Moldelectrica

Moldova-Romania Power Interconnection Project Feasibility Study

Part 1: Feasibility assessment and ESIA of the 1st priority project

Component A: Back to back (BtB) station at Vulcanesti and OHL 400* kV Vulcanesti-Chisinau

Task 6: Preliminary environmental and social analysis and ESIA scoping

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*In the contract the name of the Project is referring to a 330 kV OHL, see the justification in chapter 1.3

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List of Acronyms

AC	Alternative Current
ATUG	Autonomous Territorial Units of Găgăuzia
ATUT	Administrative-territorial Unit from Transnistria
CHP	Cogeneration Heating and Power Plant
CLO	Community Liaison Officer
DC	Direct Current
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EGO	Emergency Government Ordinance
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMF	Electro Magnetic Field
EMU	Environmental Management Unit
ENSTO	European Network of Transmission System Operators
EP	Equator Principles
EPA	Environmental Protection Agency
EPFIs	Equator Principles Financial Institutions
ESIA	Environmental and Social Impact Assessment
ESAP	Environmental and Social Action Plan
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
EU	European Union
FAO	Food Agriculture Organization
GD	Government Decision
HVDC	High Voltage Direct Current
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IFC	International Finance Corporation
IPPC	Integrated Pollution Prevention and Control
kV	kilo Volt
LACP/RAP	Land Acquisition and Compensation Plan/ Ressetlement Action Plan
LCP	Large Combustion Plant
MD	Republic of Moldova
MGRES	Thermal Power Plant in Transnistria
MO	Ministerial Order
MW	Megawatt
NGO	Non- Governmental Organization

OHL	Over Head Line
OPGW	Optical Ground Wire
PA	Protected Area
PIA	Project Impact Area
PIP	Public Information Policy
PRs	Performance Requirements
RO	Romania
SEP	Stakeholder Engagement Plan
SEA	Strategic Environmental Assessment
SCI	Sites of Community Importance
SPA	Special Protected Area
UCTE	Union for the Coordination of the Transmission of Electricity
UNDP	United Nations Development Program
VSC	Voltage Source Convector
WB	World Bank
WFD	Water Framework Directive
WHO	World Health Organization

1. INTRODUCTION

1.1 Proposed activity

The general objective of the project ***"Moldova - Romania Power Interconnection – Feasibility Study"*** is to present technical, economic, commercial, environmental and social feasibility studies, including other necessary documentations for Moldelectrica (client) in order to assess and approve the following investments:

- "Back to back " station Vulcănești and OHL Vulcănești - Chișinău;
- "Back to back" station and 330/400kV OHL Romania – Ungheni - Straseni;
- "Back to back" station and 400kV OHL Bălți - Suceava.

The first feasibility study will present the priority investment ***"Back to back"station Vulcănești and 400 kV OHL Vulcănești - Chișinău.*** The others two feasibility studies will be elaborated after the implementation successfully of the first Project.

The present ***ESIA Scooping Report*** is for the evaluation of the environmental and social impact of the first Project ***"Back to back" station Vulcănești and 400 kV OHL Vulcănești - Chișinău.***

1.2 Project location

The main elements of the proposed Project include 149 km overhead power line, a new sub-station "Back to back" and upgrading the current sub-station Chişinău 330/110/35 kV.

The station "Back to back" will be located in the existing sub-station Vulcănești 400/110/35 kV at about 8 km East of Vulcănești city.

The route of 400 kV OHL that connect the stations 400/110/35 kV Vulcăneşti and 400/330/110/35 kV Chişinău passes through six districts in the south part of Republic of Moldova: Chișinău, Ialoveni, Dubasari Hancesti, Cimișlia, Taraclia, Cahul and one Autonomus Territorial Unit of Găgăuzia.

The sub-station *Chişinău 330/110/35 kV* is situated at 6.0 km in the south part of Chişinău city. The distance is measured from the sub-station to the outskirts of the city.

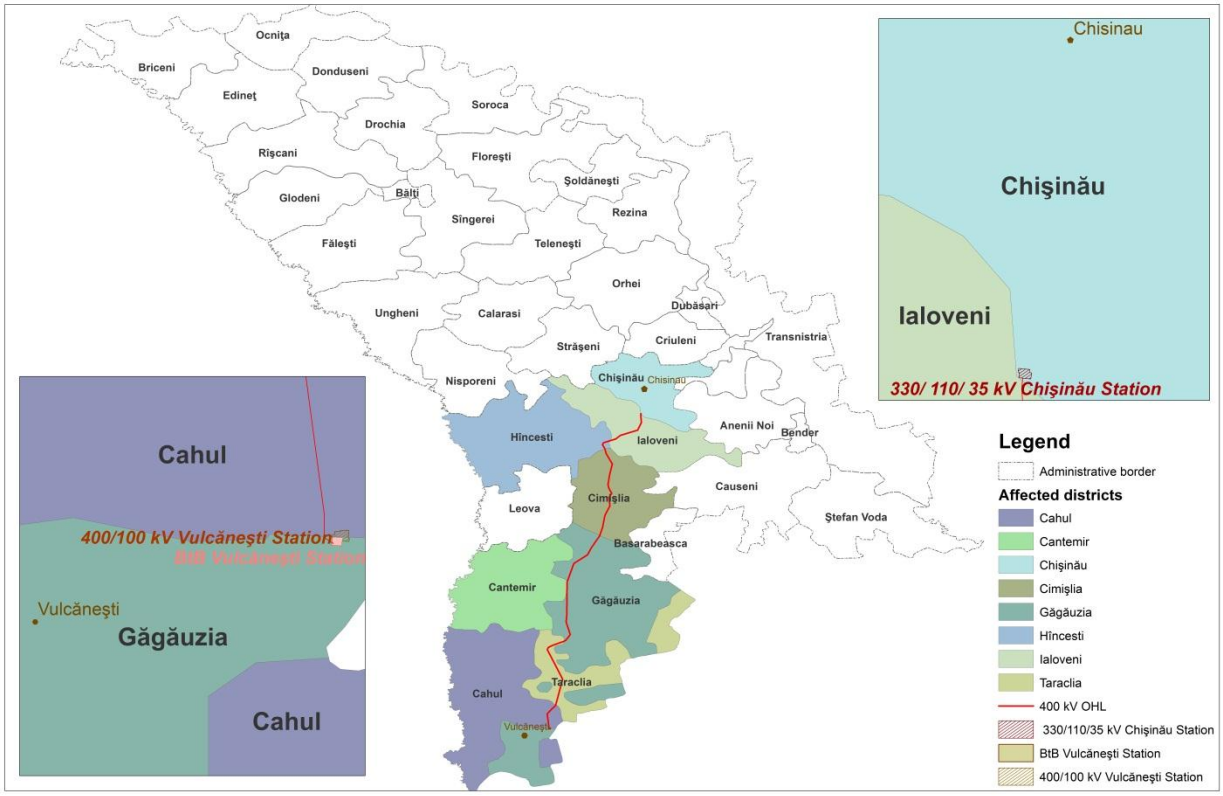

Figure 1.2 *The suggested route for the transmission line and affected communities indicated in color*

1.3 Project justification

In 2009 Republic of Moldova (MD) joined the Energy Community Treaty that extends the EU energy policy to the South-East Europeand signed the Accession Protocol in 2010. This allowed MD to be an active member on regional and European energy market. Through the main objectives of the Energy Community Treaty are the following:

- To create a single regulatory space for trade in the energy network;
- To enhance security of supply in this space and develop cross-border relations;
- To develop the market competition in the energy network.

As part of the Energy Community Treaty, Republic of Moldova has unique advantages such as integration into European energy market, joining the ENTSO-E, investments opportunities, etc.

The integration of Republic of Moldova's energy market into European energy market assures a real competion and transparent and equitable prices. So, the security of supply is expected to enhance through diversification of market participants.

In 2015 Republic of Moldova approved ***the Roadmap for energy sector.*** In work package 3 *Promoting the energy infrastructure investment projects*, point "a" *Presentation of priority*

projects with the European Union (Romania) is mentioned the priority project **"Back to back" Vulcăneşti station and 330* kV OHL Vulcănești – Chişinău** is mentioned.

The project implementation will ensure, according to the Energy Strategy 2030 adopted in 2013 by the Governmentof MD a high level of security for Moldova and integration in the European energy market.

The Grid System Study elaborated as part of this Project "MD-RO Power Interconnection" has considered the following aspects:

- the impact on the power system of the Republic of Moldova of each interconnection point (Vulcănești – maximum 600 MW, Bălți – maximum 400 MW, Strășeni – maximum 300 MW), of any two of the three interconnection points and of all three interconnection points;
- the calculations focused on the power import in the Republic of Moldova, as well as on the export to Romania;
- the interconnection with the Ukraine;
- the possible contribution of the sources in the Republic of Moldova, varying between a mandatory minimum and a maximum power generated (MGRES, CHP1, CHP2 and other conventional or renewable sources), under conditions of the power imported from Romania;
- the winter peak, summer peak and summer off-peak levels for the 2020 stage;
- a new Vulcănești – Chișinău transmission line to be built at 330 kV (in accordance with the tender specifications) or at 400 kV.

One of the result of the analysis was that a 400 kV option would be better than the 330 kV option for the new OHL Vulcănești – Chișinău. The main reasons are as follows:

- decreasing the power losses in the grid system with 0.3 ÷ 1.4 MW;
- the steady-state stability condition is higher by up to 37 MW;
- minimum values for short-circuit requirements, the rigidity of the point places is in the range of intermediary systems (the calculated coefficient is 2.5, is larger than 2 and lower than 4).
- during the transient stability condition, the synchronism of the existing power units is maintain.

Moldelectrica decided to develop the Project with ***400 kV for the new OHL Vulcănești – Chișinău*** instead of the 330 kV option as presented in the Project ToR***.***

1.4 ESIA Scoping Report objectives and structure

This Report provides information regarding the key gaps and identifies the scoping future environmental and social impact associated to the project components:

- "Back to back" station and changes in 400 kV Vulcănești station as a result of asynchronous interconnection between the power system of Republic of Moldova and the power system of Romania;

- The 400 kV OHL between the two sub-stations Vulcănești - Chișinău;
- Modification in the current sub-station Chișinău 330/110/35 kV as an introduction of new 400 kV voltages.

Taken into the consideration MD legislation, EBRD requirements and Terms of Reference, the main objectives of the ESIA Scoping Report are as follows:

- To identify the legal framework in MD and EU and see how should be applied in the Project;
- To analyze the main alternatives routes considered and reasons for selecting a preferred one;
- To establish the OHL route corridor where should be done the environmental and social assessment;
- To identify in the affected areas the current relevant issues on environment (biodiversity, historical monuments, material values, industrial facilities, towns etc.), social and economic aspects;
- To identify the land statute and plans of changing, as well as residential zones in the Project area or vicinity;
- To see if there are in MD regulations concerning compensation in case of expropriation/resettlement;
- To identify the stakeholders: governmental authorities involved in authorization procedure, NGOs, land owners/users, local population, public, etc.;
- To plan a program for the dissemination of information related to the Project;
- To identify the major environmental and social concerns from stakeholders associated with the Project development;
- To draft the *Stakeholder Engagement Plan,* which should be updated periodically during the Project development;
- To determine the proper methodology to evaluate the Project impacts on environment and social, including occupational health and safety;
- To make a plan on the aspects that has to be developed further in the main ESIA Report.

The structure of the Scoping Report is based, on the general context on why the Project is needed, on the description of the alternatives considered and of the main characteristics of the Project and on the environment and social constraints in the area where is located:

- *Physical environment:* land use, geology, geomorphology and geo-hazards, soil, water, climate, air;
- *Biological environment:* flora, fauna and habitats, existing and proposed protected area, Ramsar sites, Emerald network, Important Bird and Biodiversity areas;
- *Socio-economic environment:*

  - People, infrastructure, tourism, communities, cultural heritage, archaeological and historical environment, public and occupational health and safety;

- Land acquisition and possible physical and economic displacement.

Taken into consideration the characteristics of the south region of MD between Chișinău – Vulcănești a route corridor, where the environment and social assessment will be done is established to 10 km on the left and 10 km on the right of the OHL axis (a total width of 20 km).

This region is situated between rivers Prut and Nistru, with an average distance of 60 km and Danube and Black Sea is not far away, here we found the migratory bird routes from West to East in spring time and East to West in autumn. To evaluate the impact of the OHL on the migratory birds and take the mitigation measures it will be considered for this issue a route corridor with a total with of 40 km.

2. LEGAL AND POLICY FRAMEWORK

2.1 Moldova legal and policy framework

2.1.1 Environmental legislation, including national guidelines and standards for environmental protection

The following national environmental legislation, including national guidelines and standards for environmental protection shall be considered for the Project:

- ***Law on Environmental Impact Assessment***

  The legal framework in Moldova for assessment of the effects of certain public and private projects on the environment is assured by Law no. 86/2014 on Environmental Impact Assessment, which partially transpose the provision of EU Directive (Directive 2011/92/EU). The Law no. 86/2014 (EIA Law) establishes the EIAs principle, defines the scope of the EIA, the competent authorities attribution and the procedure for obtaining the Environmental Agreement (EA) for planned activities. The Law, as EIA Directive, requires an EIA for Annex 1 projects and screening of Annex 2 projects in order to decide the need of EIA.

- ***Law on environmental protection***

  Law no. 1515/1993, establishing the legal framework at national level for environmental protection defines the main principles for environmental protection: respecting the environmental legislation as well as legislation related the use of natural resources and energy consumption, pollution prevention and prevention of damages on biosphere and human health.

- ***Water Law***

  Moldova's Water Law is assured by Law no. 272/2011 which establishes the legal framework for the management, protection and efficient use of surface water and groundwater, based on assessment, planning and decision process and also the mechanisms for protection, prevention of water pollution and restoring the aquatic habitat considering the EU requirements. The law partially transposes the provision of several EU Directives.

- ***Law on natural areas protected by the State***

  The Law no. 1538/1998 establishes the legal framework for setting up and operation of natural areas protected by the State, principles, conservation mechanisms and also, the attributions of central and local authorities, non-governmental organizations and public.

  In order to reduce the anthropogenic impact on objects and complexes situated in protected area specific width of the protection zones are established by urban and landscaping planning documentation, approved by the Government.

- ***Law on cultural heritage monuments protection***

  The Law no. 1531/1993 establishes the legal framework for protection of cultural heritage monuments and defines the attributions of competent authorities for administration the national or local registries.

- ***Law related the Red Book of Moldova***
  The Law no. 325-XVI/2005 establishes the legal framework for protection, use and restoring the species of plants and animals included in the Red Book of Moldova, and also the specific attribution of the public authorities and scientific institutions. The Red Book represents an official document including the list of plants and animals extinct, critically endangered, endangered, vulnerable, rare and indeterminate in Moldova and also general information related to their status, condition, distribution and protection and conservation methods.
- ***Law on cultural heritage monuments protection***
  The Law no. 1531/1993 establishes the legal framework for protection of cultural heritage monuments and defines the attributions of competent authorities for administration the national or local registries.
- ***Law on protection of archaeological heritage***
  The Law no. 2018/2010 establishes the necessary of a preventive archaeological research sustain by the investor (Moldelectrica) in order to protect the sites from damage or destruction during construction works.

2.1.2 Legal framework for land acquisition (compensation)

The regulatory framework related to change of land use, land sale/purchase and compensation of damages/losses in force in the Republic of Moldova is assured by:

- ***Land Code no. 828-XII, 25 January 1991***, that includes provision related to change of land use, temporary land withdrawal from agricultural use and compensation of damages/losses.
- ***Law no. 488-XIV, 8 July 1999,*** on expropriation in case of public utility defines the procedure applicable in case of expropriation of land for public utilities projects;
- ***Law no. 1308, 25 July 1997***, on normative price for land and sale/purchase procedure establishes provisions relevant for the proposed investment:
  - lands withdrawal from agricultural use and from forest lands are allowed for public utilities projects;
  - losses caused by lands withdrawal from agricultural use and from forest lands shall be compensated.
- ***Forest Code no. 887-XIII, 21 June 1996,*** specify that in case of OHL construction is allowed to withdraw forests from the forests fund, under a special Government degree and establishes the rules for compensation;
- ***GD no. 1451, 24 December 2007***, on approval of provisions for procedure on the assignment, land use change and land exchange establishes the procedure for preparation, submissions and processing the application documents and defines the involved authorities and timeframe of the process;
- ***GD no. 514/2002*** for approval the *Regulation regarding the protection of electrical network* specify that for normal operation conditions of the OHLs and

prevention of accidents will be allocated special lands and established protection zones and corridors clear of trees in massive woodlands and plantations.

The OHL protection corridor (the land and airspace limited by vertical planes, on both sides of the line), in case of 400 kV OHL shall be 30 m on both side of the line (a total width of 60 km).

The lands located on the protection corridor, not taken from land owners, can be used for agricultural works and other works

The planned works for repairing, technical maintenance and reconstruction of OHLs crossing agricultural land will be performed with the consent of the land owners and usually in the period when the lands are not occupied by crops or when it is possible to ensure the integrity of agricultural cultures.

2.2 EU environmental and social legislation

The most important European Directives that has to be considered for the environmental assessment are:

- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, amended by Directive 2014/52/EU (EIA Directive), defines the requirements for assessment of potential impact on the environment by a wide range of public and private;
- Directive 2000/60/EC establishing a framework for Community action in the field of water, modify by Decision 2455/2001/CE and Directives 2008/32/EC, 2008/105/ECE, 2009/31/EC, 2013/39/EU, 2013/64/EU and 2014/101/EU, (Water Directive);
- **Directive 2006/12/EC** on waste (repeal by Directive 75/442/CEE), modify by Directives 2008/98/CE and 2009/31/CE (Waste Directive);
- **Directive 2002/49/EC** relating to the assessment and management of the noise in the environment, (Noise Directive);
- **Directive 92/43/EC** on the conservation of natural habitats and of wild fauna and flora, (Habitat Directive);
- **Directive 97/62/EC** which adapts the Habitat Directive to the scientific and technical progresses, substituting the Annexes I and II;
- **Directive 79/409/EEC** on the conservation of wild birds, (Birds Directive);
- **Decision 82/72/EEC** related to the Convention on the conservation of wild life and natural environment in Europe;
- **Decision 82/461/EEC** related to the Convention on the conservation of the migratory species of wild fauna;
- **Recommendation 75/65/CEE** of 20 December 1974, on the protection of the Architectural and Natural Patrimony;
- Directive 89/391/EEC on the introduction of measure to encourage improvements in the safety and health of workers et work, (OHS Framework Directive).

2.3 International law and agreements

The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) brings together all stakeholders to prevent environmental damage before it occurs. The Espoo Convention requires that Member States notify and consult each other on all projects that might have an adverse transboundary environmental impact. The current situation regarding the Espoo Convention in Republic of Moldova and the neighboring countries is the following:

- Republic of Moldova: signed the accession in 4.01.1994;
- Romania: ratified in 29.03.2001;
- Ukraine: ratified in 29.07.2001.

Therefore, Republic of Moldova shall notify Romania and Ukraine, as per the Espoo Convention Procedure, if trans-boundary impacts are expected from Project implementation or not.

The other **main international conventions** ratified by Republic of Moldova are the following:

- *Convention on Long-Range Transboundary Air Pollution* (Aarhus, Denmark, 1998); the Moldova's ratification document to the convention is the Ratification Law no. 10178-XV, 25 April 2002;
- *United Nations Convention on Climate Change* – UNFCCC (New York, 1992); the Moldova's ratification document to the convention is the Parliament Degree no. 404-XIII, 16 March 1995;
- *United Nations Convention on Biological Diversity* (Rio de Janeiro, 1992); the Moldova's ratification document to the convention is the Parliament Degree no. 475-XIII, 16 May 1995;
- *United Nations Convention on Wetlands of International Importance* – **Ramsar Convention** (Ramsar, Iran, 1971); the Moldova's ratification document to the convention is the Parliament Degree no. 504-XIV, 14 July 1999;
- *United Nations Convention on the Conservation of Migratory Species of Wild Animals* (Bonn, 23 June 1979); the Moldova's ratification document to the convention is the Law nr. 1244-XIV, 28 September 2000;
- *Convention of the Conservation of European Wild Life and Natural Habitats* – **Bern Convention** (Bern, 1982), ratified by Republic of Moldova on 24.05.1994;
- *Convention Concerning the Protection of the World Cultural and Natural Heritage* – UNESCO World Heritage Convention (Paris, 1972); the Moldova's ratification document to the convention is the Law nr. 1113-XV, 06 June 2000;
- *European Convention on Landscape* (Florence, 2000); the Moldova's ratification document to the convention is the Ratification Law Parliament, 14 March 2002;

- *UNECE Convention on Access to Information, Public Participation in Decision–making and Access to Justice in Environmental Matters* – **Aarhus Convention** (Aarhus, Denmark, 1998); the Moldova's ratification document to the convention is the Parliament Degree no. 346-XIV, 07 April 1999.

2.4 International best practices standards and guidelines

2.4.1 European Bank for Reconstruction and Development

International lenders, including the European Bank for Reconstruction and Development (EBRD), require that projects financed should be in compliance with national law and regulation as well as environmental and social policies and guidelines adopted by the lenders.

EBRD has adopted a comprehensive set of specific Performance Requirements (PRs), as part of Environmental and Social Policy (EBRD, 2014), that clients are expected to meet, covering a range of key areas of environmental and social impacts, occupational and public health and safety, resettlement and other issues and actions involved in the project development and operation.

Therefore, in addition to strictly comply with Republic of Moldova legal requirements, the Project will also need to meet the following specific PRs defined in EBRD Environmental and Social Policy:

- **PR1** - Assessment and Management of Environmental and Social Impacts and Issues;
- **PR2** - Labour and Working condition;
- **PR3** - Resource Efficiency and Pollution Prevention and Control;
- **PR4** - Health and Safety;
- **PR5** - Land Acquisition, Involuntary Resettlement and Economic Displacement;
- **PR6** - Conservation and Sustainable Management of Living Natural Resources;
- **PR7** - Indigenous Peoples;
- **PR8** - Cultural Heritage;
- **PR9** - Financial Intermediaries;
- **PR10** - Information Disclosure and Stakeholder Engagement.

2.4.2 European Investment Bank

European Investment Bank (EIB) represents the interests of the European Union Member States and works closely with other EU institutions in order to implement EU policy.

All the projects financed by the EIB must not only be bankable but also comply with strict economic, technical, environmental and social standards.

EIB defines, as part of Environmental and Social Practices and Standards Handbook 2013, ten Environmental and Social Standards (ESS) covering the full scope of environmental, climate and social impacts, namely:

- **ESS 1** - Assessment and Management of Environmental and Social Impacts and Risks;
- **ESS 2** - Pollution Prevention and Abatement;
- **ESS 3** - EIB Standards on Biodiversity and Ecosystems;
- **ESS 4** - EIB Climate-related Standards**;**
- **ESS 5** - Cultural Heritage;
- **ESS 6** - Involuntary Resettlement;
- **ESS 7** - Rights and Interests of Vulnerable Groups;
- **ESS 8** - Labour Standards;
- **ESS 9** - Occupational and Public Health, Safety and Security;
- **ESS 10** - Stakeholder Engagement.

2.4.3 Equator Principles

The Equator Principles (EP) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects. Currently 84 Equator Principles Financial Institutions (EPFIs) in 35 countries have officially adopted the EP, covering over 70% of international Project Finance debt in emerging markets.

The EP defines ten principles that ensure that the financed projects are developed in a manner that is socially responsible and reflects environmental management practices, namely:

- **Principle 1** - Review and Categorisation;
- **Principle 2** - Environmental and Social Assessment;
- **Principle 3** - Applicable Environmental and Social Standards;
- **Principle 4** - Environmental and Social Management System and Equator Principles Action Plan;
- **Principle 5** - Stakeholder Engagement;
- **Principle 6** - Grievance Mechanism;
- **Principle 7** - Independent Review;
- **Principle 8** - Covenants**;**
- **Principle 9** - Independent Monitoring and Reporting;
- **Principle 10** - Reporting and Transparency.

3. PROJECT DESCRIPTIONS AND ALTERNATIVES

3.1 Project overview

The Project concerns the construction of two new sub-stations: the 400 KV Vulcănești "back to back" sub-station, the 400/330 kV Chișinău sub-station and the construction of a new overhead line (OHL) of 400 kV with a total length of about 150 km.

The Project is at present in a ***Feasibility state*** where the aim is to find efficient technical options, to estimate their costs and to minimize the environmental and social impacts. When the necessary funds for the investment are found, follows a period of time for designing and for obtaining the approvals according MD legislation, to have the permission for construction, which can last minimum two years. This period of time depends on the property of the land needed to do the Project and the compensation decided.

Only when the construction authorization is in place, the Project starts to be built; usually this takes 30 to 48 months, including the manufacturing of some sub-station equipment (e.g. autotransformer).

The operation of the 400 kV OHL can begin earliest in 5 years, if everything goes as it is planned and the funds are obtain in time.

3.1.1 "Back to back" sub-station Vulcănești

The new "**Back to back**" sub-station will be incorporated in the existing line of 400 kV Isaccea - Vulcănești, inside the existing Vulcănești sub-station, on a free space of about 67,000 m^2, as is presented in figure 3.1.1.1.

The Vulcănești 400/110/35 kV sub-station is located in the vicinity of the existing road M3 - E87 between Chișinău and Giurgiulești at a distance at about 6 km from the town Vulcănești.

The ***400/110/35 kV Vulcănești*** operates under the following authorisations:

- *Authorization for emissions of pollutants into atmosphere from stationary sources*, IES no. 001457 of September 20, 2011 and validate till September 20, 2016, released by the State Ecological Inspectorate, Ministry of Environment;
- *Authorization for special usage of water*, IES no. 000003 of May 21, 2013 and validate till May 21, 2016, released by the Ecological Agency of Chișinău, from the State Ecological Inspectorate, Ministry of Environment.

Figure 3.1.1.1 *400/110/35 kV Vulcănești station*

In the Vulcănești station a few capacitors had been demolished a few years ago and as a result there were concerns that the soil at this site could have been contaminated. After measures taken for pollution reduction, recent soil samples and other measurements reveals no hazardous levels for pollutants. Acacia trees have been planted to further remove any contaminants, see figure 3.1.1.2.

Inside the existing station there is free space for building the new “back to back” station and for changes in the existing 330 kV station, as a result of asynchronous interconnection between the power system of Republic of Moldova with the power system of Romania.

Figure 3.1.1.2 *The demolish site considered for the new sub-station, also note the accacia tree nearby*

The "**Back to back**" sub-station will consist of the following installation and equipment (presented in figure 3.1.2.3):

- outdoor 400 kV sub-station towards Romanian Power System (with inlet from the existing OHL towards Isaccea);
- two HVDC (High Voltage Direct Current) electronic converters of 300 MW, type VSC (Voltage Source Converter);
- outdoor 400 kV sub-station towards the Republic of Moldova Power System;

The design should make consideration ofthe follow existing issues:

- the position of existing towers of Isaccea - Vulcănești OHL and the access road in the sub-station precinct;
- steep slope of the land available that will required an horizontally land arrangement;
- two halls for converters (valves) should be provided;
- the two lines of 400 kV (Isaccea and Vulcănești) will be connected through an individual autotransformer to the two converters.

Figure 3.1.1.3 *Vulcănești 400/110/35 kV sub-station and suggested area for construction of the "back to back" sub-station*

The 400 kV outdoor sub-station towards Romania Power System

The bay pertaning to the Isaccea line and the bays pertaining to the two transformers towards converters will be connected to the sub-station bus-bar. Interface transformers of 300 MW between converter and A.C. system will be in a single three-phased unit

Each of the two converter of ”**Back to back**” sub-station has two ends, one performs A.C. conversion in D.C. and the other performs D.C. conversion in A.C.

The control**,** protection, telecommunications and auxiliary services building will be located near by the two halls of converter. This building will include the control room, auxiliary services room, cooling installation room, storage batteries, workshops, offices.

The 400 kV outdoor sub-station towards the Power System of Republic of Moldova

Similar to the sub-station provided towards Romania Power System, this sub-station will consists of the bays pertaining to the line (towards Vulcănești sub-station) and transformers.

In the current 400 kV Vulcănești sub-station will be built a new bay pertaining to Vulcănești - Chișinău OHL and the destination of the existing bay Isaccea OHL will be changed into the line towards the ”**Back to back**” sub-station. A new bay is proposecd to be built on the North side of 400 kV sub-station near-by the existing cell 2AT in the sub-station precinct.

3.1.2 400 kV Chișinău sub-station

The current 330/110/35 kV Chișinău sub-station will be extended with a new bay pertaining to 400/330 kV autotransformer. The sub-station is located outside the city, in the south part at 6,0 km to the limit building.

The ***330/110/35 kV Chișinău station*** is in the south part of the city and operates under the following authorizations:

- *Authorization for emissions of pollutants into atmosphere from stationary sources*, AE no. 0149 of September 12, 2014 and validate till September 12, 2019, released by the Ecological Agency of Chișinău, from the State Ecological Inspectorate, Ministry of Environment;
- *Authorization for special usage of water*, AE no. 0060 of May 27, 2014 and validate till May 27, 2017, released by the Ecological Agency of Chișinău, from the State Ecological Inspectorate, Ministry of Environment.

Figure 3.1.2.1 *330/110/35 kV Chișinău station*

Inside the Chișinău sub-station, and in its neighbourhoods, the team could not identify any immediate issues that would be risk issues from an environmental point of view.

There is enough free space inside the station for the new 400 KV station (two cells – OHL and AT) and for extending the 330 KV station with an auto transformer cell and auto transformer 630MW, 400/330kV.

Figure 3.1.1.3 *Free space inside 330/110/35 kV Chișinău station*

The new cell proposed to be built on the East side of 330 kV sub-station near-by the existing bay of OHL MGRES 2 where it is available space as is presented in figure 3.1.1.3.

At the same time with the new bay, it is necessary the extension of the two current bus-bars with 2 fields. The width of the bay field will of 24 m.

Formular cod: FPM-03.01-01-02 Act.0

The new bay will have primary equipment sized at 2000A, 40 kA/1s, similar to the ones from the opposite side of OHL Vulcănești. High frequency line traps will be mounted on the terminal frame at sub-station, too.

The 400 kV sub-station will be provided with a grounding installation and lightning strikes protection installation.

Figure 3.1.2 *330/100/35 kV Chișinău sub-station and 400 kV Chișinău*

3.1.3 400 kV OHL Vulcănești - Chișinău

The 400 KV Vulcănești “back to back” sub-station and the 400/330 kV Chișinău sub-station of the designed line, dictate the general orientation of the OHL route on the South-North direction.

Formular cod: FPM-03.01-01-02 Act.0

The 400 kV OHL Vulcănești - Chișinău with a length of 149 km will be made on single circuit towers. The angle towers will be made of metal and the suspension towers can be made of metal or concrete.

The height of the 400 kV OHL towers to be mounted varies according to the profile of the land and the obstacles encountered, but no higher than 40 m. The foundations of OHL towers will be cast or drilled according to the geological recommendations.

The 400 kV line designed will be equipped with two earth wire conductors across its entire length, of which one with embedded optical fiber type, so called optical ground wire (OPGW).

The insulation of the overhead line will be ensured by insulator strings where the insulating part will be made of glass or a composite material.

To make the investment for the 400 kV OHL Vulcănești - Chișinău, permanent land areas (foundations of OHL towers) as well as temporary land areas (the period of execution of the investment) is needed for the OHL towers mounting platforms and corridor for stringing the phase conductors and earth wire conductors for OHL.

The land areas required for the foundations of OHL towers vary, according to the type and length of the towers. In cases of passing forest land there is need to ensure that objects come too close to the lines. In case of other land, there would be restrictions in terms of how the land can be used linked to exposure of magnetic fields.

The land areas occupied temporarily are:

- Service platform for mounting the suspension towers;
- Service platform, for the angle towers, for stringing phase and earthwire conductors;
- Service corridor (access area) for OHL, 3 m wide, for mounting (pulling) phase and earthwire conductors.

3.2 Alternatives route proposed for 400 kV

Vulcănești and Chișinău end sub-stations of the line designed dictates the general orientation of OHL routeline on South-North direction.

The 400 kV OHL route has to be as close as it can to the straight line which connects the end sub-stations. The deviations from the straight line are due to the different obstacles:

- the residential area and the industrial sites, which are in continuously development;
- the existing protected areas;
- the large forest areas, (to avoid the deforestation);
- the national, county and communal road system, (to be used for OHL execution and maintenance);

- the instable geological areas, (to avoid landslices).

The general principles in designing an OHL route is to avoid as much as is possible the following areas:

- Populated areas;
- Forested areas;
- Farming lands with vineyards and orchards;
- Parks and natural reserves;
- Geologically unstable areas;
- Special landscape or with an architectural and historical value.

Analysing the maps, scale 1:50,000 and what was identified during the visits on the site, it was proposed three route options for the 400 kV OHL Vulcănești - Chișinău:

- OHL route Option 1, red colour located West and crossing the forest in the narrowest area;
- OHL route Option 2, blue colour the central option;
- OHL route Option 3, green colour mainly along the Ukrainian border.

OHL route Option 1, red colour

The 400 kV OHL Vulcănești - Chișinău route starts from the 400 kV Vulcănești back to back station, situated at the West side of Vulcănești locality, the South part of Moldova, near the Ukrainian border. The route heads North, overpasses the decommissioned 750 kV OHL, the Burlăceni and Iujnoe localities, bypasses on the South side the Musaitu locality and on the East side the Salcia locality; the route is parallel with the national road M3. In this area, the route overpasses the local roads: L696 (Burlăceni-Musaitu) and L673 L671 (Salcia-Orehovca).

The route continues to the North, bypasses on the East side the Albota de Jos, Albota de Sus and Sofievca localities, overpasses the road R38 (Vulcăneşti-Cahul-Taraclia), bypasses the vineyards near the Svetlii and Borceag localities. Near the Borceag locality, the route overpasses the local road L643 (Chioselia Mare-Dimitrova); then, the 400 kV OHL route overpasses the arable land and the local roads near Congaz locality: L641 (Congaz-Cîietu) and L642 (Congaz- Chioselia Rusă). Moving to the West, near the Comrat locality, the OHL overpasses the 110 kV OHL Comrat - Iargara and Comrat - Sadâc, the 35kV OHL Comrat-Vişniovca and the national road R37 (Ceadîr – Lunga – Comrat - Cantemir).

After bypassing the Comrat town, the OHL route overpasses the Ialpug river and the railway near the Bugeac locality. Then, the OHL route overpasses the Topală and Dimitrovca localities, at West side of Cimişlia locality, bypasses vineyards and overpasses the 35kV OHL Cimişlia - Javgur and the national road R47 (Cimişlia – Iargara - Sărata Nouă).

The OHL route overpasses the river meadow Cogilnic, the 110 kV OHL Gura Galbenei - Cimişlia, the local road L580 (Mihailovca – Sagaidac - Valea Perjei), the 110 kV OHL Gura

Galbenei - Cimişlia and the national road R3 (Chişinău – Hînceşti – Cimişlia - Basarabeasca).

The OHL route bypasses at the East side the Gura Galbenei, Ivanovca Nouă and Fârlădeni localities, avoiding the existing forest, overpasses the South – East sides of Hansca, Costeşti and Mileştii Mici localities. Then, the OHL enters into the 400/330/110 kV Chișinău station situated in the South side of the Chişinău municipality, after overpassing the local road L458 (Ialoveni-Sîngera) and the 110 kV OHL Chișinău - Anenii Noi.

After Chișinău municipality, the OHL route turns right and overpasses the 110 kV OHL double circuit Chișinău - Hîncești and Chișinău - Gura Galbenei. The OHL route is parallel to the 110kV OHL Chișinău - Hîncești and overpasses it, at the South side of the Hansca village.

Near the village Gura Gălbenei, the OHL route overpasses the 110 kV OHL (entry and exit in Gura Galbenei station) and the local road L578 (Albina - Fetiţa - Lipoveni - Munteni – Porumbrei).
The OHL route is parallel to the two 330 kV OHL lines to MGRES and overpasses them near the Străişteni village.

The OHL route avoids construction areas along the route, lakes and most of the existing vineyards.
In option 1, the length of the 400 kV OHL Vulcăneşti - Chişinău is about 149 km.

OHL route Option 2, blue colour

The 400 kV OHL Vulcănești - Chișinău route starts from the 400 kV Vulcănești back to back station, situated at the West side of Vulcănești locality. The route heads North, overpasses the decommissioned 750 kV OHL, following the red route and the area between Burlăceni and Iujnoe localities. Near Iujnoe village, the route separates from the red route and overpasses the areas between Vinogradovca and Ciumai localities, the West side of Chirilovca and the South side of Aluatu, the West side of Taraclia, between Cazaclia and Corten localities and heading North towards Comrat. In the region Chirilovca, Vinogradovca and Burlăcenithe, the OHL route overpasses the 110 kV OHL d.c Vulcăneşti - Taraclia and the OHL d.c. Vulcăneşti - Balabanu and Vulcăneşti - Taraclia.

At the North – West side of Chirilovca locality, the route turns right and overpasses the Ialpug river, at the West side of Taraclia. The route overpasses the 35 kV OHL d.c. Taraclia - Svetlîi, Taraclia - Moscovei. The OHL route, along the Lunga river, intersects it twince in Valea Baurci.

At the West side of the Ferapontievca village, the OHL route overpasses the 110 kV OHL Cimişlia - Tomai and the national road Cimişlia – Ceadîr - Lunga.

The OHL route overpasses the local road L631 (Başcalia – Comrat), the railway and 110 kV OHL Comrat - Başcalia, at the North side of Başcalia village. After the national road R35 (Comrat -Basarabeasca), the OHL route overpasses the area between the Bogdanovca Veche and Sadaclia, at the East side of Ciucur - Mingir village and at the West side of Cioc - Maidan and Başcalia villages.

The OHL route overpasses the national road M3 (Chişinău - Vulcăneşti) and 35 kV OHL Cişmila -Mihailovca and reaches the nearby Cimişlia city, through the West side of Porumbei and Sagaidac localities.

After the Moleşti forest and the West part of the Zâmbrei village, the OHL route turns to left side, overpasses the 110 kV OHL Chişinău - Gura Galbenei and the East part of the Cigîrleni village.

The OHL route overpasses the local road L645 (Zîmbreni - Costeşti) towards Iasloveni locality, from where the route is common with the red route up to 400/330 kV Chişinău station.

The OHL route avoids construction areas along the route and most of the existing vineyards.

In option 2, the length of the 400 kV OHL Vulcăneşti - Chişinău is about 150 km.

OHL route Option 3, green colour

The 400 kV OHL Vulcănești - Chișinău route starts from the 400 kV Vulcănești back to back station, situated at the West side of Vulcănești locality. The route heads North, overpasses the decommissioned 750 kV OHL, the area between Burlăceni and Iujnoe localities and, respectively, between Vinogradovca and Ciumai localities. Near the Vinogradovca and Ciumai localities, the route separates from the blue route and turns to the East, bypassing the Copceac locality. At the South side of the Chirilovca village, the OHL route overpasses the Iaipug and Lunga rivers, the railways and the national road Chişinău – Vulcăneşti.

The OHL route overpasses the 400kV OHL MGRES - Vulcăneşti, near the Copceac village; the route turns right near Valea Perjei village and overpasses twice the 110 kV OHL Vulcăneşti – Ceadîr - Lunga. The OHL route overpasses the national road R36 (Ceadîr – Lunga -Basarabeasca), at the East part of the Beşghioz village and Ceadîr - Lunga city. Between Joltai and Tvardiţa villages, the OHL overpasses the 100 kV OHL d.c (110 kV Tvardiţa station), the railway and the river Lunga.

The OHL route overpasses the national road R35 (Cimişlia - Basarabeasca) and the local road L639 (Avdarma – Chiriet - Lunga).

Between Iardanovca and Abaclia villages, the OHL route overpasses the 110 kV OHL Başcalia – Basarabeasca. Also, overpasses the 110 kV OHL Taraclia Nord – Basarabeasca and near the Carabetovca village follows the existing OHL.

The OHL route overpasses the West side of Troiţcoe village, between Ivanovca and Iserlia villages, at the East side of Sadaclia village and the 35 kV OHL Taraclia Nord – Mihailovca.

Thereafter, the OHL overpasses the areas between Ciufleşti and Surchiceni villages, Batîr village and Taraclia city, the national road R29 (Răzeni – Pervomaisc), the area between Nileştii Noi and Gangura, Chircăieştii Noi and Căinari, the East side of Carbura village and the 35 kV OHL Văratic – Răzeni.

The OHL route overpasses the North side of Răzenişi storage lake, follows the Botna river and intersects it at the Northe - East side of Mileştii Noi village.

At the East side of Horeşti village the route overpasses the national road M3 (Chişinău – Vulcăneşti) and twice the 110 kV OHL Chişinău – Horeşti. Near the Străişteni village, the route overpasses two 330 kV OHL Chişinău – MEGRES. After bypassing the Străişteni village, the OHL route heads to the 400/330/110 kV Chişinău station, at the South side of Chişinău municipality. At entering into Chişinău station the route overpasses the 110 kV OHL Chişinău – Anenii Noi.

In option 3, the length of the 400 kV OHL Vulcăneşti - Chişinău is about 163 km. The route is near the border between Moldova and Ukraine (around 8.5 km).

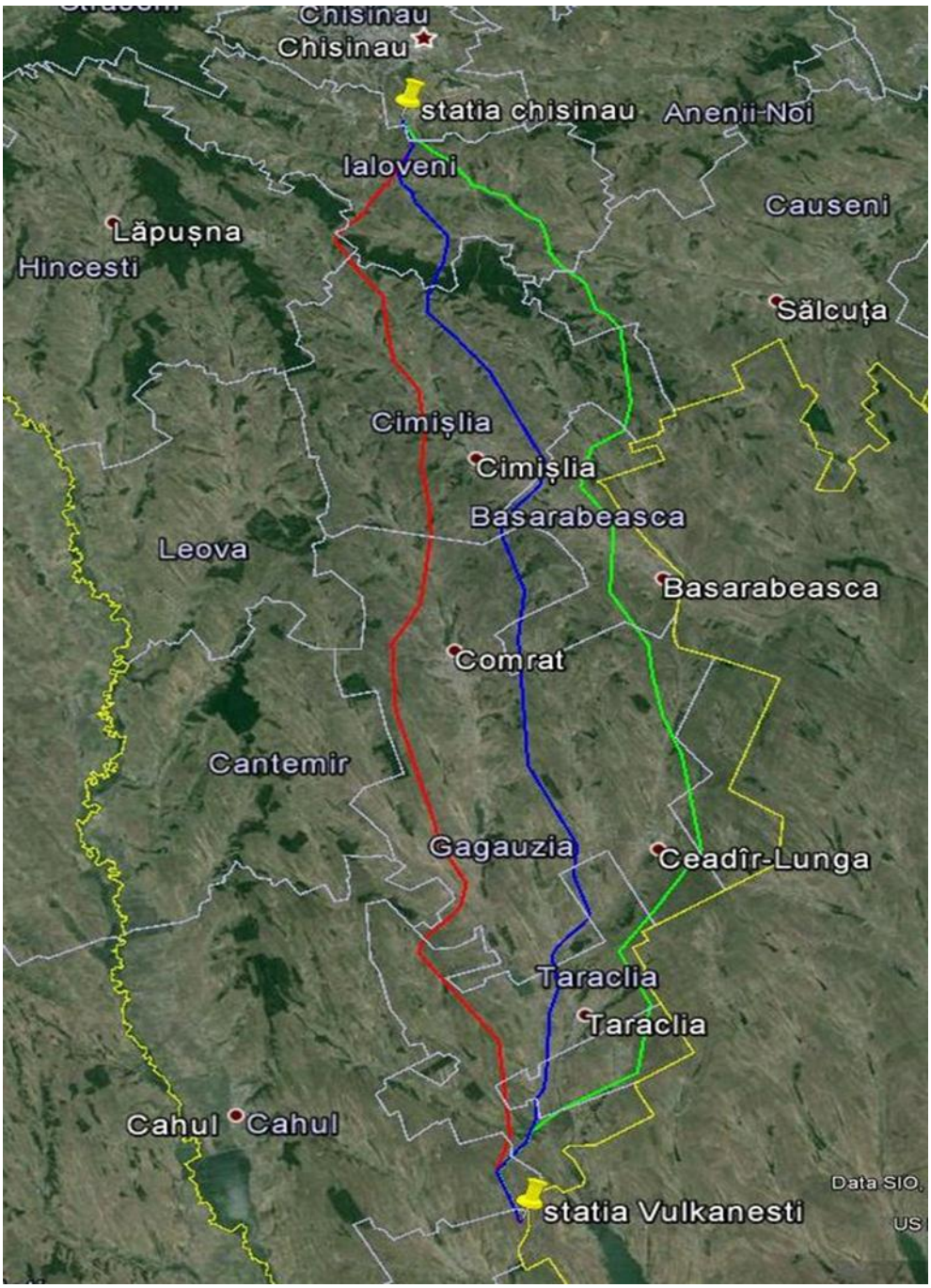

Figure 3.2.1 *Analysed 330 KV OHL routes Vulcăneşti -Chişinău*

The description of the three routes option for the 400 kV OHL Vulcănești – Chișinău leads to the main characteristics presented in the table 3.2.1

Table 3.2.1 *Main characteristics of the three route options*

Item	Characteristic	Option 1	Option 2	Option 3
1.	Length, km	149	150	163
2.	Number of towers	420	433	459
3.	Overpassing other OHL: - 400 kV - 330 kV - 110 kV - 35 kV	11 - 2 7 2	9 - 2 5 2	11 1 2 6 2
4.	Overpassing railway	Near village Bugeac	North village Bașcalia	Near villages Jiltai, Vardița and Chirilovca
5.	Overpassing roads: - national - regional - communal	15 4 - 11	8 - 4 4	5 - 4 1
6.	Rivers	9	11	10
7.	Water storage	-	-	Răzeneși
8.	Forests	-	Molești forest	-
9.	Agriculture lands	Less	More	More
10.	Vineyards	Less	More	More
11.	Existing protected areas	Less	Much more	Much more
12.	Proposed protected areas	Less	Much more	Much more
13.	Migratory birds routes	Yes	Yes	Yes

3.3 Multi – criteria decision model for deciding on best OHL option

The multi- criteria analyses of the route option for 400 kV OHL Vulcănești – Chișinău take into consideration technical, socio – economic and environment aspects as follows:

- *Technical aspects:*
  - Length of the line;
  - Number of special towers;
  - Number of special foundations (the nature of the foundation soil);
  - Co-existence with other objectives (roads, railways, water streams, OHL, telecommunication lines, pipes, etc.);
  - Route accessibility (level of difficulty).

- *Environment and social:*
  - Crossing highly productive areas (vineyard, farm lands);
  - Visual impact;
  - Impact on ecological systems;
  - Crossing protected area or forests.

The optimum 400 kV OHL Vulcănești - Chișinău route is established considering the technical-economic criterion and the environmental criterion in equal share (50%).

Within the technical-economic criterion, the five defined indicators are weighted depending on their importance in making the decision regarding the OHL route line.

Within the environmental and socio-economic criterion the four defined indicators are weighted depending on their importance in making the decision regarding the OHL impact on the environment.

Each indicator will receive a mark based on the performance in relation to the specific aspect:

- 3 - for the best solution;
- 2 - for an average solution;
- 1 – for less unfavourable solution.

The optimum alternative is corresponding to the alternative with the closest score to mark 3.

The length of the line is the main technical-economic indicator because has the greatest impact on the investment values.

Consequently, when selecting 400 kV OHL route line it one strategy is to be as close to the straight line joining the end points: Vulcănești sub-station, respectively Chișinău sub-station.

The deviations from the right line are due to different obstacles, existing/proposed objectives and environmental issues.

This indicator is quantified through the percentage of exceeding the length of the route alternative as compared to the straight line which is 136.88 km.

According to this indicator, percentages are the following:

- Option 1 - red: 109.15% longer than the straight line option (149.41 km OHL);
- Option 2 - blue: 109.84% longer than the straight line option (150.35 km OHL);
- Option 3 - green: 119.14% longer than the straight line option (163.08 km OHL).

The table below shows the assessment of the indicators considering route line alternatives for 400 kV Vulcănești - Chișinău OHL.

Table 3.3.1 *The multi-criteria analysis of the route option for 400 kV OHL Vulcănești-Chișinău*

CRITERION	SPECIFIC INDICATORS	Weight of indicators as part of the criterion	OPTION 1 - RED		OPTION 2 - BLUE		OPTION 3 - GREEN	
			Rating	Weighted average	Rating	Weighted average	Rating	Weighted average
TECHNIC	Length of the line	15%	3	0.45	2	0.30	1	0.15
	Percentage of special towers	15%	2	0.30	3	0.45	2	0.30
	Nature of the foundation soil (geological stability)	15%	3	0.45	3	0.45	3	0.45
	Accessibility of the route (difficulty level)	20%	3	0.60	2	0.40	1	0.20
	Coexistence with objectives	35%	2	0.70	3	1.05	2	0.70
	Total technical and economic criterion	**100%**		**2.50**		**2.65**		**1.80**
ENVIRONMENT and SOCIAL	Occupying highly productive areas	20%	3	0.60	2	0.40	2	0.40
	Visual impact	25%	2	0.50	1	0.25	2	0.50
	Crossing protected areas	25%	3	0.75	1	0.25	1	0.25
	Crossing the built area of localities	30%	3	0.90	3	0.90	3	0.90
	Total environmental criterion	**100%**		**2.75**		**1.80**		**2.05**
TOTAL				**2.625**		**2.225**		**1.925**

The results of the multi-criteria analysis indicate that option 1 is the preferred route for 400 kV OHL Vulcănești – Chișinău, as presents the following advantages compared with options 2 and 3:

- Technical criterion:
  - has the shortest length;
  - has an accessible route;
- Socio-economic and environmental criterions:
  - has the lowest visual impact;
  - does not pass protected areas;
  - does have less impact on highly productive lands.

As it can be seen in table 3.3.1, option 1 – red is the best considering mostly the environmental criterion.

The hierarchy of the three proposed routelines is presented in table 3.3.2.

Table 3.3.2 Hierarchy of routeline options by sections

ROUTE OPTION	WEIGHTED AVERAGE	PLACE
1 - red	2.625	1
2 - blue	2.225	2
3 - green	1.925	3

A sensitivity analysis has been made for the proposed criteria to demonstrate that the hierarchy is correct, considering different shares for the two areas of consideration, thus 40% - 60% and 60% - 40%. The results of the sensitivity analysis are shown in table 3.2.4.

Table 3.3.3 *Hierarchy of routeline alternatives based on the sensitivity analysis*

ROUTE OPTIONS	HYPOTHESES					
	40% - 60%		50% - 50%		60% - 40%	
	Weighted average	Place	Weighted average	Place	Weighted average	Place
1 - red	2.65	1	2.625	1	2.60	1
2 - blue	2.41	2	2.225	2	2.31	2
3 - green	1.95	3	1.925	3	1.90	3

The sensitivity analysis strengthens the option 1- red, as optimum alternative for 400 kV OHL Vulcănești – Chișinău. The hierarchy is not affected by hypotheses related to the shares of criteria and indicators.

The option 1- red has been approved by Moldelectrica, which required in the areas when the route is overpassing the high voltage OHLs to be corrected, as follows:

- To avoid the simultaneously overpassing of 330 kV Chișinău - MGRES 1 and 2 OHLs, there are necessary separate investments MGRES - Chișinău 1 OHL and MGRES - Chișinău 2 OHL, by identifying a location where one of 330 kV MGRES-Chișinău OHL will be relocated so that to ensure the possibility to install an enough number of towers for the new Vulcănești - Chișinău OHL, between 330 kV MGRES-Chișinău 1 and 2 OHLs;
- To avoid the intersection with the section 110 kV double circuit of 110 kV Chișinău - Hîncești OHL and 110kV Chișinău -Gura Găbenei OHL, by ensuring the passing through a location where 110 kV double circuit section is divided in separated circuits (North of Zimbreni). An alternative to be anaylzed is passing over 110 kV

Chișinău - Gura Gălbenei North to Zîmbreni OHL, the routeline going towards South-West up to South of Hansca on the East side of OHL Chișinău - Hîncești, avoiding to pass over it;

- Minimizing the crossings with 110 kV OHL Gura Gălbenei – Cimișlia in the region Valea Pierjei, Grădiște, Ecaterinovca;

This route of 400 kV OHL Vulcănești – Chișinău (Option 1- red) has been optimized taking into consideration the recommendation made by Moldelectrica, too.

4. ENVIRONMENTAL AND SOCIOECONOMIC CURRENT STATUS

Information on existing environmental condition in Moldova has been collected from a long range of sources of which the following are key sources:

- **State of the Environment in the Republic of Moldova 2007 ÷ 2010,** elaborated by the Ministry of Environment, Academy of Science and Institute of Ecology and Geography;the document is available on the website http://mediu.gov.md/index.php/starea-mediului/rapoarte;
- **State of the Air Quality in the Republic of Moldova for 2014**, elaborated by the State Hydrometeorological Service; the document is available on the website http://www.meteo.md/monitor/anuare/2014/anuaraer_2014.pdf;
- **State of Environment Report (SOER),** elaborated by the Ministry of Environment and published in 2011 for the period 2007-2010; the document is available on the website http://mediu.gov.md/images/Anunturi/SOER_agregated.docx;
- **Cadastre of Protected Natural Areas,** Institute of Ecology and Geography, Academy of Sciences of Moldova, http://www.ieg.asm.md/ro/cadastrul_ariilor_protejate;
- **First site visit on the first week of April, 2016** of the team formed by experts from ISPE, IVL and Energoproiect in order to see the potentially areas affected by the construction of the proposed routes for the 400 kV OHL and to make preliminary identification of environmental and social issues in order to be further considered and assessed in the continuation of the Project;
- Second site visit on the last week of June, 2016 of the team formed by experts from ISPE, IVL, Energoproiect and Moldelectrica to meet and discuss with stakeholders about the implementation of the Project.

The monitoring of environmental condition in Moldova is assured by the State Hydrometeorological Service which performs systematic monitoring of the quality of air, surface waters, soil and radioactivity. The national environmental monitoring network for the year 2014 is presented in the following figure.

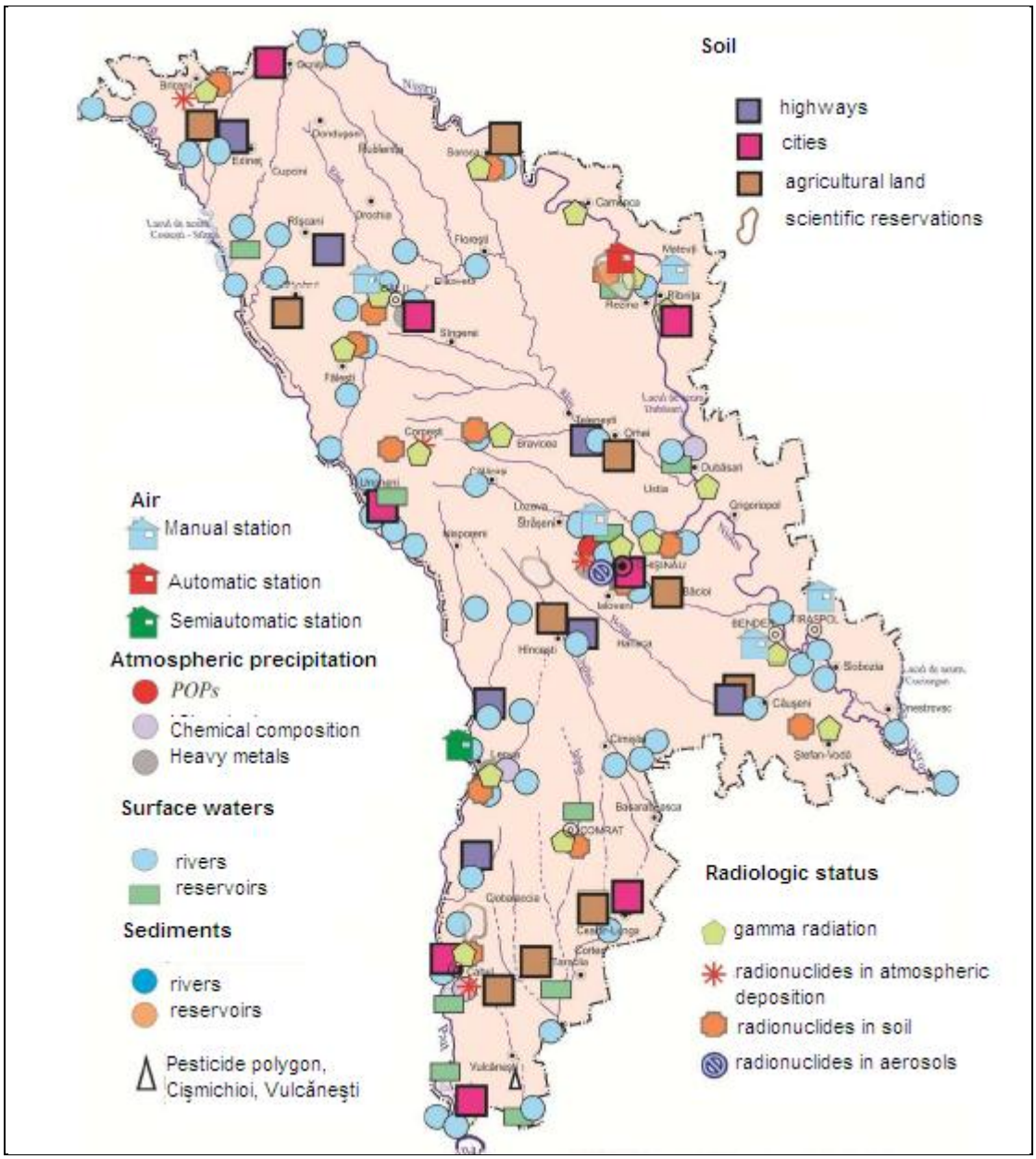

Figure 4.1 National environmental monitoring network, 2014

4.1 Air quality

In 2014, the national network for monitoring of the air quality consists in 19 monitoring stations, namely:

- 17 manual monitoring stations located in 5 industrial areas of the Republic of Moldova (Chișinău - 6 stations, Bălți - 2 stations, Bender - 4 stations, Tiraspol - 3 stations, Rybnita - 2 stations) which suppose the manual collection of the samples (3 times per day); the following substances was measured: sulfur dioxide, carbon monoxide, nitrogen dioxide, soluble sulphates, nitrous oxide, phenol, formaldehyde; the monitoring stations do not measure pollutant such as particulate matter 10 (PM10) and ground-level ozone (O_3);
- automat monitoring stations located at Mateuţi (for substances CO, O_3, total particulate matter) and Leova (for particulate matter PM10, Cl^-, NO_{3-} , SO_4-S, SO_2-S and NO_2).

There are no monitoring stations for the quality of air in the area where the Project will be done; this means no information about the pollutants emitted in atmosphere.

Taken into consideration there is no power plant or other significant industrial plant in the south part of MD, the main pollutants are coming from transport sector. The evolution of the pollutant emissions from road transport reflects an increase of pollutant emissions (especially CO, NOx and PM), mainly due to fleet evolution, the fuels used and the roads technical condition.

4.2 Climate Change

The Republic of Moldova is a non-Annex I Party to the United Nations Framework Convention on Climate Change (ratified in 1995). In 2003 Moldova ratified the Kyoto Protocol.

In the period 1990 ÷ 2013 the trend of aggregated GHG emissions, without/with LULUCF sector relieves a significant decrease of GHG emissions of almost 70%.

In terms of the GHG emissions type, the highest share from total emissions has the CO_2 emissions (65%), followed by CH_4 emissions (21%) and N_2O emissions (13%).

In general, Energy Sector has the greatest contribution to the national GHG emissions, with an average share of 65% follow by agriculture (16%), waste (12%) and industrial process (5%), *Source:* Moldavian State of Environment Report (SOER).

4.3 Water Quality

The Project, especially the route of 400 kV OHL is situated approximately in the middle of south part of the country, overpassing through the hydrological district Nistru (basins of rivers Bîc and Botna) and the hydrological district Danube, (basins of rivers Cogâlnic, Ialpug and Cahul) as is presented in figure 4.3

Almost 90% of route line is in the hydrographical basins of Cogâlnic and Iapulg.

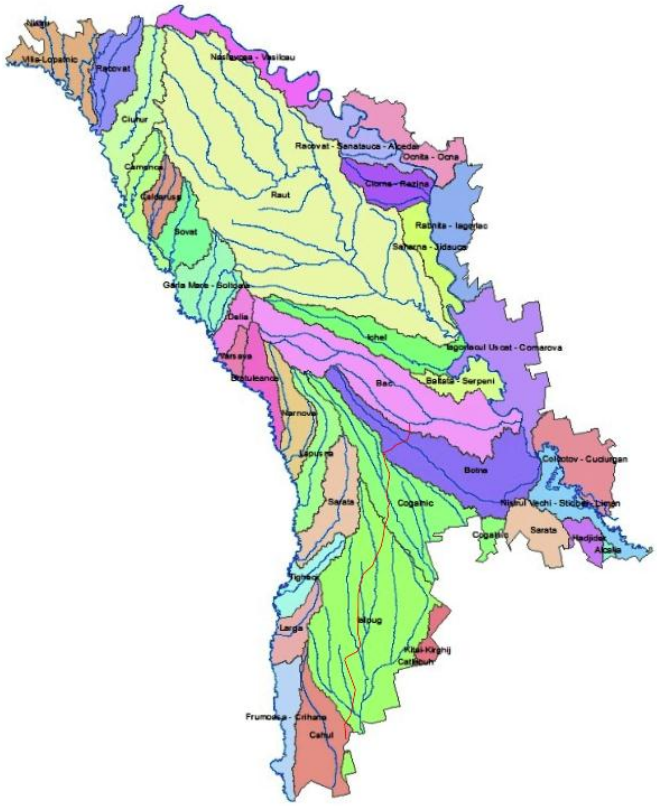

Figure 4.3 *The river basins in the area of the Project*

Bîc River has 155 km length and flows to Nistru river passing through Chișinău city.

Botna River with a 152 km flows to Nistru above 5 km from Tiraspol city

Cogâlnic River starts from Codri Basarabei forest of Nisporeni district and is the longest river in south part of MD. It flows in lagoon Sasic on the seaside of BlackSea, situated in Odessa region, Ukraine.

The main river tributaries are on the left side - Schinoasa, Ceaga, Gealar and Cilighider. In MD the Cogâlnic river goes through several cities, as Hîncești, Cimișlia și Basarabeasca.

Ialpug River starts near Tomai village, Leova district cross the territory of MD – Cimișlia district, ATU Găgăuzia and Taraclia District and flows into Iaplug lake in Odessa region, Ukraine.

The main river tributaries are on the left side – Iapugel, Lunga, and on the right side – Chirsova, Iaplugel and Salcia mare. Ialpug river overpass Comrat the capital of ATU Găgăuzia.

The 400 kV OHL proposed route will overpass Cogâlnic and Iaplug rivers.

The surface waters in the south part of MD does not have the quality needed for drinkable water, so deep drillings are commonly found as the source for water used in the households. Usually the rural towns have a water network. These water systems are in some cases in need of rehabilitation.

4.4 Soil

The route option for 400 kV OHL is part of the Bugeac Steppe in the South side and in the area of the Central Moldavian Plateau in the North side of the studied area. The relief of these areas with average altitudes between 80 and 300 m is characterized by the alternation of low hill areas with smooth slopes and plains, valleys with mainly farming lands.

In the area where the Project is developed, it is found the typical characteristic of soil that in the hole country that has more than 75% chernozioms as presented in the Figure 4.4.1:

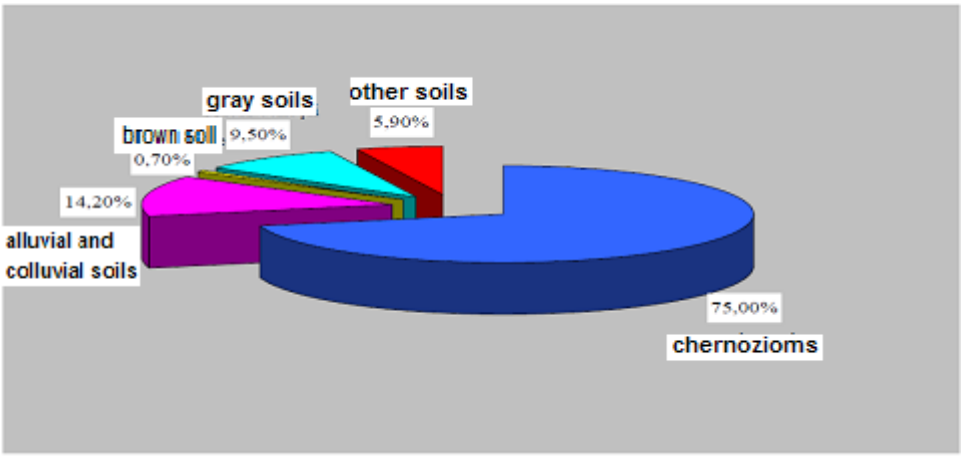

Figure 4.4.1 *Soil types in the Republic of Moldova*

This type of soil is very good for agriculture, so in the area analyzed there is an important development of this sector: it is cultivated crops (wheat, barley and maize), vineyard and orchards (cherries, peaches, nuts, plumes, etc.)

There is no history of landslides in the area of the proposed 400 kV OHL route.

MD is subject to seismic hazard of a very high degree, being driven mainly by intermediate depth earthquakes of Vrancea. Depending on removing outbreak Vrancea seismic varies between 7 and 9 degrees on the MSK scale of 12 degrees. The most destructive earthquake occurred on 30 August 1986 that has not reached a maximum intensity possible, but caused great material losses.

4.5 Natural protected areas

The natural areas protected by the State, which includes scientific reservation, natural protected area (geological and paleontological, hydrological, zoological, botanical and mixed), national park, biosphere reservation, natural reservation, landscape reservation, resources reservation, area with multi-operation management, dendrological garden,

landscape architecture monument and zoological gardens and wetland of international importance are presented in the following figure.

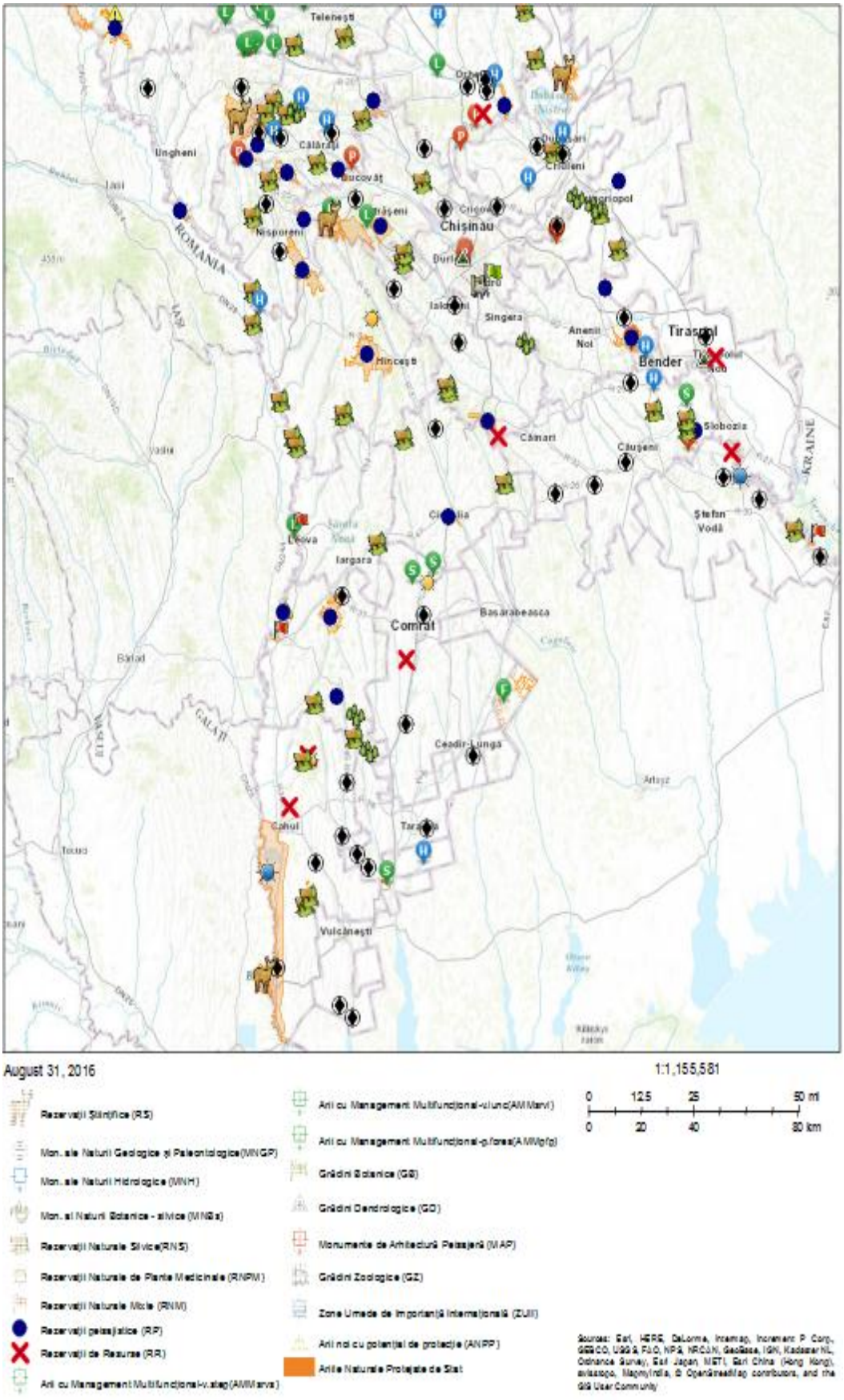

Figure 4.5.1 *Natural areas protected by State ,Source: Cadastre of Protected Natural Areas*

In the particularly zones, near the existing electrical station and the proposed OHL route, there are the following protected areas specified by the Annexes of *Law on natural areas protected by State (no. 1538/1998)*:

- *Annex 3,* A) Geology and paleontology:
  - "Cotofana Ravine", east to Gura Galbeni village, Cimișlia District;
  - Geological section of the valley of Ialpug river – Comrat District;
  - "Vasaieni Ravines", on the right site of the river Botna valley, Ialoveni District;
  - "Outcrop Costesti", North to Costesti village, on the left site of the river Botna valley, Ialoveni District;
  - "Ialoveni recif", near Ialoveni city, on the left site of Isnovat river;
  - "Stone Ravine", North to Tudora village, Taraclia District;
  - "Musaitu Ravine", in the middle of Musaitu village, Taraclia District;
  - "Outcrop", South to Taraclia city, Taraclia District;

  B) Hydrological:
  - River source of Copceac village, Taraclia District;

  C) Botanical:

  a) Representative forest sector:

  - Borceac, Forest Zone Congaz, Comrat District;
  - Cîietu, Forest Zone Congaz, Comrat District;

  b) Old protected trees:

  - English oak, Forest Zone Congaz, Comrat District;
- *Annex 4* – Natural Reservations:

  a) Forests:
  - Hirtopul Moisei, Forest Zone Mihailovca, Cimișlia District;
  - Bolgrad Highschool, near Frumusica village, Forest Zone Congaz, Comrat District;
  - Molesti, 2 km of Molesti village, Forest Razeni, Ialoveni District;
  - Model Forest, between Malcoci and Condriá villages, Forest Scoreni, Ialoveni District;

  b) Medicinal Herbs:
  - Bugeac, Agriculture Plant "Bugeac", Comrat District;
- *Annex 5* – Landscape Reservations:
  - "Cimișlia Ravines", South to Cimișlia city, on the road to Basarabeasca city, Forest Ciucur-Mingir, Cimișlia District;
- *Annex 6* – Resources Reservations:

- The usual cernoziom of Danubian steppe zone, Agriculture Plant "Maiac", Comrat District;

- *Annex 7* – Areas with multi operation management:

a) Where steppe vegetation is representative:

- In the North part of Bugeac, near Bugeac city, Comrat District, border to Cimslia District;
- In the South part of Bugeac, near Vinogradovca city, Taraclia District.

Protected area included in EMERALD network in the region where the Project will be implemented there is Bugeac steppe. Here it can be found typical birds for steppes such as the Tawny Eagle, Quail, Partridge, Calandra Lark and rarely Bustard

The 400 kV OHL route is in the middle of south part of MD, between basins river of Prut and lower Nistru. In these wetland areas over 80 species of migratory birds: the Greylag Goose, various Sandpiper species, Coot, Mallard, Pintail, Gadwall, Netta, Spoonbill, Widgeon, Heron, Garganey, Bittern, Marsh Harrier. Only in recent time swans (Whooper Swan and Mute Swan) and pelicans (Great White Pelican and Dalmatian Pelican) start to nest in the lower part of Prut and Nistru rivers.

Actually the 400 kV OHL crosses the routes of migratory birds to the wetland area of lower Nistru river.

In MD there are three areas according to the Convention on wetlands - RAMSAR, namely:

- The lakes of lower Prut, situated in the west part of the OHL route and sub-station Vulcănești, at 35 km distance;
- The Lower Nistru (communes Copanca and Paluna) on the east side of the OHL at 70 km;
- Unguri and Holoșnița, placed in the north of MD, at 160 km from Chișinău sub-station.

In Appendix 1 is presented a map with the area protected find in the area of interest sub-stations Chișinău and Vulcănești and the three alternative proposed for route of the 400 kV OHL.

4.6 Socio economic environment

4.6.1 General area

The area where the OHL will be placed is typically farming land and other public land. The OHL will not cross major forested areas. Houses are normally found in villages or towns. The affected people will firstly be those communes and villages, including neighbouring vulnerable groups inside the safety and protected area of the OHL and secondly the regional development agencies, districts, municipalities and cities that are closed to the OHL.

- *Primary impact area* - communes and villages, inside the safety and protected area of the OHL: *Secondary impact area* - neighbouring Municipalities and Cities administratively subordinated to the following districts:

- Chişinău Municipality and some of the surrounding communes;
- Ialoveni District;
- Dubăsari-Hânceşti District;
- Cimişlia District;
- Taraclia District;
- Cahul District;
- Autonomous Territorial Unit of Găgăuzia: Comrat and Vulcăneşti Municipalities and some of the surrounding communes.

4.6.2 Demographics

The structure of the stable population (01.01.2016) in the Project area of interest is presented in Table. 4.6.2.1

Table 4.6.2.1 Population in the Project area

Name of District / Municipality	Number of inhabitants*	Rural / urban (%)*		Men/women (%)*		Urban of which men/women (%)*		Rural of which men/women (%)*	
Chişinău**	814, 147	9	91	47	53	47	53	49	51
Ialoveni	101, 331	84	16	49	51	48	52	50	50
Dubăsari Hânceşti	120 ,176	85	15	49	51	47	53	50	50
Cimişlia	60 ,069	76	24	49	51	48	52	50	50
Taraclia	43, 563	53	47	49	51	48	52	50	50
Cahul	124, 647	68	32	48	52	46	54	49	51
U.T.A. Găgăuzia	161, 876	59	41	48	52	47	52	49	51
*** 2016** **** The sub-station is found in the very South of Chișinău and will not directly affect people in Chișinău city.**									

Source: Statistical Summary 2016 - National Bureau of Statistics of the Republic of Moldova, 2016

The population density of the districts affected by the OHL transmission line route is relatively low as the population is predominately rural in most districts. Most affected districts have a low population density of between 60 ÷ 75 persons per sq. km (Cimişlia, Dubăsari-Hânceşti and Taraclia) to 75 ÷ 90 people per sq. km (Cahul and U.T.A Găgăuzia) and 120 ÷ 150 people per sq. km (Ialoveni). The most populated area along the route is Chişinău municipality (1,300 ÷ 1,800 persons per sq. km). However, as the sub-station is found in the very South of Chișinău municipality it will not directly affect people in most dense areas of Chișinău municipality (e.g. Chișinău city). Hence, the proposed OHL route avoids more densely populated areas.

Furthermore, considering the topographic maps for the proposed OHL route for the interconnection of the electrical stations Chișinău – Vulcăneşti, including data on land ownership structure and land use destination in the surrounding areas, it can be concluded that the population in the primary impact area is predominantly rural.

Moldovans are the largest ethnic group in the Republic of Moldova as a whole (75.8%). Moreover, several other ethnic groups exist, where about 8.4 % are Ukrainians, 5.9% are Russian, 4.4% are Gaguas, 2.2% are Romanian, 1,9% are Bulgarian and 1.4 % belong to

other groups. The districts in which the proposed OHL route is suggested to pass are not homogenous when it comes to ethnicity composition (See Table 4.7.2.2)

Table 4.7.2.2 *Ethnicity composition of the population in municipalities/districts overpass by the proposed OHL line*

Name of District / Municipality	Moldovans (%)*	Ukrainian (%)*	Russian (%)*	Gagauz (%)*	Romanian (%)*	Bulgarian (%)*	Other nationalities (%)*
Chișinău**	67,6	8,3	13,9	0,9	4,5	1,2	1,6
Ialoveni	76,3	6,6	6,5	3,1	1,8	4,9	0,9
Dubăsari-Hânceşti	90,3	5,2	1,2	0,1	2,5	0,2	0,4
Cimişlia	86,9	5,5	3,9	0,5	0,5	2,2	0,4
Taraclia	13,9	6,1	5	8,3	0,1	65,6	1,1
Cahul	76,3	6,6	6,5	3,1	1,8	4,9	0,9
U.T.A. Găgăuzia	4,8	3,2	3,8	82,1	0	5,1	0,9

* **Population census 2004**

**** The sub-station is found in the very South of Chișinău and will not directly affect people in Chișinău city.**

Source: Population Density 2015 and population Census 2004

The languages usually spoken in the Republic of Moldova follows, to a large degree, the ethnicity composition in the country. Main language used is Moldovan and Romanian (virtually the same language) spoken by 75,2 % of the population (58,8% Moldovan and 16,4 % Romanian). Other languages usually used are Russian (16 %), Ukrainian (3,8 %), Gagauz (3.1 %), Bulgarian 1,1% and other/unspecified 0,7%. In most districts affected by the proposed OHL route, main language used is Romanian. In U.T.A Găgăuzia, the official language is Gagauz, which is spoken by most population belonging to the Gagauz ethnic group. However, almost all the population in U.T.A Găgăuzia also speaks Russian.

It is very common in the areas affected by the project that people work in other countries or areas for longer periods of time. In the villages the elderly people and children will be left while men and women go abroad for work. The main reason for this migratory work is that there are limited work opportunities at home. In some cases there are seasonal works available in the areas linked to farming activities.

4.7 Land use and ownership

The lands for the construction of 400 kV OHL Vulcănești - Chișinău, with the length of 149 km, are owned by the state or by individuals or legal entities, their legal regime being qualified/regulated according to the law in force in Republic of Moldova.

The route starts from Chișinău station and goes through Ialoveni District passing near some forest as is shown in figure 4.7.1. The east part of the forest is found in Cimișlia district.

The 400 kV OHL passes the Molești forest through a natural corridor avoiding the need to cross the forest.

Figure 4.7.1 *Protected forest at North side of the Chișinău station*

The area which will be affected by the project is mainly farming areas. And available land is used for farming activities. There is land for crops (mainly wheat and corn) but there are also quite a number of vineyards found. These vineyards are typically found in clusters. Also some land is for orchards where for example peaches are grown. Some public land is also found where grazing cattle can be found.

Figure 4.7.2 *Lake in the south part*

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Figure 4.7.3 *Specific area along the proposed route*

Generally, the farm land is private. In many cases the land areas owned are relatively small and it is common that land is leased out for more efficiently land use. Land leases are typically no longer than 3 years due to legal reasons. There are also a number of areas with vineyards. For vineyards the leasing will be longer – up to 15 years. There is need to pay special attention in the upcoming work with the ESIA to ensure that all affected landowners are included. Also informal land use, of for example public land, needs to be captured to ensure that these socio-economic impacts are covered. In **Figure 4.7.4** an example is given of a wine yard which overlooks the valley. The landscape is different in the Northern side of the proposed line, where there are valleys, as compared to the Southern part, where most of the areas are plains.

Figure 4.7.4 *Area with vineyards*

Formular cod: FPM-03.01-01-02 Act.0

In most cases, according to site visits and study of aerial photos and maps, the people stay in villages. The houses spread out in the landscape are few, which makes possible to position the OHL for avoiding crossing the existing houses and buildings and avoiding people relocation. During the on-site visit, it was noted that in some cases houses are build close to already existing OHL, despite the risks associated.

Figure 4.7.5 *Houses build close to existing OHL*

The route is passing through Cimișlia, Comrat and Taraclia districts. Among the OHL route there are protected area with steppe vegetation, one near Bugeac city and another one near Vinogradovca city.

Figure 4.7.6 *Bugeac steppe – protected area*

4.8 Cultural heritage monuments

In Republic of Moldova, the Law no. 1531/1993 protects the monuments which are cultural and natural heritage. This law take into consideration the requirements of European legislation. The monuments are defined as *"object or ensembles of objects wit historical, artistic or scientific value, which represents proofs of the evolution of civilisation on the republic territory, and also of the spiritual, political, economic and social development"*.

The Parliament Decision no. 1531/1993 implement the Law regarding the monuments protection and approved The State Protected Monuments Register of Republic of Moldova, published in 2010 (http://date.gov.md/ckan/dataset/5180-registrul-monumentelor-republicii-moldova).

The Culture Law, no. 413/1999 creates the legal framework for the restoration and protection of monument with historical and artistic value on the MD territory. In 2002 the Parliament ratified the „*Convention Concerning the Protection of the World Cultural and Natural Heritage".*

The cultural heritage monuments are included in National or local registers, depending on their recognised importance. The villages nearby the proposed OHL route, identified and included in the registry of cultural heritage monument, are presented below.

Hanceşti

Hincesti is located at a distance of 36 km from Chișinău, And has 3 museems.

Cimişlia District

- *Cultural:* Cimișlia has several objectives: Zloty Monastery, History Monument *Valul lui Traian* and landscape reserve *Carbunara*.
- In village Zloty we find the monastery of St. George the Martyr, in Selemet an orthodox church, year of construction 1812 and in the village Cenac the church of St. Nicolai, year of construction 1853.
- The Museum of Village Selemet is unique, with almost 7,000 historical exhibits<
- *Natural:* there are a forested area named Zloty Lippovan of 600 ha, located 35 km from the district centre, a monument of Nature Geological and Paleontological "magpie" at 10 km east of the village of Gura yellow, ravines with bones mineralized from Paleolithic, a secular stone (size 9/6m) from sec. XVIII in the village Gura-yellow.

Comrat District (Autonomous Territorial Unit of Găgăuzia)

- Cathedral of St. John the Baptist, built in 1820;
- Museum of local lore;
- Art Gallery;

- Glory Alley Gagauz people;
- The statue of Lenin;
- Regional History Museum Comrat.

Ialoveni District

- There are 61 cultural institutions, among them the Culture Palace of the District, cultural centers, public libraries, educational institutions and museums.
- *Museums*
- There are five museums in Ialoveni district, one the Museum of History and Ethnography of Văsieni village is well known for its archaeological and ethnographical exhibits.
- *Landmarks*
  - Suruceni Monastery;
  - Horești Monastery;
  - Church "Holy Parascheva";
- Quality Wines "Milestii Mici";
- Winery “Ialoveni Wines “, 10 km from the capital Chișinău;
- Museum of Handicrafts;
- Natural Monument geology and paleontology “Rape Văsieni“, protected natural area that covers an area of 3 ha, Văsieni village, on the coast right Botna River valley, west of the village hospital;
- Natural Monument geology and paleontology “Costeşti outcrops", protected natural area that covers an area of 1 ha, north of Costesti, on your left side Botna River valley, near the road to the village Milestii Mici;
- Natural Monument Geology and Paleontology "Ialoveni Reef", protected natural area that covers an area of 3 ha near Ialoveni on the way, on the left bank of the river Isnovat;
- Reserve Forest "Moleşti", protected natural area that covers an area of 5 ha, 2 km south of the village Moleşti , forestry Răzeni Ialoveni.

Taraclia District

- Church "St. Gheorghe";
- The memorial house of Olimpii Panov, national hero of Bulgaria, participating in the battle of Plevna;
- Monument at the grave of soldiers killed in war 1941 ÷ 1945;
- Monument in memory of fellow villagers who died in war 1941 ÷ 1945;
- Monument heroes of the war 1941 ÷ 1945;
- Monument in memory of fellow villagers who died in war 1941 ÷ 1945.

Cahul District

There are a Musical - Drama Theatre, a History Museum and other public institutions and monuments. At the beginning of July, every two years, takes place an important folk music festival, "Nufărul Alb" ("White Nymphaea").

Maps identifying cultural and religious sites mentioned above have been studied and with present preliminary routes there is no obvious impact on any such site.

During the Project analysis there have been registered eight archaeological sites located near the OHL Vulcănești-Chisinău route:

- Valul lui Traian de Jos (segment), Vulcănești district.
- Svetlîi Tumulul 1, Comrat district.
- Dezghingea Tumulul 9, Comrat district.
- Ecaterinovca I, Cimișlia district.
- Valul lui Traia de sus (segment), Cimișlia district.
- Hansca Livadă, Ialoveni district.
- Străisteni II, Ialoveni district.
- Straisteni I, Ialoveni district.

In order to protect those sites from damages or destruction during construction works, preventive archaeological research is required in line with Law no. 2018/2010 on the protection of archaeological heritage.

5. PRELIMINARY IDENTIFICATION OF POTENTIAL IMPACTS

The area analysed to identify the preliminary impact of the Project is in the zones where are placed the existing sub-stations Chișinău and Vulcănești and in a corridor along the proposed route of 400 kV OHL with 10 km on right side and 10 km on left side (total width of 20 km).

5.1 Physical environment

5.1.1 Potential impact on geology, geomorphology and geo-hazards

The route proposed for the 400 kV OHL pass through Central Moldavian Plateau and Bugeac Steppe. The relief of these areas with average altitudes between 80 and 300 m is characterized by the alternation of low hill areas with smooth slopes and plains, valleys with mainly farming lands.

During site visit, the project team did not observe any special physical or geological phenomena, like landslides along the route. Anyhow a geological study for the places where the towers will be built is on-going, so in the ESIA Report will be presented more information about the current status and potential impact.

According to the preliminary information there are no geological reserves near the proposed OHL route.

5.1.2 Potential impact on soil

The construction of OHL towers implies the removing of the surface layer soil and in that specific zone the characteristics of the soil can partially change. If the soil is fertile it can be reused for other purpose. The surface affected by the foundation of the tower, depending on its type can be between 65 ÷ 110 m^2.

All the materials for preparing the concrete needed for foundations (gravel and sand) or backfill will be taken from existing quarries.

The works for the “back to back” station will be done inside the existing electrical station Vulcănești, so is no needs for supplementary space. The equipment that will be installed has a low potential impact on soil and required devices for managing any oil leakages will be installed at site.

After the construction of towers the temporarily land affected by the mounting, the surface layer of the soil will be brought to the initial condition.

There will not be used any kind of chemical substances that may have an impact on soil.

5.1.3 Potential impact on water

The Project is not expected to have any impact on underground water, even in the area where the level is high, because the new construction consists only in the limited tower foundations. It is expected to have no impact on the aquifer.

Direct impact during construction process, for example oil leak from equipment or vehicles will be in a restricted area and may be minimized if there will be taken preventing measures.

The water streams which the OHL route will pass are tributary streams of Prut and Nistru rivers. Installing the wires above these water streams has low negative impacts, only indirect impact during construction works. Temporary contamination of surface water may occur with soil particles, oil leaks from vehicles, paints or solvents and waste from construction or household. This may be prevented using proper techniques for construction in order to avoid any impact on water streams.

5.1.4 Potential impact on air quality and climate

During construction is expected to have emissions from traffic and from work equipment, but it will be on short time in localized areas and along roads.

In summer months, when is very dry, the dust can be a problem that can be resolved by watering the roads.

In certain atmospheric conditions (rain, fog or rime) is possible to appear an electrical phenomena, like Corona discharge, which can produce air ionization around the wires and ozone formation.

The measurement made under 400 kV OHL shows that the concentration of ions are in normal limits and the ozone emissions are usual under the detection limit.

It is not expected that the OHL will affect the climate in any direct way. Indirectly, the Project may support the development of a more climate efficient power system in the region, as the power line can transport electricity supplied by high efficient and/or low emitting power plants.

5.1.5 Potential impact on noise and vibration

During construction typical noise will occur that is impossible to avoid.

After the OHL will be in operation may appear noise and vibration because of Corona discharge, of the wind action or of the electrical line itself. The noise of the OHL conductors may be avoided by using rigid spacers and anti - vibrating devices.

According to different studies and measurement, in extreme condition, an electrical line can produce a noise with an intensity of maximum 52 dB in the limit of protection corridor with 60 m wide.

5.1.6 Potential impact on landscape and visual environment

During construction there will be some areas temporally changed because it is needed service platforms for mounting the towers, for stringing phase and earthwire conductors and service corridor for access of 3 m wide. After finishing the construction works the areas affected will be restored to the initial micro - relief and vegetation.

The visual impact of an OHL is obvious, major and permanent. It is recommended from design phase to take into account proper solutions for various types of area, in accordance with natural, historical and traditional conditions.

Solutions are to have a relatively slim design of the towers, to apply the principle of routing in the way of parallel alignment with existing structures or to have large distances to cities/villages.

After the first months the wires are hanging, the OHL may be more visible in certain lighting conditions – metal wire is shiny or reflects the sunlight and sparkles on it. In time this effect is reduced because of the weather impact on the metal.

5.2 Biological environment

A new OHL can change the existing landscape and reduce the green areas. Because of this from design phase the route was choose to avoid passing through existing forests. If there is needed to cut isolated bushes or trees, they will be replaced in near places with new ones.

There are rare possibilities to have collisions with birds with OHL or electrical shocks if the line is situated on migration route or near nesting places. This risk can be reduced by installing bird markers on the line.

Along the route chosen for the 400 kV OHL Vulcănești - Chișinău was identified a protected habitat included in EMERALD network – Bugeac steppe. The line passes through the north part of the steppe and there will be taken measures to minimize the impacts (avoiding as much as possible the area, less number of towers, etc.)

Other protected areas are at a significant distance and it's considered not to be affected during OHL construction or operation.

5.3 Socio economic environment

The impacts on the socio-economic environment will be further investigated and specified in the full ESIA study, and also include the parameters that needs to be followed up and targeted in the ESMP as well as incorporated in the SEP. The presentation here illustrates the identified challenges and gives priority to the impacts foreseen. The main challenge in the project area will be the impact on land access both during the construction and operation. One major challenge in the detailed study of the project will be to identify and ensure that all land owners have been able to react and take part in the process of establishing the transmission line and sub-stations. This process is defined in the MD law linked to the detailed EIA required as part of the legal framework (see 2.1) in MD.

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5.3.1 Potential impacts on community

The impact of the Project on the community along the OHL route and near the electrical station will be studied in more detail. Based on initial studies there are good opportunities to avoid habited places (no relocation needed) but certain impacts on land used for farming or other productive purposes cannot be avoid. The upcoming work with the ESIA will focus on design and detail routing that minimize negative impacts on these aspects.

There are several towns that will be found within the 10 km radius from the proposed route of the OHL. There will be visual impacts from the OHL and also impacts from any sound that is resulting from the construction and operation. Construction impacts can be controlled and carried out during day time in order to minimize the impacts. In order to ensure that sounds during operation (5.1.5) will not negatively impact people the detailed design phase needs to ensure that distance to towns and/or houses are kept.

The nearest villages to OHL route (a distance of less than 500 m) include:

- Musaitu (175 m from the south south-eastern point of the village);
- Străișteni (270 m from the eastern point of the village);
- Congazcicul de Jos (320 m from the south-eastern point of the village);
- Valea Perjei (370 m from the north-eastern point of the village);
- Brăila (375 m from the eastern point of the village);
- Hansca (380 m from the south-eastern point of the village);
- Vinogradovca (430 m from the eastern point of the village);
- Burlăceni (500 m from the south point of the village).

Even though farming is the main economic activity in the area, there are also some indications that efforts is made to establish some tourism industry (in Ecaterinova for example). The OHL line could reduce the attractiveness of some tourism activities if the activities relate to eco-tourism activities or activities that show-case “untouched” rural area.

The construction of OHL is not expected to generate any new permanent jobs locally. There are some changes that during the construction period temporally employment opportunities will be created. At present it is not known to what extent the construction will affect the farming activities in the project area. Certain farmland will not be possible to cultivate during the construction and in these cases compensation for access to land will be needed. The level of compensation is defined in MD laws. Some impacts could also be experienced by the seasonal workers as reduced land areas are cultivated. Details on exact land use impacts will be provided in the ESIA full report. Based on experience the magnitude of impacts in terms of total affected land is relatively small

The “back to back” station will possible generate in Vulcănești some new personnel positions for operation and maintenance. The maintenance and operation of the OHL will be managed by Moldelectrica and generate some work opportunities in the area.

5.3.2 Potential impacts on infrastructures

The intensity of the electrical field depends directly on the OHL voltage. Therefore, the effects of the electrical field are more marked the higher the value of the field, so for high voltage levels. The impact of the electrical field on the surface of the land consists in the currents induced in conductor objects and in the voltages induced in ground-insulated objects. The high values of the electric fields from the surface of conductors and clamps (if crown discharges appear) can have an impact on the audible noise, produce radio-tv interferences and generate ions and ozone. The 400 kV OHL shall be designed according to the requirements of the standards concerning the values of the intensity of the electric field at ground level.

The environmental impact of the electrical field can be divided in two categories:

- at the level of the ground or at 1.8 m high from ground level high;
- at the level of conductors and clamps where the electrical field is hundreds of times bigger than at the ground level.

The magnetic field is characterized by the density of the flow or of the induction and is generated by currents circulating through OHL conductors and depends on the values of currents, the configuration of phases and the height of over ground conductors. . The electrical and magnetic fields produced by the OHL in operation may have a direct impact on the human body. The height of the towers will be 40 m, the electrical conductors are at 21 m, and usually the narrow of the line is 12 m, so the distance to ground is approximately 9 m.

There are several guidelines and recommendations to ensure that the EMF is not exceeding safe levels. The WHO have guidelines making difference between occupational levels and public exposure. The occupational levels can be higher as it can be considered that these people would know what they are doing, public exposure would need to be safe also in cases where people are unaware of the situation.

Table 5.3.2: *Electric magnetic field thresholds*

Institution	Electric field (kV/m)
WHO (occupational)	10
WHO (public exposure)	5
Moldova regulation[1]	10

[1] In Moldova the limitations of electric field are as follows: inside the buildings - 0.5 kV/m; inside residential area - 1 kV/m; inside localities outside residential area - 5 kV/m; For OHTL: road crossings: 10 kV/m; inside inhabited areas (without buildings) - 15 kV/m, in very hard and inaccessible areas - 20 kV/m

The design of 400 kV OHL shall observe the requirements of the rules regarding the values of the intensity of the magnetic field at ground level. Based on experience with 400 kV transmission lines the level of EMR could exceed 5 kV/m, at the point below lowest part of the hanging power line. The EMF will then decline when moving out from the centre point. In the ESIA full report further details will be given to the EMF and the impacts that this will have on people's possibility to live and also work in close vicinity to the transmission line. The EMF aspect will also be part of the ESMP in order to track and ensure that theoretical levels correspond with reality.

5.3.3 Potential impacts on cultural, archaeological and historical environment

The 400 kV OHL will be constructed in the landfill with the nearest distance to a residential area is to 170 m (Musaitu village). There are more 6 villages with buildings less than 500 m distance to the OHL, other villages along the route line are at a longer distance.

The existing archaeological sites were identified at present the data is compiled and fed into existing GIS system. Further analysis of the material will be needed.

At present it is known that the OHL route will pass near some archaeological sites. According to the national legislation (Law nr. 218/2010 regarding protection of archaeological heritage) the Projects that suppose construction works in the area where is a potential archaeological site has to be approved by Ministry of Culture, based on the expertise made by National Archaeological Agency.

The terrain in this situation has to obtain the *Permit for archaeological discharge*. The procedure is financed by the investor and realized by the National Archaeological Agency.

Only if the *Permit for archaeological discharge* is in place the construction work can continue, if not the route line has to avoid the archaeological site or take the proper measures for its protection.

Proper training and protocols will have to be in place to ensure that the workers will be aware of what the routines are in case archeological artefacts are found during the construction work. Apart from further details on the archaeological sites already identified in the project area, the ESMP will include sections on routines and monitoring of training and routines for ensuring consideration of new archeological sites.

5.3.4 Potential impacts on public health

For a 400 kV OHL, the legislation in force in the Republic of Moldova imposes a protection corridor with a width of 60 m where no construction may be done.

As detailed technical analysis has not yet been completed the details of EMF around the transmission lines can only be based on experiences. Below the lines there should be no constructions (as per the regulations in Moldova) but there may also be some restrictions in terms of time that people should spend inside the 60 meter corridor due to the level of EMF. This would then be specifically important for farmers, sheppards and other people moving around and working in the area. Further details will be provided in the full ESIA.

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It will be important to ensure that people living in the area are made aware of the hazards that may arise from any problems with the transmission line. Also, the hazards in terms of violating, the “no entry” signs. Information campaigns will be needed and targeted towards both habitants and people working in the vicinity of the OHL. Components of this will be included in the ESMP.

5.3.5 Potential impacts on occupational health and safety

According to available information the construction of a new 400 kV transmission line has not been made in Moldova for many years. The experience of construction of smaller transmission lines are there but this project will include several new challenges in the construction and operation phase. During construction work hazards can appear due to use heavy equipment and cranes, falls of the workers or objects, electric shock working with tools and machinery, exposure to dust and noise, etc. that can be prevent buy proper procedure for work protection and periodically training of the workers. These risks on construction sites will be reduced by implementing an Action Plan on Occupational Health and Safety imposed to the construction company. This Action Plan has to respect the provisions of the Law no.186/2008 regarding the Occupational Health and Safety.

The traffic will be increasing during construction that means the possibility of accidents during different movements (excavators, bulldozers, cranes, lifting equipment, trucks, etc.). These risks can be reduces if the access roads will be selected in coordination with local authorities, rules of driving and maintenance will be respected and speed limits, too.

The access to construction sites has to be limited, not allowing other person that is not working there or children and animals. The site has to be secured by fences and guards to prevent the entrance of unauthorized people.

During the operation of the transmission line there may be risks associated with repairs and maintenance. Moldelectrica has procedures and safety regulations that need to be followed. Their staffs are participating in mandatory training courses. There are special routines that ensure that the safety regulations, in case there are accidents, are followed up and improvements of routines are made. One challenge is that in this type of project outside entrepreneurs will be hired. It will be central that also these people have the necessary training to minimize risk of working accidents.

The routines and protocols for safety measures in the work also apply for the operation of the sub-stations as well as the back to back station.

5.3.5 Potential impact on land use

The lands for the construction of 400 kV OHL Vulcănești - Chișinău are owned by individuals or legal entities, as well as being state owned. According to the law in force in Republic of Moldova the legal regime being qualified/regulated.

The criteria for deciding on the OHL route take into consideration avoiding settlements, forests, protected areas, archaeological sites, heritage and culture monuments.

The nearest villages to OHL route (a distance of less than 0.500 km from the axis of the OHL) include:

Musaitu (0.175 km from the south south - eastern point of the village), Străișteni (0.270 km from the eastern point of the village), Congazcicul de Jos (0.317 km from the south-eastern point of the village), Valea Perjei (0.370 km from the north-eastern point of the village), Brăila (0.375 km from the eastern point of the village), Hansca (0.377 km from the south- eastern point of the village) and Vinogradovca (0.532 km from the eastern point of the village).

The Order no. 119/2014 approving *The norms for hygiene and public health of the population* establish sanitary protection zone from residential area, between 50 m to 1500 m depending on the different activities developed (domestic animals farms and auxiliaries, fuel or waste deposits, wind and photovoltaic farms, waste water treatment plants, etc.) There is no distance specified in case of OHL.

There is no forest overpasses by OHL, through Molești forest the line is going in a natural corridor without trees. But the route is overpasses groups of trees with length between 22 and 240 m. The surface affected by the OHL protection corridor in this situation is approximately of 10 ha. In general there are not very high trees, if is less than 4.0 m is no necessary to be cut.

During construction work it can be estimated very precise how many trees must be cut or relocated if it is possible. For example, when OHL overpasses a road or is going along a road, usually on the left side and right side, there are trees. These trees will be into the OHL protective corridor and should be decided depending on their height if it is necessary to be cut.

The 400 kV OHL needs a protection corridor of 30 m (the land and airspace limited by vertical planes, on both sides of the line) from the axis on both sides (total width of 60 m), according to the GD no. 514/2002 for approval the *Regulation regarding the protection of electrical network.*

For normal operation conditions of the OHLs and prevention of accidents should be allocated special lands and established protection corridors clear of trees in massive woodlands and plantations.

The lands located on the protection corridor, not taken from land owners, can be used for agricultural works and other works

The planned works for repairing, technical maintenance and reconstruction of OHLs crossing agricultural land will be performed with the consent of the land owners and usually in the period when the lands are not occupied by crops or when it is possible to ensure the integrity of agricultural cultures.

Most of the villages used drinkable water from underground, the GD for approving *Regulation on areas Sanitary protection of water intakes* establish sanitary protection area around well of 30 m or 50 m if is considered that the underground water is not enough protected from contamination.

In case of surface waters there are establish distances from 50 m to 200 m depending on where are located water outlets

There are very little forested areas in the area affected by the project. The Molești forest which is found South of the Chisinau substation is passed via a natural gap between the Molesti forest and forested area between Buteni and Hanca. The route will over passes smaller forested areas. In some cases these are planted trees. The length of these forested areas varies from 20 up to and 250 m. The surface affected by the OHL protection corridor in this situation is approximately of 10 ha. In general there are not very high trees, if is less than 7 - 8 m is no necessary to be cut.

Almost all the land is used for agriculture (vineyards and crops) and raising animals. The impact will be seen during the construction when land areas are needed to raise the pylons and put transmission cables, etc. in place. This will be only during the period of construction and land will then be accessible again. But there will also be permanent impacts as pylons will require land area. The surface of land needed for the foundation of the 420 towers depends of their type and can be between 27,330 and 46,200 m^2.

There is no need for supplementary land for the construction of the substations; these will be done inside the current substation of Chișinău and Vulcănești.

Further details on the impacts on land use will be given in the full ESIA. As there have been changes in the technical design with this project, the details on the land use is at present studied.

6. TERM OF REFERENCE ESIA

6.1 ESIA objectives and overview

ESIA will be prepared in compliance with the EU Directives on EIA and EBRD Requirements on Environment and Society.

The proposed assessment process and impact assessment will include the following stages:

- Gap analysis of the national, European and international legislation;
- Analysing what type of maps can be found regarding the geological, hydrogeological, land slices, water streams, forests, biological, cultural monuments, archaeological sites, etc. and identify the authorities involved. Finding constrains for the OHL route.
- Effects on the biodiversity. To identify the areas proposed to be protected like ecological corridor or core areas. There is a national program that plans to determine such kind of specific area that need to be preserved.
- Effects on the migratory birds routes. Finding proper mitigations measures to minimize the impact of OHL.
- Withdrawal of lands. The areas occupied permanent by the foundation of towers shall be identified and their owners. Collecting more information and maps regarding land affected Analysis of the data collected during the onsite visits in the current sub-stations and along the OHL route;
- Effect on air quality. The investment will not produce emissions during operational phase, but during construction period has to be considered measures for prevention pollution.
- Effects on climate change. In the sub-station there will be transformers that use SF_6 to insulate the equipment. SF_6 is a greenhouse gas which if leaked to atmosphere, could increase the greenhouse gases levels.
- Effects on water and soil. Some equipment during construction phase (vehicles and devices) or during operational phase (transformer and Diesel engines) uses oil for different scopes. Mitigations measures for prevention leakages on soil, surface or underground water should be considered.
- Effects on noise and vibration. The sub-stations will have switchgear or other additional devices and their impact during operational phase has to be assessed. The high voltage cables are designed to have no impact.
- Electro-magnetic compatibility, (EMC). An analysis of the possible effect of sub-stations and OHL on radio and TV interference and on occupational and public effect under normal operation condition will be developed during ESIA.
- Effects on economy and tourism. The effects will be assessed qualitatively on potential impact to tourism and recreation affected by this investment

- The environmental and social assessment of the substations and OHL during design, construction, operation and decommissioning phases will be done based on field surveys, consultations with authorities involved and public feedback and professional judgment;
- Update the *Stakeholder Engagement Plan* (SEP);
- Preparation of *Environmental and Social Management and Monitoring Plan* (ESMMP*)* for the entire project development (design, construction, operation and decommissioning) phases;
- Developing an Environmental and Social Action Plan;
- Identifying Moldelectrica's labor and working conditions requirements and proposed measures and policies if is necessary;
- Assisting Moldelectrica during public consultation, information and public debate meetings and preparation of any support materials/documentation.

6.3 Draft structure of ESIA report

The ESIA Report will be structured in seven sections that will describe and evaluate the Project considering the impact of designing, construction, operation and decommissioning on environment and social:

- Introduction on the purpose of the Project and on the scope and approach of ESIA;
- The legislation in force and policy requirements;
- The Project description and the alternatives considered;
- The current status of the environment and socioeconomic description;
- Potential impact of the project on environment and socioeconomic (land use, geology, soil, ground water and surface water, air and climate, landscape, habitas, flora, fauna, people, communities, infrastructures, tourism, cultural, archaeological and heritage, occupational health and safety);
- Non- Technical Summary, NTS
- Environmental and Social Monitoring and Management Plan, ESMMP;
- Environmental and Social Action Plan, ESAP;
- Stakeholders Engagement Plan, SEP.

6.4 Draft ESIA time schedule

ESIA Report will be elaborated in parallel with the Feasibility Study and be finalized after public consultations.

The first analysis starts in the middle of June 2016 with the gap analysis of the national, European and international legislation.

The first contact with the authorities involved and local public is made at the end of June 2016.

During July and August 2016 were made investigations to find the proper maps for the currents status on hydrogeological, land slices, water streams, forests, biological, cultural monuments and archaeological sites for the south part of MD where the Project should be implemented. A methodology for the ESIA was established to quantify the investment impacts on each aspect considered.

From September starts to assess the impact of the substations and 400 kV OHL on environment and social focused on protected area and biodiversity, most on migratory birds. The lands affected by the construction of 400 kV OHL begin to be identify.

In October the effects of the investment on air, surface and ground water, soil, land use, biodiversity, occupational and public health, cultural heritage and archaeological sites are evaluated based on the methodology proposed.

The Preliminary ESIA Disclosure Package (ESIA Report, NTS, SEP, ESMMP and ESAP) should be ready on the end of November, and the Final ESIA Disclosure Package after including the public comments on the 20th of December 2016.

7. STAKEHOLDERS ENGAGEMENT

7.1 Introduction

The purpose of the Stakeholders' Engagement Plan (SEP) is to provide a basis for a constructive relationship, between the contract owner and the affected stakeholders over time. The SEP will be an instrument for MOLDELECTRICA in describing its strategy and program for engaging with stakeholders, through the various stages of MD-RO project (planning - studies and consulting, engineering; construction - commissioning and operation), by ensuring relevant and understandable information and by providing, to all the project's targeted public, opportunities to express their views and receive responses. The nature of and frequency of engagement is defined by the risks and impacts that the project will have. The SEP also stipulates for stakeholders how their concerns are to be considered in compliance with a grievance procedure.

Related to 'MD-RO' Project current stage of development, this document will be focused, and will refer strictly to the Feasibility Study phase.

According to EBRD Environmental and Social Policy – Performance Requirements - PR10 (revised 2014 version) 'MD-RO' Project is classified in Category A "Construction of high voltage overhead electrical power lines", that are likely to have adverse environmental or social impacts and issues during mainly the construction and operation phase.

The SEP is a living document which is to be periodically reviewed and adapted to cultural specificity, the frequency and methods of revisions being described in the document itself.

7.2 Stakeholders identification and analysis

According to EBRD's Performance Requirement (PR) 10 both internal and external stakeholders were identified within the SEP.

The categories and list of identified stakeholders will evolve together with 'MD-RO' Project. At the present stage the general stakeholder groups, as presented in Figure 7.2.1, has been identified. All stakeholders are at present found in MD; it is possible that extension of stakeholder groups to also include Romanian groups would be needed in the future.

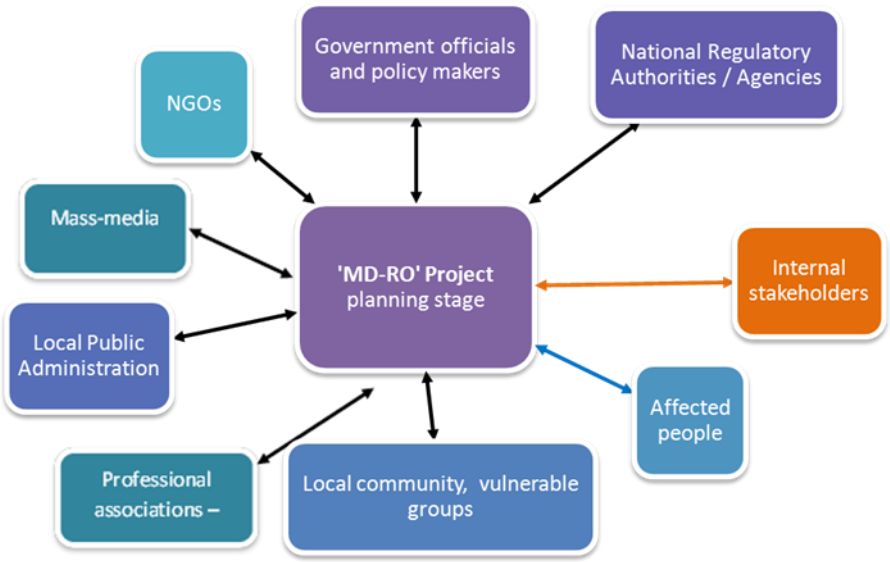

Figure 7.2.1 *Targeted stakeholders groups*

External stakeholders

This category of stakeholders is represented by the public resident in the most probably affected areas and the public that called itself "concerned/interested public" if it can be determined that it is likely to be affected by the 'MD-RO' Project. The main stakeholders groups, considering 'MD-RO' Project geographic area of impact, are:

- People affected directly by the construction and/or operation of the OHL;
- Local community and vulnerable groups;
- Local Public Administration;
- Government officials and policy makers;
- National Regulatory Authorities/Agencies;
- Academic and RDI environment;
- Professional organizations;
- Labor Unions;
- Civil society - NGO's;
- Mass media;
- The business environment;
- International financing bodies.

Internal stakeholders

- MOLDELECTRICA managing staff and its employees with focus on the 'MD-RO' Project team;
- Other stakeholders related to the internal public: consultants, general contractor, the lender - EBRD.

During the Feasibility Study stage, the stakeholders' analysis started by revealing the most directly affected public by 'MD-RO' Project, whether from the use of land all along the project site or the impacts on human health, air and water or even the socio-economic

effects of job creation throughout the entire chain (planning, construction, commissioning, operation). A stakeholders' mapping process all along the impact zones was performed, followed by a prioritisation of the main identified groups.

Additional details are presented in the updated SEP document – revision 1, regarding the stakeholders' mapping process (selection criteria, prioritization, identified barriers, tailored communication tactics and tools, etc.).

7.3 Disclosure of information

The objective of the disclosure process is to solicit feedback from project affected settlements/stakeholders, vulnerable groups and interested stakeholders on 'MD-RO' Project impacts and proposed mitigation actions and where required make the necessary changes to the ESIA to reflect comments received. Within the ESIA process, a formal public consultation campaign will be conducted along the OHL route, carried out by MOLDELECTRICA Project team working alongside the consultants' consortium.

The main steps of the disclosure process will be:

- Preparation and distribution of disclosure materials (disclosure information package);
- Announcements and engagement of the media (press release);
- Disclosure meetings;
- Collection and incorporation of comments and feedback.

The information to be disclosed publicly is governed by EBRD's Public Information Policy, PR 10 and Republic of Moldova national legislation.

The disclosure information package will be distributed, in the adequate languages, to the relevant stakeholders at least one week prior to the commencement of the official disclosure period, and at least two weeks prior to the disclosure meetings thus ensuring to stakeholders enough time to review the documentation prior to the meetings.

The required public comment period must conform to national legislation and EBRD's requirements. In 'MD-RO' Project case, the Bank will require at a minimum a 120-day comment period between the publication of the final ESIA and Board consideration. MOLDELECTRICA will keep ESIA-related documentation in the public domain until 'MD-RO' Project will be completed.

Printed, electronic copies of the draft information disclosure package (NTS, ESIA and ESAP, ESMMP and SEP), will be made available in Romanian, Russian and English languages prior to the disclosure period. Special attention to people that live along the OHL (a corridor approach to identify these people will be applied) and land owners directly affected will be a prioritised group in order to ensure that they have understand their rights in terms of relaying opinions on the construction and operation of the OHL. To this aim key information, as NTS and "MD-RO project in brief" brochure will be printed also in Găgăuz language in the area of interest – local administration potentially affected from ATU Găgăuzia.

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7.4 Stakeholders Engagement Programme

Up to date scoping meetings have been performed and internal stakeholders have been consulted and engaged in the project planning process.

According to SEP Program the following engagement activities were performed so far:

During PRE-ESIA Analysis and stakeholders' identification stage (April ÷ May 2016):

- MOLDELECTRICA staff, as well as EBRD, has been consulted in the process of establishing the most favourable route of the OHL between Vulcăneşti sub-station and Chişinău sub-station;
- Onsite visits to the areas that are located near the existing sub-stations as well as where the proposed "option one" OHL route will pass have been implemented and the experiences from these on-site missions have been used to update the future activities and plans presented in the first draft version of SEP.

During ESIA Scoping stage (June ÷ July 2016):

- Face to face interviews with local communities' representatives along the OHL proposed route;
- Meetings with national NGOs (introductory);
- Meetings with governmental officials (introductory).

The objectives of the scoping phase were to verify:

- The range of social and environmental impacts and issues (risks and opportunities) relevant to the 'MD-RO' Project; and
- Stakeholders relevant to the 'MD-RO' Project and vulnerable groups
- Scoping meetings took place between 28th of June and 1st of July 2016 according *to the detailed presentation within the updated SEP document - revision* 2.

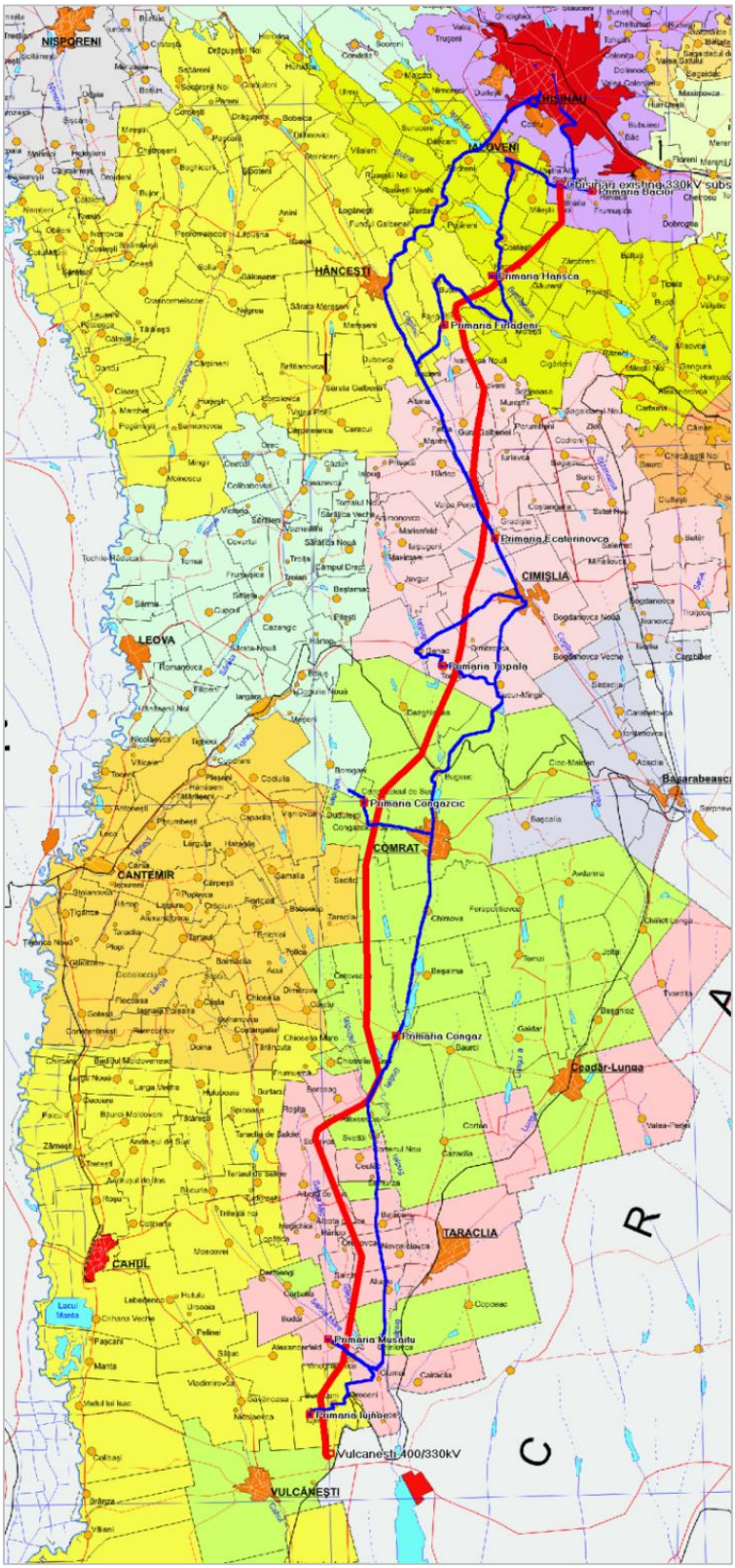

Figure 7.4 *Scoping onsite mission map*

OHL route – version one, approved; Driving road; Stops – villages/communes' local administration

Table 7.4 *Scoping meetings in local communities, governmental and non-governmental organisations*

Date	Communities Governmental organisation NGOs	Persons met / Position
28.06.2016	Chişinău Municipality - Băcioi locality	Mr. Ilie LEAHU, vice-mayor Mr. Dumitru STANILA, engineer Ms. Valentina BALTATESCU, accounting
	Ialoveni District - Hanşca locality	Ms. Svetlana BOSTANICA, accounting Ms. Silvia ARHIRII, secretary
	Hânceşti District - Fîrlădeni locality	Mr Pavel BARBOS, Mayor
	Cimişlia District - Ecaterinovca locality	Mr. Efim STROGOTEANU, Mayor
	Cimişlia District - Topală locality	Ms. Nadejda COSTAS, Mayor Mr. Constantin Gherea, engineer Ms. Raisa COMERZAN, social assistant Ms. Mirea RACILA, accounting Ms. Mariana CERNEI, secretary
29.06.2016	ATU Găgăuzia - Congazcic locality	Mr. Dimitrii IKIZLI, Mayor Mr. Grigori IKIZLI, engineer
	ATU Găgăuzia - Congaz locality	Mr. Mihail ESIR, Mayor
	Taraclia District - Musaitu locality	Ms. Raisa TASNICENCO, Mayor
	Cahul District - Iujnoe locality	Mr. Ghenadie FOCSA, Mayor
30.06.2016	Ministry of Regional Development and Construction	Mr. Anatolie ZOLOTCOV, vice minister Ms. Elena BEJENARU, Head of Architecture, Construction and Dwellings General Division Mr. Serghei MUNTEANU, Head of Architecture, design, urbanism and land use planning Division Ms. Victoria JARDAN, expert in the same Division
	Ministry of Environment	Ms. Maria NAGORNÎI, Head of Policy Analysis, Monitoring and Assessment Department Ms. Veronica JOSU, Deputy Head of Natural Resources and Biodiversity Department Mr. Vitalie GRIMALSCHI, Head of Protected areas, biodiversity and biosecurity Unit
	Ministry of Culture	Mr Gheorghe POSTICA, vice minister Ms. Emilia RISTIC, Capital investments Service
	AgroInform Farmers Association	Mr. Iurie HURMUZACHI, Deputy Director
01.07.2016	MOLDELECTRICA	Mr. Veaceslav ZASTAVNEȚCHI, Deputy General Director - Head of the Central Dispatcher Mr. Iurie CAZACU, Head of Electricity Regimes and Forecasts Division Mr. Dmitri POPOV, Head of Forecasts Dpt. Ms. Nelli MELNICENCO, Deputy Head of Environmental Dpt. Mr. Dmitri SUHAZEV, Head of OHL Division Mr. Vitalie BITCA, Head of Electrical Substations Division

The purpose of all these meetings-interviews was to understand the potential project area of influence and the potentially impacted stakeholders, to gather local level insights and a

clear picture of the perceptions of the potential impacts of the project and main affected stakeholders, as perceived by the stakeholders themselves. All notes related to the informal interviews performed during the scoping meetings, have been gathered and can be checked in the updated SEP document - revision 2.

The selection of sites (Figure 7.4) in which face-to-face meetings were performed, during the scoping onsite mission, was based on environmental, social and other (e.g. geographical spread logistics etc.) criteria for settlement selection.

The future planned activities will be focused on the consultation meetings enrolled during ESIA process, and will include:

- Public consultation meetings in local communities (local citizens, NGOs, vulnerable groups, informal leaders);
- Possible to also include individual consultations. Depends on findings in ESIA study and technical specifications;
- Press-releases to the printed and online media.

Stakeholder consultations may create actions and reactions among the stakeholders and this will be considered in the 'MD-RO' Project future planning activities.

Stakeholders feedback (question, complain, request, etc.) will be taken into consideration during all the Project development stages and managed according to the Grievance Mechanism.

7.5 Grievance Mechanism

A grievance mechanism will be implemented to ensure that MOLDELECTRICA is responsive to any concerns and complaints particularly from affected stakeholders and communities. This grievance mechanism covers both internal public (employees) and external public (i.e. affected people and other relevant stakeholders).

A schematic flow for the grievance mechanism is presented below in Figure 7.5. Both verbal and written complaints are to be registered and documented. Any comments or concerns can be brought to the attention of the company verbally (by phone) or in writing (by post or e-mail) or by filling in a grievance form. Designated staff at MOLDELECTRICA will be trained for the management of the grievance mechanism.

In the SEP document contact details will be provided to the stakeholders both for the CLO (Community Liaison Officer) and ESIA and SEP Manager.

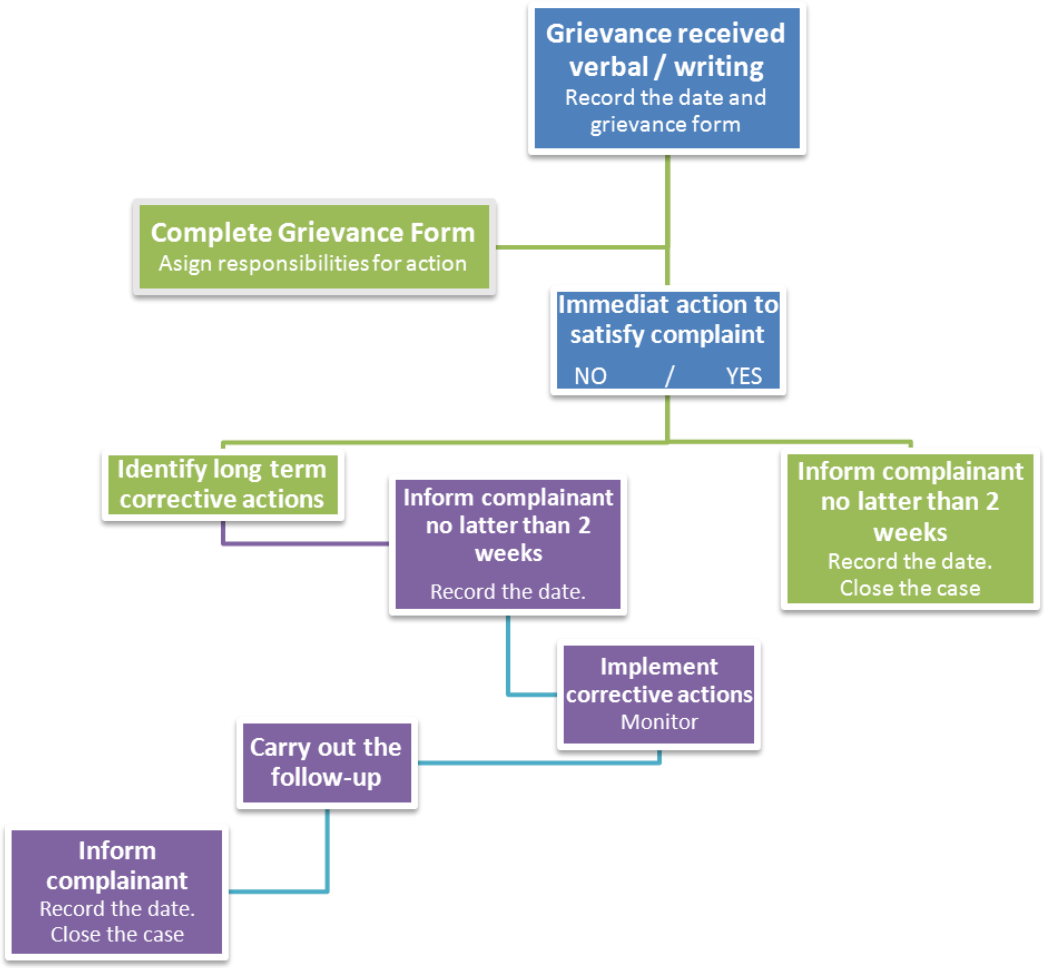

Figure 7.5 *Grievance procedure*

7.6 Monitoring and Reporting

Consultation records, minutes of meetings and query forms of informal consultations (face-to-face interviews) will be maintained by MOLDELECTRICA CLO and consultants' consortium social impact responsible representative. Periodic (4Q) Reports summarising the activities and key emerging themes raised by affected groups will be performed.

An Annual Report will be also prepared by MOLDELECTRICA CLOs summarising SEP results, based on which updated information will be delivered back to the community / stakeholders targeted group, including also work progress of 'MD-RO' Project development stages. MOLDELECTRICA will act consequently – activate feedback loop and implement corrective measures, both in the environmental and social field.