.

Protected area Stârmina Forest is declared a mixed natural reservation through HCJ no. 26/1994 and forest reservation of national interest by Law 5/2000, with an area of 100.3 ha. It corresponds to IUCN category IV, a protected area managed mainly for conservation through management interventions.

ROSCI0299 Dunărea la Gârla Mare – Maglaviț

ROSCI0299 Dunărea la Gârla Mare – Maglaviț is a protected natural area that covers the Mehedinți (57%) and Dolj (43%) counties, totally overlapping the Continental biogeographical region. The site is in close contact with ROSPA0074 Maglavit and ROSPA0046 Gruia - Garla Mare Sites. The altitude varies from 17 m (minimum altitude) to 71 m (maximum altitude).

The main classes of site habitats are: crops, arable land with a coverage of 3.04%, pastures (16.76%), deciduous forests (27.78%), vineyards and orchards (1.24%), artificial land (0.11%), transition forests (10%).

The site has been declared a site of Community importance due to the presence of a habitat type of Community interest with good conservation status (92A0 Zvoaie with *Salix alba* and *Populus alba*) and 8 species of community interest, of which 2 mammalian species, 3 species of reptiles and amphibians and 3 species of fish. Of the total number of species, 2 are characterized by excellent conservation status, 5 with good conservation status and one species (*Spermophilus citellus* - ground squirrel) with a medium or reduced conservation status.

The area is characterized by the presence of a mosaic of habitats that harmoniously combines the dry land with the wetland - the most important part of the site. It is among the few sites designated for the species *Spermophilus citellus* (leeches), *Lutra lutra* (otter), *Emys orbicularis* (European water tortoise) and *Triturus dobrogicus* (Dobrogean triton with crest).

ROSCI0306 Jiana

Protected natural area ROSCI0306 Jiana is located in Mehedinți County and totally overlaps the Continental biogeographical region. The site's surface is 13,256 ha and the altitude ranges from 27 m (minimum altitude) to 124 m (maximum altitude). Habitat classes on the site are: rivers, lakes with a share of 1.91%, marshes, peatlands (11%), natural meadows, steppe (0.57%), crops, arable land (31.21%), pastures (12.96%), deciduous forests (31.54%), vineyards and orchards (2.72%), artificial lands (0.26%) and transition forests (7.83%).

The site is declared a site of Community importance due to a number of 3 types of habitats of Community interest, one of which is a priority one (91I0 * Eurosyberian silvosteppe vegetation with *Quercus* spp.) and 8 species of which 2 mammalian species, 4 reptile and amphibians and 2 invertebrate species. Both habitats and species are characterized by a good conservation status at the site level. Also, ROSCI0306 Jiana is connected to the special bird protection areas Natura 2000 ROSPA0011 Blahnița and ROSPA0046 Gruia - Garla Mare.

The site is of particular importance for herpetofauna (dry and water turtles, red stinging pond, Danube triton), small mammals (ground squirrel), invertebrates (large tailor bird, chaffinch, fire butterfly) and the three habitats of Community interest which is the subject of the declaration: 91M0 Balkan-Pannonian durmast forests occupying 6% of the site's surface, 91I0 * Euro-Siberian silviculture with *Quercus* spp. (0.6% of total site area) and 92A0 *Salix alba* and *Populus alba* (0.4% of site area).

ROSPA0011 Blahnița

Area of special bird protection ROSPA0011 Blahnița is located in Mehedinți county, Continental biogeographic region. Its surface is 44,003 ha and the altitude varies from 15 m (minimum altitude) to 302 m (maximum altitude). The area is in connection with the sites of community importance ROSCI0173 Stârmina and ROSCI0306 Jiana, as well as the natural protected areas of national interest Bunget forest and the Stârmina forest natural reservations. The site includes a wetland protected area at the county level (Hinova - Ostrovul Corbului with an area of 185 ha), declared as a reservation by Decision no. 13 / 10.07.2000 on completing the Decision no. 26/1994 of the Mehedinți County Council on the protection of natural reservations and monuments in Mehedinți County.

The major types of habitats and their percentage coverage are the following: rivers, lakes (8%), marshes, peatlands (4.88%), natural meadows, steppes (0.26%), crops, arable land (53.68%), pastures (4.29%), deciduous forests (18.70%), vineyards and orchards (6.67%), artificial land (0.66%) and transitional forests (2.86%).

The site was declared for the 104 bird species referred to in Article 4 of Directive 2009/147 / EC on the conservation of wild birds and Annex IIIa to Directive 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora.

The wide variety of flora and fauna species characteristic to the site is due both to the geomorphology and the extremely favourable position of the area, well protected by the cold winds in the north, strong sunstrokes, which has allowed many southern and western Asian elements to reach in these places where they adapted easily.

The site hosts important flocks of protected bird species. According to the Site Standard Form, of the total number of bird species mentioned above, 18 are the species listed in Annex I of the Birds Directive, 88 are migratory species listed in the annexes to the Convention on migratory species (Bonn) and 5 are endangered species globally. Also, the site is important for nesting populations of the species *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Ardea purpurea*, *Egretta alba*, *Egretta garzetta* și *Aytya nyroca*, especially during migratory and wintering periods.

As a result of the special importance of this special bird protection area, it was designated as the wetland of international importance RAMSAR in February 2013.

ROSPA0013 Calafat - Ciuperceni - Dunăre

The Natura 2000 Calafat - Ciuperceni - Danube site, located in Dolj County, covers an area of 29,379 ha and totally overlaps the Continental biogeographical region. The altitude varies from 2 m (minimum altitude) to 54 m (maximum altitude). The special bird protection area ROSPA0013 Calafat-Ciuperceni-Danube partially overlaps with the site of community importance ROSCI0039 Ciuperceni-Desa. Also, the area is in close relationship with 3 natural protected areas of national interest - the natural reserves Ciuperceni - Desa, Balta Neagră and Balta Lată.

The categories of habitats identified on the surface of the site as well as their coverage are: rivers, lakes (9,47%), swamps, peatlands (15,71%), natural meadows, steppes (9,16%), crops, arable lands (15.82%), pastures (1.57%), deciduous forests (33.45%),

vineyards and orchards (3.67%), artificial land (0.23%) and transitional forests (10.92%).

The site was declared for 105 species of birds whose presence was reported on the site, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43 / EEC. According to the Standard Site Form, conservation status is unknown for most of these species and the species with known status are included in category B - good conservation status and category C - medium or reduced conservation status.

Drainage, dams, irrigation and discharges in the Danube's meadow caused important changes in the area of the Danube elbow from Calafat. The forests in this area have been grubbed up, the ponds turned into farmland or fish ponds, strongly influencing bird species. The only remaining place is south of Calafat, near Desa - Ciuperceni, where the environmental conditions remained similar to those before the aforementioned transformations. Here is the Ciuperceni Desa Ornithological Reservation, which stretches over an area of 200 ha bordered to the north by the Forest of Povezele, to the east by Dealul Granicerilor, and to the south by the Zăvoi Arcerul Forest. The numerous Danube islands in this area represent a significant nesting place for many bird species. Besides the brooder bird species, there are many migratory species of spring or autumn, and others come and even eat in the area. The pedoclimatic conditions in the area of the large bend bordered by the Danube flowing from Calafat have led to the protection of several territories in the same area. There is also the Balta Lata, with an area of 28 hectares, and the Balta Neagra, with an area of 1.20 ha. Their vegetation is specific to the pond ecosystem, which determines the adaptation and establishment of aquatic animal species.

The importance of the site is reflected by the fact that it hosts important flocks of protected species, namely: 39 species listed in Annex I of the Birds Directive, 71 migratory species set out in the Appendices to the Convention on migratory species (Bonn) and 6 endangered species globally. Also, the site is of particular importance for the nesting populations of *Ardea purpurea*, *Ardeola ralloides*, *Aythya nyroca*, *Botaurus stellaris*, *Burhinus oedicnemus*, *Caprimulgus europaeus*, *Chlidonias hybridus*, *Chlidonias niger*, *Ciconia ciconia*, *Ciconia nigra*, *Circus aeruginosus*, *Coracias garrulus*, *Egretta alba*, *Egretta garzetta*. During the migration period, the site hosts over 20,000 birds. Due to its importance, on February 2, 2013, the site was designated as RAMSAR site, becoming a wetland of international importance.

ROSPA0023 Confluența Jiu - Dunăre

Protected natural area ROSPA0023 Jiu-Danube confluence, located in the Continental biogeographical region, Dolj county, has an area of 19,530 ha and partially overlaps with the site of community importance ROSCI0045 Corridor Jiu and is also related to the natural reservations Locul fosilifer Drănic and Zăval. The altitude varies from 6 m (minimum altitude) to 162 m (maximum altitude).

The habitat classes identified on the site are: rivers, lakes (16.01%), swamps, peatlands (2.64%), crops, arable land (27.39%), pastures (9.26%), of deciduous trees (38.52%), vines and orchards (0.45%), artificial lands (0.59%), transitional forests (5.13%).

The site was declared for 113 species of birds whose presence was reported on the site, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of

Directive 92/43 / EEC. According to the Site Standard Form, the conservation status of the species for which it was determined varies from good to medium or reduced. There are no species for which the conservation status is very good.

Jiu meadow is characterized by an increased diversity of habitats, where meadows and forests, orchards, grasslands, agricultural land, wetlands - ponds and canals and numerous anthropogenic habitats are met, all concentrated on this surface, thus intermingling, and their delimitation sometimes becomes difficult. The site hosts important flocks of protected bird species, namely: 34 species listed in Annex I of the Birds Directive, 77 migratory species listed in the Appendices to the Convention on Migratory Species (Bonn) and 5 endangered species globally.

The importance of the site is also due to the nesting populations of *Crex crex*, *Haliaeetus albicilla*, *Ciconia ciconia* și *Burhinus oedicnemus*, as well as the migratory species *Tringa glareola*, *Pelecanus crispus*, *Platalea leucorodia*, *Plegadis falcinellus* și specia *Phalacrocorax pygmaeus*, wintering here.

In July 2017, ROSPA0023 Jiu-Danube Confluence also became a RAMSAR wetland of international importance.

ROSPA0024 Confluența Olt - Dunăre

The Olt-Danube confluence is the special bird protection area located in the administrative territories of Olt (30%) and Teleorman (70%), in the Continental biogeographical region. Its surface is 20,483 ha and the altitude varies from 3 m (minimum altitude) to 53 m (maximum altitude). The area is connected with the sites of community importance ROSCI0044 Corabia-Turnu Magurele and ROSCI0376 Olt River between Mărunței and Turnu Magurele, but also with the natural reservation of national interest Ostrovul Mare.

The habitat categories identified at the site level and percentage coverage are as follows: sandy beaches (5.46%), rivers, lakes (13.10%), marshes, peatlands (1.30%), natural meadows, steppe (1,20%), crops, arable land (41,88%), pastures (14,04%), deciduous forests (13,13%), vineyards and orchards (3,20%), artificial land (0,21%) and transition forests (6,49%).

The site was declared for 84 species of birds whose presence was reported on the site, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43 / EEC. According to the Site Standard Form, one species is classified as having a medium or reduced conservation status, for 9 species the conservation status is good and for the rest of the listed species it is not known.

This sector is a vestige of the natural meadow of Oltul Inferior, little influenced by the human presence. The Olt River flows into the Danube at km 604, between Turnu Magurele and Islaz, on the territory of Teleorman County. To the east of Islaz, the meadows of the two waters unite and form a lower and larger surface. The last kilometres the Olt cross until its spill into the Danube is the only part that preserves the natural aspect of the river, with banks not consolidated with concrete, steep, washed by streams, bordered here and there by poplars, willows or alder, also in this sector, sand islands are formed. Even at the confluence of the Danube, on the left bank, there are parks, and on the right bank there are meadows, agricultural crops and a forest protection layer made of poplars.

The greatest importance of the site is given by the fact that it hosts important herds of protected bird species, namely: 17 species listed in Annex 1 of the Birds Directive, 66 migratory species listed in the annexes to the Bonn migratory species Convention and 3 globally threatened species. Of particular importance is the presence of nesting populations of the species *Phalacrocorax pygmaeus* and *Coracias garrulus*. At the same time, in June 2016, it was also designated as Ramsar site - a wetland of international importance.

ROSPA0026 Cursul Dunării - Baziaș - Porțile de Fier

The site is located in the Caraș-Severin (56%) and Mehedinți (44%) counties, totally belonging to the Continental biogeographical region. The surface of the site is 10331.00 ha, the average altitude is 65 m and the maximum altitude is 192 m.

The site overlaps with another Natura 2000 site, namely: ROSCI0206 Porțile de Fier

According to the standard site Form, the following habitat classes and their coverage are found: rivers, lakes (95.18%), peat bogs (0.69%), crops (arable land) (0.30%), pastures (2,61%), other arable land (0,36%), deciduous forest (0,41%), other artificial land (0,30%), forest habitats (forests in transition (0.10%).

The site has been designated for the protection of 80 bird species referred to in Article 4 of Directive 2009/147 / EC, the species listed in Annex II to Directive 92/43 / EEC and an important Amphibian species - *Bufo bufo*.

The site includes the Danube with muddy banks with Hydrocharition type vegetation, meadows with bushy willow, being a focal point at national and European level for many wild bird species being one of the few places where on such a small area it is possible to encounter such a large number of wild bird species as in this area.

This site hosts important flocks of protected bird species. According to the data, we have the following categories: a) number of species in Annex 1 of the Birds Directive: 12 (b) Number of other migratory species listed in the Annexes to the Convention on migratory species: 62 c) number of endangered species globally: 3

The site is important during the migration period for the species: *Mergus albellus*, *Cygnus cygnus*, *Egretta alba*, *Aythya nyroca*, *Anas platyrhynchos*, *Phalacrocorax pygmaeus*, *Aythya ferina*, *Aythya fuligula*, *Bucephala clangula*. The site is important for wintering for the following species: *Mergus albellus*, *Cygnus cygnus*, *Egretta alba*, *Anas platyrhynchos*, *Phalacrocorax pygmaeus*, *Aythya ferina*, *Aythya fuligula*, *Bucephala clangula*, *Fulica atra*.

In the migration period, the site hosts more than 20,000 birds of wading birds, being a possible candidate as a RAMSAR site.

ROSPA0046 Gruia - Gârla Mare

ROSPA0046 Gruia - Garla Mare is the special bird protected area located in the Continental biogeographical region, in Mehedinți County. It has an area of 2 963 ha and the altitude ranges from 27 m (minimum altitude) to 90 m (maximum altitude). The area partially overlaps with Natura 2000 sites ROSCI0299 Dunărea la Gârla Mare - Maglaviț and ROSCI0306 Jiana.

The main types of habitat characteristic of the site are: rivers, lakes (7.85%), marshes, peatlands (19.96%), natural meadows, steppes (0.72%), crops, arable land (2.98%),

pastures (12.68%), deciduous forests (30.74%), vineyards and orchards (2.13%) and transitional forests (22.92%).

The site has been designated for 71 species of birds whose presence has been reported on the site, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43 / EEC. According to the Standard Site Template, 2 species have a medium or reduced conservation status, 15 species have a good conservation status, and only one has a very good conservation status. For the other species, assessment of the conservation status is missing.

Located in the floodplain meadows of the Danube, this site follows the shape of the left bank of the river. Evergreen vegetation could not grow too much, but the submerged vegetation is abundant and is a support for large grebe nests (*Podiceps cristatus*) and white-cheeked chirighiță (*Chlidonias hybridus*). Balta Gruia attracts in this area an impressive number of birds, both in terms of the number of species and the number of individuals, in the warm and cold season, for wintering.

The site hosts important flocks of protected bird species: 19 species listed in Annex I of the Birds Directive, 89 migratory species listed in the annexes to the Bonn Convention on migratory species and 6 endangered species globally. The importance of the site is also given by nesting populations of the species *Aythya nyroca*, *Falco cherrug*, *Phalacrocorax pygmaeus*, *Nycticorax nycticorax*, *Phalacrocorax pygmaeus*, *Ardea purpurea*, *Egretta garzetta*, *Ardeola ralloides*, *Haliaeetus albicilla*, *Botaurus stellaris*, de speciile migratoare *Phalacrocorax pygmaeus*, *Phalacrocorax carbo* și pentru speciile *Aythya ferina*, *Phalacrocorax pygmaeus*, which winter in the site.

ROSPA0074 Maglavit

The special bird protection area ROSPA0074 Maglavit is located in the South-West administrative development region in the Continental biogeographic area. The area has a surface of 3 642 ha and has been designated for 112 bird species whose presence has been reported on the site, species covered by Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43/EEC. According to the Standard Site Form, 7 of the 112 species have medium or low conservation status, 12 species have a good conservation status, and for the rest of the species no evaluation has been carried out. The site is also linked to the natural reservation of national interest Pajiștea Cetate in the Danube Meadow.

In terms of land cover, the habitats classes identified in the natural protected area are: rivers, lakes (26.95%), swamps, peatlands (14.01%), crops, arable land (3.19%), pastures (16.82%), deciduous forests (33.21%), vineyards and orchards (2.91%), artificial lands (0.25%) and transition forests (2.67%).

The site includes the floodplain area of the Danube between the towns of Cetate and Calafat, where several lakes have been formed (Fântâna Banului, Hunia, Maglavit, Golenți). Their existence at a short distance from the Danube and the present aquatic vegetation form favourable conditions for many species of water birds. Situation on a migration route gives the area a particular importance, thus becoming a temporary place of staging, a feeding passage for migratory or sedentary bird species dependent on the aquatic environment. The site hosts important fleets of protected bird species, namely: 35 species listed in Annex I of the Birds Directive, 89 migratory species listed in

the annexes to the Bonn Convention on migratory species and 5 endangered species globally.

The importance of the site is accentuated by the presence of nesting species *Ciconia ciconia*, *Chlidonias hybridus*, *Himantopus himantopus*, *Recurvirostra avosetta*, *Ardea purpurea*, *Egretta garzetta*, *Emberiza hortulana*, cât și a speciilor migratoare *Aythya nyroca*, *Platalea leucorodia*, *Falco vespertinus*, *Pluvialis apricaria*, *Larus minutus*, *Philomachus pugnax*, *Phalacrocorax pygmaeus*, *Nycticorax nycticorax*, *Sterna hirundo*, *Tringa glareola*.

ROSPA0135 Nisipurile de la Dăbuleni

Area ROSPA0135 Nisipurile de la Dabuleni is located in Olt (74%) and Dolj (26%) counties, in the Continental biogeographical region. Its surface is 11 009 ha and the altitude varies from 10 m (maximum) to 43 m (minimum).

The area covers the following main categories of habitats: rivers, lakes (10,17%), crops, arable lands (51,68%), pastures (16,47%), deciduous forests (9,76%), transition forests (11.93%).

The site has been designated for 21 species of birds whose presence has been reported on its territory, species listed in Article 4 of Directive 2009/147 / EC and species listed in Annex II of Directive 92/43 / EEC. According to the Standard Site Form, 4 species are assessed as having a medium or reduced conservation status, 14 species have a good conservation status, and for 3 species it has not been evaluated.

The site holds important nesting populations of *Falco vespertinus*, *Emberiza hortulana*, *Coracias garrulus*, *Lanius collurio* and *Lanius minor*. Of the aquatic species, the nesting population of *Aythya nyroca* and the herds of *Ardeola ralloides* and *Platalea leucorodia* that occur here during migration.

The area is linked to the site of community importance ROSCI0045 Coridorul Jiului and to the natural reservation Casa Padurii in Potelu Forest.

ROSCI0006 Balta Mică a Brăilei

The site is fully located in Braila County, fully registered in the steppe biogeographical region. The site area is 20665 ha, and the average altitude is 5m and the maximum height is 38 m.

According to the Standard form of the site, the following classes of habitats and their level of coverage are found: rivers, lakes (27,02%), swamps, bogs (30,10), natural meadows, steppes (10,2%), grazing lands (0,25%), hardwood forests (31,04%), forest habitats (forests in transition) (1,53%).

The site has been designated for protection of 9 types of habitats of which: communities of tree lines with tall hydrophil grass up to the mountain and alpine area (2%), low altitude meadows (1%), rivers with muddy banks with *Chenopodium rubri* and *Bidenton* vegetation (0,3%), *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils, (0,2%), Alluvial grasslands of *Cnidion dubii* (1%), Mixed riparian forests (1%), Groves of *Salix alba* and *Populus alba* (15%), Riparian galleries and bushes (8%), Oligotrophic to mesotrophic standing waters with vegetation of *Littorelletea uniflorae* and/or of *Isoëto-Nanojuncetea* (0.1%);

The site was designated for the protection of 17 species out of which: one species of mammals (*Lutra lutra*), 3 species of amphibians (*Bombina bombina*, *Emys orbicularis*, *Triturus dobrogicus*) and 13 species of fish (*Alosa immaculata*, *Alosa tanaica*, *Cobitis taenia*, *Gobio albipinnatus*).

Located in the Danube flood plan, the area has a group of terrestrial and water ecosystems whose configuration depends on the annual dynamics of the Danube stream –the size and duration of seasonable floods. So, there is a succession and a periodical switch between the types of ecosystems, without a strict time limit.

This area is well-known for its ornitological importance, since it is situated on the most important bird migration corridor of the inferior basin of the Lower Danube, at the middle of the migration routes between the nesting areas from Northern Europe and the winter huts from Northern Europe and the winter huts from Africa. A large number of birds internationally protected by the Berna, Bonn conventions were observed, representing half of the number of species of migrating birds specific to Romania. The ratio of the categories of ecosystems is 50% natural, 35% seminatural and 15% other types.

ROSCI0065 Danube Delta

The site is located on the territory of the counties Tulcea (93%) and Constanța (7%) , belonging to two biogeographical regions, namely Pontic (50.24%) and Steppe (49,76%). The surface of the site is 453645 ha, the average height is 1 m, and the maximum height is 229m.

According to the standard form of the site, the following classes of habitats and their level of coverage are found: marine areas, maritime islands (0.12%), estuaries, lagunas (14.81%), salty swamps (1.20), sand beaches (1.37%), rivers, lakes (12.77%), swamps, bogs (48,68%), natural meadows, steppes (4.35%), crops (farming land) (9.85%), grasslands (0.55%), other farming lands (0.10%), hardwood forests (4,45%), other artificial lands (0.86%), forest habitats (forests in transition) (0.87%).

The site has been designated for protection of 29 types of habitats out of which 7 are priority (62C0 * - Ponto-Sarmatic steppes, 2130 * - Dunes fixed by perenial grass vegetation (grey dunes), 1150 * - Coastal lagunas, 7210 * - Calcareous fens with *Cladium mariscus*, 40C0 * -Ponto-sarmatic decidous bushes, 1530 * - Panonic and Ponto-sarmatic salt marshes and salt meadows, 6120 * Xeric meadows on calcareous underlayer) and 41 of species: 7 species of mammals (a priority species: 1356* - *Mustela lutreola*), 5 species of amphibians, 15 species of fish, 9 species of non-vertebrates, 5 species of plants.

The first geographical coordinate of Danube Delta is its location in the Northern hemisphere, approx. between the actual delta and the Razim-Sinoie lake complex, on Tulcea Hills. An important feature is also that Danube, on its 2,860 km in length and 817,000 km² hydrographic basin, has a latitudinal spread, on slightly oceanic influences, to the West, to the continental influences, both being part of the temperate climate. This position of the Danube, with the drainage by its affluents, of two mountain formations – the most important in Europe – the Alps and the Carpathians, has

influences sometimes till the determination of the hydrological regime in the mouth area, i.e. over the delta.

The species living on this land is certainly higher than it is currently known, since the inventories made in the past and after the establishment of RBDD did not cover all the areas, systematically or territorially. Until now, 1642 species of plants and 3768 species of animals were inventories, of which approx. 1530 species of insects, 70 species of snails, 190 species of fish, 16 species of reptiles, 8 species of frogs, 325 species of birds and 34 species of mammals. Among the plants we mention –*Centaurea pontica* and *Centaurea jankae* endemites, the orchids (*Orchis elegans*, *Platantera bifolia*, *Anacamptis pyramidalis*), the Greek vine (*Periploca graeca*), the sand bindweed (*Convolvulus persicus*), among the insects the iris butterflies (*Apatura metis*, *Rhiparioides metelkana*, *Catocala elocata*, *Arctia villica*, *Thersamonia dispar*), among the coleopter – the European rhinoceros beetle (*Oryctes nasicornis*), *Empusa fasciata* and *Saga pedo*. Among the amphibians, the European tree frog (*Hyla arborea*) is very widespread here. Birds are well-represented, some of them are protected (common pelican and curly pelican, the mute swan, the great white egret and the little egret, the yellow, the yellow heron, the heron, the pied avocet, the phalaropes, the black-winged stilt, the red-crested pochard, the red-breasted goose and many others). The majority are nesting in the area.

ROSCI0088 Gura Vedei - Saica - Slobozia

The site is located in the counties Giurgiu (67%) and Teleorman (28%) , fully covering the continental biogeographical area. The surface of the site has 10137 ha, the average altitude is 20m, and the maximum altitude is 108m, and the minimum altitude is 2m.

According to the Standard form of the site, the following classes of habitats are found here and their coverage rate: sand beaches (3%), rivers, lakes (41%), swamps, bogs (2%), crops (farming land) (6%), grasslands (3%), hardwood forests (45%).

The site was designated for protection of 2 types of habitats: 92A0 – Groves with *Salix alba* and *Populus alba* și 91F0 – Mixed riparian forests with *Quercus robur*, *Ulmus laevis*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the large rivers (*Ulmion minoris*) and 21 species, out of which: 7 species of mammals, 2 species of amphibians, 11 species of fish and one species of non-vertebrates.

The site Gura Vedei-Saica -Slobozia is located in the lower basin of Vedea River, which is part of the lower meadow of the Danube, Lunca-Pasărea sub-unit, also comprising the shore-dam area. The geomorphological unit encountered is the meadow. Geologically, this site falls in the large structural unit Moesic Platform, and the sedimentary bed consists of loessoid deposits and alluvial deposits of holocen age, highly varied in texture, in the minor riverbed they are almost exclusively alluvial deposits, making up the string of fluvial grinds.

The vulnerability of the site is mainly caused by anthropic factors, by fluvial transportation and commercial fishing, but also by one of the natural factors represented by the Danube variations.

ROSCI0131 Oltenița - Mostiștea - Chiciu

The site is fully located in Călărași County, in the steppe biogeographical region. The area of the site is 11521 ha, and the average altitude is 15 m, and the maximum altitude is 49m.

According to the standard form of the site, the following classes of habitats and their spreads are: rivers, lakes (64.10%), swamps, bogs (0.88%), natural meadows, steppes (0.62%), crops (farming land) (3.16%), grasslands (3.87%), other farming lands (0,53%), hardwood forests (24,51%), vineyards and orchards (0,16%), other artificial lands (2,12%).

The site was designated for protection of 4 types of habitats, i.e.: 3270 - Rivers with muddy banks with *Chenopodium rubri* and *Bidention* vegetation, 3150 - natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation, 3130 Oligotrophic to mesotrophic standing waters with vegetation of *Littorelletea uniflorae* and/or *Isoëto-Nanojuncetea*, 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*); and 17 species, among which: one species of mammals, 3 species of amphibians, 13 species of fish.

The subsector Oltenița Călărași is part of the group of terraces and meadow of Danube valley between the mouth of Arges and Braila, characterized by the approximately equal development of terraces and meadow. A 10-12m bump, slanted but continuous, extended almost rectilinearly up to East of Călărași, highlights the limit between the morphological complex of Danube valley and the North plain.

The site proposed includes areas occupied by agricultural crops, forests, shore protection curtains, lakes, degraded lands and meadows. Compared to the mammals, birds are the most numerous because here they have food, resting, reproduction and even nesting conditions. Birds who nest on the water shore: the common kingfisher, the bee-eater, the sand martin and also found near waters is the white wagtail.

III.2.1. IDENTIFICATION OF PROJECTS WHERE INDICATIVE LOCATIONS INTERSECT NATURA 2000 SITES

Of the 18 RES objectives, 10 of them intersect Natura 2000 sites in Romania: 7 in the energy production sector and 3 in the energy transport sector. This statistical analysis was performed taking into account all Natura 2000 sites potentially being adversely affected by the implementation of the RES objectives.

The type and number of Natura 2000 sites potentially adversely affected by the implementation of the REs objectives are described below:

- At national level, the total number of SCIs intersected with RES objectives is 28. Of these, 21 SCI (39.6% of the total number of Natura 2000 sites intersected at national level) are intersected by energy production objectives, 5 SCI (9.4% of the total number of Natura 2000 sites intersected at national level) are intersected by energy transport objectives and 2 SCI (3.8% of the total number of Natura 2000 sites intersected at national level) are intersected by both types of objectives mentioned above;

- At national level, the total number of SPAs intersected with RES objectives is 25. Of these, 21 SPA (47.2% of the total number of Natura 2000 sites intersected at national level) are intersected by energy production objectives, 3 SCI (5.7% of the total number of Natura 2000 sites intersected at national level) are intersected by energy transport objectives and 1 SPA (1.9% of the total number of Natura 2000 sites intersected at national level) is intersected by both types of objectives mentioned above;
- Internationally, besides the 53 Natura 2000 sites intersected by RES objectives at the level of Romania, a number of other Natura 2000 sites present on the territory of other neighbouring states of Romania have been identified that could be adversely affected by the implementation of the RES. Of the 42 Natura 2000 sites identified, 27 there are 27 SCI and 15 SPA, respectively: Bulgaria - 17 SCI and 12 SPA, Croatia 3 SCI and 1 SPA, Hungary - 7 SCI and 2 SPA.

Reporting the number of sites intersected by the RES objectives to the total number of Natura 2000 sites declared at national level is represented by Figure 34. Of the total SCI in Romania, 6.44% are intersected by the RES targets, and out of the total number of SPAs declared at national level, 14.62% are intersected by the RES targets.

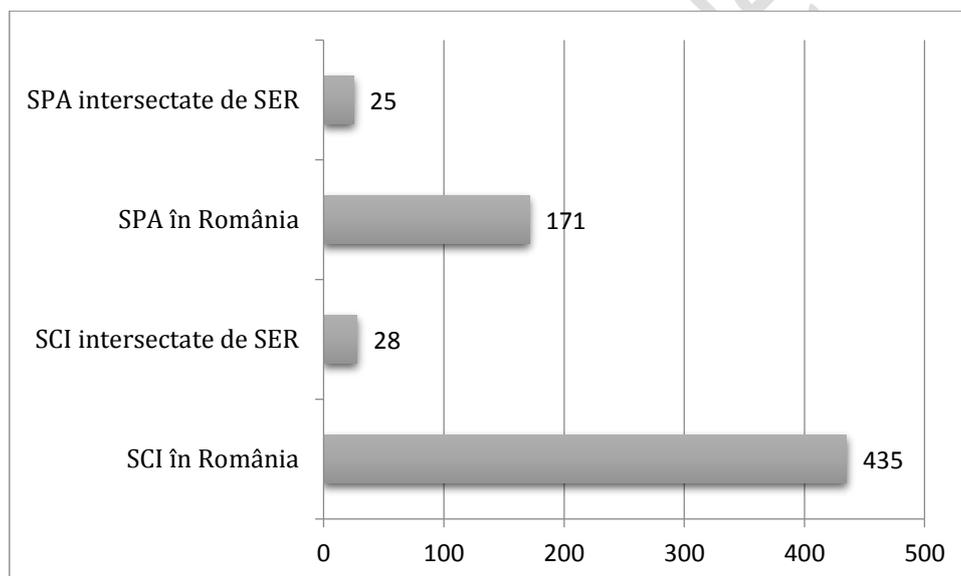


Figure 34 The number of Natura 2000 sites intersected by the RES objectives in relation to the number of sites declared at national level

According to the Natura 2000 Standard Forms, the 28 sites of community importance intersected by the RES objectives total a number of 73 habitats of community interest, of which 22 are priority (30.1%), and a number of 128 species of community interest, of which 10 are priority (7.8%).

No. of intersected SCI	No. of habitats of community interest	of which priority habitats*
28	73	22
* Priority habitats: 1150 * Coastal lagoons 1530 * Pannonian and ponto-Sarmatian salt meadows and marshes 2130 * Dune fixate cu vegetație herbacee perenă (dune gri) 4070 * Bush with <i>Pinus muogo</i> and <i>Rhododendron myrtifolium</i>		

40A0 * Peri-Pannonian sub-Continental bushes 40C0 * Ponto-Sarmatian fardwood bushes 6110 * Calcareous communities or basifil grasslands of <i>Alyso-Sedion albi</i> 6120 * Xerical meadows on limestone substrate 6230 * <i>Nardus</i> mountain pastures rich in species on siliceous substrates 6240* Sub-Pannonian steppe 62C0 * Ponto-Sarmatian steppa 7110 * Active turbaries 7210 * Calcareous marshes <i>Cladium mariscus</i> 7220 * Travertin-forming rock springs (<i>Cratoneurion</i>) 7240 * Alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i> 8160 * Medial-European calcareous groves on mountain floors 9180 * <i>Tilio-Acerion forests</i> on steep slopes, groves and cloughs 91AA* Eastern white oak forests 91E0 * Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion, Alnion incana, Salicion albae</i>) 91H0 * Pannonian forests with <i>Quercus pubescens</i> 91I0 * Euro-Siberian silvosteppe vegetation with <i>Quercus</i> spp. 9530 * Sub-Mediterranean forest vegetation with endemit <i>Pinus nigra</i> ssp. <i>Banatica</i>		
No. of intereseected SCI	No. of species of community interest	of which priority species *
28	128	10
* Priority species: 1087 * <i>Rosalia alpina</i> 1078 * <i>Callimorpha quadripunctaria</i> 1084 * <i>Osmoderma eremita</i> 1352 * <i>Canis lupus</i> 1354 * <i>Ursus arctos</i> 4070 * <i>Campanula serrata</i> 4039 * <i>Nymphalis vaualbum</i> 1093 * <i>Austropotamobius torrentium</i> 1356 * <i>Mustela lutreola</i> 4024 * <i>Pseudogaurotina excellens</i>		

With regard to the special avifaunistic protection areas intersected by the RES objectives, as represented in the chart from Figure 34 , 25 are intersected by the RES objectives. According to the Natura 2000 standard forms for SPA intersected by the RES objectives, the number of bird species which are the subject of their designation and which are covered by Article 4 of Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of birds and Annex II to Directive 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora is 285. Of the total number of 310 bird species covered by the Birds Directive and SPAs in Romania, the 285 species account for about 92%. The number of bird species of Community importance present in the sites intersected by the RES and referred to in the two mentioned Directives are mentioned in the chart Figure 35.

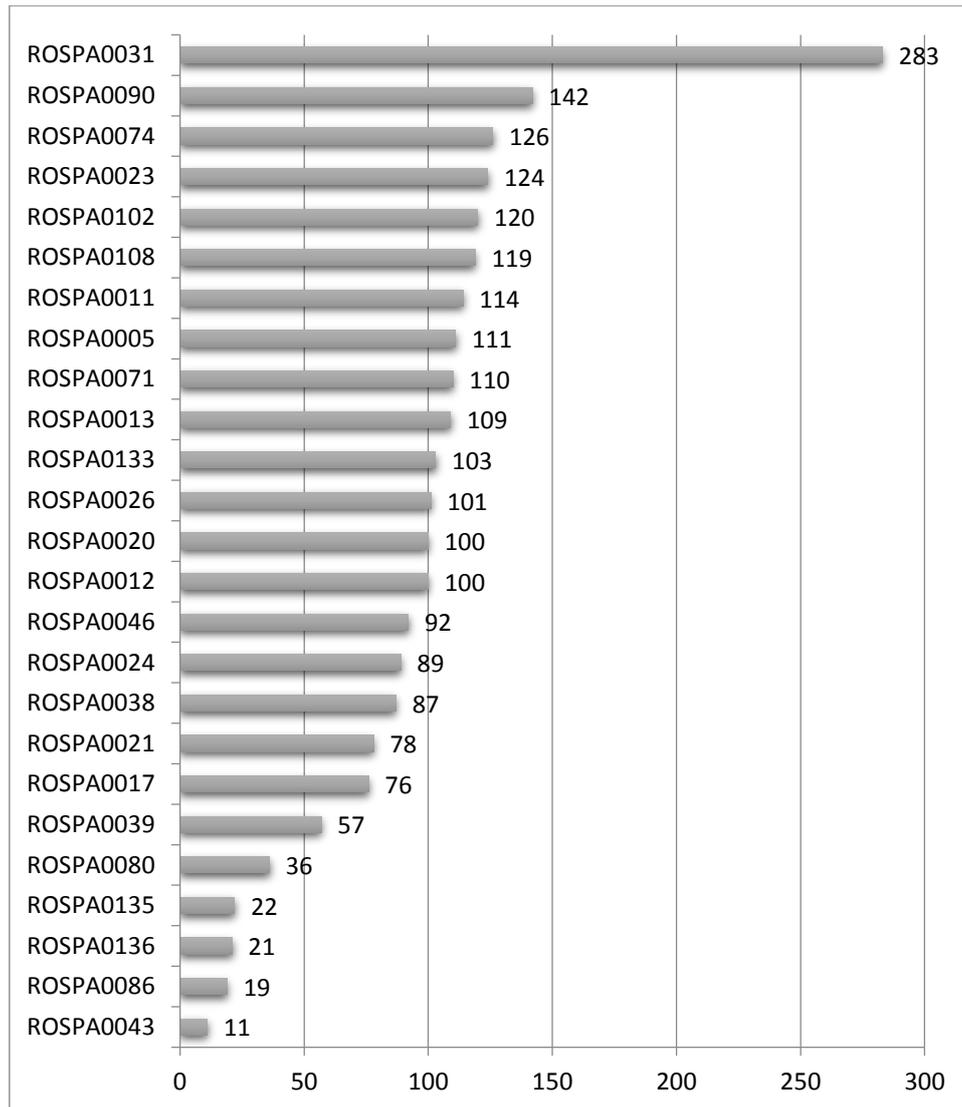


Figure 35 Number of species of birds of Community interest present in SPAs intersected by RES (according to the Standard Forms, the species referred to in Article 4 of Directive 2009/147 / EC and Annex II to Directive 92/43 / EEC were reviewed)

III.3 DATA ON THE PRESENCE, LOCATION, POPULATION AND ECOLOGY OF SPECIES AND / OR HABITATS OF COMMUNITY INTEREST PRESENT ON THE AREA AND IN THE PROXIMITY OF RES 2019-2030, WITH PERSPECTIVES FOR 2050, REFERRED TO IN THE STANDARD FORMS OF PROTECTED NATURAL AREAS OF COMMUNITY INTEREST

Data on the presence, location, population and ecology of the species and / or habitats of community interest present on the area and in the proximity of RES 2019-2030, with perspectives for 2050, are not difficult to identify due to the lack of national data with a resolution useful in this case, and due to the unknown boundaries of the locations of certain projects.

Taking these issues into consideration, the analysis of the information to be presented in this section was carried out starting from sites intersected by the RES objectives and

those located near the RES for which the Natura 2000 Standard Forms were consulted in order to reproduce an overview of species and habitats of community interest identified at site level.

Habitats of community interest are characterized by their conservation status. It represents the degree of conservation of the structures and functions of the natural habitat type concerned, as well as the possibilities for restoration / reconstruction. This feature also includes three sub-criteria: the degree of conservation of the structure, the degree of conservation of functions and the possibility of restoration. After separate evaluation of the three sub-criteria, the results are combined to achieve the conservation status of the reviewed habitat.

According to the Natura 2000 standard forms of sites of Community importance intersected by the RES objectives or located less than 1 km away from them, the following values of the corresponding conservation status of the habitats of Community interest present on their territories were identified: 54 cases in which 31 habitats have excellent preservation type A, of which 8 priority habitats, 229 cases where 63 habitats have B-preservation type - good conservation, of which 17 priority habitats, 25 cases where 20 habitats are type C - medium or low conservation, of which 4 priority habitats and 10 cases where 9 habitat types of which 2 priority habitats do not have an assessment of the conservation status. In percentages, these values are graphically represented in Figure 36.

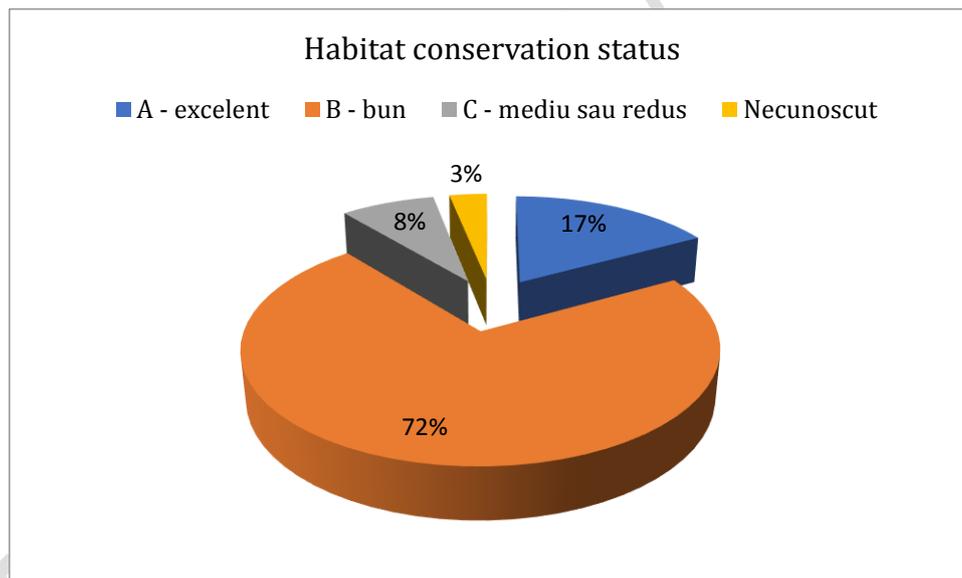


Figure 36 Percentage expression of the conservation status of habitats of Community interest present in or near RES depending on the number of cases, according to the Natura 2000 Standard Forms

Excelent – excellent

Bun – good

Mediu sau redus – medium or low

Necunoscut – not known

In the case of the species of community interest identified at SCI level, two elements were reviewed: the type of population and the degree of conservation.

In the case of the type of population, more than 95% of the populations of the species are permanent (*Figure 41*).

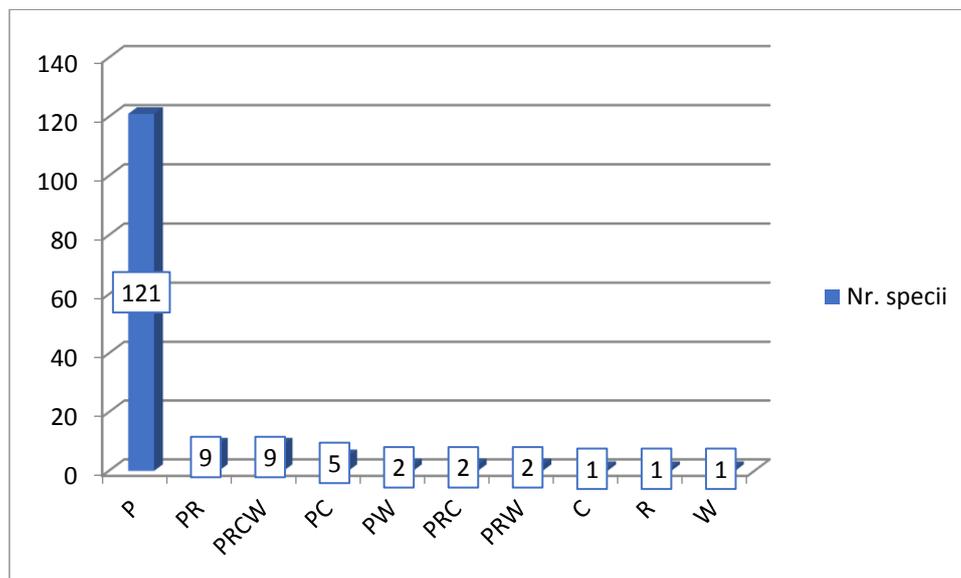


Figure 37 Number of species of community interest according to the type of population (according to the Natura 2000 Standard forms of SCIs intersected by RES objectives or located at > 1km away from them) (P-species is found throughout the year in the site, R- the species uses the site for nursing and breeding, C - the species uses the site to migrate or change the feathers outside the breeding area, W- the species uses the site in winter)

Concerning the conservation of species of community interest on the territory of SCIs subject to review, it should first be mentioned that this aspect refers to the conservation status of habitat features that are important for species and its recovery potential. Affiliation to a conservation category is a result of a multi-criteria analysis: 1) the conservation status of habitat features that are important for the species and which require a global assessment of the habitat features in terms of biological requirements for the species. Features related to population dynamics are among the most appropriate for the evaluation of species, both for plants and for animals; 2) the possibility of restoration.

According to the data provided by the Natura 2000 Standard Forms, 46 species identified in 12% of cases have excellent conservation status, 114 species identified in 76% of the cases have a good conservation status, 24 species identified in 6% of cases have a status medium or reduced conservation status, and for 26 species identified in 6% of the cases, the conservation status is unknown / not evaluated (*Figure 38*).

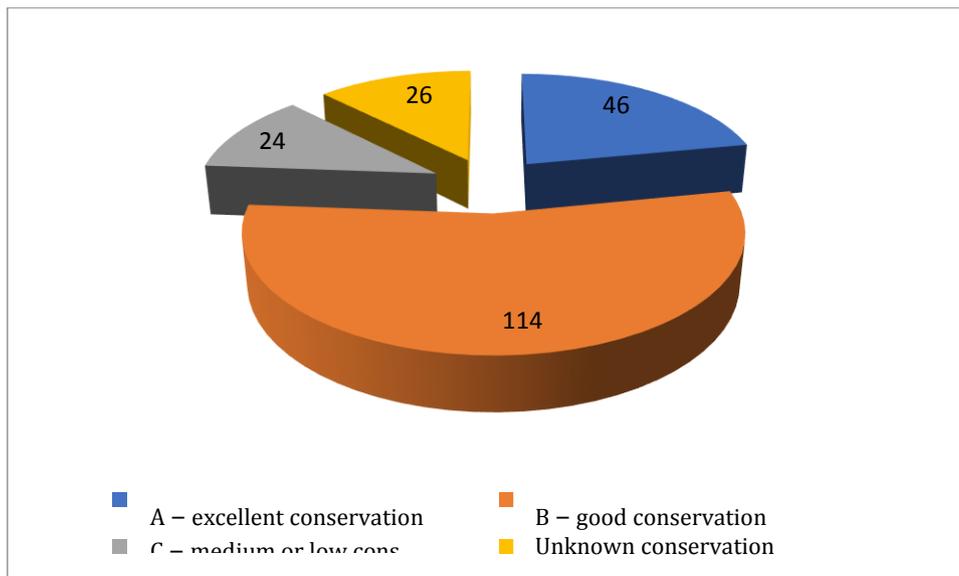


Figure 38 Status of conservation of species of community interest at SCI level (data taken and processed from Natura 2000 Standard Forms)

As regards the SPAs sites subject to review, the bird species present on their territory were characterized by the same considerations set out above. Thus, the following situations were identified:

- ❖ 161 species in 40% of cases using the sites as migratory passage areas or for change of feathers outside the breeding area, 154 species in 7% of the cases present in the sites for breeding and nursing, 62 species from the total species number in 46% of the cases that are present on sites throughout the year and 48 species use the sites for wintering in 7% of the cases (Figure 39). There have also been cases with double and triple status of the population, but their number is low;
- ❖ 7 SPA sites with a total of 24 species with excellent conservation status, 19 sites with 109 species with good conservation status, 16 sites with 38 species in the medium or reduced conservation category and 18 sites in which there were identified 200 species whose conservation status is unrated and unknown. Transposing these values as a percentage, depending on the number of cases identified and reviewed, yields the statement from Figure 40.

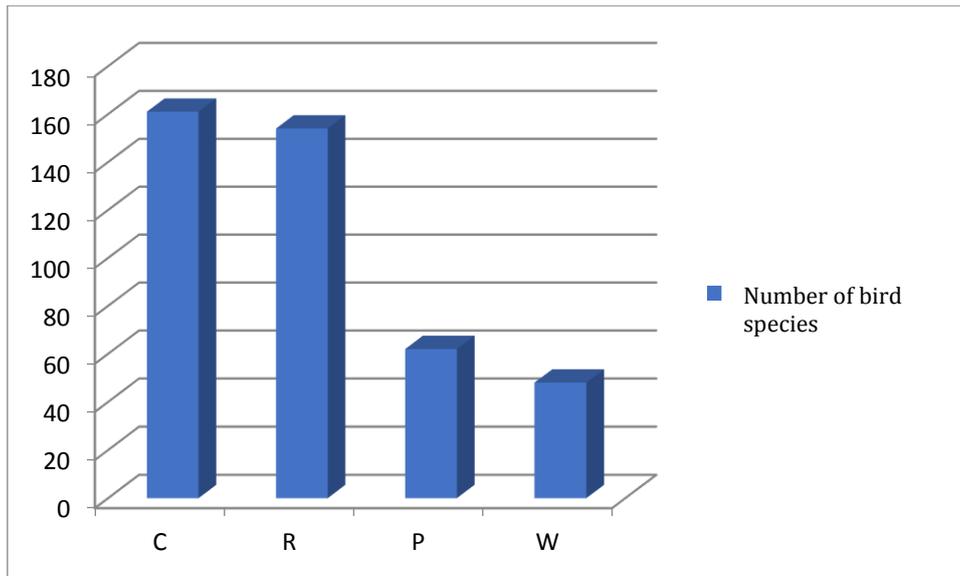


Figure 39 Number of species of community interest according to the type of population (according to the Natura 2000 Standard forms of SPAs intersected by RES objectives or located at > 1km away from them) (P-species is found throughout the year in the site, R- the species uses the site for nursing and breeding, C - the species uses the site to migrate or change the feathers outside the breeding area, W- the species uses the site in winter)

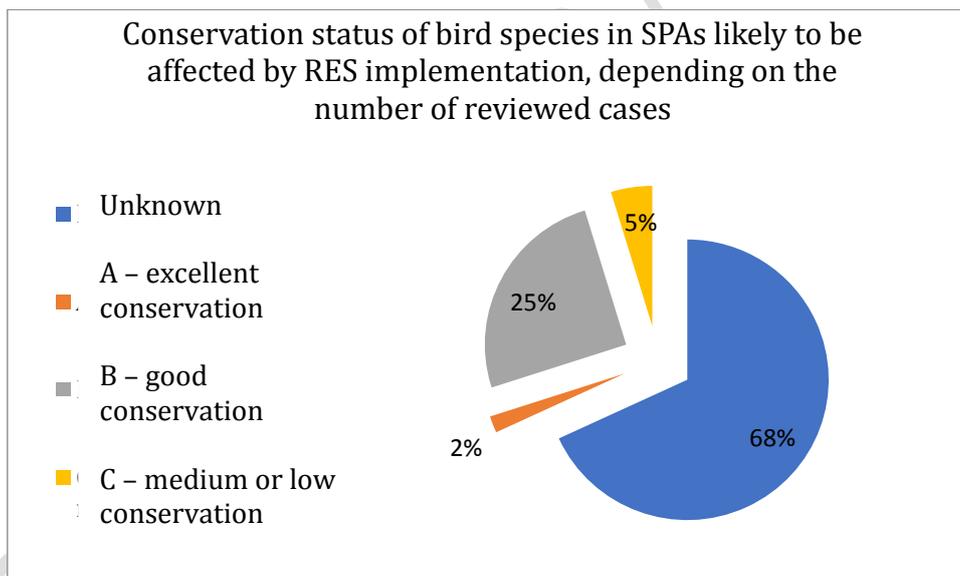


Figure 40 Conservation status of bird species of Community interest according to the number of cases identified and reviewed (according to Natura 2000 Standard Forms)

III.4 DESCRIPTION OF THE ECOLOGICAL FUNCTIONS OF THE SPECIES AND HABITATS OF COMMUNITY INTEREST THAT ARE AFFECTED (SURFACE, LOCATION, CHARACTERISTICS) AND THEIR RELATIONSHIP WITH PROTECTED NATURAL AREAS OF COMMUNITY INTEREST AND THEIR DISTRIBUTION

Habitats and species of community interest are the subject of Natura 2000 sites designation, thus being their key structural and functional components.

Due to the large number of species and habitats of community interest potentially affected by the RES objectives, it would be difficult to make a detailed description of their ecology, of the important functions they perform, for each site. The present documentation has opted for describing the general ecological functions of species and habitats, knowing the important role in maintaining the structural and functional integrity of the sites hosting them.

Besides the habitats of community interest present in the Natura 2000 sites potentially affected by the RES objectives, there are species included in the following major categories whose functions will be detailed below: invertebrates, fish, reptiles and amphibians, birds, mammals.

Invertebrates
<p>Invertebrates play a key role in the good functioning of ecological systems in the light of two major reasons: ecological plurivalence and feeding regime.</p> <p>On the other hand, importance is also given by the status of the food source they have in the trophic network for both other invertebrate species and species of amphibians, birds, reptiles or small mammals. The vast majority of invertebrate species are vulnerable to changes in the structure and functions of their ecological system. For this reason, their presence is associated with a good functioning of the ecological system they occupy, thus being indicative species.</p> <p>The main ecological functions performed by them are:</p> <ul style="list-style-type: none"> ❖ The differential feed source of larval stage individuals often influences the structure and composition of the plant communities; ❖ Reproduction of plant communities is due to pollination by adult individuals (lepidoptera, hymenoptera, coleoptera, etc.); ❖ The invertebrates present in the soil (larval or even adult stage - anelids, coleoptera, nematodes, etc.) provide the plant nutrients by decomposing the vegetal or animal matter, as well as by releasing them. They are also responsible for soil aeration and mixing of nutrients from different soil layers; ❖ Polyphage larvae, components of habitats with favorable conservation status, eliminate seeds that may come from adventitious or invasive species, thus preserving the integrity of plant communities and, at the same time, the integrity of the habitat (s).
Reptiles and amphibians
<p>Reptiles and amphibians have a double role in the trophic network, both as prey and predator. As a predator, their importance is that of regulating aquatic invertebrates and other amphibian species, and as a prey their importance is the trophic resource for small and medium mammals, birds or even other species of reptiles and amphibians.</p> <p>The vast majority of reptile and amphibian species are biological indicators of the state of the environment due to the high permeability of the skin through which toxic substances from water, air or soil can be absorbed.</p> <p>Reptiles and amphibians need quality habitats to carry out both reproduction and hibernation. Amphibians are the best example for qualitative habitat requirements due to the multiple larval stages they have in their development.</p> <p>From a functional point of view, reptiles and amphibians fulfill essential roles in ecological systems:</p>

<ul style="list-style-type: none"> ❖ It is a source of food for other species (supply services); ❖ Contributes to maintaining the stability and resilience of organic systems, improving the availability of essential nutrients for plant species (support services); <p>It contributes to the reproduction of plant species through pollen and seed dispersion as well as to the interaction process at various trophic levels, thus contributing to species control (regulation services).</p>
<p>Fish</p>
<p>Fish are a major component of lotic or lentic aquatic ecosystems, both because of their environmental and socio-economic role.</p> <p>Fish species can be omnivorous, herbivore, insectivore, planktore, piscivore, being the main food source for many organisms, including birds and mammals.</p> <p>Certain fish species play a role as biological indicators of the aquatic ecosystems in which they live, especially in the case of long-term effects of anthropogenic pressures.</p> <p>Fish migratory species moving long distances to lay their eggs are vulnerable to changes in water flow and temperature.</p> <p>Some of the important roles that this group of organisms performs within ecological systems are:</p> <ul style="list-style-type: none"> ❖ Regulatory services: control of populations, as is the case with microorganisms, plankton), nutrient recycling, regulation of ecosystem resilience, regulation of carbon flows to the atmosphere, maintenance of sedimentation processes, maintenance of biodiversity, etc.; ❖ Linking services in: the dynamics of aquatic ecosystems, between aquatic and terrestrial ecosystems, the transport of nutrients, carbon and other minerals, the transport of energy, etc. <p>In order to ensure these services and many others that this group of organisms is doing, management measures must be based on the fact that fish are a component of ecological systems and that substitutions for the decline of populations or the loss of habitats very rarely replace the losses generated by the services generated by them.</p>
<p>Birds</p>
<p>Within the trophic network, bird species occupy many levels, from secondary and tertiary consumers to peak predators. The main ecological services these organisms provide are the following:</p> <ul style="list-style-type: none"> ❖ Regulatory services by ensuring genetic diversity: frugivore and non-fertile species ensure the transport of plant genetic material through pollen and seeds; Regulatory services by controlling invasive species through bird species feeding on invertebrates and vertebrates and the disposal of waste and corpses by necrophagous bird species; ❖ Support services by circulating and depositing nutrients. <p>The vast majority of bird species are considered key species within ecological systems because their presence / disappearance produces a chain reaction, indirectly affecting other species as well. On the other hand, it should be noted that there are species of plants that are reproductively dependent on the activity of birds.</p>
<p>Mammals</p>
<p>Mammals, be they micro, meso or large mammals, form a group of influential organisms in the trophic network. Micromammals play an important role in controlling population levels of predators, insects and host species for parasites, thereby ensuring the proper functioning of the occupied ecological system. Micromammals feed on invertebrates, plant material, other mammals and, in turn, provide food for medium and large mammals as well as for bird species or some reptile species.</p> <p>In the case of medium-sized carnivorous mammals, the controlling role of the populations is particularly true among small mammals, reptiles, amphibians and even birds, thus facilitating the flow of nutrients. In the case of large-scale carnivorous mammals occupying the top of the trophic pyramid, it should be noted that these are the main species responsible for the good functioning of the ecosystems by maintaining the balance within the biocenoses.</p>

Control over the mammalian populations brings a number of benefits whose disappearance could trigger chain reactions (e.g. the decline in large carnivorous populations may be followed by a pronounced increase in herbivorous species which could cause rapid disturbance at the level of vegetation but also among bird populations, small mammals and other categories of organisms).

III.5 DATA ABOUT THE STRUCTURE AND DYNAMICS OF POPULATIONS OF AFFECTED SPECIES (THE NUMERICAL EVOLUTION OF POPULATION IN PROTECTED NATURAL AREA OF COMMUNITY INTEREST, ESTIMATED PERCENTAGE OF A SPECIES POPULATION AFFECTED BY THE IMPLEMENTATION OF RES 2019-2030, WITH PERSPECTIVES FOR 2050)

At this stage of the analysis, data on the structure and dynamics of the populations belonging to the species of community interest potentially affected by the implementation of the RES objectives are difficult to quantify, and there is no uniform starting base at national level regarding the actual situation of these species and the dynamics to the Natura 2000 network.

This analysis will be carried out in the appropriate assessment studies for each project with a significant impact on Natura 2000 sites

III.6 STRUCTURAL AND FUNCTIONAL RELATIONS THAT CREATE AND MAINTAIN THE INTEGRITY OF PROTECTED NATURAL AREA OF COMMUNITY INTEREST

The integrity of a protected natural area of community interest is given by its structural and functional elements. There are generally valid aspects of the proper functioning of a protected natural area.

Consideration should always be given to the purpose of designating these areas, namely to maintain or bring, where appropriate, a favourable conservation status of the species and habitats of Community interest for which they have been designated. At the same time, it must be taken into account that Natura 2000 sites are components of the Natura 2000 European Ecological Network, a biodiversity conservation tool by designating areas of high conservative value and making them consistent between them. The link between these areas is, in most cases, established by overlapping the two types of component parts, thereby creating a link to strengthen the structure and functions.

Structural alteration, in as small a part as possible, will bring about a chain reaction with observable and functional effects. In other words, in any of the sites intersected by RES, the structure of the ecological systems is essential to maintain the conservation status of species and habitats of community interest, any structural change at site level leading to further structural and functional changes in the long term, some potentially irreversible.

Areas of land outside Natura 2000 sites are very important, especially when we talk about maintaining species conservation status through mobility / movement of species that ensure population connectivity, genetic diversity and food resources. Even though there are no clearly defined areas in relation to the links between Natura 2000 sites,

account must be taken of the broad meaning of the term *biodiversity* and all the processes involved.

We believe that when the appropriate assessment studies for each RES project with potential impact on the Natura 2000 Network are conducted, the impact analysis will be extended to all types of land use affected by them because a cumulative numerical estimate of the areas is not sufficient given that in many situations the significant structural and functional changes of the habitats can have major long-term effects.

III.7 CONSERVATION GOALS OF PROTECTED NATURAL AREA OF COMMUNITY INTEREST, WHERE ESTABLISHED BY MANAGEMENT PLANS

Following the analysis of management plans of Natura 2000 sites covered by the objectives of the RES (only where they exist) it can be noticed that they outline 3 general goals that are directly related to the conservation of the areas:

1. Ensure the conservation of the species and habitats for which Natura 2000 sites have been declared to achieve / maintain their favourable conservation status;
2. Ensure the efficient management of Natura 2000 sites in order to improve / preserve the conservation status of species and habitats of conservative interest;
3. Raising awareness / improving knowledge, changing stakeholder attitudes that have an impact on biodiversity conservation.

The following are the general goals for conservation of Natura 2000 sites identified as having a management plan:

No.	Name	Conservation goal
1	The revised management plan of the Călimani National Park	❖ Management measures for amphibians and reptiles: Maintaining existing aquatic habitats and, if possible, creating new habitats to some extent;
2	Management plan of the Balta Mică of Braila Natural Park	❖ Protecting habitats and nesting sites; ❖ Maintaining the water regime of wetlands and stubble surfaces, nests and habitats protection; ❖ Ensuring the quality of the water, maintaining the natural character of the wetlands, ecological reconstruction and combating poaching; ❖ Water quality and natural hydrodynamics preservation.
3	Management plan for protected natural areas: ROSCI0022 Canaralele Dunării, ROSCI0053 Allah Bair Hill, ROSPA0002 Allah Bair Capidava, ROSPA0017 Canaralele de la Hârşova, ROSPA0039 Dunăre-Ostroave, Neo-Jurassic shelf from Topalu (2353), Fossiliferous shelf Şeimenii Mari (2355), Allah Bair Hill (2367), Ostrovul Şoimul (IV.19),	❖ Ensuring the conservation, in the sense of achieving a favourable conservation status, of the habitats 3130 Standing oligotrophic to mesotrophic waters with vegetation of Littorelletea uniflorae and / or Isoeto-Nanojuncetea, 3140 Strong oligo-mesotrophic waters with benthic vegetation of 50 species of Chara, 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetation, 3270 Rivers with muddy banks with Chenopodion rubri and Bidention vegetation, 40C0* Pontosarmatic deciduous shrubs, 62C0* Pontosarmatic steppes, 6430 High-grass hydrophobic border communities from plain to mountain and alpine areas, 6440 Alluvial meadows of Cnidion dubii, 6510 Low altitude meadows (Alopecurus pratensis Sanguisorba officinalis), 91AA Pontosarmatic forest vegetation with soft oak, 9110* Euro-Siberian silvan steppe

No.	Name	Conservation goal
	<p>Celea Mare-Valea lui Ene (IV.24), Cetate Forest (IV.25), Bratca Forest (IV.26), Canaralele din Portul Hârșova (2.369), Fossiliferous site Cernavodă (2.534), Fossiliferous site Movila Banului</p>	<p>vegetation with <i>Quercus</i> spp., 91F0 Riparian forest mixed with <i>Quercus robur</i>, <i>Ulmus laevis</i>, <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i>, along the great rivers (<i>Ulmenion minoris</i>), 91M0 Balkan-panonic forests of Austrian oak and holm, 92A0 Parks with <i>Salix alba</i> and <i>Populus alba</i>, 92D0 Riparian galleries and shrubs (<i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i>); Ensuring the conservation, in the sense of achieving a favourable conservation status, of the habitats 3130 Standing oligotrophic to mesotrophic waters with vegetation of <i>Littorelletea uniflorae</i> and / or <i>Isoeto-Nanojuncetea</i>, 3140 Strong oligo-mesotrophic waters with benthic vegetation of 50 species of <i>Chara</i>, 3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> type vegetation, 3270 Rivers with muddy banks with <i>Chenopodion rubri</i> and <i>Bidentation</i> vegetation, 40C0* Pontosarmatic deciduous shrubs, 62C0* Pontosarmatic steppes, 6430 High-grass hydrophobic border communities from plain to mountain and alpine areas, 6440 Alluvial meadows of <i>Cnidion dubii</i>, 6510 Low altitude meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>), 91AA Pontosarmatic forest vegetation with soft oak, 91I0* Euro-Siberian silvan steppe vegetation with <i>Quercus</i> spp., 91F0 Riparian forest mixed with <i>Quercus robur</i>, <i>Ulmus laevis</i>, <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i>, along the great rivers (<i>Ulmenion minoris</i>), 91M0 Balkan-panonic forests of Austrian oak and holm, 92A0 Parks with <i>Salix alba</i> and <i>Populus alba</i>, 92D0 Riparian galleries and shrubs (<i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i>);</p> <ul style="list-style-type: none"> ❖ Ensure conservation in order to maintain the favourable conservation status for the species: <i>Campanula romanica</i>, <i>Moehringia jankae</i>, <i>Potentilla emilii-popii</i>, <i>Pulsatila grandis</i>, <i>Bombina bombina</i>, <i>Emys orbicularis</i>, <i>Testudo graeca</i>, <i>Triturus dobrogicus</i>, <i>Anisus vorticalus</i>, <i>Alosa immaculate</i>, <i>Gobio albipinnatus</i>, <i>Gymnocephalus schraetzer</i>, <i>Misgurnus fossilis</i>, <i>Pelecus cultratus</i>, <i>Rhodeus sericeus amarus</i>, <i>Zingel streber</i>, <i>Zingel zingel</i>, <i>Aspius aspius</i>, <i>Gobio kessleri</i>, <i>Alosa tanaica</i>, <i>Gymnocephalus baloni</i>, <i>Cobitis taenia</i>, <i>Eudontomyzon mariae</i>, <i>Sabanejewia aurata</i>, <i>Lutra lutra</i>; ❖ Ensure conservation of avifauna species in order to achieve and/or maintain a conservation status favourable to them.
4	<p>Integrated management plan for the Cheile Nerei-Beusnita National Park (ROSCI0031 and ROSPA0020 Cheile Nerei-Beusnita)</p>	<ul style="list-style-type: none"> ❖ Prohibition of the implementation of large infrastructure works and industrial exploitation of resources: stone quarries, industrial water catchments, mineral aggregate extraction stations, etc. (targeted habitats: 3220, 3260, 6430, 91E0*; Target species: fish, aquatic invertebrates, <i>Lutra lutra</i>, birds related to the river ecosystem (e.g. <i>Alcedo atthis</i>); 3220, 3260, 6430, 91E0*; specii vizate: pești, nevertebrate acvatice, <i>Lutra lutra</i>, păsări legate de ecosistemul râului, de exemplu <i>Alcedo atthis</i>); ❖ Site fragmentation control, ensuring connectivity with

No.	Name	Conservation goal
		<p>neighbouring sites, creation of micro-corridors / passages for the movement of wild animals (target species: amphibians, mammals);</p> <ul style="list-style-type: none"> ❖ Prohibition of lower riverbed development works during the fish reproduction and pre-development period, April-July, except in cases of force majeure, for example, floods (targeted habitats: 3220, 3260; target species: all fish species); ❖ Prohibition of the placement of micro-hydroelectric plants on the Nera river, upstream of its entry into ROSCI0031; the control of other hydrotechnical works on this sector, between April and July (targeted habitats: 3220, 3260, 6430, 91E0*; Target species: fish, aquatic invertebrates, <i>Lutra lutra</i>, birds related to the river ecosystem (e.g. <i>Alcedo atthis</i>); 3220, 3260, 91E0*; specii vizate: toate speciile de pești, <i>Austropotamobius torrentium</i>, <i>Cordulegaster heros</i>, <i>Unio crassus</i>, <i>Lutra lutra</i>); ❖ Maintaining a favourable conservation status (FV), i.e. improving the conservation status of species and habitats with unfavourable inappropriate (U1) or unfavourable-low (U2) conservation status; ❖ Rational use of mineral resources and other resources.
5	<p>Integrated management plan for protected areas Ciuperceni-Desa ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Danube, 2.392. Ciuperceni-Desa, 2.398. Balta Lată, 2.397 Balta Neagră</p>	<ul style="list-style-type: none"> ❖ Ensure optimum breeding conditions during the implementation of the management plan in order to achieve a favourable conservation status for the site species; ❖ Maintaining the marsh vegetation in the counter-channels during April-August to ensure the habitat characteristic to the species <i>Bombina bombina</i>; ❖ Ensure optimum feeding conditions during the implementation of the management plan in order to achieve a favourable conservation status for the site species; ❖ Maintaining the quality of the feeding habitat from the tail of the lakes for the species for which the site ROSCI0039 Ciuperceni Desa was designated; ❖ Implementation of measures related to the maintenance of water quality - by this measure the Jiu Basin Water Administration will ensure the implementation of the requirements of the Water Framework Directive transposed in the national legislation by the law 310/2004, the national legislation in force regarding the water quality; ❖ Monitoring of factors with insufficient impact on protected species; ❖ Ensure the efficient management of the protected natural area in order to preserve the favourable conservation status of conservative species and habitats.
6	<p>Management Plan of protected natural areas ROSCI0045 Coridorul Jiului, ROSPA0023 Confluența Jiu-Dunăre, ROSPA0010 Bistreț and</p>	<ul style="list-style-type: none"> ❖ Ensuring conservation of the species: <i>Marsilea quadrifolia</i>, <i>Euphydryas aurinia</i>, <i>Carabus hungaricus</i>, <i>Lycaena dispar</i>, <i>Carabus hungaricus</i>, <i>Lucanus cervus</i>, <i>Morimus funereus</i>, <i>Cerambyx cerdo</i>, <i>Carabus variolosus</i>, <i>Gobio albipinnatus</i>, <i>Alosa immaculata</i>, <i>Cobitis taenia</i>, <i>Sabanejewia aurata</i>, <i>Gymnocephalus schraetzer</i>, <i>Misgurnus fossilis</i>, <i>Aspius</i>

No.	Name	Conservation goal
	the natural reservations Locul Fosilifer Drănic- 2.391 and Pădurea Zăval- IV.33	<p> <i>aspilus, Pelecus cultratus, Rhodeus sericeus amarus, Zingel streber, Zingel zingel, Barbus barbus, Barbus meridionalis, Gobio kessleri, Bombina bombina, Triturus cristatus, Bombina variegata, Triturus dobrogicus, Emys orbicularis</i> and fauna-important species <i>Alcedo atthis, Anthus campestris, Aquila pomarina, Ardea purpurea, Ardeola ralloides, Aythya nyroca, Botaurus stellaris, Branta ruficollis, Burhinus oedicnemus, Buteo rufinus, Caprimulgus europaeus, Chlidonias hybridus, Chlidonias niger, Ciconia ciconia, Ciconia nigra, Circaetus gallicus, Circus aeruginosus, Circus cyaneus, Coracias garrulous, Crex crex, Dendrocopos medius, Dendrocopos syriacus, Egretta alba, Egretta garzetta, Ficedula albicollis, Haliaeetus albicilla, Himantopus himantopus, Ixobrychus minutus, Lanius collurio, Larus minutus, Lullula arborea, Nycticorax nycticorax, Pelecanus crispus, Pelecanus onocrotalus, Pernis apivorus, Phalacrocorax pygmeus, Philomachus pugnax, Platalea leucorodia, Plegadis falcinellus, Porzana parva, Recurvirostra avosetta, Sterna albifrons, Sterna hirundo, Tringa glareola;</i> </p> <p> ❖ Conservation of habitats: 1530* Pajiști și mlaștini sărăturate panonice, 2130* Dune fixate de coastă cu vegetație erbacee - dune gri, 2190 - Depresiuni umede interdunale, 3130 - Ape stătătoare oligotrofe până la mezotrofe, cu vegetație de <i>Littorelletea uniflorae</i> și/sau <i>Isoëto-Nanojuncetea</i>, 3140 - Ape puternic oligo-mezotrofe cu vegetație bentonică de specii de <i>Chara</i>, 3150 - Lacuri eutrofe naturale cu vegetație de <i>Magnopotamion</i> sau <i>Hydrocharition</i>, 3260 - Cursuri de apă din zona de câmpie până în etajul montan, cu vegetație de <i>Ranunculion fluitantis</i> și <i>Callitricho-Batrachion</i>, 3270 - Râuri cu maluri nămolose, cu vegetație de <i>Chenopodion rubri</i> p.p. și <i>Bidention</i> p.p., 6240* - Pajiști stepice subpanonice, 6260* - Stepe panonice pe nisipuri, 6430 - Comunități de lizieră cu ierburi înalte higrofile de la nivelul câmpiilor, până la cel montan și alpin, 6440 - Pajiști aluviale ale văilor râurilor cu <i>Cnidion dubii</i>, 6510 - Fânețe de joasă altitudine (cu <i>Alopecurus pratensis, Sanguisorba officinalis</i>), 9130 - Păduri de fag de tip <i>Asperulo-Fagetum</i>, 9170 - Păduri de stejar cu carpen de tip <i>Galio-Carpinetum</i>, 91E0* - Păduri aluviale de <i>Alnus glutinosa</i> și <i>Fraxinus excelsior</i> (<i>Alno-Padion, Alnion incanae, Salicion albae</i>), 91F0 - Păduri mixte de luncă de <i>Quercus robur, Ulmus laevis</i> și <i>Ulmus minor, Fraxinus excelsior</i> sau <i>Fraxinus angustifolia</i> din lungul marilor râuri (<i>Ulmenion minoris</i>), 91I0* - Păduri stepice euro-siberiene de <i>Quercus</i> spp., 91M0 - Păduri balcano-panonice de cer și gorun, 91Y0 - Păduri dacice de stejar și carpen, 92A0 - Păduri galerii (zăvoaie) cu <i>Salix alba</i> și <i>Populus alba</i>;</p> <p> ❖ Monitoring the conservation status of habitats and species;</p> <p> ❖ Applying measures to ensure the favorable conservation status of habitats and species of community interest;</p> <p> ❖ Improving land management in sites so that it contributes </p>

No.	Name	Conservation goal
		to preserving the favorable conservation status of habitats and species of community interest.
7	The integrated management plan of the Jiu Gorge National Park and the Natura 2000 site ROSCI0063 Jiu Gorge (Defileul Jiului)	<ul style="list-style-type: none"> ❖ Maintaining / improving the conservation status of species and habitats of community and national interest, respectively, preserving the characteristic landscapes of the Jiu Gorge National Park / ROSCI0063 Jiu Gorge, during the implementation of the management plan (target species including to continue the inventory: <i>Cinclus cinclus</i>, <i>Dendrocopus sp.</i>, <i>Anguis fragilis</i>, <i>Elaphe longissima</i>, <i>Vipera berus</i>, <i>Vipera ammodytes</i>, <i>Salamandra salamandra</i>, <i>Triturus vulgaris</i>, <i>Bombina bombina</i>, <i>Capreolus capreolus</i>, <i>Cervus elaphus</i>, <i>Salmo trutta fario</i>, <i>Thymallus thymallus</i>, <i>Squalius cephalus</i>, <i>Phoxinus phoxinus</i>, <i>Alburnoides bipunctatus</i>, <i>Barbus sp.</i>, <i>Barbatula barbatula</i>, <i>Campanula sp.</i>, <i>Carlina acanthifolia</i>, <i>Galanthus nivalis</i>, <i>Hepatica transsilvanica</i>, <i>Juniperus sabina</i>, <i>Leucojum vernalis</i>, <i>Lycopodium clavatum</i>, <i>Orchis sp.</i>, <i>Symphyandra wanneri</i>; target habitats including to continue the castration: 4060, 40A0, 6190, 6410, 6510, 8210, 9150, 3240, 3230, 3220, 9170, 91L0, 6430, R6111); ❖ Approval and control of the use of the hydrographic network and fishery resources; ❖ Preventing / combating antisocial acts with impact on the protection and conservation of PA.
8	Management Plan of the Semenic-Cheile Caraşului National Park, ROSCI0226 Semenic-Cheile Caraşului, ROSPA0086 Semenic Mountains-Cheile Caraşului and the natural protected areas of national interest in their region	<ul style="list-style-type: none"> ❖ Maintaining / restoring in a favorable conservation status of protected species and habitats by implementing specific activities, regulating the activities in the protected natural area, taking into account the results of assessing the pressures and threats on identified elements of conservative interest; ❖ Conservation of strict and full protection areas of the national park and maintenance of natural ecological processes in these areas; ❖ Landscape conservation; ❖ Maintaining and promoting traditional practices of sustainable use of lands and exploitation of renewable natural resources.
9	Management Plan for the Geopark Mehedinti Plateau and Natura 2000 sites in its region: ROSCI0198 Platoul Mehedinti and ROSPA0035 Domogled-Valea Cernei	<ul style="list-style-type: none"> ❖ Provide conditions to protect and conserve all plant and animal populations and maintain their habitats in a favourable conservation status; ❖ Maintaining or improving the beauty and natural landscape status of the GPMH area and its vicinity; ❖ Regulate human activities to a level that ensures the sustainable use of natural resources.
10	Management Plan of the Domogled-Valea Cernei National Park	<ul style="list-style-type: none"> ❖ Conservation of invertebrate species, fish, amphibians and reptiles (<i>Testudo hermanni</i>, <i>Bombina variegata</i>), birds, mammals (<i>Ursus arctos</i>, <i>Canis lupus</i>, <i>Lynx lynx</i>, <i>Lutra lutra</i>), chiroptera and habitats: Conservarea speciilor de nevertebrate, pești, amfibieni și reptile (<i>Testudo hermanni</i>, <i>Bombina variegata</i>), păsări,

No.	Name	Conservation goal
		<p>mamifere (<i>Ursus arctos</i>, <i>Canis lupus</i>, <i>Lynx lynx</i>, <i>Lutra lutra</i>), chiroptere și a habitatelor: 9530* (sub) Mediterranean forests of endemic black pines, 6190 Pannonian rocky meadows (Stipo-Festucetalia pallentis), 6210 Semi-natural xerophilous meadows and shrubs on limestone substrate (Festuco-Brometalia), 8160 * Carbonatic mid-European detritus on hilly and mountainous areas, 9180 Tilio-Acerion forests on slopes, detritus and gills, 91M0 Balkan-Pannonian forests of Austrian oak and holm, 91K0 Illyrian forests of <i>Fagus sylvatica</i> (Aremonio-Fagion), 91V0 Dacian beech forests (Symphyto-Fagion), 9110 Luzulo - Fagetum beech forests, acidophilic beech forests of central-European type, 9130 Asperulo-Fagetum beech forests, neutrophil beech forests of central-European type, 9410 Acidophilic spruce forests (<i>Picea</i>) from mountain to the alpine floor (Vaccinio-Piceetea), 91Q0 Western-Carpathian forests of <i>Pinus sylvestris</i> on calcareous substrates, 91E0* Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnus incanae</i>, <i>Salix alba</i>), 4060 (sub) alpine and boreal shrubs, 4070* <i>Pinus mugo</i> and <i>Rhododendron myrtifolium</i> shrubs, 4080 Subarctic shrubs of <i>Salix</i> sp., 6150 Boreal and alpine meadows on silicate substrates, 6230* <i>Nardus</i> grasslands rich in species, on silicate substrate from mountainous areas (and sub-mountainous areas, in continental Europe), 8220 Silicate rocky slopes with casmophytic vegetation, 3230 Woody vegetation with <i>Myricaria germanica</i> along mountain water streams, 40A0* Sub-continental peri-Pannonian shrubs, 6110* white calciferous or basifilic grasslands Alysso-Sedion, 6170 Alpine and subalpine calcific meadows, 6430 High hygrophilous grassland communities from the plains and from the mountain to the alpine level, 6250 Mountain meadows, 8110 - Silicate detritus from the mountain floor to the nival floor, 8210 Calcareous rocky flanks with casmophytic vegetation, 9150 Middle European beech forests from Cephalanthero-Fagion on calcareous substrates, 91H0* - Pannonian oak forests, 6240 * - Sub-Pannonian steppe grasslands, 6410 - <i>Molinia</i> grasslands on calcareous, turbid or clay soils (in case of their identification or reinstallation on the site), 6440 - Alluvial grasslands of the valleys of rivers <i>Cnidion</i> river / <i>Agrostion</i> rivers, 6510 - Low altitude meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>), 8120 - Calcareous detritus and calcareous shale from the mountain and alpine floors (<i>Thlaspietea rotundifolii</i>), 91L0 Illyric oak and hornbeam forests, 3220 - Mountain watercourses and herbaceous vegetation on their banks, 7220* Petrifying springs with travertine formation, 8310 - Caves closed to public access;</p> <ul style="list-style-type: none"> ❖ Unaltered preservation of existing natural elements; ❖ Maintaining and preserving landscape features; ❖ Regulating, monitoring and controlling resource use activities in the park so as to enable traditional activities that

No.	Name	Conservation goal
		do not harm the biodiversity, the physical environment and the landscape of the park; ❖ Ensure an efficient and adaptable management to achieve the park objectives.
11	Management Plan of ROSPA0071 Lunca Siretului Inferior and overlapping natural protected areas	❖ Ensure conservation of species and habitats in order to achieve a conservation status favourable to them; ❖ Conservation / restoration of populations of species of conservation interest by applying specific conservation measures; ❖ Ensure conditions to maintain / restore the favourable conservation status of wetland species and habitats; ❖ Maintaining population stocks corresponding to favourable conservation status of conservative species whose hunting is allowed; ❖ To carry out the monitoring of the state of preservation of species of conservative interest through the use of monitoring protocols.
12	Integrated Management Plan of Natura 2000 sites ROSPA0011 Blahnița, ROSCI0173 Stârmina Forest, ROSCI0306 Jiana and ROSPA0024 Gruia-Garla Mare, Only the body that overlaps partially with ROSCI0306 Jiana	❖ Ensure the conservation of the habitat in order to maintain the favourable conservation status of the habitats; ❖ Ensuring conservation of the species in order to maintain the favourable conservation status of the species for which the site was designated; ❖ Ensure the efficient management of the protected natural area in order to preserve the favourable conservation status of conserved species and habitats; ❖ Limit illegal and harmful activities to site-specific natural values: fish and hunting poaching, unauthorized wood exploitation, pollution, inappropriate waste management, arson and illegal construction; ❖ Promoting the sustainable use of forestry resources, fisheries, meadows and agricultural land; ❖ Promoting the sustainable exploitation of construction materials within the protected natural area: pitches, quarries and the like, including the management plan provisions.
13	Natura 2000 site management plan ROSCI0299 Dunărea la Gîrla Mare Maglavit	❖ Conservation of favourable conditions for habitats and species; ❖ Evaluating, updating and completing inventories of habitats and species of interest; ❖ Monitoring the quality of biotope factors; ❖ Improving site management; ❖ Sustainable management of natural resources.
14	Management Plan for protected natural areas ROSPA0099 Podisul Hârțibaciului, ROSCI0227 Sighișoara + Târnavă Mare, ROSCI0144 Forest of holm and oak on the	❖ Restoring / maintaining, through responsible forestry works, the optimal structure of the forest land and the state of preservation of forest habitats from the forest area and outside it, in order to achieve the favorable conservation status of the habitats and to ensure the necessary conditions for the species of conservative interest; ❖ Maintaining permanent meadows by encouraging the

No.	Name	Conservation goal
	Purcărețului Hill, ROSCI0143 Forest of holm and oak from Dosul Fânașului, ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu Sud-Est, ROSCI0304 Hârtibaciu de Sud-Est, natural reservation Stejarii seculari from Breite - Sighișoara municipality, reservation Canionu Mihăileni, fluffy oak reservation - village Criș	sustainable management of small parcels of pastures and meadows in order to ensure conditions for restoration of habitats of community interest and restoration / maintenance of grassland-dependent species populations; ❖ Ensure conditions to maintain / restore favorable conservation status of habitats and species dependent on watercourses; ❖ Ensure functional habitats connectivity through reconstruction works and conditioning investments / works that can lead to fragmentation, so that species movement is not restricted; ❖ Maintaining the restoration of populations of conserved species by applying specific conservation measures; ❖ Maintaining the integrity and values of Protected Areas by engaging in relevant regulatory activities and providing the necessary resources for management.
15	Management plan of the Danube Delta Biosphere Reserve	❖ Stopping the decline of biological diversity and preserving the natural heritage; ❖ Maintaining / restoring the proper ecological status of the ecosystems; ❖ Ecological reconstruction in embankment enclosures; ❖ Sustainable use of natural resources and ecosystem services.
16	Integrated management plan of Natura 2000 site ROSCI0085 Frumoasa and ROSPA0043 Frumoasa	❖ Applying measures to ensure the favorable conservation status of habitats and species of community/national interest; ❖ Prohibition of construction and dislocation of rocks in areas with habitats 8220 according to distribution maps; ❖ Prohibition of the construction of micro-hydroelectric plants, except for the devices that serve the needs of forest management throughout the site and does not significantly affect the watercourses (habitats targeted: 9110, 91V0, 9410, 9130, 91E0*, 91D0*); ❖ Rigorous assessment of the local and cumulative environmental impact on the construction of other utility networks throughout the site.
17	Management Plan of ROSCI0122 Făgăraș Mountains and ROSPA0098 Piedmontul Făgăraș	❖ Improving the conservation status of habitats 3220 Herbaceous vegetation on the banks of the mountain rivers, 3230 - Woody vegetation with Myricaria germanica along the mountain rivers, 6430 - High hygrophilic grassland communities from plains to the mountain and alpine floors, 4060 - Alpine and boreal shrubs, 4070* Shrubs with Pinus mugo and Rhododendron myrtifolium, 4080 Subarctic shrub species Salix, 6150 - Boreal and alpine grasslands on siliceous substrate, 6170 - Calcific alpine and subalpine grasslands, 6230* - Mountain grasslands Nardus rich in species, on siliceous substrates, 6410 - Molinia meadows on calcareous, turbid or clay soils and 6520 - Mountain meadows, 8110 - Siliceous detritus from the mountain to the alpine floor, 8120 - Calcareous detritus and of calcareous

No.	Name	Conservation goal
		shale from the mountain to the alpine floor, 8210 - Rocky flanks with chasmophytic vegetation on calcareous rocks and 8220 - Rocky slopes with chasmophytic vegetation on siliceous rocks, 7140 - Transition turbulent swamps and oscillating peatlands - not fixed to the substrate and 7220* - Petrifying springs with travertine formation - Cratoneurion <ul style="list-style-type: none"> ❖ Improving the conservation status of the <i>Tozzia carpathica</i> species by prohibiting / limiting drainage activities, regulating watercourses, hydrotechnical arrangements, which could lead immediately or in time to surface shrinkage or habitat disappearance; Maintaining and improving, as the case may be, the conservation status of forest habitats of Community interest: ❖ Regulation of activities that may lead to pollution of aquatic habitats or adjacent areas; ❖ <i>Cottus gobio</i> and <i>Barbus meridionalis</i>: Ensuring longitudinal connectivity of watercourses; ❖ Increasing the degree of longitudinal connectivity of watercourses by implementing ecological reconstruction actions; ❖ Regulating the activities that can lead to affecting the connectivity of the watercourses; ❖ Regulation of human activities that can lead to the damage of species and habitats used by them; ❖ Regulation of human activities that can lead to the damage of species and specific habitats; ❖ Regulation of activities likely to reduce the areas occupied by the typical habitats in which the species <i>Campanula serrata</i>, <i>Tozzia carpathica</i>, <i>Poa granitica</i> ssp. <i>disparilis</i> vegetate; ❖ Establishing the areas of buffer zones around the nests and regulating the forest activities in the buffer zone during the nesting period, in order to ensure the conditions necessary for the successful breeding of the predatory species and the Black Stork; ❖ Isolation of medium voltage lines through collaboration with electricity transmission companies; ❖ Maintaining and improving, as the case may be, the conservation status of grassland-dependent species as habitats for feeding or nesting by regulating grazing in the protected natural area.
18	Portile de Fier Natural Park Management Plan	<ul style="list-style-type: none"> ❖ Conservation of the landscape, including that resulting from human activities, namely maintaining species and habitats of community and national interest in a favourable conservation status, preserving the characteristic landscapes and specific geological, geomorphological and paleontological elements; ❖ Maintaining species and habitats of community and national interest, preserving the characteristic landscapes and the specific geological, geomorphological and paleontological elements; ❖ Maintaining and promoting sustainable resource exploitation activities and eliminating those likely to have a

No.	Name	Conservation goal
		negative impact on the environment, biodiversity and geodiversity.
19	Valea Ierii ROSCI0263 Management plan	<ul style="list-style-type: none"> ❖ Assuring the conservation of the species <i>Canis lupus</i>, <i>Ursus arctos</i>, <i>Lynx lynx</i>, <i>Lutra lutra</i>, <i>Bombina variegata</i>, <i>Triturus (Lissotriton) vulgaris ampelensis</i>, <i>Cottus gobio</i>, <i>Lucanus cervus</i> and habitats 9130 <i>Asperulo-Fagetum</i> beech forests, 9410 Acidophilic forests of <i>Picea abea</i> in the amountain region(<i>Vaccinio-Piceetea</i>), 6520 Mountain meadows, 9110 <i>Luzulo-Fagetum</i> beech forests, 9170 <i>Galio-Carpinetum</i> hornbeam and oak forests, 91E0* Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incnana</i> , <i>Salicion albae</i>), 91V0 Dacian beech forests (<i>Symphyto-fagion</i>), in order to maintain their favourable conservation status; ❖ Ensure the efficient management of the protected natural area in order to preserve the favourable conservation status of conservative species and habitats; ❖ Promote the sustainable use of natural resources, which provides support for species and habitats of conservative interest.
20	ROSPA0038 Danube-Oltenița site management plan	<ul style="list-style-type: none"> ❖ Maintaining favourable conditions for species dependent on grassland habitats, agricultural land, wetland and water surface habitats, forest habitats; ❖ The management of the water from the embankment area in accordance with the ecological needs of the bird species; ❖ Maintaining moist habitats and prohibiting drainages in them; ❖ Maintaining a minimum level of water throughout the year so that the emergent and submergent vegetation does not disappear; ❖ The relatively constant maintenance of the water level during the nesting period - March 15 - July 30.
21	Management plan of the special birds protection area ROSPA0006 Maglavit	<p>In order to conserve the species, the following will be observed:</p> <ul style="list-style-type: none"> ❖ Maintaining proper feeding habitats and avoiding their fragmentation and isolation; ❖ Maintenance and conservation of natural habitats for favourable conditions for living and breeding; ❖ The natural functioning of aquatic environments (groundwater, underground network, spring, watercourses, lakes and ponds) will be maintained; ❖ The stability and quality of the hydrological systems of the existing waters, the groundwater and the standing water will be maintained (without drainage, without artificial embankment, without dams, pollution control); ❖ drainage, drying and inflorescence in water will be avoided; ❖ the prohibition of any type of activity that causes alteration of the species' feeding and breeding habitats.
22	Integrated management plan for Natura 2000 site	<ul style="list-style-type: none"> ❖ Ensuring the conservation of the species for which ROSPA0135 was declared and the protected area of national

No.	Name	Conservation goal
	ROSPA0135 Nisipurile de la Dăbuleni and protected area of national interest 2.667 Casa Padurii from Potelu Forest	interest Casa Padurii of Potelu Forest, in order to maintain their favourable conservation status; ❖ Maintaining the quality of wetland habitats; ❖ Impact assessment for the projects, plans and programmes that are carried out in the territory of ROSPA0135 and RN Casa Pădurii in Potelu Forest and granting opinions - negative / positive / with restrictions;

III.8 DESCRIPTION OF THE CURRENT CONSERVATION STATUS OF THE PROTECTED NATURAL AREA OF COMMUNITY INTEREST, INCLUDING EVOLUTION / CHANGES THAT MAY OCCUR IN THE FUTURE

The current state of conservation of the protected natural areas of community interest can be found in their Management Plans or in the standard Natura 2000 forms for the sites that do not have an approved management plan.

The evolution / changes that will take place in the future on the protected natural areas have been estimated in Chapter IV. Impact identification and assessment.

Studiu Evaluare Ambient

IV. IMPACT IDENTIFICATION AND ASSESSMENT

IV.1 CURRENT IMPACT FORMS ASSOCIATED WITH ENERGY OBJECTIVES ON NATURA 2000 SITES

The main impacts that currently exert pressure on sites of Community importance and bird special protection areas relevant to the RES 2019-2030, with perspectives for 2050, are presented below. The data source is represented by the Standard forms of Natura 2000 sites (2017), Management plans related to natural protected areas.

Objectives aiming at energy production:

- ❖ Realization of groups 3 and 4 from Cernavodă NPP – the objective aims at the existing site at Cernavodă NPP and it is in progress. In terms of location, C.N.E. Cernavoda does not overlap with the European ecological network Natura 2000, but is in the vicinity of some Natura 2000 sites, at a distance of about 2 km; according to the Environmental Agreement for Units 3 and 4 and the Environmental Permit for Units 1 and 2, issued by the Ministry of the Environment for the aforementioned objective, the activity carried out will not have a significant negative impact on any environmental factor; the measures to prevent, reduce and, where possible, offset the significant negative effects on the environment, both for the project execution period and during the operational period, aim to eliminate or diminish any negative impact on environmental factors.
- ❖ Realization of a new 600 MW power plant in Rovinari targets the already existing site. The project will be carried out within the current power plant or in the immediate vicinity of it. If the same local conditions are maintained, the project will not intersect the protected natural areas included in the Natura 2000 network, thus not exerting a direct impact on the protected species and habitats during the execution period of the works; there will be an indirect impact during the period of operation with the activities of exploitation and transport of the raw material from the quarries to the site.
- ❖ Realization of a new 400 MW power plant in Turceni in ultra-supercritical parameters targets the already existing site. The project will be carried out within the current power plant or in the immediate vicinity of it. According to the analysis carried out in the present study, the project area is located near the Natura 2000 site ROSCI0045 Jiului Corridor. According to the Standard Form of the site, the sources of impact with small / medium effects on it are represented by: surface mining, industrial and commercial areas, soil pollution with solid waste; in the period of construction (upgrade) of the objective will have a direct and short-term impact on the environmental factors, and during the period of operation the impact will be indirect and remote in terms of the activities of exploitation and transport of the raw material.
- ❖ Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești targets the already existing site. The project will be carried out within the current power plant or in the immediate vicinity of it. If the same assumptions are maintained, the project will not intersect the protected natural areas included in the Natura 2000 network, thus not having a direct impact on the

protected species and habitats; during the period of execution of the investment, a direct and short-term impact will be manifested on the environmental factors, and during the operational period the environmental factors that could be affected by the operation of the investment will be monitored and timely remedial measures will be taken when exceeding the maximum limits allowed by the legislation for the respective indicators.

- ❖ Realization of a new 400 MW MWG CCGT gas power plant in Mintia aims at the already existing site. The project will run on the existing power plant or in its immediate vicinity. If the same localization prerequisites are maintained, the project will not overlap Natura 2000 network, but will be located close to the site ROSCI0373 Mures River between Brănișca and Ilia. According to the Standard Form of the site, the sources of impact with medium and low negative effects at its level are represented by factories; during the period of execution of the investment, a direct and short-term impact will be manifested on the environmental factors, and during the operational period the environmental factors that could be affected by the operation of the investment will be monitored and timely remedial measures will be taken when exceeding the maximum limits allowed by the legislation for the respective indicators.
- ❖ Realization of the hydroelectric power plant with accumulation by pumping Tarnița-Lăpușești:
 - the land that the investment will occupy is not precisely defined, but from the data provided by the Beneficiary and the reviews carried out by the team of experts, the objective could intersect two Natura 2000 sites: ROSCI0263 Valea Ierii and ROSCI0427 Pajiștile de la Liteni – Săvădisla;
 - the sources of impact with a high negative effect on the species and habitats of conservative interest listed in the Standard Forms of sites are traps, poisoning and poaching (in case of ROSCI0263 Valea Ierii), with a negative medium / low effect: continuous urbanization, surface water pollution, floods (in the case of ROSCI0263 Valea Ierii) and grazing, urbanization and residential and commercial development (in the case of ROSCI0427 Pajiștile de la Liteni – Săvădisla);
 - the forms of impact that may arise from the construction and operation of the investment are: during the construction period the impact will be direct and on short term on the environmental factors; the most exposed environmental factors will be water, which will also be the natural resource that will enter into the process of functioning of the objective, and biodiversity; during the period of operation there will be an indirect and long-term impact on aquatic organisms and on habitats that are closely correlated with water. In order to minimize the negative effects of investment products, we propose, for both the execution phase and the operating phase, monitoring of the environmental factors affected: water, air, biodiversity, soil and interventions by applying remedial measures.
- ❖ Realization of hydroelectric power plant 35 MW Răstolița:
 - has a defined location because the project is underway;
 - The project intersects the natural protected area ROSCI0019 Călimani-Gurghiu on the entire surface of the accumulation on an area of 0.08 ha and is located in the buffer zone of the protected natural areas ROSPA0133 Călimani Mountains that overlap with RONPA0009 Călimani National Park;

- the forms of impact that may arise from the construction and operation of the investment are: during the construction period the impact will be direct and on short term on the environmental factors; the most exposed environmental factors will be water, which will also be the natural resource that will enter into the process of functioning of the objective, and biodiversity; during the period of operation there will be an indirect and long-term impact on aquatic organisms and on habitats that are closely correlated with water. In order to minimize the negative effects of investment, we propose, both for the execution phase and for the operating phase, monitoring of the environmental factors affected: water, air, biodiversity, soil; if the environmental factors listed above will be affected by the project, viable remedial solutions will be found and applied in situations that may arise;
- In the implementation of the project, the need for such a project will be taken into account in correlation with the location of the hydropower units in relation to the protected natural areas; if, following the campaigns carried out on field to monitor the species of flora and fauna, priority species and / or habitats will be identified, the project will no longer be possible.
- ❖ Realization of Turnu Magurele-Nicopole hydroelectric power plant:
 - the land that the investment will occupy is not precisely defined, but from the data provided by the Beneficiary and from the expert team's analysis, the objective could intersect several Natura 2000 sites; from the preliminary analysis carried out by the expert team it was concluded that the project intersects with the following Natura 2000 sites: RORMS0012 Suhaiia (RAMSAR site) on an area of 506.05 ha and ROSCI0044 Corabia-Turnu Magurele on an area of 143.27 ha;
 - the forms of impact that may arise from the construction and operation of the investment are: during the construction period the impact will be direct (altering water quality, altering biotic and non-biotic elements, altering/occurrence of imbalances in primary productivity, particularly as regards aquatic ecosystems) and on short term on the environmental factors; the most exposed environmental factors will be water, which will also be the natural resource that will enter into the process of functioning of the objective, and biodiversity; during the period of operation there will be an indirect and long-term impact (changes in water flow regime, morphological changes, changes in water temperature, reducing the amount of sediments) on aquatic organisms and on habitats that are closely correlated with water, but also on water bodies. In order to minimize the negative effects of investment products, we propose, for both the execution phase and the operating phase, monitoring of the environmental factors affected: water, air, biodiversity, soil.
 - the project will represent, by the nature of its constructions (dam and lakes / barrier lakes), a barrier to the migration of fish species; at the moment of this study, the technical data for the aforementioned objective are not established.
- ❖ Realization of hydroelectric power stations on the Jiu River 90 MW:
 - there is a defined site because the project is underway;
 - The project overlaps with the ROSCI0063 natural area Jiu Gorge on an area of 8.59 ha (Jiu Gorge of the Jiu National Park overlaps with ROSCI0063 Jiu Gorge);

- the forms of impact that may arise from the construction and operation of the investment are: during the construction period the impact will be direct and on short term on the environmental factors; the most exposed environmental factors will be water, which will also be the natural resource that will enter into the process of functioning of the objective, and biodiversity; during the period of operation there will be an indirect and long-term impact on aquatic organisms and on habitats that are closely correlated with water but also on water bodies. In order to minimize the negative effects of investment products, we propose, for both the execution phase and the operating phase, monitoring of the environmental factors affected: water, air, biodiversity, soil.
- ❖ Realization of hydroelectric power plants on the Olt River - 145 MW:
 - there is a defined location because the project is underway. Of the 5 objectives that make up the hydroenergy plant on Olt River, in the area of the gorge, CHE Lotrioara is located in the buffer zone of 4 Natura 2000 sites: ROSCI 0085 și ROSPA0043 Frumoasa, ROSCI0122 Munții Făgăraș and ROSCI0132 Oltul Mijlociu - Cibin-Hârtibaciu, each of them affecting up to 2.86 ha;
 - the forms of impact that may arise from the construction and operation of the investment are: during the construction period the impact will be direct and on short term on the environmental factors; the most exposed environmental factors will be water, which will also be the natural resource that will enter into the process of functioning of the objective, and biodiversity; during the period of operation there will be an indirect and long-term impact on aquatic organisms and on habitats that are closely correlated with water but also on water bodies. In order to minimize the negative effects of investment products, we propose, for both the execution phase and the operating phase, monitoring of the environmental factors affected: water, air, biodiversity, soil.

For the stage of construction, as regards the objectives inside the protected natural areas, the internal zoning of these objectives or of the habitats of species and priority habitats, the positioning of site organizations, of temporary access roads, loan holes etc must be taken into account. For objectives located in the vicinity of protected natural areas, the construction works shall be conducted as far as possible from the protected habitat.

For the objectives underlying energy transport, a brief analysis of the impact forms is given below:

- ❖ The new 400 kV dc OHL (with an equipped circuit) between existing stations Smârdan and Gutinaș:
 - The site is defined;
 - the project intersects with the following Natura 2000 sites: ROSCI0162 and ROSPA0071 Lunca Siretului Inferior;

The impact is associated with the following aspect: from the length of the 138 km LEA route, about 3,483 km cross the forests with land on the territory of which, in the construction and ecological reconstruction stage, a 54 m wide aisle will be gutted, resulting in an area of 18, 8084 ha of grazed forest, out of which:

- on the territory of Bacău county - 8,6086 ha of deciduous forest, out of which 0,2731 ha is on the territory of ROSCI0162;
- on the territory of Vrancea county - 5,6778 ha of deciduous forests and 575 m of the OHL intersects a plantation of walnut and acacia with the height of the specimens of 3 - 6 m;
- on the territory of Galați County - 4,5219 ha of deciduous forest, of which 0,1080 ha of poplar plantation in the shape of a curtain in the Cosmești area, an area in which the territories ROSCI0162 and ROSPA0071 Lunca Siretului Inferior overlap territorially.
- ❖ New 400 kV dc OHL between the existing stations Cernavodă and Stâlpu with an incoming / outgoing circuit at the 400 kV Gura Ialomiței station - there is a defined location; the project intersects with the following Natura 2000 sites: ROSCI0022 Canaralele Dunării, ROSPA0012 Brațul Borcea, ROSCI0290 Coridorul Ialomiței, ROSPA0120 Kogălniceanu-Gura Ialomiței, ROSPA0006 Balta Tâtaru: - the impact forms are represented by:
 - ✓ in order to realize the 400 kV Cernavodă - Stâlpu OHL and to connect to Gura Ialomiței station, it is necessary: to remove from the forest area the surface of 65129 sq. m., of which 1837 sq. m permanent occupation and 63292 sq. m temporary occupation; deforesting an area of 64920 sq. m. of which 1837 sq. m. permanent deforestation and 63083 sq. m. temporary deforestation; deforesting an area of 0.0598 ha (598 sqm) from ROSCI0022 Canaralele Dunarii.
 - ✓ for deforested areas, replanting in other areas is required, in agreement with Forest Directorates and custodians in the affected areas, in a ratio of 1/1 and with the same species that will be deforested.
 - ✓ total deforested areas are the areas to be occupied by the pillars, and the temporarily deforested areas are those necessary for the construction of work and safety corridors. The surfaces necessary for the corridors are to be mostly repopulated with species similar to the deforested ones. With the exception of the Danube meadow areas and the Borcea branch, the LEA route avoids areas with forests.
 - ✓ in the crossing area of ROSCI0290 Ialomita Corridor, there are no meadow forests;
 - ✓ in the maintenance phase of the 400 kV Cernavoda-Stalpu LEA, no deforestation will be carried out, but only tree dressing, to avoid reaching the active conductors by the high crowns or extending the trees into the passageways and safety corridors. Only those trees and shrubs that pose a real danger of falling over electric lines or supporting posts during storms will be cut.
- ❖ 400 kV Porțile de Fier – Anina – Reșița OHL:
 - defined site;
 - intersects the following Natura 2000 sites: ROSCI0206 Poțile de Fier, ROSCI0198 Platou Mehedinți, ROSCI0069 Domogled - Valea Cernei, ROSCI0226 Semenic - Cheile Carașului, ROSCI0031 Cheile Nerei – Beușnița, ROSPA0080 Munții Almăjului – Locvei, ROSPA0086 Munții Semenic - Cheile Carașului, ROSPA0020 Cheile Nerei – Beușnița;
 - the forms of impact are represented by: The total area required for the project through deforestation is 148.1270 ha. Of this, 80.4370 ha (54.3%) are located on the surface of protected natural areas as follows: ROSCI0206 Porțile de Fier 0.0325%, ROSCI0198 Platoul Mehedinți

0.0189%, ROSCI0069 Domogled - Valea Cernei (RN Iardașița) 0.0012%, ROSCI0226 Semenice - Cheile Carașului 0.0069%, ROSCI0031 Cheile Nerei-Beușnița 0.0662%, ROSPA0080 Munții Almăjului - Locvei 0.0345%, ROSPA0086 Munții Semenice - Cheile Carașului 0.0071%, ROSPA0020 Cheile Nerei - Beușnița 0.0618%.

- ❖ New 400 kV dc OHL between existing stations Resita (Romania) and Pancevo (Serbia):
 - defined site;
 - the project intersects with Natura 2000 site ROSCI0226 Semenice - Cheile Carașului;
 - measures to mitigate the impact on the protected area are foreseen.

Studiu Evaluare Adecvată

Identification of the types of impact for the relevant investment categories presented in RES 2019-2030 with perspectives for 2050.

Table 8 Identifying the types of impact identified in RES 2019-2030 with perspectives for 2050

Investment category	Objectives	Types of impact in the stage of construction/	
		Direct/Indirect (D/I)	Short or long-term (S/L)
Modernization and realization of electricity production capacities in heat power plants powered by coal and natural gas	Realization of a new energy group of 600 MW at Rovinari	Direct impact in the construction and decommissioning phase (e.g.: fragmentation and alteration of habitats; Indirect impact in the operating phase (e.g. loss of species and habitats, change of surface water bodies quality);	Short-term impact in the stage of construction and decommissioning : activities carried out during a limited time period (up to 2 years, according to the objective); Long-term impact in the stage of operation: lifetime of energetic objectives of ten years, this way it can be manifested for a long period, of years; it is recommended finding solutions that prevent the persistence of the forms of impact (e.g: storage of solid waste from the thermoenergetic objectives on concrete platforms and outside protected natural areas).
	Realization of a new energy group of 400 MW ultra supercritical parameters at Turceni		
	Realization of a new energy group of 200 MW CCGT – Craiova II, powered by gas, with flexible operation, including the energy storage in Ghercești underground deposit		
	Realization of a new energy group of 400 MW CCGT powered by gas with flexible operation Mintia		
Realization and completion of electricity production capacities in hydroenergy power plants	Realization of the hydroenergy plant with accumulation by pumping Tarnița-Lăpușești	Direct impact in the stage of construction and decommissioning (e.g. fragmentation and alteration of habitats; Indirect impact in the stage of operation (e.g.: loss of species and habitats) ;	Short-term impact in the stage of construction and decommissioning: activities conducted for a limited period (up to 1 year); Long-term impact in the stage of operation: lifetime of overhead power lines of tens of years; the studies used as basis for issuing the environmental regulation deeds, these do not have a long-
	Realization of the hydroenergy plant Răstolița 35 MW		
	Realization of the hydroenergy plant Turnu Măgurele-Nicopole		
	Realization of hydroenergy power plants on Jiu River 90 MW		
	Realization of hydroenergy power plants on Olt River - 145 MW		
Extension of investments in the electricity transmission subsector.	New 400 kV d.c. OHL (with equipped circuit) between the existing stations Smârdan and Gutinaș	Direct impact in the stage of construction and decommissioning (e.g. fragmentation and alteration of habitats; Indirect impact in the stage of operation (e.g.: loss of species and habitats) ;	Short-term impact in the stage of construction and decommissioning: activities conducted for a limited period (up to 1 year); Long-term impact in the stage of operation: lifetime of overhead power lines of tens of years; the studies used as basis for issuing the environmental regulation deeds, these do not have a long-
	New 400 kV d.c. OHL between the existing stations Cernavodă and Stâlpu		
	400 kV OHL Porțile de Fier – Anina – Reșița		
	New 400 kV d.c. OHL between the existing stations Reșița		

Investment category	Objectives	Types of impact in the stage of construction/		
		Direct/Indirect (D/I)	Short or long-term (S/L)	
	(Romania) and Pancevo (Serbia)		term impact.	

Studiu Evaluare Adecvată

IV.2 IDENTIFICATION OF POTENTIAL IMPACT FORMS

RES 2019-2030 with perspectives for 2050 involves the re-engineering of some energy objectives, the construction of new objectives and the extension / modernization of the electricity transmission networks.

Through the RES 2019-2030 with perspectives for 2050, most investments are planned for the realization of hydroenergy power plants in order to generate electricity. The locations where these projects will be implemented are not known at the moment for all the objectives. We note that the impact generated by these renewable energy sources needs to be assessed on a case by case basis, depending on the area where the project will be implemented, the distance from Natura 2000 sites and the vulnerability of the species and habitats of Community importance for which the sites were declared.

In order to evaluate the potential impact, determined by the implementation of the objectives of the Energy Strategy of Romania 2019-2030, with perspectives for the year 2050, the latter have been reclassified according to location:

1. TYPE A Objectives for which the location is known:
 - Realization of a new 600 MW power plant in Rovinari;
 - Realization of a new 400 MW power plant with ultra supercritical parameters in Turceni;
 - Realization of a new 200 MW CCGT - Craiova II power plant, on gas, with flexible operation, including energy storage in the underground storage facility Ghercești;
 - Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia;
 - Realization of hydroelectric power plant 35 MW Rostolița;
 - Realization of hydroelectric power plants on the Jiu River 90 MW;
2. TYPE B Objectives for which approximate location is known:
 - Realization of hydroelectric power plant with accumulation by pumping Tarnița-Lăpuștești;
 - Realization of a hydroelectric power plant at Turnu Magurele-Nicopole;
3. TYPE C Objectives for which the environmental agreement was issued:
 - Completion of Groups 3 and 4 from Cernavoda nuclear power plant;
 - Obiectivele ce vizează transportul de energie.

In this section, correlations will be made between the objectives of RES 2019-2030, with perspectives for 2050 and the representative data on the impact generated by similar projects selected from specialized works/ studies. There are also objectives in progress or for which certain documents were compiled that refer to the potential impact on biodiversity.

The analysis shall be made on energy sectors, as previously mentioned.

<p>Nuclear energy – on the existing sites (TIP C)</p>	<p style="text-align: center;"><u>Objective</u></p> <p>❖ Realization of groups 3 and 4 at Cernavodă NPP</p>
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The objective aims at the current site at Cernavodă NPP and it is underway. Location-wise, Cernavodă NPP does not overlap the European ecological network Natura 2000.

According to Environment agreement for the project *Continuation of the works of construction and completion of the Units 3 and 4 at Cernavodă NPP*, pursuant to the results and conclusions of the report related to environment impact, of additional documents submitted by the holder of the project between 2006-2013 and conclusions formulated in the final opinions of the states potentially affected by the project, it is stated that for each environment element one has identified and assessed the potential impacts due to the operation of the Units 3 and 4, as well as the impact cumulated for the simultaneous operation of the 4 nuclear units, not being identified a significant negative impact for normal operation.

Also, the outage of water with changed temperatures formed with the discharge of effluent from Cernavodă NPP in Danube does not present negative effects if the operation of the units 3 and 4 will be made with the observance of the conditions stipulated by the Water Rights Permit no. 54/2013 related to the *Continuation of the works of construction and completion of the Units 3 and 4 at Cernavodă NPP* issued by the National Administration Romanian Waters that updates the Water Rights Permit no. 35/2011 of *Cernavodă Nuclear Power Plant Units 3 and 4*, county Constanța²². The conditions entail that the additional thermal input by discharge of effluent will be maximum 10 °C on the temperature of Danube and, pursuant to crossing the mixing area, the water temperature will not exceed 35 °C.

The impact on biodiversity pursuant to the discharge of cooling water was analysed in the proper study of evaluation, relying on the premise that the nuclear-electric power plant with 4 units is near some Natura 2000 sites. The stations for the special measurements on vertical (on water column) and transversal (left bank - canal - right bank) in the area of outage of water with changed temperatures were in number of 3 and, according to the summary of *Proper evaluation of environment impact of Units 3 and 4 of Cernavodă NPP – Impact on biodiversity* (INCDDD, 2012), were located as follows: P1 – 700 m downstream of waterway outfall for discharge of cooling water, P2 – 1,5 km downstream of waterway outfall for discharge of cooling water and P3 – 2.5 km downstream of waterway outfall for discharge of cooling water.

The characterisation of effluent with temperatures changed discharged in Danube was quantified by Danube Delta– Tulcea²³ Institute of Research Development by performing measurements during summer (July-August 2010), autumn (September-November 2010), winter (January-March 2011) and spring (April-May 2011) and some tests in laboratory of hydrochemical and hydrobiological samples of the cooling canal of Cernavodă NPP and stations established on the level of Rasova-Capidava sector, with

²² Acord de Mediu pentru proiectul *Continuarea lucrărilor de construire și finalizare a Unităților 3 și 4 la C.N.E. Cernavodă*

²³ *Evaluare adecvată a impactului de mediu a Unităților 3 și 4 ale C.N.E. Cernavodă – Impactul asupra biodiversității* (INCDDD, 2012) – rezumat (http://www.mmediu.ro/beta/wp-content/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuinccddrezumatromana.pdf)

site observations performed on the section Călărași-Hârșova. The conclusions resulted pursuant to the interpretation and correlation of results emphasized the following:

- ❖ During the periods characterised by the increase of river in Cernavodă by over 200 cm, mainly during summer and winter, the waters having as source the canal of discharge of cooling waters of the power plant flow on Danube on a distance of 3.5 km without mixing;
- ❖ On the contrary, during the periods when the Danube level is low in Cernavodă (under 200 cm – spring and autumn), the stratification phenomenon does no longer occur, the waters mixing from the first hundreds of meters after discharging. Thus, the warm water outage presents a length of only 1.5-2 km;
- ❖ The dimensions of water outage changed are the following: variable width in the discharge area of 300-400 m reduced to approximately 50 m near the locality Șeimeni.

Among the most important conclusions of *Proper evaluation of environment impact of the Units 3 and 4 of Cernavodă NPP*, according to environment agreement, we mention:

- ❖ The impact of the projects of units 3 and 4 is insignificant, the simultaneous operation of 4 nuclear units in Cernavodă NPP not impairing the favourable maintenance status of habitats and species, including those of community interest present on the territories of the closest sites Nature 2000 (ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava and ROSPA0017 Canaralele de la Hârșova);
- ❖ No significant negative impact on the evolution of flora and fauna in the area has been identified in the area of influence of the project due to the discharges of technological warm water in Danube;
- ❖ In case of accident, the documentation of evaluation of impact on environment includes operation procedures, measures of intervention of the staff of nuclear power plant, and other authorities in charge;
- ❖ One has analysed the effects on natural succession and composition of reofil phytoplankton from Danube, on the conservation of the species of community interest (plants, invertebra, fish, amphibians, reptiles, birds, mammals) emphasized that the impact would be insignificant among them.

The potential impact was correlated with the changes that might occur in the future pursuant to commissioning the Units 3 and 4 of Cernavodă NPP considering the length and width of outage of water with temperatures changed in the area of discharge of cooling waters²⁴:

High levels of Danube (summer and winter)

Low levels of Danube (autumn and spring)

There is the possibility that the water layer with changed temperatures covers a length of 4.5-6.5 km *.

There is the possibility that the water outage has a length of 3-3.5 km *.

*This depends on the increase of debit of

*This depends on the increase of debit of discharged waters and the difference between

²⁴ *Evaluare adecvată a impactului de mediu a Unităților 3 și 4 ale C.N.E. Cernavodă – Impactul asupra biodiversității* (INCDDD, 2012) – rezumat (http://www.mmediu.ro/beta/wp-content/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuinccddrezumatromana.pdf)

discharged waters with the commissioning of another 2 units within Cernavodă NPP, as well as the difference between the temperature of water coming from the discharge canal and the temperature of Danube waters upstream of the outfall of the canal of discharge of cooling waters.

the temperature of water coming from the discharge canal of cooling waters and the temperature of Danube waters upstream of the outfall of the canal of discharge of cooling waters.

As for the width of water outage changed, with the doubling of the debit of cooling water by commissioning the units 3 and 4, it is possible that it increases up to 450 m.

<p>Energy from renewable sources (coal, natural gas) – on the existing sites (TIP A)</p>	<p style="text-align: center;"><u>Objective</u></p> <ul style="list-style-type: none"> ❖ Realization of a new energy group of 600 MW la Rovinari; ❖ Realization of a new energy group of 400 MW ultrasupercritical parameters at Turceni; ❖ Realization of a new energy group of 200 MW CCGT - Craiova II, powered by gas with flexible operation, including the storage of energy in the underground deposit Ghercești; ❖ Realization of a new energy group of 400 MW CCGT powered by gas with flexible operation Mintia.
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The element incriminated for the potential occurrence of negative impact in case of energy coming from non-renewable sources is represented by the burning of these resources, in this case, burning of carbon and natural gas.

The effects of combustion are multiple and have, on its turn, visible secondary effects present on all levels of organisation of organised matters. The compounds generated by the burning of fossil fuels often remain in the air in the form of polluting particles or reach the ground or waterways with the acid rains that it forms. The main effects of acid rains are the acidification of water or soils and influence on growth or foliar degradation of trees, mainly on high heights.

Another compound released in the atmosphere in large quantities by burning fossil fuels is carbon dioxide – a greenhouse gas. Globally, the growth of the quantities of carbon dioxide is associated with global warming that causes changes in the distribution of vegetation at the level of ecological systems, and the change of species distribution habitats, the loss of habitats, the growth of the death rate due to thermal stress of bodies, changes in the reproduction cycles, extension of the habitats of invasive species and trophic changes²⁵.

According to the *National Strategy and Plan of Action for Conservation of Biodiversity 2010-2020*²⁶, the exploitation of carbon on surface often needs the uncovering of wide areas, this causing the pollution of surface waters used in floating. For underground

²⁵ Biodiversity and climate change

(http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=COB_Module-3_Climate.pdf)

²⁶ *Strategia Națională și Planul de Acțiune pentru Conservarea Biodiversității 2010-2020*

(<http://biodiversitate.mmediu.ro/implementation/legislaie/politici/strategia-nationala-si-planul-de-actiune-pentru-conservarea-biodiversitatii/>)

exploitations, the acid mine waters and containing heavy metals reach surface causing several ecological misbalances.

The potential impact associated to the production of energy from non-renewable resources, in this case by burning carbon and natural gas, must be analysed from several perspectives: impact caused by the exploitation of resources, transport of it and actual use.

For the two kinds of resources, the main potential effects in the detriment of biodiversity are the following²⁷:

Exploitation	Transport	Burning
<ul style="list-style-type: none"> - Occurrence and aggravation of erosion; - Phonic pollution; - Atmospheric pollution; - Degradation and fragmentation of species' habitats, manly by stubbing different areas of forest, and facilitation of entry of invasive species; - Damage of water quality; - Esthetical alteration of landscape; - Topography changes. 	<ul style="list-style-type: none"> - Accentuation of the impact due to mine exploitation by increase of the concentrations of polluting emissions from mobile sources. 	<ul style="list-style-type: none"> - Increase of atmospheric pollution concentrations due to increased emissions of carbon dioxide, nitric oxide, sulphur and methane dioxide generated by burning, affecting the health of bodies; - contribution to occurrence of photochemical smog, of acid rains and accentuation of the effects of climatic changes.

In this context, please note that, among the RES objectives for execution of new energy groups, there are two objectives that aim to use supercritical and ultrasupercritical parameters of operation:

- ❖ Supercritical parameters - Realization of a new energy group of 600 MW at Rovinari;
- ❖ Ultra supercritical parameters - Realization of a new energy group of 400 MW ultra supercritical parameters at Turceni.

The inclusion of these parameters in the production of energy from fossil fuels is a first step towards reducing greenhouse gas emissions as follows:

Supercritical parameters

- The operation with supercritical parameters constitutes a double economic and environmental advantage, the fuel used to obtain an electricity GWh needs 5% less fuel;
- Sulphur dioxide emissions resulting from burning fossil fuels are controlled by the calcium carbonate injected in the burning boiler;

²⁷ Center for Biological Diversity
(https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/coal/index.html)

- The burning at low temperatures and fractioned combustion allows to control the quantities of nitrogen oxide emissions;
- Solid particles resulting from the combustion of fossil fuels are retained by an electrical filter;

Ultra supercritical parameters

- The most important effect of introducing the ultra supercritical parameters in the process of energy production is the significant reduction of the quantities of carbon dioxide emissions, the fact that the energy group observes the limits admitted by the European Union for polluting emissions and economic yield.

<p>Energy from renewable sources – hydroenergy (TIP A si B)</p>	<p style="text-align: center;">Objective</p> <ul style="list-style-type: none"> ❖ Realization of the hydroenergy plant with accumulation by pumping Tarnița-Lăpușești; ❖ Realization of the hydroenergy plant Turnu Măgurele - Nicopole 500 MW; ❖ Realization of the hydroenergy plant Răstolița 35 MW; ❖ Realization of hydroenergy power plants on Jiu River 90 MW; ❖ Realization of hydroenergy power plants on Olt River - 145 MW.
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For a safer and more sustainable economy, with low carbon emissions, the European Commission has developed several strategy in the field of energy. Renewable sources are aimed by the 2020 energy/climate package adopted in 2008 and requesting the reduction of the energy consumption and greenhouse gas emissions with 20% and increasing the level of use of renewable resources to 20% of the total energy consumption. Among the renewable energy sources, there is also wind energy, solar energy (thermal, photovoltaic and concentrated energy), hydroenergy, mareomotric energy, geothermal energy, biofuels and the renewable part of waste²⁸.

Energy from renewable sources has become a controversial subject in recent years, hydroenergy, along with the effects of the location and operation of hydroenergy power plants (CHE) and microhydroenergy power plants (MHC) being extensively discussed. There are plenty of studies that analyze the impact of obtaining energy from hydrological sources by creating large MHC and CHE. On the basis of these, for the objectives RES 2019-2030, with perspectives for 2050 aiming at hydroenergy, the direct and indirect impact, the potential elements affected by the implementation thereof at the level of ecological, alternative systems and compensatory measures or impact reduction strategies will be identified.

The increase of investments for the execution of MHC in Romania was very accelerated and led to the appearance of high pressure on biodiversity so that, in 2015, the European Commission launched the infringement procedure against Romania as a result of the projects of execution of MHC in Fagaras Mountains.

²⁸ Renewable energy statistics/ro – Eurostat (<https://ec.europa.eu/eurostat/statistics-explained/pdfscache/64880.pdf>)

According to Nistorescu, M., Doba, A., Țîbîrnac, M., Nagy, A.A., Cosmoiu, D., Berchi, G.M., Ilinca C., (2016). Guide to good practices for planning and implementing investments in the Micro Hydro power plant sector. The “Milvus Group” Association has established a number of recommendations regarding the location of MHCs (micro-hidropower plants) nationwide:

1. It is recommended to avoid the construction of MHCs within the protected natural areas that have been set up for the protection of the categories of water-dependent organisms (fish, otter, crab) and priority riparian habitats (e.g.: 91E0* - păduri aluviale cu *Alnus glutinosa* și *Fraxinus excelsior* etc.);
2. The planning and realization of a MHC will be done by taking into account the potential of optimizing the existing infrastructure and all the options carefully reviewed for choosing the variants that have the least impact on the environment;
3. Preparing specialized studies to identify the river sectors where the construction of MHCs is not possible (no go areas) due to the significant impact on the components of interest for the protected natural areas;

Following the analysis carried out for the localization of the MHCs at national level and the studies carried out by the institutions ²⁹ focused on nature conservation and ecotourism, the following have been proposed:

1. Exclusion areas: the development of micro-hydroelectric plants will not be proposed under the following conditions and locations:
 - Sections of rivers included in protected natural areas - SCIs that have been designated for the conservation and protection of fish, otter, crab and riparian habitats, for a distance of 20 km downstream and upstream of its location;
 - River sections included in strict and comprehensive protection areas for national parks, scientific reserves, biosphere reserves, wetlands of international importance, etc., 20 km downstream and upstream of its location;
 - River sections with very good ecological status and sections of rivers with good ecological status correlated with a very good hydromorphological class (DCA);
 - Coridoare ecologice.
2. Unfavourable areas: those areas with a special value for nature and society are classified as belonging to the provided environmental services. It is proposed to make investments in hydropower for remote areas, where electricity is lacking. However, technical solutions with cross-capture will not be allowed. The development of micro-hydroelectric plants will not be proposed under the following conditions and locations:
 - Sections of rivers with good ecological status, but the hydromorphological class is only “moderate”, without embankments;
 - Unfragmented rivers or sections of rivers, relevant to ecosystems, including those that are important for continuity (existing or potential) and for sediment transport and input;

²⁹ Document de Poziție ONG din data de 8 iulie 2014 elaborat de către WWF împreună cu alte organizații (Asociația “Grupul Milvus”, Focus ecocenter și Asociația de Ecoturism din România)

- River sectors where ecological reconstructions are proposed;
- River sectors that are included in protected natural areas with priority species and habitats.

Monitoring of the biodiversity is proposed on the river sectors where hydropower objectives are located to quantify the type of impact and the dynamics of the species and habitats potentially affected by their implementation.

Assessing the impact of the objectives on the environment is a tool with which activities that interact negatively with the elements of biodiversity will be identified and at the same time will minimize their effect by identifying optimal measures.

Although hydropower is associated with clean, carbon-free, green energy that uses a renewable resource to produce electricity, specialized studies have identified a number of positive and negative actions associated with it:

Positive

*For obtaining hydroenergy, the command factor is gravitation, the water used for activating it is a renewable source (Abbasi and Abbasi, 2011);

*Hydroenergy does not affect the quality of air and, implicitly, does not pollute the air we breath, because it is not a source generating atmospheric emissions (Yüksel, 2010);

*because hydroenergy replaces a part of energy production from burning fossil fuels, it can be said that it has a positive impact on the problem of smog and acid rain (Abbasi and Abbasi, 2011; Yüksel, 2010).

Negative

*The damming of water streams has a long-term impact on the terrestrial ecological systems and biodiversity in a general sense, the flowing regime of rivers, the migration of water bodies and also causes greenhouse gas emissions (The Report of the World Commission on Dams, Noiembrie 2000);

*Hydroenergy production affects the flowing regime of rivers, the migration of water bodies and the transportation of nutrients and sediments (Bratrich et al, 2004);

*Hydroenergy power plants have major effects on all types of habitats identified on the site, on the mouth of the river into the sea for large power plants, on the riverbeds where they are located (Abbasi și Abbasi, 2000).

The potential impact of hydrotechnical constructions (especially of MHC) is analyzed in numerous specialized studies and divided in the positive and negative impact. In particular, these would be:

Potential positive impact:

- Accumulation lakes can be important resting and feeding places for bird species, especially in the migration period;
- As the Frazier study (1999) also suggests, the habitats close to accumulation lakes are also resting places for certain species of birds. At an international level, 75 of the total number of wetlands of international importance (Ramsar sites), are artificially dammed lakes that contain species of birds of international importance;

- Crisp and colab. (1983) have highlighted that, by regularizing the flow of a water stream, the conditions for species of *Cottus gobio* and *Salmo trutta* have been improved due to a constant water flow, a low turbidity and the absence of the sub-layer of silt;
- The potential positive impact of growth of certain species of fish and the formation of accumulation lakes considered quiet places are two important features that are a useful habitat for the mammal *Lutra lutra*.

Potential negative impact

- The increase of the number of populations of certain species of fish to the detriment of other species characteristic for lotic waters;
- The disappearance of certain components of complex ecological systems from the location area – water species and habitats are primarily targetted. but also species of amphibians, nesting birds in forest areas or invertebrates in habitats altered by hydrotechnical constructions;
- the appearance of genetical imbalances and the fragmentation of habitats – the loss of connectivity;
- the appearance of physical-chemical alterations of the water;
- the alteration of the prey-predator relations due to the change of the bentic characteristics and the disappearance of the areas used and favoured by certain species characteristic to the betonic area;
- Affecting the biological cycles due to the appearance of water level fluctuations during the reproductive period;
- The loss of tree line forests and the appearance of species of non-native trees.

As regards the potential impact of large hydrotechnical constructions, for example the RES objective *Realization of the hydroenergy plant Turnu Măgurele - Nicopole 500 MW*, according to Bergkamp și colab. (2000) can be divided into three orders of impact as follows:

Impact order	Upstream effects	Downstream effects	Comments
I	*Changes in the water flowing regime; *Morphological changes; *Alteration of the water quality; *Accumulation of sediments in tanks.	*Changes in the water flowing regime; *Morphological changes; *Changes of water temperature; *Reduction of the quantity of sediments.	The effects are noticed immediately or shortly after the beginning of construction.
II	*Alteration of biotic and abiotic elements; *Changes of the structure of ecological systems; *Alteration/Appearance of imbalances at the level of primary productivity.	* Alteration of biotic and abiotic elements; * Changes of the structure of ecological systems; *Alteration/Appearance of imbalances at the level of primary productivity.	The second order of impact is the result of the changes caused by the impacts mentioned in the first order. This order is associated with a very long period, the effects being noticed a few years after the construction of the hydroenergy plant.

Impact order	Upstream effects	Downstream effects	Comments
			Bergkamp and colab. (2000) mention that the main changes are highlighted in riparian vegetation, the rate of growth of macrophytes, of the plankton and of the periphyton.
III	*The effects at the level of bodies (fish fauna, bird fauna, invertebrates and mammals) from the relevant ecological deposits.	*The effects at the level of bodies (fish fauna, bird fauna, invertebrates and mammals) from the relevant ecological deposits. *The downstream impact is also felt at the level of the discharge of a river into the sea, and at the sea level.	The impacts of the third order are the result of the first two orders. These are felt after a larger period compared to the second order of impact, before striking a new ecological balance.

According to the *National Strategy and the Action Plan for Biodiversity Conservation 2010-2020*³⁰, the impact of large hydrotechnical constructions (in our country, the one from Porțile de Fier) was and still is negative for the species of migrating fish or of fish that need to travel upstream for reproduction. In the case of sturgeons, their numbers were cut in half because of this. Moreover, the damming of beds destroyed areas used during the reproduction period for species of fresh water fish (e.g. the carp that prefers shallow, transparent and warm waters. For this species, the numbers were reduced by 10%). Moreover, this Strategy also mentions the impact caused by hydrotechnical constructions from harbours. In this case, the discharge of a large quantity of sediments in the coastal waters caused the *disappearance of entire bental associations, habitats for ecologically and financially valuable species*.

The objective is also associated with a positive impact identified by flood control and ensuring safe and constant conditions of navigation on the Danube.

Based on the information on the potential impact from downstream and upstream due to large hydrotechnical constructions previously mentioned, the forecast on the number of protected natural areas under potential threat was completed with the identification of 59 whose structure and functions could be affected (Tabel 9). These were also represented in *Figure 41*.

³⁰ *Strategia Națională și Planul de Acțiune pentru Conservarea Biodiversității 2010-2020* (<http://biodiversitate.mmediu.ro/implementation/legislaie/politici/strategia-nationala-si-planul-de-actiune-pentru-conservarea-biodiversitatii/>)

Tabel 9 Protected natural areas potentially threatened by the implementation of the objective Realization of the hydroenergy plant Turnu Măgurele - Nicopole 500 MW

Code	Name	Type of protected natural area
ROMAB0003	Rezervația Biosferei Delta Dunării	Biosphere reserve
RONPA0014	Parcul Natural Porțile de Fier	Natural park
RONPA0017	Parcul Natural Balta Mică a Brăilei	Natural park
RONPA0316	Balta Nera - Dunăre	Natural reserve
RONPA0614	Gura Vaii - Vârciorova	Natural reserve
RONPA0625	Dealul Varanic	Natural reserve
RONPA0626	Cazanele Mari și Cazanele Mici	Natural reserve
RONPA0627	Locul fosilifer Șvinița	Natural reserve
RONPA0641	Cracul Crucii	Natural reserve
RONPA0642	Fața Virului	Natural reserve
RONPA0898	Ostrovul Gâsca	Natural reserve
RONPA0942	Cama - Dinu - Păsărica	Natural reserve
RORMS0001	Delta Dunării	Wetland of international importance
RORMS0002	Parcul Natural Balta Mică a Brăilei	Wetland of international importance
RORMS0006	Parcul Natural Porțile de Fier	Wetland of international importance
RORMS0009	Bistreț	Wetland of international importance
RORMS0011	Confluence Olt - Danube	Wetland of international importance
RORMS0012	Suhaia	Wetland of international importance
RORMS0013	Blahnița	Wetland of international importance
RORMS0014	Brațul Borcea	Wetland of international importance
RORMS0015	Calafat - Ciuperceni - Danube	Wetland of international importance
RORMS0016	Canaralele de la Hârșova	Wetland of international importance
RORMS0017	Ostroavele Dunării - Bucgeac - Iortmac	Wetland of international importance
RORMS0018	Confluence Jiu - Danube	Wetland of international importance
RORMS0019	Dunărea Veche - Brațul Măcin	Wetland of international importance
ROSCI0006	Balta Mică a Brăilei	Site of community importance
ROSCI0022	Canaralele Dunării	Site of community importance
ROSCI0039	Ciuperceni - Desa	Site of community importance
ROSCI0044	Corabia - Turnu Măgurele	Site of community importance
ROSCI0045	Coridorul Jiului	Site of community importance
ROSCI0065	Delta Dunării	Site of community importance
ROSCI0088	Gura Vedei - Șaica - Slobozia	Site of community importance
ROSCI0131	Oltenița - Mostiștea - Chiciu	Site of community importance
ROSCI0173	Padurea Stârmina	Site of community importance
ROSCI0206	Porțile de Fier	Site of community importance
ROSCI0278	Bordușani - Borcea	Site of community importance
ROSCI0299	Dunărea la Gârla Mare - Maglavit	Site of community importance
ROSCI0306	Jiana	Site of community importance
ROSCI0319	Mlaștina de la Fetesti	Site of community importance
ROSPA0005	Balta Mică a Brăilei	Important bird area

Code	Name	Type of protected natural area
ROSPA0011	Blahnița	Important bird area
ROSPA0012	Brațul Borcea	Important bird area
ROSPA0013	Calafat - Ciuperceni - Danube	Important bird area
ROSPA0017	Canaralele de la Hârșova	Important bird area
ROSPA0021	Ciocănești - Dunăre	Important bird area
ROSPA0023	Confluence Jiu - Danube	Important bird area
ROSPA0024	Confluence Olt - Danube	Important bird area
ROSPA0026	Danube - Baziaș - Portile de Fier course	Important bird area
ROSPA0031	Delta Dunării și Complexul Razim - Sinoie	Important bird area
ROSPA0038	Dunăre - Oltenița	Important bird area
ROSPA0039	Dunăre - Ostroave	Important bird area
ROSPA0046	Gruia - Gârla Mare	Important bird area
ROSPA0074	Maglavit	Important bird area
ROSPA0080	Almăjului - Locvei Mountains	Important bird area
ROSPA0090	Ostrovu Lung - Gostinu	Important bird area
ROSPA0102	Suhaia	Important bird area
ROSPA0108	Vedea - Dunăre	Important bird area
ROSPA0135	Sands from Dăbuleni	Important bird area
ROSPA0136	Oltenița - Ulmeni	Important bird area

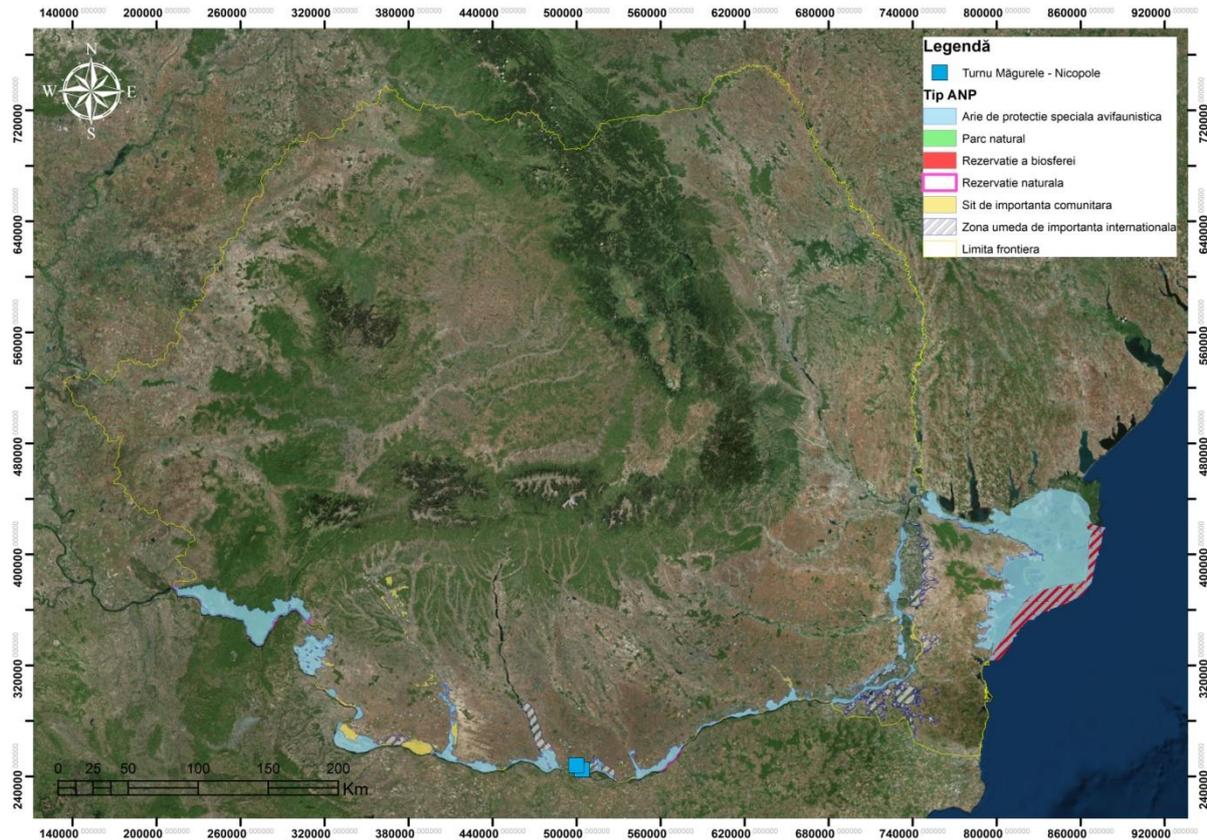


Figure 41 Forecast of the localization of the potential impact on protected natural areas after the implementation of the objective Realization of the hydroenergy plant Turnu Măgurele - Nicopole 500 MW

This objective is overlapped by the FAST DANUBE project, approved for financing under the CEF Transport 2014 Call, whose main objective is to identify technical solutions to be implemented in order to ensure the navigation conditions in the common Romanian-Bulgarian sector of the Danube and the transport of transport on the Danube in safe conditions throughout the year, in accordance with the recommendations of the Danube Commission of Budapest³¹.

³¹ FAST DANUBE (<http://www.fastdanube.eu/ro>)

<p>Energy transport</p>	<p style="text-align: center;"><u>Objective</u></p> <ul style="list-style-type: none"> ❖ New 400 kV d.c. OHL (with an equipped circuit) between the existing stations at Smârdan and Gutinaș; ❖ New 400 kV d.c. OHL between the existing stations from Cernavodă and Stâlpu, with an entry/exit circuit at 400 kV Gura Ialomiței station; ❖ Extension of 220/110 kV Stâlpu stationb by building 400/110 kV station; ❖ 400 kV Porțile de Fier - Anina - Reșița OHL; ❖ New 400 kV d.c. OHL between the existing stations Reșița (Romania) and Pancevo (Serbia); ❖ Switch to 400 kV of 220 kV d.c. Reșița-Timișoara-Săcălaz-Arad OHL; ❖ Extension of the 220/110 kV Reșița station by building a new 400/220/110 kV Reșița station; ❖ Replacing the 220/110 kV Timișoara station by building a new 400/220/110 kV station.
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The impact of commissioning a new overhead power line and extending a new station or replacing by bulding them is, in this case, directly associated with the activities that will be carried out for these objectives. The crossing of protected natural areas and the execution of forest works, namely the deforestation of certain areas for building OHL supporting pillars, have a visual-aesthetic impact and, first of all, multiple effects on biodiversity (chain imbalances at the level of the trophic network: air barriers for migrating birds, the alteration of habitats for various species of flora/fauna, disturbance of migrating species of birds, alteration of habitats for different species of flora/fauna, disturbing species of faune during the reproduction and/or offspring development periods, etc.).

Because the objectives that aim towards the transportation of energy overlap several protected natural areas and, implicitly, cover multiple distribution areas, ways by which these have a potential negative impact on biodiversity will be presented below.

The habitats and species of plants are the main major element at the level of which the potential impact of energy transportation is directly observed. The deforestation of the established areas causes chain imbalances at the level of the trophic network. The main forms of potential impact are the alteration of habitats and of the flora from areas located in the immediate vicinity of the works area, therefore affecting the integrity of the habitat/s, the reduction of the number of individuals and of the distribution areas of species and the surge of the fragmentation process.

Invertebrates are indirectly affected by the reduction of the habitats used for feeding, reproduction, resting. Because this is a food source for many other categories of organisms, the reduction of the number of invertebrates in forest areas causes major functional ecological imbalances, for example the appearance of invasive species of insects or the reduction of the food sources for birds, amphibians, reptiles or chiroptera.

Amphibians and reptiles can be affected by the building, extension or replacement of the energy transmission infrastructure only when the works conducted overlap water habitats and adjacent habitats. Most likely, these activities could be associated with the

alteration of the areas used by species of reptiles and amphibians as food, reproduction and resting areas. These on top of air pollution caused by the works, especially dust-suspended particles.

Fish are a group of organisms potentially affected by works of extension of the energy transmission infrastructure only if they occur in water habitat areas or in tree line areas. The reduction of the tree line areas can also threaten the fish fauna by the resulting physical-chemical changes of the water.

Birds can be directly affected by such works, especially birds of prey, nesting birds or birds whose habitats overlap the areas where extension works for the energy transmission infrastructure will be carried out. Also, the noise produced during works and all the other imbalances caused to invertebrates, reptiles, amphibians or mammals – main food sources of birds of prey – is a potential negative impact at the level of this major group of organisms.

Mammals have a high rate of probability to be negatively affected by the execution of such works. This is due to the very large distribution area and their high mobility (large mammals), and due to the large distances they travel for food purposes (small mammals, such as chiroptera). The alteration of the habitat and the noise produced during works can be real ecological barriers. If the works conducted for extending the energy transmission infrastructure overlap the areas used by species of mammals for feeding, resting, reproduction, the potential associated impact is more significant, the structural imbalances caused at the level of the entire ecological system is strongly felt at the functional level too.

Brief presentation of the forms of potential impact

Among the 18 energy objectives targetted by the Romanian Energy Strategy 2019-2030, with perspectives for 2050, 10 are located inside or close to protected natural areas Natura 2000.

The potential forms of impact on the groups of organisms of community importance will be associated with the energy objectives based on the following key indicators:

- loss of habitats;
- alteration of the habitats used by species of community interest for food, rest, reproduction;
- fragmentation of habitats;
- disruption of species of community interest;
- the change of the density of the populations of species of community interest and the replacement of species and/or habitats affected by the implementation of objectives;
- alteration of components of community interest and appearance of functional changes of natural areas protected by community interest.

If the quantitative data is not sufficient, qualitative data was identified regarding the conservation value of species and habitats and the strict dependency of species of habitats from Natura 2000 sites.

Tabel 10 Potential forms of impact, per categories of investments and key indicators

	Key-indicators	

		Loss of habitats	Alteration of the habitats used by species of community interest for food interest and reproduction	Fragmentation of habitats	Disruption of species of Community interest	Change of the density of populations of species of community interest and replacement of species and/or habitats affected by the implementation of objectives	Alteration of the components of community interest and appearance of functional changes of natural areas protected
1	Nuclear energy (1st objective)						<i>Possibly, according to the information presented in section IV.2</i>
2	Energy from renewable sources (objectives 2-5)		X		X		X
3	Hydroenergy (objectives 6-10)	X	X	X	X	X	X
4	Energy transmission (objectives 11-18)		X	X	X		X

IV.3 ESTIMATION OF SURFACES FROM WITHIN AND PROXIMITY OF NATURA SITES POTENTIALLY AFFECTED BY THE IMPLEMENTATION OF PROJECTS PROPOSED BY RES 2019-2030, WITH PERSPECTIVES FOR 2050

The localization of the projects was done using the data received from the Beneficiary, and for those projects for which this information could not be made available by the Beneficiary, the spatial localization was made using digitization based on the satellite image on Google Earth.

The analysis also included projects under RES 2019-2030, with perspectives for 2050 and new projects and ongoing projects, even if some of them have already gone through the appropriate assessment procedure.

For the assessment of the land areas affected by the implementation of RES 2019-2030, with perspectives for 2050, polygons were created corresponding to the projects involving new constructions, as well as modernization / rehabilitation / extension works using the GIS "Buffer" function. The distances used were different depending on the type of work involved (hydroenergy, thermal power plants, etc.) and the form of anticipated impact (habitat destruction, alteration, disruption). The polygons of the projects thus created were intersected with the sensitivity areas of the Natura 2000 sites (SCI and SPA) and the 1 km buffer zone around the sites.

Concerning the intersection of the projects with the land use categories (according to Corine Land Cover 2012), please note that in the case of permanent occupation, the analysis of the project was based on the buffer for projects involving new constructions or extensions where a loss of habitat will occur, and in the case of temporary occupation the buffer was considered for projects involving modernization or rehabilitation of existing buildings (i.e. where a habitat alteration will occur).

Nuclear energy

The sole objective targeting this economic sector is *Completion of groups 3 and 4 from Cernavodă nuclear power plant*. The objective does not intersect Natura 2000 sites, as previously mentioned.

Energy from renewable sources

Although the four objectives falling in this category target the existing sites, an area of 0.85 kmp was identified, where the negative effects of the combustion of fossil fuels will be felt. The area corresponds to the buffer zone around the two sites of community important that can be regarded as an area that allows the passage from the area of the site and the protected natural area.

Hydroenergy

In the case of energy from renewable sources, hydroenergy in this case, the following categories of natural areas potentially affected by objectives 6-10 have been identified:

- sites of community importance (SCI, Natura 2000);
- areas of special bird fauna protection (SPA, Natura 2000);
- natural reserves of national importance ;
- wetlands of international importance (Ramsar);
- national / natural parks;
- biosphere reserves.

In this study, the focus is on the sites which are part of Natura 2000 network. Therefore, the areas identified as affected by the implementation of hydroenergy objectives are presented in Tabel 11.

Energy transmission

The areas affected by the implementation of energy objectives corresponding to energy transmission have been obtained on the basis of environmental permits, the information mentioned in section II.7 of this study. In numbers, these are presented in *Tabel 11*.

Tabel 11 Areas intersected by RES objectives, per categories of investments

Category	Affected area (kmp)			
	SCI	buffer	SPA	buffer
Nuclear energy	-	-	-	-
Energy from renewable sources	-	0.85	-	-
Hydroenergy	9,488	64,912	0.0008	68,258
Energy transmission	0,973	-	0,501	-

IV.4 IMPACT ASSESSMENT

The residual impact is the level of impact from the application of the avoidance and mitigation measures.

We believe that the projected impact of the implementation of RES 2019-2030, with perspectives for 2050, can be achieved by implementing the proposed measures under section 5.1 (Avoidance and mitigation measures). Mainly, there are two key approaches:

- ❖ Avoid sensitive areas. Avoid protected natural areas and / or sensitive areas within them. In this way, projects will intersect areas of lower sensitivity classes or even “non-sensitivity” classes, resulting in reduced impact significance (from significant impact to moderate impact or moderate impact to reduced impact);
- ❖ Reduce the scope of the changes. Implement measures to reduce impacts (areas affected by these impacts), thus reducing the magnitude of the changes and, implicitly, reducing the impact (similar to the previous approach); for example, installing a fish stairs to ensure fish migration in an important area will reduce the affected area within that area and thus reduce the significance of the impact of the proposed project.

We recommend that the two approaches mentioned above be applied at the design stage, in order to minimize the risk of significant damage to the natural protected areas.

For smaller sites (preferably <3000 ha and especially <1000 ha), it is imperative to find solutions to avoid locating / intersecting projects with Natura 2000 sites. This solution would avoid most of the significant impacts identified (except ROSCI0063 Jiu Defile).

For large sites where it is not possible to avoid locating / intersecting projects with Natura 2000 sites, measures are needed to avoid areas of high and high sensitivity, preferably also of areas of moderate sensitivity.

Impact mitigation measures are required for all projects located within or near the Natura 2000 sites, whose magnitude of proposed changes is moderate, high or very high.

The implementation of the avoidance and mitigation measures proposed here is able to ensure avoiding a significant residual impact.

Impact significance

The significance of the impact was determined on the basis of the following parameters: sensitivity and the magnitude of the changes.

In case of sensitivity, the analysis was mainly performed on the basis of the qualitative information regarding the species and habitats present in Natura 2000 sites intersected by the RES objectives. In particular, the conservation value of habitats and of the species of community importance, the strict dependence of species on habitats likely to be affected were taken into consideration.

For sites of Community importance that host priority species and habitats, and within which activities for RES objectives are pursued, in addition to environmental studies targeting biodiversity, a point of view will also be requested from the European Commission to determine whether to implement the project or not.

The sites were divided into the following sensitivity classes: very high, high, moderate and low / no sensitivity.

The identification of the sensitivity classes for the objectives of TYPE A were established as follows:

- Each Natura 2000 site has been assigned with 3 buffer zones, thus establishing 4 sensitivity areas (very high , high , medium , low);

- Identification of sites in whose perimeter there are species and / or habitats of priority community interest (in the case of SCI) and of the major categories of birds (number of permanent species in the site, number of species that winter, feed, nest, etc., in the case SPAs); depending on the major categories of organisms, as well as their stages of development, the approximate periods of starting / carrying out the works will be identified;
- In this analysis was also included the project of TYPE B Hydroelectric power plant with pumping accumulation Tarnița-Lăpuștești , according to the project description (www.hidrotarnita.ro/localizare/):
 “The new plant will be carried out in the Someșul Cald river basin, in the left slope adjacent to the existing Tarnița accumulation, on the administrative territory of the Rașca, Căpușu Mare, Mărișel and Gilau communes including the Dângăul Mare, Dealu Mare, Lăpuștești, Someșul Cald, mostly in their unincorporated area.”

The identification of the sensitivity classes for the objectives of TYPE B was established as follows:

For the strategic objective of Turnu Măgurele Nicopole hydroelectric power station, the approach will follow two distinct directions:

- The area of the future site will be reviewed from the perspective of the sensitivity of the protected natural areas located near it (as mentioned in TYPE A);
- There will be an analysis of the sensitivity of the areas throughout the Danube, at national level;
- The establishment of the sensitivity areas will be achieved by creating buffer zones along the Danube, along the following distances: 250 m - very high sensitivity ; 500 m - high sensitivity , 750 m - medium sensitivity , 1000 m - low sensitivity .

In the case of sensitivity analysis, the following were identified:

- 2 sites of community importance, 1 site of avifaunistic importance and 2 national parks in the very high sensitivity class , in the case of type A objectives, and 13 sites of community importance, 19 sites of avifaunistic importance classified in the very high sensitivity class , in the case of type B objectives;
^{32 33}
- 1 site of community importance in the high sensitivity class , in the case of type A objectives, and 13 sites of community importance, 19 sites of avifaunistic importance classified in the

³² ROSCI0019 Călimani-Gurghiu, ROSPA0030 Defileul Mureșului Superior, ROSCI0063Defileul Jiului, Parcul Național Călimani, Parcul Național Defileul Jiului;

³³ ROSCI0006 Balta Mică a Brăilei, ROSCI0022 Canaralele Dunării, ROSCI0039 Ciuperceni – Desa, ROSCI0045 Coridorul Jiului, ROSCI0065 Delta Dunării, ROSCI0088 Gura Vedei - Șaica – Slobozia, ROSCI0131 Oltenița - Mostiștea – Chiciu, ROSCI0173 Padurea Stârmina, ROSCI0278 Bordușani – Borcea, ROSCI0299 Dunărea la Gârla Mare – Maglavit, ROSCI0306 Jiana, ROSCI0319 Mlaștina de la Fetești, ROSPA0005 Balta Mică a Brăilei, ROSPA0011 Blahnița, ROSPA0012 Brațul Borcea, ROSPA0013 Calafat - Ciuperceni – Dunăre, ROSPA0017 Canaralele de la Hârșova, ROSPA0021 Ciocănești – Dunăre, ROSPA0023 Confluența Jiu – Dunăre, ROSPA0026 Cursul Dunării - Baziaș - Porțile de Fier, ROSPA0031 Delta Dunării și Complexul Razim – Sinoie, ROSPA0038 Dunăre – Oltenița, ROSPA0039 Dunăre – Ostroave, ROSPA0046 Gruia - Gârla Mare, ROSPA0074 Maglavit, ROSPA0080 Munții Almăjului – Locvei, ROSPA0090 Ostrovu Lung – Gostinu, ROSPA0108 Vedeia – Dunăre, ROSPA0135 Nisipurile de la Dăbuleni, ROSPA0136 Oltenița - Ulmeni

high sensitivity class , in the case of type B objectives;

- 2 sites of community importance, and 1 site of avifaunistic importance in the medium sensitivity class , in the case of type A objectives, and 13 sites of community importance, 19 sites of avifaunistic importance classified in the medium sensitivity class , in the case of type B objectives;
- 1 site of community importance in the low sensitivity class , in the case of type A objectives.³⁴

The analysis and determination of the magnitude of the impact will be carried out on the assumption that the intensity of the impact decreases with increasing distance to the point where it is produced.

In this sense, the second variable that will lead to the identification of the type of impact will be reviewed by creating buffer zones around the sites:

- Very large magnitude - on the existing location / approximate area of the objective location;
- Large magnitude - 500 m buffer around the approximate location / area of the objective;
- Medium magnitude - 1000 m buffer around the approximate location / area of the objective;
- Low magnitude - 1500 m buffer around the approximate location / area of the objective;

The analysis of the magnitude of the changes was completed by identifying the following:

- 2 sites of community importance (SCI), 1 site of avifaunistic importance (SPA) and 2 national parks in the very high sensitivity class , in the case of type A objectives, and 13 sites of community importance (SCI), 19 sites of avifaunistic importance (SPA) classified in the very high sensitivity class , in the case of type B objectives;
- 1 site of community importance (SCI) in the large magnitude class for type A objectives;³⁵
- 1 site of community importance (SCI) in the medium magnitude class for type A objectives;³⁶
- 1 site of avifaunistic importance (SCI) in the low magnitude class for type A objectives;³⁷

Even if this analysis does not show a high degree of accuracy and the actual impact on the protected natural areas will only be declarative and based on a coarse analysis, it will be resumed in the studies that will be elaborated for each specific target.

The significance of the impact was quantified taking into account the presence of the priority species and habitats but also the breeding / nesting periods, as follows:

- March – June (for large mammals),

³⁴ ROSCI0045 Jiu Corridor

³⁵ ROSCI0045 Jiu Corridor

³⁶ ROSCI0373 Mureş River between Brănişca and Ilia

³⁷ ROSPA0133 Călimani Mountains

- April - June (fish species for spawning);
- end of February - May / March / April, depending on location (for spring migration to fish species);
- September - November / August-October, depending on location (for autumn migration to fish species);
- May-June (for bird species).

The impact was classified into 4 major classes: significant negative impact, significant impact, moderate impact and low impact. These were chosen based on the degree of sensitivity and the magnitude of the changes produced by the RES objectives as follows:

Table 12 Impact assessment matrix for type A objectives

	Sensitivity			
Magnitude of changes	Very high	High	Moderate	Low
Very high				
High				
Moderate				
Low				

Legend of colours: red - significant negative impact, orange - significant impact ; yellow - Moderate impact , green - Low impact

In case of non-implementation of RES 2019-2030 with perspectives for 2050, the possible impact that these will have on biodiversity is reflected in the localization on the territory of protected natural areas or at a certain distance from them, as follows:

- the realization of the hydroenergy plant with accumulation by pumping at Tarnița-Lăpuștești could have a negative impact (increasing the noise level over species of faune of conservative interest, the fragmentation of the habitats for water species by creating dams – lack of migration passages for the bird fauna, reduction of the water flow required to sustain species of water flora and fauna), directly or indirectly, over species and habitats of community interest existing on the territory of the following protected natural areas inside the location of the site: ROSCI0263 Valea Ierii, ROSCI0427 Pajiștile de la Liteni – Săvădisla, through the alteration, fragmentation or loss of habitats and implicitly of species protected by sites;
- Realization of a new energy group of 400 MW ultra supercritical parameters at Turceni could have a direct or indirect negative impact on species and habitats of community interest present on the territory of the protected natural area ROSCI0045 Coridorul Jiului close to the location of the project; we mention that this project will be located on the existing site or close-by;
- Realization of a new energy group of 400 MW CCCGT powered by gas with flexible operation Mintia could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of the protected natural area ROSCI0373 Mures River between Brănișca and Ilia close to the location of the project; we mention that this project will be located on the existing site or close-by;
- Realization of the hydroenergy plant Răstolița35 MW could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of protected natural areas ROSPA0133 Munții Călimani close to the location of the project and ROSCI0019 Călimani-Gurghiu, by alteration, fragmentation or loss of

the habitats and implicitly of protected species of sites, inside the area where the project is located;

- the realization of hydroenergy power plants on Jiu River of 90 MW could have a direct or indirect negative impact on the species and habitats of community interest present on the territory of the protected natural area ROSCI0063 Defileul Jiului inside the area of the project, by alteration, fragmentation or loss of habitats and implicitly of species protected by sites;
- realization of hydroenergy power plants on Olt River of 145 MW could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of protected natural areas ROSCI0085 Frumopasa, ROSPA0043 Frumoasa, ROSCI0112 Munții Făgăraș, ROSCI0304 Hârtibaciu de Sud- Vest și ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu close to the location of the project, by alteration, fragmentation or loss of habitats and implicitly of species protected by sites;
- Realization of the hydroenergy plant Turnu Măgurele - Nicopole 500 MW could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of protected natural areas RORM0012 Suhaia, ROSCI0044 Corabia-Turnu Măgurele, inside the area where the project is located, i.e. ROSCI0039 Ciuperceni-Desa, ROSCI0044 Corabia-Turnu Măgurele, ROSCI0045 Coridorul Jiului, ROSCI0173 Pădurea Stârmina, ROSCI0206 Porțile de Fier, ROSCI0299 Dunărea la Gârla Mare-Maglavit, ROSCI0306 Jiana, ROSPA0011 Blahnița, ROSPA0013 Calafat- Ciuperceni-Dunăre, ROSPA0023 Confluența Jiu-Dunăre, ROSPA00024 Confluența Olt- Dunăre, ROSPA0026 Cursul Dunării –Baziaș-Porțile de Fier, ROSPA0046 Gruia- Gârla Mare, ROSPA0074 Maglavit, ROSPA0080 Munții Almăjului-Locvei, ROSPA0135 Nisipurile de la Dăbuleni close to the location of the project, by alteration, fragmentation or loss of habitats and implicitly of species protected by sites; the following Natura 2000 sites in Bulgaria and Hungary were identified as likely to be adversely affected by the project implementation, as presented in *Tabel 1Table 7*.
- the realization of the new OHL 400 kV Gutinaș-Smârdan could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of the protected natural areas ROSCI0162 Lower Meadow of Siret River and ROSPA0071 Lower Meadow of Siret River located in the area of the project;
- the realization of the new OHL 400 kV Cernavodă-Stâlpu could have a direct or indirect negative impact on the species and habitats of community interest present on the territory of protected natural areas ROSPA0012 Brațul Borcea, ROSCI0290 Coridorul Ialomiței, ROSPA0120 Kogălniceanu-Gura Ialomiței, ROSPA0006 Balta Tătaru which are inside the area of the project;
- the realization of the new OHL 400 kV nouă Porțile de Fier - Anina-Reșița could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of protected natural areas ROSCI0206 Porțile de Fier, ROSCI0198 Platoul Mehedinți, ROSCI0069 Domogled-Valea Cernei, ROSCI0226 Semenic-Cheile Carașului, ROSCI0031 Cheile Nerei-Beușnița, ROSPA0080 Munții Almăjului-Locvei, ROSPA0086 Munții Semenic- Cheile Carașului, ROSPA0020 Cheile Nerei-Beușnița which are inside the area of the project;
- the realization of OHL 400 kV Reșița (Romania 0 - Pancevo (Serbia) could have a direct or indirect negative impact on the species and habitats of community interest existing on the territory of the protected natural area ROSCI0226 Semenic-Cheile Carașului which is inside the area of the project;
- the execution of the switch from 400 kV of OHL 220 kV d.c. Reșița-Timișoara-Săcălaz-Arad could have a direct or indirect negative impact on the species and

habitats of community interest on the territory of the protected natural area of ROSCI0277 Becicherecu Mic, ROSCI0109 Lunca Timișului, ROSPA01258 Lunca Timișului, ROSPA0047 Hunedoara Timișană which are inside the area of the project.

We mention that for implementing the aforesaid projects, the measures of prevention, reduction and compensation mentioned in this study will be considered, and then during the environmental impact evaluation procedure to identify other forms of impact, in more details for each taxonomic group identified in the project area.

Impact assesment rezults

Following the significance analysis of the impact it was found that in a number of 12 protected natural areas a significant negative impact can be manifested both during the execution period and during the operating period. Significant impact was identified for 6 of the protected natural areas. Moderate impact was identified to manifest in 26 of the protected natural areas, and low impact will manifest in 8 of the protected natural areas.

After the analysis, investment categories were identified, as well as the potential impact associated to each RES objective (Tabel 13). Therefore, for the energy from renewable sources, 2 Natura 2000 (SCI) sites were identified, representing 4% of the total number of Natura 2000 sites intersected by RES objectives.

The transportation of energy is the second category that intersects 11 Natura 2000 sites (7 SCI and 4 SPA) possibly affected by the implementation of RES objectives. From the total number of Natura 2000 sites intersected by RES, this category is a possible threat to around 22.25% of the total number of sites targeted.

Hydroenergy, the most important category in this case, intersects 40 Natura 2000 sites (81.6% of the total number of Natura 2000 sites) of which 5 falling in the class of significant impact, 29 in the class of moderate impact and 6 in the class of low impact.

Tabel 13 Number of Natura 2000 sites that may be affected by RES objectives, per categories of investments

Category	Natura 2000 sites potentially affected			
	Significant negative impact	Significant impact	Moderate impact	Low impact
Nuclear energy	-	-	-	-
Energy from renewable sources	-	1	-	1
Hydroenergy	5	1	26	7
Energy transmission	7	4	-	-

The analysis of the impact on each RES objective is performed in the table below where the land surfaces intersected by them can be identified.

Following the analysis conducted on the objectives included in RES 2019-2030 with perspectives for 2050, the potential impact they will have on biodiversity is reflected in the location within the protected natural areas or a certain distance from them as follows:

- ❖ *Achievement of the hydro power plant from Tarnița-Lăpuștești with accumulation by pumping:*
 - it could have a significant negative impact, such as: the increase of the noise level produced on the fauna species of conservative interest, the fragmentation of the habitats for the aquatic species by the creation of dams - the lack of migration passages of the aquatic fauna, the reduction of the water flow necessary to support the species of aquatic flora and fauna), directly or indirectly, on the species and habitats of community interest present in the territory of the following protected natural areas within the project location: ROSCI0263 Valea Ierii, ROSCI0427 Pajistile de la Liteni - Săvădisla, by altering, fragmenting or losing habitats and implicitly the species protected by the sites;
 - prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable; creating opportunities for wildlife migration; providing biological corridors / passages for wildlife movement; carrying out construction works outside the breeding season of the protected animals identified in the works area; ensuring the water column for tributaries to ensure the viability of fish species.
- ❖ *Realization of a new 400 MW power plant with ultra supercritical parameters in Turceni:*
 - could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the territory of the protected natural area ROSCI0045 Jiu Corridor in the vicinity of the location of the project; please note that this project will be located on the existing site or in the immediate vicinity;
 - prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable; not to carry out activities in the areas where the 4 priority habitats are located in the area of Natura 2000 site ROSCI0045 Jiului Corridor (1530*, 6120*, 91E0*, 91I0*)³⁸ ;
 - the main potential effects that may occur to the detriment of biodiversity are: during the exploitation period (occurrence or increase of erosion; noise and atmospheric pollution; degradation and fragmentation of species habitats, in particular by clearing certain portions of forest, and facilitating the invasion of water species; deterioration of water quality; aesthetic alteration of the landscape; changes of topography); during transport (increasing the impact due to mining by increasing concentrations of pollutant emissions from mobile sources), in the combustion stage (increasing concentrations of atmospheric pollutants due to increased emissions of carbon dioxide, nitrogen dioxide, sulphur dioxide and methane emitted following combustion, with effects on the health of organisms, contribution to the appearance of photochemical smog, acid rain and to accentuating the effects of climate change);

³⁸ 1530* - Pannonian marshes and steppe, 6120* - Xeric and calcareous grasslands on sands, 91E0*- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), 91I0* - Euro-Siberian silvan steppe vegetation *Quercus* spp;

- ❖ *Realization of a new 400 MW CCGT power plant on gas, with flexible operation, at Mintia:*
 - could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the territory of the protected natural area ROSCI0373 Raul Mures between Branisca and Ilia in the vicinity of the location of the project; please note that this project will be located on the existing site or in the immediate vicinity;
 - prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable;
- ❖ *Realization of hydroelectric power plant 35 MW Rostolița:*
 - could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural areas ROSPA0133 Calimani Mountains located near project site and ROSCI0019 Călimani-Gurghiu by altering, fragmenting or losing the habitats and implicitly the species that are protected by the sites, being within the area where the project is located;
 - for the conservation of species and habitats the following conservation measures are proposed: maintaining the current level of groundwater by prohibiting works with impact on groundwater, maintaining habitats, not being allowed to cut or replace the species in that habitat with other species;
- ❖ *Realization of hydroelectric power plants on the Jiu River 90 MW:*
 - could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural area ROSCI0063 Jiului Gorge, located within the area where the project is located, by altering, fragmenting or losing the habitats and implicitly the species protected by the sites;
 - prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable; creating opportunities for wildlife migration; providing biological corridors / passages for wildlife movement; carrying out construction works outside the breeding season of the protected animals identified in the works area;
- ❖ *Realization of hydroelectric power plants on the Olt River 145 MW:*
 - could have a negative impact, directly or indirectly, on the species and habitats of the community present on the protected natural areas ROSCI0085 Frumopasa, ROSPA0043 Frumoasa, ROSCI0112 Făgăraș Mountains, ROSCI0304 Hârtibaciu de Sud- est and ROSCI0132 Olt Mijlociu-Cibin-Hârtibaciu near the location of the project, by altering, fragmenting or losing the habitats and implicitly the species protected by the sites;
 - prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable; creating opportunities for wildlife migration; providing biological corridors / passages for wildlife movement; carrying out construction works outside the breeding season of the protected animals identified in the works area;
- ❖ *Realization of a hydroelectric power plant at Turnu Magurele - Nicopole 500 MW:*

- could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural areas RORM0012 Suhaia, ROSCI0044 Corabia-Turnu Magurele, located inside the area where the project is placed, and ROSCI0039 Ciuperceni-Desa, ROSCI0044 Corabia-Turnu Magurele, ROSCI0045 Jiu Corridor, ROSCI0173 Stârmina Forest, ROSCI0206 Portile de Fier, ROSCI0299 Dunărea la Gârla Mare- Maglavit, ROSCI0306 Jiana, ROSPA0011 Blahnița, ROSPA0013 Calafat-Ciuperceni-Danube, ROSPA0023 Jiu-Danube confluence, ROSPA00024 Olt-Danube confluence, ROSPA0026 Danube-Baziaș-Portile de Fier course, ROSPA0046 Gruia-Gârla Mare, ROSPA0074 Maglavit, ROSPA0080 Almăjului-Locvei Mountains, ROSPA0135 Nisipurile de la Dăbuleni near the location of the project, by altering, fragmenting or losing the habitats and implicitly the species protected by the sites;
- prevention, reduction and compensation measures: restricting the use of machines and vehicles and manually executing works in areas or during periods when wildlife species are vulnerable; creating opportunities for wildlife migration; providing biological corridors / passages for wildlife movement; carrying out construction works outside the breeding season of the protected animals identified in the works area;
- ❖ *Realization of a new 400 kV Gutinas-Smârdan LEA (overhead power line - en.)* could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural areas ROSCI0162 Lunca Siretului Inferior and ROSPA0071 Lunca Siretului Inferior inside the area where the project is located; ;
- ❖ *Realization of a new 400 kV Cernavoda-Stâlpu LEA* may have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural areas ROSPA0012 Bratul Borcea, ROSCI0290 Ialomița Corridor, ROSPA0120 Kogălniceanu-Gura Ialomiței, ROSPA0006 Balta Tătaru inside the area where the project is located;
- ❖ *Realization of a new 400 kV LEA Portile de Fier - Anina-Reșița* could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the territory of protected natural areas ROSCI0206 Portile de Fier, ROSCI0198 Mehedinți Plateau, ROSCI0069 Domogled-Valea Cernei, ROSCI0226 Semenice-Cheile Carașului, ROSCI0031 Nerei-Beusnița Gorges, ROSPA0080 Almăjului-Locvei Mountains, ROSPA0086 Semenice Mountains - Carasului Gorges, ROSPA0020 Nerei-Beusnița Gorges located inside the area where the project is located;
- ❖ *Realization of the LEA 400 kV Resita (Romania) - Pancevo (Serbia)* could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the protected natural area ROSCI0226 Semenice-Carașului Gorges located inside the area where the project is located;
- ❖ *Realization of a 400 kV crossover of the 220 kV dc LEA Reșița-Timișoara-Săcălaz-Arad* could have a negative impact, directly or indirectly, on the species and habitats of community interest present on the territory of the protected natural area ROSCI0277 Becicherecu Mic, ROSCI0109 Lunca Timișului, ROSPA01258 Lunca Timișului, ROSPA0047 Hunedoara Timișană within the area the project is located.

Please note that for the implementation of the projects mentioned above, the prevention, reduction and compensation measures specified in this study will be taken into account, and other forms of impact, more detailed for each taxonomy group

established in the project area, will be identified in the environmental impact assessment procedure.

Studiu Evaluare Adecvată

ROMANIAN ENERGY STRATEGY 2019-2030, WITH PERSPECTIVES FOR 2050

Appropriate assessment study _rev05

Tabel Analysis of the impact on Natura 2000 sites intersected by RES objectives, based on sensitivity and magnitude classes

Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
Nuclear energy	Completion of groups 3 and 4 at Cernavodă NPP	-					
Energy from renewable sources	Realization of a new energy group of 600 MW at Rovinari	-					
	Realization of a new energy group of 400 MW ultra supercritical parameters at Turceni	ROSCI0045 Jiu River Corridor		0.70	High	0.10	x
	Realization of a new energy group of 200 MW CCGT – Craiova II, pe gaz, cu funcționare flexibilă, inclusiv stocarea energetică în depozitul subteran Ghercești	-					
	Realization of a new energy group of 400 MW CCGT powered by fax with flexible operation Mintia	ROSCI0373 Mures River between Brănișca and Ilia		0.15	Low	0.81	
Hydroenergy	Realization of the hydroenergy plant with accumulation by pumping Tarnița-Lăpuștești	ROSCI0263 Valea Ierii	7.5		Very High	11.92	x
		ROSCI0427 Meadows at Liteni-Săvădisla	0.08		Very High	0.33	x
	Realization of the hydroenergy plant Răstolița 35 MW	ROSPA0133 Călimani Mountains	0.0008		High	0.0003	x
		ROSCI0019 Călimani-Gurghiu	0.5		Very High	0.04	x

ROMANIAN ENERGY STRATEGY 2019-2030, WITH PERSPECTIVES FOR 2050

Appropriate assessment study _rev05

Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
Realization of the hydroenergy plant Turnu Măgurele-Nicopole	the	ROSCI0006 Balta Mică a Brăilei		6.64	Low	3.21	
		ROSCI0022 Canaralele Dunării		3.14	Moderate	1.20	
		ROSCI0039 Ciuperceni - Desa		6.06	Moderate	1.53	
		ROSCI0044 Corabia-Turnu Magurele	1.4	4.75	Very high	5.69	x
		ROSCI0045 Jiu Corridor		6.34	Moderate	0.89	
		ROSCI0065 Delta Dunării		0.47	Moderate	0.01	
		ROSCI0088 Gura Vedei - Șaica - Slobozia		8.90	Low	8.78	
		ROSCI0131 Oltenița - Mostiștea - Chiciu		5.24	Low	4.55	
		ROSCI0173 Padurea Stârmina		0.05	Low	0.18	
		ROSCI0206 Porțile de Fier		14.57	Moderate	1.16	
		ROSCI0278 Bordușani - Borcea		2.82	Moderate	4.82	
		ROSCI0299 Dunărea la Gârla Mare - Maglavit		4.26	Low	4.49	
		ROSCI0306 Jiana		0.77	Low	0.58	
		ROSCI0319 Mlaștina de la Fetești		0.91	Low	4.30	
		ROSPA0005 Balta Mică		6.67	Moderate	2.59	

ROMANIAN ENERGY STRATEGY 2019-2030, WITH PERSPECTIVES FOR 2050

Appropriate assessment study _rev05

Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
		a Brăilei					
		ROSPA0011 Blahnița		6.33	Moderate	1.44	
		ROSPA0012 Brațul Borcea		4.93	Moderate	3.71	
		ROSPA0013 Calafat - Ciuperceni - Dunăre		5.12	Moderate	1.74	
		ROSPA0017 Canaralele de la Hârșova		2.04	Moderate	2.79	
		ROSPA0021 Ciocanești - Dunăre		0.02	Moderate	0.28	
		ROSPA0023 Confluența Jiu - Dunăre		2.77	Moderate	1.42	
		ROSPA0024 Confluența Olt - Dunăre		3.58	Moderate	1.75	
		ROSPA0026 Cursul Dunării - Baziaș - Porțile de Fier		8.06	Moderate	7.80	x
		ROSPA0031 Delta Dunării și Complexul Razim - Sinoie		0.72	Moderate	0.01	
		ROSPA0038 Dunăre - Oltenița		2.45	Moderate	4.13	
		ROSPA0039 Dunăre - Ostroave		2.81	Moderate	1.73	
		ROSPA0046 Gruia - Gârla Mare		0.84	Moderate	2.83	
		ROSPA0074 Maglavit		1.17	Moderate	3.22	

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Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
		ROSPA0080 Munții Almăjului - Locvei		7.20	Moderate	0.61	
		ROSPA0090 Ostrovu Lung - Gostinu		2.00	Moderate	7.86	x
		ROSPA0102 Suhaia		2.16	Moderate	4.79	
		ROSPA0108 Vedeia - Dunăre		4.62	Moderate	2.06	
		ROSPA0135 Nisipurile de la Dăbuleni		2.37	Moderate	2.15	
		ROSPA0136 Oltenița - Ulmeni		2.40	Moderate	1.93	
	Realization of hydroenergy power plants on Jiu River 90 MW	ROSCI0063 Jiu defile	0,008		Very high	0.01	
	Realization of hydroenergy power plants on Olt River 145 MW	-					
Energy transmission	New OHL 400 kV d.c. (with an equipped circuit) between the existing stations Smârdan and Gutinaș	ROSCI0162 Lunca Siretului Inferior	0.0027		Very high	0,001	
		ROSPA0071 Lunca Siretului Inferior	0.0011		High	0.0003	
	New OHL 400 kV d.c. between the existing stations Cernavodă and Stâlpu, with an entry/exit circuit at 400 kV Gura Ialomitei station	ROSCI0022 Canaralele Dunării	0.0006		Very high	0.0002	

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Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
	Extension of the 220/110 kV Stâlpu station by building a 400/110 kV station						
	OHL 400 kV Porțile de Fier – Anina – Reșița	ROSCI0206 Porțile de Fier	0.4		Very high	0.03	
		ROSCI0198 Platoul Mehedinți	0.17		Very high	0.03	
		ROSCI0069 Domogled - Valea Cernei	0.2		Very high	0.03	
		ROSCI0226 Semenic - Cheile Carașului	0.1		Very high	0.03	
		ROSCI0031 Cheile Nerei-Beușnița	0.1		Very high	0.03	
		ROSPA0080 Munții Almăjului - Locvei	0.3		High	0.03	
		ROSPA0086 Munții Semenic - Cheile Carașului	0.1		High	0.03	
	ROSPA0020 Cheile Nerei - Beușnița	0.1		High	0.02		
	New OHL 400 kV d.c. between the existing stations Reșița (Romania) and Pancevo (Serbia)	-					
Switch to 400 kV of OHL 220 kV d.c. Reșița-Timișoara-Săcălaz-Arad	-						
Extension of the station 220/110 kV Reșița by	-						

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Investment category	Objective	Natura 2000 Site potentially affected	Affected area		Sensitivity	Magnitudde	Natura 2000 site possibly significantly affected
			sit	buffer			
	building a new station 400/220/110 kV Reșița						
	Replacing the 220/110 kV Timișoara station by building a new 400/220/110 kV station	-					

Studiu Evaluare Adecvare

V. IMPACT AVOIDANCE AND MITIGATION MEASURES

V.1 IMPACT AVOIDANCE AND MITIGATION MEASURES

Over the next few years, projects proposed for funding under the RES 2019-2030, with perspectives for 2050, will go through successive stages of planning, design and implementation that require consideration of the implementation of the next set of measures to avoid and reduce the impact on the national network of Natura 2000 sites. Some of the RES projects (phased projects) have already undergone environmental impact assessment and / or appropriate environmental assessment procedures, with their regulatory acts containing a number of measures to avoid and mitigate the impact. Therefore, below we present a part of these studies: Government Decision 737/2013 on issuing the Environmental Agreement for the project "Continued construction works and completion of units at Cernavodă NPP", Adequate evaluation study for: "Overhead power line 400 kV Porțile de Fier- Anina- Reșița, the section on the territory of Porțile de Fier Natural Park"³⁹, "Overhead power line 400 kV Porțile de Fier- Anina, the section on the territory of the National Parks Cheile Nerei-Beușnița and Semenic - Cheile Carașului"⁴⁰, " Overhead power line 400 kV Porțile de Fier- Anina- Reșița, the section on the territory of the geopark Platoul Mehedinți"⁴¹.

For the latter, in case of changes, it will be necessary to complete the bordering stage.

General actions for implementation of certain types of investments:

- MG1 – Phasing construction works of projects from the same location or located in adjacent areas and correlating the measures of prevention, reduction, compensation (if necessary) with those established after evaluations for other strategies, plans and programs;
- MG2 – Approaching all the aspects that relate to the stage of construction during the evaluations of the environmental impact starting from the location of the site organization up to the areas of deforestations (if they are absolutely necessary for the project), the quarries and/or cement trucks that will be opened for obtaining raw materials, construction of technological roads, utility supply;
- MG3 – Avoiding the placement of projects inside or in the immediate vicinity of protected natural areas; if this cannot be avoided, to establish the necessary measures according to the management plans for protected areas or by applying measures of avoidance, compensation of the significant environmental impact established in the adequate evaluation procedure;
- MG4 – Execution of environmental management plans for projects so that during these works (stage of design, construction and operation), the environmental performance can be evaluated.

³⁹ Beneficiary: SC Transelectrica SA – ST Timișoara, septembrie 2011, elaborator SC Acer SRL;

⁴⁰ Beneficiary: SC Transelectrica SA – ST Timișoara, September 2011, drafted by SC Acer SRL;

⁴¹ Beneficiary: SC Transelectrica SA – ST Timișoara, septembrie 2011, elaborator SC Acer SRL;

Specific measures recommended for preventing and reducing the negative environmental impact in relation to the relevant environmental elements presented in the following table:

Crt. no.	Environmental element	Specific measures recommended to prevent and reduce the negative environmental impact	
1.	Air	MS1	Selecting the locations so that the transportation distances are minimal
		MS2	Avoiding sensitive areas in terms of air quality, so that the localization of projects that involve high emissions of atmospheric pollutants is made during construction or in the stage of operation
		MS3	Adjustment of the design solutions by taking into account the climatic changes;
2.	Water	MS4	Excluding areas exposed to floods for sites targeted by the project; if this cannot be avoided, the project will include the necessary measures for protection against floods;
		MS5	Avoiding the implementation of projects that might alter the chemical state of water bodies and of their potential/ecological state;
		MS6	Selecting the site of a project by considering all the uses of the water downstream the implementation area, during execution or included in some plans or programs (e.g. sources of drinking water, sources of industrial water, irrigations);
3.	Soil	MS7	Limiting the temporarily occupied land areas (during the construction);
		MS8	Analysing the opportunities of changing the categories of use of the lands for implementing projects so that the activities in the area are not affected;
		MS9	Rehabilitation of the locations of working points after the completion of construction works
4.	Biodiversity	MS10	Restriction on the use of machines and vehicles and manual execution of works in areas or during periods when wildlife species are vulnerable;
		MS11	Creating fauna migration opportunities;
		MS12	Providing biological corridors/passages for the movement of the fauna;
		MS13	Execution of construction works outside the reproduction season of protected animals identified in the area of works;
5.	Population and human health	MS14	Implementing air quality, water quality and noise monitoring programs in areas where the projects might cause discomfort and risk for the population, during the construction and during operation, for adopting the adequate measures for reducing the impact on human health;
		MS15	Reducing the acoustic pressure level in residential areas close to future objectives that would generate a potential discomfort to the population;
		MS16	Reducing the risks for the health of workers by technical measures (using new, efficient and reliable machines/equipment) and organizational measures. For new projects, to take into account the location of the high voltage lines by observing the provisions of ANRE Order no. 49/2007

Crt. no.	Environmental element	Specific measures recommended to prevent and reduce the negative environmental impact	
			for human health protection;
6.	Economic and social environment	MS17	Development and implementation of traffic management plans during the construction works (for infrastructure works);
		MS18	Implementation of non-structural measures for preventing the risk of flood;
		MS19	Avoiding interferences with various infrastructures by coordinating the projects from the same area;
7.	Cultural patrimony and landscape	MS20	Including in projects measures to protect objectives with proiecte a unor măsuri pentru protejarea obiectivelor cu valoare culturală, arhitectonică
		MS21	Choosing sites for projects so that the impact on areas with special visibility from recreational, touristic, residential areas is minimum.

The proposed measures are formulated in a general manner to cover the requirements of the variety of projects proposed to be financed under the RES 2019-2030, with perspectives for 2050.

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Component / impact type	Measure code	Measure description	Expected result
Planning, design and evaluation of impact	M1	Strategic environmental assessment, environmental impact assessment and appropriate assessment should be started from the earliest phases of design and continued through the development and implementation of projects, especially for those project proposals that may have an impact on Natura 2000 sites.	Reducing costs for the environment associated with the projects
	M2	For all new projects involving constructions within or near the Natura 2000 sites, appropriate assessment studies are required. Based on these studies, the areas of habitats (Natura 2000, community interest species) affected by project implementation (including areas corresponding to avoidance / mitigation / mitigation measures) must be clearly identified and the proposal of avoidance / reduction / compensation measures must consider the ecological requirements of each species or habitat of community interest. In the case of phased projects for which the appropriate assessment phase has already been carried out but undergoes changes, it will be necessary to re-take the bordering stage.	
	M3	For all projects involving constructions within or near the Natura 2000 sites, it is recommended to adopt a worksheet that aims to plan the performance time of the works so as not to affect the critical areas for species of Community interest (for example, to avoid works in the breeding / nesting months of bird species, hibernation / breeding months of small mammals - ground squirrel, during the months when amphibians lay eggs, during the spawning period for fish)	Avoidance of occurrence of impacts
	M4	In designing routes and constructive solutions for transport infrastructure, environmental protection and risk management, i.e. energy and energy efficiency, the hierarchy of options for implementing measures should be: avoiding impacts on Natura 2000 sites, mitigating impacts, and compensating impacts when first two options (avoidance and reduction) are not enough. In Natura 2000 sites, the habitats to be affected (Natura 2000 habitats and habitats of species of Community interest) as a result of the proposed projects will have to be subject to compensation measures, which are set in the appropriate assessment procedures, implementing them before the actual start of the projects. Compensatory measures must be the last option as a result of: the uncertainty about the actual “recovery” of the lost ecological goods and services, the high implementation costs, and the length of time that the expected results are produced.	
Loss of habitats	M5	Avoid placing projects on the surface of protected natural areas (including protected natural areas outside the Natura 2000 network).	

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Component / impact type	Measure code	Measure description	Expected result
	M6	Where it is not possible to avoid the placement of proposed projects within protected natural areas, the options available for avoiding sensitive areas within a protected natural area (Natura 2000 habitats, important areas for the reproduction and shelter of species of community interest, wild areas where the anthropic influence is reduced).	Avoiding harm to the components of Community interest
	M7	Minimizing the associated / additional activities that will be generated as a result of the implementation of the proposed projects within and in the immediate vicinity of Natura 2000 sites and, in particular, avoiding them being proposed within sensitive areas (Natura 2000 habitats, critical areas for species of interest Community).	Impact reduction on Nature sites 2000
	M8	Compensation for habitats losses (compensation refers both to the actual loss of habitat and to habitat areas that undergo structural or functional changes due to human presence, increased noise levels, atmospheric pollution or other forms of alteration / disturbance). The calculation of the compensated areas is done both for the Natura 2000 habitats losses and for the loss of habitats used for food, rest and reproduction purposes by species of community interest (basically the areas occupied by these species within Natura 2000 sites). Compensation of these areas will be achieved pursuant with the Law 46/2008 - Sylvan Code, and when this may not be achieved, compensation is required in order to cover losses (the compensation ratio must provide the new surfaces / components with time to reach the structural and functional level of the lost ones).	Loss compensation
Alteration of habitats	M9	In order to minimize the affected areas during construction work, we recommend that site organizations, borrow pits, stockpiles, etc. be located outside Natura 2000 sites (not to be located on areas occupied with Natura 2000 habitats or critical areas for species of community interest)	Impact reduction on habitats
	M10	For all proposed projects, it is mandatory to carry out a waste prevention program and to applying a waste management plan to ensure a sustainable waste management for ensuring a sustainable waste management during the construction period during the execution of the activity/closing/post-closing of the activity.	
	M11	For all proposed projects, with the exception of ecological reconstruction, the use of any type of natural resource within Natura 2000 sites should be avoided.	
	M12	For all projects involving “green reconstruction” (grassing, planting, reforestation, rehabilitation, etc.), an “Ecological Reconstruction Plan” will be developed to implement them (in the case of projects that may affect one or more Natura 2000 sites, the plan must	

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Component / impact type	Measure code	Measure description	Expected result
		provide punctual solutions for each of the habitats and species of affected sites) to prevent the use of allochthonous species as well as the installation of invasive species in areas temporarily affected by construction works and subsequently subject to restoration work.	
	M13	In future projects, it is recommended to include technical solutions to avoid contamination by infiltration, uncontrolled leakage or sediment transport by water currents in bodies of water (ground and surface) from within or near the Natura 2000 sites, as well as upstream of surface water courses (untreated rainwater loaded with particulate matter, petroleum products, salts, etc., accidental pollution followed by leakage of hazardous substances to the environment, etc.).	Avoiding impact on aquatic components
	M14	Inclusion of measures to avoid occurrence of invasive species and their control over the newly created infrastructures / investment objectives in the responsibilities of the beneficiaries of the proposed projects.	Control of invasive species
Fragmentation of habitats	M15	For projects proposed within or adjacent to Natura 2000 sites, which have the potential to limit the transit or migration of species), feasible technical solutions based on field studies and investigations will be identified and proposed constructive solutions (fish scales, sub-crossings - culverts, over-crossings - ecoducts, passageways etc.) ensuring the highest permeability and avoiding the interruption of connectivity between the habitats of community-interest species (following the general principle: the transport infrastructure must not discontinue the connectivity of the ecological infrastructure).	Ensure a high degree of permeability for species of Community interest
	M16	It is advisable to avoid any changes to the water flow, water bed, or substrate, which could significantly affect species of community interest strictly dependent on water (mainly fish species, amphibians, tube-shells, etc.) by construction works or other interventions in surface water bodies (for example, in the case of flood protection works, it is recommended for adjustment operations to minimize, to the strict minimum, cutting of elbows that can change the flow of the river by increasing slopes, and consequently flow rates, etc.; making dams will be made so that construction works do not directly affect the aquatic and / or riparian habitats, etc.).	Avoiding change of habitat requirements
Death rate	M17	For all proposed projects within or near the Natura 2000 sites, it is necessary to identify and include feasible constructive solutions (e.g. sub / over-crossings) or other types to avoid the occurrence of significant effects on populations as a result of a high mortality	Reducing rates of mortality for species

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Component / impact type	Measure code	Measure description	Expected result
		due to collisions, both during the construction period and in the operation of the investment objectives. It must also provide for additional solutions (e.g. where species of Community interest are represented by birds or bats, screens are required to prevent the penetration of these species in flight into the collision zone with the LEA lines).	of Community interest
	M18	In the case of existing rehabilitation / extension projects, it is recommended to include solutions to reduce mortality and ensure the permeability of species of fauna of Community interest, along the lengths of Natura 2000 sites.	Reducing current rates of mortality for species of Community interest
Disruption of activity of the species of Community interest	M19	For all proposed projects within or near the Natura 2000 sites, it is necessary to apply technical solutions to limit the increase in noise levels, especially at the level of critical areas for species of Community interest, both at the existing infrastructure and for all projects (e.g., as a precautionary approach, the maximum value of 40 dB including background noise and project noise must be taken into account at critical area levels for protected species within Natura 2000 sites) so that there are no losses of the territories / habitats favourable to these species.	Reducing disturbance due to noise
	M20	Avoiding the location of LEA lines (in the case of expansion projects) in the direction of SPAs, given the high distances that disturbance to birds due to noise may occur as well as the risk of collision.	
Monitoring and additional measures	M21	For all proposed projects within or around Natura 2000 sites, it is necessary to implement multi-annual monitoring programs for the assessment of residual impacts as well as the success of the implemented avoidance / reduction / compensation measures.	Control of impacts generated by the proposed investments on Natura 2000 network
	M22	For projects targeting temporary impact on land plots, it is necessary to provide long-term monitoring and control programs for invasive species (depending on the results of the evaluations at the project level, this may mean also during the entire project life cycle).	
	M23	In the case of rehabilitation projects that can target buildings, both inside and outside Natura 2000 sites, attention should be paid to the presence of species of community interest. In the case of the presence of bats or nesting birds, measures must be taken to avoid disturbance during nursing / nesting periods as well as to avoid the occurrence of some victims.	Avoiding impacts on Natura 2000 species outside the sites

V.2 MONITORING

The implementation of the monitoring program should start with the implementation of the energy production and transport objectives, but the purpose of the monitoring program should be established from the start of the development of each project, during the planning and design phase.

Assessing the effectiveness of avoidance, reduction and compensation measures (where appropriate) consists of implementing monitoring programs to identify whether or not the measures meet the purpose for which they were proposed.

The monitoring program should:

- ❖ include frequent observations on the conservation status of the habitats and species for conservation of which Natura 2000 sites have been designated to confirm that they have not been affected by the project implementation and that the proposed avoidance / reduction / compensation measures have been effective in avoiding any deterioration in the conservation status of the target species and habitats;
- ❖ identify unforeseen issues that could not be anticipated in the planning stages of a project;
- ❖ to include procedures to allow corrective or adaptive measures to be implemented to respond to unforeseen problems.

The purpose, objectives, timing and degree of detail of a monitoring program depend on the type and complexity of the project as well as the characteristics of the Natura 2000 site (s) affected by its implementation and should be established at the project planning stage and re-evaluated at intervals (for example, for hydroenergy projects that may affect Natura 2000 sites, monitoring during the operational phase should be carried out for a minimum of 3 years; monitoring programs will also need to be implemented for projects targeting rehabilitation / upgrading of existing hydroenergy infrastructure, etc.).

It is advisable to develop detailed procedures for each project category covered by the RES 2019-2030, with perspectives for 2050, to ensure that the results of the monitoring programs of the different projects are comparable.

The following two key components have to be taken into account in the process of developing the monitoring programs:

- ❖ Monitoring of measures (routine monitoring): focuses on verifying and controlling the effectiveness of proposed measures by measuring local variables (e.g. number of fish species using the fish migration corridor), checking the construction and maintenance standards and assessing the way in which they fulfil their purpose, and when non-conformities are recorded, corrective measures can be applied to solve the identified problems. Examples of activities that can be included in this type of monitoring: identify the extent to which constructive solutions are used by species of fauna of Community interest and frequency of use; recording the number of victims and locating "black spots" where a high number of deaths are recorded; verifying the noise reduction efficiency in a given area by implementing sound absorbing panels; verifying how a new habitat made as a compensation measure is used by the target species, etc.;

- ❖ Monitoring the effects of measures on habitats and species of community interest: focusing on the ecological effects of the proposed avoidance / reduction / compensation measures and identifying changes in habitats, the distribution of species of community interest, population dynamics, genetic diversity etc., the characteristics of habitats and species of community interest, as well as the natural processes recorded after the construction of a particular project, compared with the initial conditions. Thus, this type of monitoring requires longer-term and larger-scale approaches. Examples of activities that can be included in this type of monitoring: changes in species behavior due to disturbance generated by increased noise levels; changes in the distribution, composition and quality of habitats adjacent to proposed projects due to airborne pollutants generated; changes in the migration routes of aquatic species due to the change in water flow regime; the incidence of mortality caused by the proposed projects and the effects on population dynamics of the target species.

Given the level of detail of RES 2019-2030, with perspectives for 2050, the fact that it includes a series of projects to be implemented at the level of the entire national territory, of which the localization of some of them is not yet known at present, a detailed program for monitoring the effects of all projects on Natura 2000 sites can be proposed, but a relevant set of monitoring indicators of RES 2019-2030, with perspectives for 2050 is proposed, to be calculated based on the results of the individual monitoring programs at each project level. The necessary information and data will be provided by the individual project owners, as well as the custodians / administrators of the Natura 2000 sites and the environmental authorities.

In order to ensure the coherence of the appropriate assessment across the operational programme, the set of proposed monitoring indicators will have to be considered not only for new projects but also for phased projects that have undergone the appropriate evaluation procedure.

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Tabel 14 Monitoring and control indicators of the environmental effects under RES 2019-2030, with perspectives for 2050

Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
Air	OM.1 Improving air quality by reducing emissions from energy sector activities;	Emissions of pollutants into the atmosphere (CO _x , NO _x , SO ₂ , suspended particles, heavy metals, VOCs, PAHs) resulting during the construction period of projects proposed by SER 2019-2030 in the perspective of 2050 year	Quarterly measurements in the execution phase; Half-life measurements in the operating phase;	By implementing the projects, in the execution phase, pollutant emissions may have values that exceed the admissible limits established by the legislation on ambient air quality but in the operational phase they will have a significant decrease from the current situation by implementing technologies non-polluting (super-critical and ultra-supercircuit parameters in the case of thermo-power plants);	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary; Competent authority for the environmental protection;
Water (surface and ground water)	Improving water quality by reducing emissions from energy sector activities;	Changes produced in the hydro-geo-morphological regime associated with the energy sector - number of watercourses / lakes on which hydropower arrangements are made, number of temporary works in the riverbed in the execution phase of works;	Quarterly, in the execution phase, for projects proposed by SER 2019-2030, with the prospect of 2050, by sampling water from wastewater/possibly thermally polluted water evacuation stations; Semesterly, in the operational phase, for the projects	Maintaining the admissible limit values for the wastewater evacuation - NTPA001; Changes may occur in the minor water course morphology in the dynamics of the flowing, due to the construction of hidropower plants;	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary;; Competent authority for the environmental protection; Competent authority for water field;

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Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
	OM.3 Maintaining the ecological state of the flowing waters (Water Framework directive);		proposed by the SER 2019-2030, in the perspective of the year 2050, by sampling water from the wastewater evacuation station During the design and execution phase;		
Soil	OM.4 Limiting and reducing the point pollution of the soil; OM.5 Menținerea stării ecologice a solului	Emissions of pollutants into the atmosphere (COx, NOx, SO2, suspended particles, heavy metals, VOCs, PAHs) resulting from the construction of projects proposed by SER 2019-2030 with 2050 perspective; Number of accidental recorded pollution and affected areas (as a result of the projects proposed by SER 2019-2030, with the perspective of 2050); The amount and type of substances that caused accidental pollution;	Quarterly measurements in the execution phase; Hald-yearly measurements in the operation phase; Annually, both in the execution and operation phase	The evolution of pollutant emissions into the atmosphere may lead to an estimate of soil quality evolution;; This indicator is relative, the number of accidental pollution does not entirely depend on the design of the investments proposed by the Strategy, which may also be caused by human errors, means of transport etc.	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary; Competent authority for the environmental protection;
Climatical changes	OM.6 Reducing greenhouse gas emissions from the energy sector in order to meet EU targets;	Emissions of greenhouse gas (CH4, N2O, NOX, CO, CO2, NMVOCs) reported to the objectives that use coal as basic material;	Quarterly measurements in the execution phase; Hald-yearly measurements in the	Achieving this objective depends more on facilitating the placing on the market of alternative fuels, the development of	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary;

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Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
		The number of incidents caused by extreme weather conditions (floods, low / high temperatures, etc. land slides in the project area);	operation phase; Yearly	alternative fuels, the improvement of the operation technology for thermal power objectives; The situation will be compared with the one prior to the project	Competent authority for the environmental protection;
Biodiversity	<p>OM.7 Conservation of flora and fauna habitats of Community importance;</p> <p>OM.8 Maintaining the national network of protected natural areas;</p>	<p>Natura 2000 Habitats inside the sites of community interest lost/alterd by the implementation of projects from RES 2019-2030, with perspectives for 2050;The areas of Natura 2000 (ha) habitats inside the sites of community interest reversibly affected by construction works for projects from RES 2019-2030, with perspectives for 2050;The death rate of species of fauna/flora of community interest inside Natura 2000 sites resulting from the operation of the projects from RES 2019-2030, with perspectives for 2050 (no. of copies);</p> <p>Number of protected areas intersected by projects proposed from RES 2019-</p>	In the stage of execution and in the stage of operation through monitoring programs targeting various stages from the biological cycle, according to each class of organism	The localization of projects (those for which the site was not yet determined) will avoid as much as possible to cross protected natural areas or where possible the occupation rate to be minimal and not to affect the habitats; For those located in protected natural areas, measures of compensation will be proposed according to the occupied area and the species of flora and fauna encountered in those areas;	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary; Competent authority for the environmental protection;

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Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
		2030, with perspectives for 2050;			
Landscape	OM.9 Protection and conservation of the natural landscape;	The surface areas of protected areas affected (ha) by the projects proposed by RES 2019-2030 with perspectives for 2050 reported to the total area of Natura 2000 network; All the landscape transformations that could appear as a result of the projects proposed by RES 2019-2030 with perspectives for 2050 (land areas permanently or temporarily occupied, deforested areas, number of obsolete buildings); Number of archaeological sites opened on various sections of the investments proposed after discovering archeological sites etc.;	In the stage of execution and in the stage of operation by specific annual measurements;	The land areas permanently occupied by the projects proposed by RES 2019-2030 with perspectives for 2050; During the stage of execution and during the stage of operation by specific annual measurements. In the stage of design, measures will be taken to limit the negative effects on the Natura 2000 habitats that will be applied during the stage of execution and during the stage of operation. If the implementation of the measures does not yield the expected results, these will be permanently adjusted to the site situation. At the completion of the execution, the habitats will be recovered by compensatory measurements;	Ministry of Energy through the subordinated structures, in capacity of Beneficiary; Competent authority for the environmental protection; Competent authority for evaluation of the national cultural patrimony;
Cultural aspects	OM.10 Preservation and conservation of cultural heritage;		In the stage of design, measures will be taken to limit the negative effects on the Natura 2000 habitats that will be applied in the stage of execution and in the stage of operation. If the implementation of measures does not yield the expected results, these will be adjusted permanently to the site situation. At the completion of the execution, the habitats will be recovered by compensatory measurements;		
	OM.11 Preservation and		During the		

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Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
	conservation of local traditions and customs;		construction works;		
Conservation of natural resources	OM.12 Reducing the exploitation of depleting resources and facilitating the use of renewable resources	Quantity of alternative fuels used (tons equivalent of petroleum product)	Yearly	Measures can be taken in the stage of design to equip the installations using exhaustible resources with technologies/installations that can also use alternative fuels; The data will be compared with the data from the period before the implementation of the projects;	Ministry of Energy through the subordinated structures, in capacity of Beneficiary;
Waste	OM.13 Reducing the amount of waste generated and increasing recycling/recovery for all types of waste;	The quantity of waste generated (tons/year) – for the projects proposed by RES 2019-2030 with perspectives for 2050 calculated to the built area; The quantity of waste reused or recovered by recycling (tons/year) – for the projects proposed by RES 2019-2030 with perspectives for 2050 calculated at the built area;	Quarterly, during the period of execution and yearly during the period of operation.	Reporting the quantity of waste generated during the period of execution and the period of operation;	Ministry of Energy through the subordinated structures, in capacity of Beneficiary; Competent authority for the environmental protection;
Population and human health	OM.14 Decrease of pollutants in the air, but not only, and improvement of the health of the population; OM.15 Using clean (performant) technologies that generates as few risks	The number of accidents and the number of persons affected by the implementation of the projects proposed by RES 2019-2030, with perspectives for 2050;	Yearly	Measures for protecting the population against the risks associated to thermal energy objectives will be adopted, and the measures will be implemented by the contractors.	Ministry of Energy through the subordinated structures, in capacity of Beneficiary; Territorial Labour Inspectorate;

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Environmental issues	Relevant environmental objective for SER 2019-2030, in the 2050 perspective	Monitoring indicators	Frequency	Description	Responsible
	for the staff from the industrial units;	The number of persons that could be exposed to high concentrations of pollutants from the project implementation area; The number of professional illnesses and profession-related illnesses that could appear as a result of implementation of the projects.		It is estimated a reduction of the number of accidents within the energetic sector; The data will be compared with the reference scenario;	Competent authority in the field of health;
Transport	OM. 16 Facilitation of infrastructure for the provision of electric transport; OM.17 Ensure transport conditions to meet EU targets;	Number of vehicles that can use non-polluting fuels;	Yearly	-	Competent authority in the field of transport;
Energy efficiency	OM.18 Improving energy efficiency and sustainable use of resources to produce energy.	Number of projects for modernization/rehabilitatin/streamlining proposed by RES 2019-2030 with perspectives for 2050	Yearly	-	Ministry of Energy thorough the subordinated structures, in capacity of Beneficiary;

VI. METHODS USED FOR COLLECTING INFORMATION ABOUT THE POTENTIALLY AFFECTED SPECIES AND HABITATS OF COMMUNITY INTEREST

Considering the territorial extension of the RES 2019-2030, with perspectives for 2050, the strategic level of assessment approach and the fact that most of the projects that can be spatially located are in an early stage of development (indicative routes / locations), the following critical issues were considered:

- ❖ The analysis was carried out at national level through a site-by-site approach to ensure a unitary approach to evaluation;
- ❖ As a result of spatial expansion across the national territory, the study could not involve fieldwork for data and information gathering, relying mainly on GIS analysis: we mention that at this stage, the geographical area included, representative for the investment categories that contains the RES objectives is wider, and at the stage of evaluation of the environmental impact the geographical area will be more specific, located;
- ❖ The analysis included only those geospatial resources covering evenly and completely the national territory (e.g. limitations of protected natural areas, land use - CLC, etc.);
- ❖ The analysis also included the use of existing information in management plans approved so far, given the availability of Management Plans for most of the Natura 2000 sites;
- ❖ All information on the presence, flocks and pressures identified at Natura 2000 sites were extracted exclusively from the Natura 2000 standard forms, assuming that the data contained therein (updated in 2016) are complete, current and sufficient for the assessment to be carried out;
- ❖ The impact assessment was mainly made on the basis of the GIS analysis, quantifying the areas inside and the immediate vicinity of Natura 2000 sites that could be affected by the proposed projects;
- ❖ Distances and impact areas have been calculated in the plan, without taking into account the Digital Terrain Model.

For those phased projects where adequate assessment studies were available at a time prior to this study, we tried to take the conclusions of the evaluations even though their assessment methodology is not the same as used in this study.

This appropriate assessment study has been carried out taking into account the best practices that can be applied at this strategic level and our aim was to try to quantify as accurately as possible the main potential impacts on the national network of Natura 2000 sites. Such a target can be considered too demanding given the many assumptions and hypotheses taken into account and considering the level of analysis and the resources and information available.

It is very important to note that the results of this study should be interpreted with caution, as they represent only a "first overview" of the impact of the projects proposed for funding under RES 2019-2030, with perspectives for 2050 on the Natura 2000 network and not a detailed review of the impact on all types of habitats and species of community interest. The main limitations of this study are:

- ✓ The difficulty of accurate spatial localization of habitat types and species of community interest (the process of mapping and inventorying habitats and Natura 2000 species is currently ongoing and will last for a number of years);
- ✓ The routes / locations of the projects proposed for implementation are only indicative, many of them likely to undergo significant changes over the next period. We also specify that only the projects proposed for funding for which details of spatial location have been made available or could be deduced from existing studies have been considered in the analysis;
- ✓ The sensitivity of areas within Natura 2000 sites was assessed by considering the percentage of habitats and species present on each type of land use compared to the total number of habitats and species of community interest existing in each site. The chosen method is the best approach used to provide the widest possible picture of the impact of the implementation of the proposed projects under RES 2019-2030, with perspectives for 2050 on the national network of Natura 2000 sites but may not give a picture of the importance of site territories for each type of habitat and each species of community interest (that is, according to the methodology used, we considered that a site affected on a surface of 5% would have an insignificant impact, without knowing if within 5% of the affected area of the site could not find the entire territory of a habitat or species and thus the impact would be significant at the latter level). Such analysis can only be carried out at the level of a site or project;
- ✓ Conventional spatial location of habitats and species (depending on the type of land use) is a prudent approach (not taking into account the spatial extent of habitats indicated in the standard form, considering, for example, that any grassland habitat can be found on all grassland areas in the site), but inefficient in accurately locating the really critical areas to maintain the habitats and species for which the site was designated;
- ✓ The GIS analysis was based on the use of standard project sizes as well as impact distances. It is obvious that such an approach may in some cases cause overestimation and, in other cases, underestimations of the impact generated.

All these limitations in the case of the present study have made it impossible to estimate the impact for each type of habitat and each species of community interest, and at this level of analysis, the study proposes alternatives (that of non-implementation of RES 2019-2030, with perspectives for 2050 and the one presented in this study) to the reviewed projects, but may suggest areas where we must intervene at the level of projects to avoid significant impacts.

VII. CONCLUSIONS

The analysis carried out in this study allows us to draw the following conclusions:

- ❖ In this paper, the potential impact caused by the implementation of the energetic objectives on the network of protected natural areas Natura 2000 of Romania was theoretical, based on the specific data identified in specialized studies and in other sectoral works developed at national level;
- ❖ For objectives for which the exact locations are known, protected natural areas were identified as well as their surface areas that can be a potential impact in the stage of execution, but the potential impact in the stage of operation could not be estimated;
- ❖ The extent to which Natura 2000 network will be affected by the energetic objectives is hard to tell for sure, but, insofar as this paper targets the objectives which are part of a strategic national work, the clear impact of each activity will be quantified when the objectives will be in the stage of project;
- ❖ All potential significant negative impacts identified can be avoided by a proper project impact assessment as well as the cumulative assessment at each site level and the correct application of the avoidance and reduction measures proposed in this study based on these assessments.
- ❖ Natura 2000 sites most exposed to potential significant negative impacts are those with small areas (<1000 ha) for which, however, avoidance solutions can be identified (avoiding project placement);
- ❖ The study reviewed the main impacts on Natura 2000 habitats and species, grouped into the following categories: habitat loss, habitat alteration, disruption of species activity, mortality and disruption of connectivity;
- ❖ The evaluation highlighted the fact that some of the projects under RES 2019-2030, with perspectives for 2050, that do not intersect Natura 2000 sites may have negative effects on both habitats and species within sites as well as on favourable habitats of species of community interest in immediate proximity of the sites. This also calls attention to the proposed projects in the immediate vicinity of Natura 2000 sites (<1 km) and their management in a similar way to those that cross Natura 2000 sites. 5 projects are less than 1 km from the Natura 2000 site limit.
- ❖ Most of the potential significant impacts can be avoided by reconsidering project locations and positioning them outside the Natura 2000 sites (preferred option for small-scale sites) or, where appropriate, outside areas occupied by habitats and species of community interest (an option for sites that occupy large areas and that already incorporate a significant level of anthropogenic presence). For situations where it is not possible to avoid the intersection of Natura 2000 sites or critical areas within them, it is necessary to consider measures to reduce and, where appropriate, compensate any significant impacts; an example of such a compensation measure falls in the category of investment energy transportation; for cut down areas, replantations are necessary, by mutual agreement with the Forest Administrations and the National Agency of Protected Areas/Romsilva – National Forest Administration (the entities managing these sites) from the affected areas, 1/1 and with the same species that will be cut down.

- ❖ Measures to reduce negative impacts should focus on: avoiding habitat loss and alteration, maintaining ecological connectivity, avoiding disturbance of the activity of fauna species, and avoiding mortality among them.
- ❖ Compensation measures should be taken into account for all projects that will lead to the loss of Natura 2000 habitats or critical habitats of species of community interest within Natura 2000 sites.
- ❖ The evaluation methodology chosen in the present study is the best approach used, at this time of strategic environmental evaluation, to provide the widest possible picture of the impact of the implementation of the proposed projects under RES 2019-2030, with perspectives for 2050 on the national network of sites Natura 2000. The main limitation is the impossibility of capturing the spatial location and the requirements of each type of habitat and of each species of community interest (in other words, according to the methodology used, we considered that a 5% affected area of a site would have an insignificant impact, without knowing if within 5% of the affected area of the site could not be found the whole territory of a habitat or a species and thus the impact on them would be significant). Such an analysis can only be carried out at a site or project level, and recommendations have been made in the study to allow a consistent interpretation of the results of appropriate evaluations of the subsequent projects under RES 2019-2030, with perspectives for 2050.

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VIII. BIBLIOGRAPHY

1. Abbasi, S., Abbasi, N., 2000. The likely adverse environmental impacts of renewable energy sources. *Applied Energy* 65 (1-4), 121-144;
2. Abbasi, T., Abbasi, S., 2011. Small hydro and the environmental implications of its extensive utilization. *Renewable and Sustainable Energy Reviews* 15 (4), 2134-2143 (<https://www.sciencedirect.com/science/article/pii/S1364032110004193?via%3DiHub> accesat la 31.01.2019);
3. American Rivers, 2014 (<https://www.americanrivers.org/>);
4. Bergkamp, G., McCartney, M., Dugan, P., McNeely, J. și Acreman, M., 2000. Dams, Ecosystem functions and Environmental Restoration. Thematic Review II.1, prepared as an input to the World Commission on Dams, Cape Town;
5. Biodiversity and climate change (http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=COB_Module-3_Climate.pdf);
6. Bratrich, C., Truffer, B., Jorde, K., Markard, J., Meier, W., Peter, A., Schneider, M., Wehrli, B., 2004. Green hydropower: a new assessment procedure for river management. *River Research and Applications* 20 (7), 865-882;
7. Center for Biological Diversity (https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/coal/index.html);
8. Comisia Europeană – Renewable energy statistics/ro. Statistici privind energia din surse regenerabile (<https://ec.europa.eu/eurostat/statistics-explained/pdfscache/64880.pdf> accesat la 30.01.2019);
9. Crisp, D.T., Mann, R.H.K. & Cubby, P.R.. 1983. Effects of regulation of the River Tees upon fish populations below Cow Green Reservoir. *Journal of Applied Ecology* 20: 371- 386;
10. Dams and Development – A New Framework for Decision-Making. The Report of the World Commission on Dams, 2000 (https://www.internationalrivers.org/sites/default/files/attached-files/world_commission_on_dams_final_report.pdf accesat la 31.01.2019);
11. Evaluarea adecvată a impactului de mediu a Unităților 3 și 4 ale C.N.E. Cernavodă – Impactul asupra biodiversității – Raport final – REZUMAT. Institutul Național de Cercetare –Dezvoltare Delta Dunării, 2010 (http://www.mmediu.ro/beta/wp-content/uploads/2012/08/2012-08-10_centrala_cernavoda_studiuincdddrezumatromana.pdf accesat la 14.02.2019);
12. FAST DANUBE (<http://www.fastdanube.eu/ro>);
13. Formulare standard Natura 2000;
14. Frazier, S. 1999. Ramsar sites overview. Wetlands International, Wageningen;

15. Lejon, A. G. C., B. Malm Renöfält, and C. Nilsson. 2009. Conflicts associated with dam removal in Sweden. *Ecology and Society* 14(2): 4. [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art4/>;
16. Integrated management plan for protected areas Ciuperceni-Desa ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Danube, 2.392. Ciuperceni-Desa, 2.398. Balta Lată, 2.397 Balta Neagră http://www.mmediu.ro/app/webroot/uploads/files/2016-03-24_PM_CIUPERCENI-DESA.pdf;
17. Integrated management plan Cheile Nerei-Beusnita National Park (ROSCI0031 and ROSPA0020 Cheile Nerei-Beușnița) - http://cheilenerei.usab-tm.ro/docs/manag_p/PM%20PN%20Cheile%20Nerei-Beusnita%20%20Draft%201.pdf ;
18. Management Plan of the special birds protection area Balta Tătaru ROSPA0006 - http://www.mmediu.ro/app/webroot/uploads/files/2016-05-12_PM_ROSPA0006_Balta_Tataru.pdf ;
19. Management Plan of protected natural areas ROSCI0045 Coridorul Jiului, ROSPA0023 Confluența Jiu-Dunăre, ROSPA0010 Bistreț and the natural reservations Locul Fosilifer Drănic-2.391 și Pădurea Zăval-IV.33 http://www.coridoruljiului.ro/PM_ROSCI0045.pdf ;
20. Management Plan for protected natural areas ROSPA0099 Podisul Hârtibaciului, ROSCI0227 Sighișoara + Târnava Mare, ROSCI0144 Forest of holm and oak on the Purcărețului Hill, ROSCI0143 Forest of holm and oak from Dosul Fânașului, ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu Sud-Est, ROSCI0304 Hârtibaciu de Sud-Est, natural reservation Stejarii seculari from Breite - Sighișoara municipality, reservation Canionu Mihăileni, fluffy oak reservation - village Criș <https://www.natura2000transilvania.ro/library/upload/documents/2016-09-14-16-51-43-ac71b.pdf>;
21. Management Plan for the Geopark Mehedinți Plateau and Natura 2000 sites in its region: ROSCI0198 Mehedinți Plateau and ROSPA0035 Domogled-Valea Cernei- http://www.mmediu.ro/app/webroot/uploads/files/201623_PM_Geoparcul_Platoul_Mehedinți.pdf ;
22. Management Plan of Domogled-Valea Cernei National Park- http://domogled-terna.ro/planul_de_management.pdf ;
23. Management Plan of the Semenic-Cheile Carașului National Park, ROSCI0226 Semenic-Cheile Carașului, ROSPA0086 Semenic Mountains - Cheile Carasului and protected areas of national interest in their region - <http://pnsc.ro/wp-content/uploads/2018/10/Plan-managemnt-V2-2018.pdf> ;
24. Management Plan of ROSPA0071 Lunca Siretului Inferior and overlapped protected natural areas http://www.mmediu.ro/app/webroot/uploads/files/2015-12-29_PM_R_ROSPA0071_Lunca_Siretului_Inferior.pdf ;
25. Natura 2000 site management plan ROSCI0299 Dunărea la Gîrla Mare Maglavit <http://natura-ocrotita.ro/wp-content/uploads/2014/02/Plan-management-ROSCI0299-Dun%C4%83rea-la-G%C3%A2rla-Mare-Maglavit.pdf>;
26. Integrated management plan for ROSCI0109 Timiș River Meadow and ROSPA0095 Macedonia Forest - http://luncatimisului.ro/docs/Plan_de_management_integrat_ROSCI0109_si_ROSPA0095.pdf);
27. The revised management plan of Călimani National Park - <http://www.tasuleasocial.ro/wp-content/uploads/2016/08/Plan-de-management-Calimani-revizuit-Octombrie-2015.pdf> ;

28. Integrated Management Plan of Natura 2000 sites ROSPA0011 Blahnița, ROSCI0173 Stârmina Forest, ROSCI0306 Jiana and ROSPA0024 Gruia-Garla Mare, Only the body that overlaps partially with ROSCI0306 Jiana
http://www.mmediu.ro/app/webroot/uploads/files/201624_Plan_Management_Blahnița.pdf;
29. Renewable energy statistics/ro – Eurostat (<https://ec.europa.eu/eurostat/statistics-explained/pdfscache/64880.pdf>);
30. *Strategia Națională și Planul de Acțiune pentru Conservarea Biodiversității 2010-2020* (<http://biodiversitate.mmediu.ro/implementation/legislaie/politici/strategia-nationala-si-planul-de-actiune-pentru-conservarea-biodiversitatii/>);
31. Studiu de evaluare adecvată pentru Programul Operațional Infrastructură Mare 2014-2020;
32. Yüksel, I., 2010. Hydropower for sustainable water energy development. *Renewable and Sustainable Energy Reviews* 14 (1), 462-469 (<https://www.sciencedirect.com/science/article/pii/S1364032109001592?via%3Dihub> accesat la 31.01.2019);
33. Zeleňáková, M., Fijko, R., Diaconu, D.C., Remeňáková I., 2018. Environmental Impact of Small Hydro Power Plant – A Case Study. *Environments*, 5, 12.