



Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 08-Oct-2018 | Report No: PIDISDSC21812

**BASIC INFORMATION****A. Basic Project Data**

Country Moldova	Project ID P160829	Parent Project ID (if any)	Project Name Moldova Competitive Power Market Project (P160829)
Region EUROPE AND CENTRAL ASIA	Estimated Appraisal Date Jan 22, 2019	Estimated Board Date Apr 30, 2019	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) Ministry of Finance	Implementing Agency Ministry of Economy, Moldovan Energy Projects Implementation Unit (MEPIU)	

Proposed Development Objective(s)

The Project Development Objective is to increase capacity and improve reliability of power transmission system in Moldova and therefore enhance its access to the European electricity market.

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	75.00
Total Financing	75.00
of which IBRD/IDA	70.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Development Association (IDA)	70.00
IDA Credit	70.00

Non-World Bank Group Financing

Counterpart Funding	5.00
Borrower	5.00



Environmental Assessment Category

A - Full Assessment

Concept Review Decision

Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

- 1. Since the early 2000s, Moldova, has made significant progress in achieving inclusive growth, averaging 5 percent annually, and reducing poverty, which declined from 26 percent in 2007 to 11 percent in 2014.** Growth has been driven largely by consumption and poverty reduction mainly by remittances and pensions. Employment declined because of emigration and falling labor force participation, so wage income added little to improving living standards. Moldova is vulnerable to changes in external demand and climate shocks due to its small size, open economy, and reliance on agriculture. It is also at risk because of high external debt and a legacy of political instability. Emigration of the working-age population and an annual population decline of around 1½ percent add to the country's economic, fiscal, and social fragility.
- 2. After rapid growth and poverty reduction since the early 2000s, deteriorating external conditions and increased governance challenges slowed growth.** The decrease in real growth was attributed to fall in demand for Moldovan products both domestically and in the EU, as well as to the significant increase in energy prices. In 2015, the economy contracted by 0.5 percent due to: adverse external factors that reduced remittances from and halved exports to Russia; a summer drought; and a fraud in three large banks costing 12.5 percent of its GDP. The latter led to higher interest rates, an increase in public debt to 47 percent of GDP (up from 38 percent in 2014), and damage to business confidence. The authorities' short-term economic agenda is thus dominated by the macro-fiscal consequences of the banking fraud and by the desire to restore investors' confidence in economic governance.
- 3. While Moldova recovered after 2015, economic growth remains below historical averages of 5 percent and is mainly led by consumption.** Following the banking fraud in 2014 and the subsequent contraction of the economy in 2015, growth rebounded reaching more than 4.5 percent in 2016 and in 2017. This was owing to robust private consumption largely driven by remittances and public and private wage increases. Lower interest rates, the stabilization of the financial sector, and the double-digit increase in public investments led to a recovery in gross fixed investments. Despite robust exports supported by good harvests in the past two years and a stronger leu, imports rapidly increased, resulting in a negative contribution of net exports to growth (-2.7 percentage points).



4. **In the medium term, growth is expected to remain below 4 percent and prone to considerable risks.** Favorable external conditions will support the ongoing recovery in remittances, further sustaining private consumption, which will remain the main driver of growth. Real growth in public transfers and the ongoing recovery in capital spending will help support growth in the medium term, particularly in the 2018 electoral year. In the longer term, Moldova's economic outlook faces several challenges, including macroeconomic and fiscal stabilization, economic governance and transparency—especially in the investment climate—and the uncertain post-election policy environment.

5. **Increasing energy efficiency and security of energy supply are critical factors in improving Moldova's economic competitiveness.** In the electricity sector, which is currently connected only to Ukraine, the interconnection with Romania represents a major step in increasing security of supply and access to competitively priced electricity from the European energy markets. This could significantly help improve transparency and efficiency in the electricity market, which are important to secure and sustain long-term investments in the national economy.

Sectoral and Institutional Context

6. **The power sector in Moldova has achieved important results through a process of reforms and restructuring over the last 15 years.** The power sector became unbundled in 1997. The legal, functional and accounting unbundling resulted in a separate state-owned enterprise that serves as the Transmission System Operator, namely Moldelectrica (ME), provides transmission services, and is restricted from engaging in any supply activity. ME is a state-owned company managing the assets of the power transmission system and the dispatch center. In 2000, Moldova privatized a large part of the distribution sector (approximately 70 percent): three out of the five power distribution companies. Subsequently those three companies were merged into one private company, Gas Natural Fenosa (previously RED Union Fenosa), while the other two remain as state owned enterprises: RED Nord and RED Nord-Vest. The Ministry of Economy and Infrastructure (MoEI) is responsible for the policy making for the energy sector and leading the sector dialogue. Moldova's National Energy Regulatory Agency (ANRE) was established and operating since 1997. ANRE is an independent public administration authority in charge of regulating electricity, gas, petroleum, and district heating (partly). ANRE is not subordinated directly to any central public authority, but reports to the Parliament since the regulatory reform of 2010.

7. **Limited generation capacity in Right Bank.** Moldova's annual electricity consumption is 4,270 GWh in average during 2013 and 2017, peaked at 784 MW in 2017 excluding the left bank. Out of the country's electricity demand, only around 20 percent has been covered by domestic generation sources located on the Right Bank of Nistru River including three Combined Heat and Power (CHP) plants and one run-of-river Hydro Power Plant (HPP). The CHP plants are heavily constrained for electricity generation dispatched primarily to meet heat load. The country's renewable development has been limited so far with installed capacities of 2.84 MW for solar and 23.93 MW for wind as of August 1, 2018¹, which cannot be immediately expected as a major generation source for the near future. The remaining electricity demand for the Right Bank is covered by two external sources: Kuchurgan power plant or Moldavskaya GRES (MGRES) located in the Left Bank and power supply from Ukraine. MGRES was commissioned in 1964 and is operated by a subsidiary of Inter Rao UES². Table 1 below shows the list of major

¹ The country's Renewable Energy Law and Energy Strategy, both created in 2007, requires the use of energy produced from renewable sources up to 20 percent of the total gross domestic consumption and 10 percent of annual electricity production by 2020.

² Inter Rao UES is Russian diversified energy company that manages assets in Russia, Europe and the CIS in areas of electricity generation, sales, trading, and engineering. The aggregate capacity of power plants under Inter RAO Group control is about 33.5 GW (as of May 16, 2018) and its consolidated revenue reached 917 billion Rubles in 2017.



power plants (both on the Right and the Left Banks of Nistru River) and historical electricity supply and demand balances.

Table 1: Historical Electricity Supply Balances (GWh)

Sources		2013	2014	2015	2016	2017	5 years average
Supply	CHP-1	59.5	67.4	47.2	43.9	32.4	50.1
	CHP-2	694.8	702.3	732.2	708.3	692.8	706.1
	CHP-Nord	60.2	61.5	66.6	67.5	60.3	63.2
	HPP Costesti	45.3	59.3	50.6	39.3	47.6	48.4
	Others	35.6	58.2	35.8	39.4	46.3	43.1
	HPP Dubasari	268.4	261.2	218.1	190.9	237.1	235.1
	MGRES	3044.5	3893.0	4610.4	4468.4	3557.2	3914.7
	Import from Ukraine	1455.7	730.7	17.6	3.7	1133.1	668.2
Demand	Right Bank	4230.2	4290.3	4289	4246	4295	4270.1
	Left Bank	1350.9	1543.3	1486	1316	1514	1442.0
	Export to Romania	82.9	0	0	0	0	16.6
Total		5664	5833.6	5778.5	5562.4	5806.8	5728.9

8. **Transmission network is integrated with Ukraine and UPS/IPS.** Moldova’s transmission network consists of 5,977.6 km of transmission lines at three primary voltage levels: 400, 330, and 110 kV, operated synchronously with the former Soviet Union’s UPS/IPS systems. Moldova and Ukraine’s transmission networks were designed, built and operated as an integrated system during the Soviet era. They are still operated as a one interconnected power system. Interconnections with Ukrainian power system include 11 lines of 110 kV and seven lines of 330 kV: one 330 kV line from Balti substation to Dnistrovska HPP of Ukraine, two 330 kV lines from Ribnita substation to Kotovsc substation of Ukraine, and four 330 kV lines from MGRES power plant to three substations in Ukraine. Power system balancing, and frequency regulation are conducted by Ukrenergo’s dispatch center in Kiev, which in turn depends on Russia for the frequency control.

9. **Transmission network is connected with Romanian grid only as an island mode.** Romania is part of the European power system comprising several member transmission system operators (TSOs) which are organized in the European Network Transmission System Operators for Electricity (ENTSO-E). Currently, Moldova is not fully synchronized with the Romanian power system. Only three isolated 110 kV transmission lines are connected with part of the Romanian system for local supply. One single circuit 400 kV line from Moldova’s Vulcanesti substation to Romania’s Isaccea substation physically exists but it remains disconnected at the Vulcanesti substation.

10. **Transmission and distribution are efficiently operated but their financial liabilities continue to be an issue.** Moldova’s transmission losses are small, only 2.68 percent in 2017, comparable to modern transmission system operators in developed countries. The distribution sector has been also operated efficiently. The country’s largest distribution company, Gas Natural Fenosa, had merely 6.65 percent of distribution losses with almost 100 percent of collection rate for the first quarter of 2018. Despite the sector’s successful operational efforts, tariffs have been a major issue to secure the sector’s financial viability. The levels of tariffs are not adequate to provide sufficient cash flow to the sector to fully meet its financial obligations, including operational expenses and debt service although there have been some improvements in recent years as a result of which ME has been able to achieve small positive net income. Nevertheless, ANRE’s regulation of the tariffs will continue to be a significant



factor during project implementation, particularly as the interconnection investments under the project will require some modifications to the existing methodology.

11. **Limitation in supply options impedes security of electricity supply.** More than 75 percent of the country's electricity demand for the west bank of Nistru River is met by imports from Ukraine and MGRES power plant. MGRES generates electricity from gas supplied by Tiraspol-Transgaz. However, the electricity price has never been based on a transparent cost structure, because the Transnistrian authorities and the MGRES don't pay for their gas consumption.³ With limited supply options, oligopolistic pricing practices have taken place in the past, leaving Moldova with possibly colluded prices. Clearly, the current situation is not sustainable and depends on the willingness of Gazprom to continue accumulation of gas arrears. Furthermore, the upcoming changes in the regional gas market, including the development of the TurkStream gas pipeline which will create a new alternative for supply of Russian gas to Turkey, may significantly affect future transit of Russian gas through Moldova and make the current arrangement unsustainable. The availability of "free" natural gas for MGRES to generate electricity is therefore not assured over the long term. An electricity supply from Ukraine is also not sustainable considering the decreasing gas supply from Russia and the blockade of coal supplied from occupied Donbas region.

12. **Competition in the power market is severely limited due to physical constraints as well as lack of transparency.** Full market opening was initiated by the regulator in March 2005 through adoption of specific regulation, but it has never been implemented due to limited sources of domestic supply and delayed implementation of important sector legislation and regulations. Only a few customers, which account for only 10 percent of annual electricity consumption, are supplied at unregulated rate. The wholesale electricity market, in its current shape without a spot market, is based on a number of bilateral contracts between distribution companies, unregulated customers, generators, and other power suppliers (traders). Although there are twenty licensed suppliers at non-regulated tariffs having the legal right to import and export energy, the state-owned Energocom has a de-facto monopoly on imports from Ukraine and purchases from MGRES, and acts as a single buyer. With support by the Energy Community Secretariat (ECS), the GoM adopted in 2017 the Electricity Procurement Guidelines. However, the procurement arrangements have still raised suspicions regarding a possible concerted action between Enercogom, MGRES and DTEK, a Ukrainian supplier, as the last two companies negotiated directly with Energocom outside the formal procedure. Thus, neither real competitions nor a trading framework exist and market-based price references are missing. To resolve the supply security issue, the government explored various options including a new gas power plant, but this idea will not be able to address the security issue as gas supply will continue to be from Russia. On top of that, the domestic generation option is costlier than the interconnection with Romania.

13. **GoM made a strategic decision to interconnect asynchronously with Romania as the optimal solution to resolve the security of supply issue.** The Energy Strategy 2030 proposes that Moldova strives to build new interconnectors connected to power systems of members of ENTSO-E to foster competition and increase security of supply and energy efficiency. As a new member to the EU Energy Community through joining the Energy Community Treaty in 2010, integration to regional power market is a policy priority for Moldova, and so is diversifying the energy supply. The World Bank's 2015 technical study funded by ESMAP, Electric Power Market Option Study (P146401), has confirmed the asynchronous interconnection with Romania via Back-to-Back (BtB)

³ MGRES generates electricity with low-efficiency single cycle units. The price of electricity sold by MGRES does not reflect the true cost of gas because of a chronic non-payment of MGRES to Tiraspol-Transgaz which, in turn, has accumulated huge arrears to Gazprom, Russia.



link⁴ while maintaining energy trades with Ukraine and MGRES, as the least cost and optimal solution to improve the security and affordability of electric power supply for Moldova. Following the study's recommendation, GoM has taken a strategic decision in 2015 to establish an asynchronous interconnection with Romania. Moreover, the GoM plans to implement the sector reform under a program called PowerSAP, a power sector reform action plan for the electricity sector developed in conjunction with the Energy Community, the EIB, the EBRD, and the WB. The WB will specifically support establish electricity markets under the upcoming technical assistance funded by EU, closely collaborating with Energy Community Secretariat (ECS), which is developing electricity market regulations.

14. Access to Romanian electricity markets will improve security of supply and increase competition in Moldova. Romanian electricity market, operated by the country's market operator (OPCOM), is considered as one of the most competitive and transparent electricity markets in Europe. Well balanced and low-carbon generation mix in Romania includes 28 percent from hydro, 25 percent from coal, 17 percent from nuclear, 15 percent from gas and 11 percent from wind. The overall surplus of electricity and abundant amount of wind resource in the Romanian power market is attractive for Moldova. The average Day Ahead Market price at OPCOM from 2015 to June 2018 is 39.3 EUR/MWh, which is 1.9 EUR/MWh cheaper than an average current contract price with MGRES. Besides this price advantage in Romanian markets, an access to Romanian markets is expected to create downward pressures on bid prices offered from MGRES and Ukrainian suppliers due to increased competition. As Romanian markets are transparently and competitively priced, integration with the electricity Romanian markets is expected to increase the transparency of Moldovan electricity procurements.

15. The proposed asynchronous interconnection will be realized through installation of HVDC BtB station. Two units of 300 MW High Voltage Direct Current (HVDC) BtB converter based on VSC technology⁵ are proposed to be installed at Vulcanesti substation to realize the asynchronous interconnection with Romania. The location of the BtB station is proposed to be a vacant space inside the existing Vulcanesti substation. In order to enable stable and reliable operations of the BtB, a new 400 kV transmission line connecting from Vulcanesti to Chisinau is necessary, together with associated substation modification for those two substations. Hence, the overall interconnection project consists of two components: construction of the BtB station; and the domestic transmission network reinforcement. A Feasibility Study was prepared with funding by the European Bank for Reconstruction and Development (EBRD) for the project components. It was agreed among the IFIs that the BtB station will be financed by the EBRD, the European Investment Bank (EIB), and the European Union's (EU) Neighborhood Investment Fund, while the domestic transmission network reinforcement will be supported by the World Bank. The construction of the BtB station will be implemented in two phases: one 300 MW unit as the first phase scheduled to be commissioned in 2022, and the second 300 MW could be built later. In addition to the aforementioned investments, ME plans to implement other domestic network reinforcements in preparations for the eventual synchronization with the ENTSO-E system, including Wide Area Monitoring System (WAMS) and several 110 kV transmission lines.

⁴ Romanian power system and Moldovan power system are not synchronously operated and cannot be immediately connected as the connection to Romanian power system, Continental European power system, requires significant amount of preparation work as explained in paragraph 12. Therefore, the immediately connection is only possible through an installation of so-called back-to-back station, where electric current is converted to direct current (DC) and then converted back to alternate current.

⁵ Voltage Source Converter technology is the latest HVDC technology suitable for a connection to a weak power system like a substation bus at Vulcanesti substation. The alternative conventional technology, Line Commutated Converter (LCC), is around 25 percent cheaper but the price difference is getting closer due to the recent technological development of the VSC technology.



16. **Synchronization of Moldovan and Ukrainian power systems with ENTSO-E systems is pursued in parallel as a mid-term goal, which is considered ambitious.** Moldova and Ukraine signed a Partnership Agreement with Romania to apply to Join Operational Program Romania-Ukraine-Republic of Moldova 2007-2013. In 2016, a consortium comprised of ENTSO-E member TSOs conducted a Pre-Feasibility Study on the synchronous interconnection of Moldovan and Ukrainian power systems to ENTSO-E Continental Europe Power System. The pre-FS confirmed the feasibility of the proposed synchronization and identified the necessary measures to do so. Moldova and Ukraine further in July 2017 signed an agreement on the Conditions for Future Interconnections with Ukraine and Moldova with TSOs of the ENTSO-E Continental Europe region, to implement a catalogue of measures, which include: an additional comprehensive Feasibility Study of the synchronization, tests of generation units; and harmonization of operational handbooks. The preparation process for the synchronization is estimated to be completed in six years. However, given the recent other countries' experiences such as Turkey, the timeline may be too ambitious and it could take from ten to fifteen years, thus serving as longer-term goal. The GoM considers the proposed asynchronous interconnection through the new BtB station as a short- to mid-term solution to immediately resolve the supply security issue. Even if full synchronization is implemented in the future after the installation of the BtB, the advanced HVDC technology adopted to the BtB will provide various benefits for the power systems including power flow control, losses reduction, and firewall to prevent a large-scale black-out. Moreover, the domestic transmission network reinforcement, which will be financed by the World Bank, is necessary and beneficial for the Moldovan power system by enhancing transmission reliability and reducing losses regardless of the possible scenarios including even without the BtB. These benefits are being quantitatively analyzed under an on-going ESMAP funded study: Promoting Competition in Moldovan Electric Power Market through Regional Integration (P166195).

Relationship to CPF

17. **The proposed project contributes to an important part of two out of three pillars of the World Bank Group's new Country Partnership Framework (CPF) for 2018-2021.** Specifically:
- (i) Focus Area 1: ECONOMIC GOVERNANCE – strengthening the rule of law and accountability in economic institutions. This aims to address two related priorities: upgrading administrative services and improving the efficiency of public finance and assets, while explore possibilities for supporting private participation in energy infrastructure; and
 - (ii) Focus Area 2: SERVICE GOVERNANCE – improving efficiency, quality and inclusive access to public services. In the energy sector this would be addressed through the proposed *Transparent Power Market* project, aiming to diversify Moldova's energy sources through the interconnection with Romania to access more competitively priced and more secure power supplies, while at the same time reducing the scope for corruption in power trade.
18. **The proposed project is consistent with the World Bank Group's approach to Maximizing Finance for Development (MFD)** in the following ways. First, the Romania-Moldova interconnector will allow private producers, suppliers, and traders from European markets to access to Ukrainian and Moldovan markets and vice versa, leading to potentially price reduction due to increased competition. Second, the fall in prices of renewable energy technologies, especially PV, has created favorable conditions for financing of low cost electricity generation from renewable energy resources. Regional interconnections will help reduce technical barriers to penetration of variable renewable energy generation through the formation of larger balancing areas.



C. Proposed Development Objective(s)

The Project Development Objective is to increase capacity and improve reliability of power transmission system in Moldova and therefore enhance its access to the European electricity market.

Key Results (From PCN)

19. The PDO-level results indicators are the following:
 - (a) Increased power transmission capacity along the Vulcanesti-Chisinau corridor (MW)
 - (b) Improved reliability indicators in selected transmission segments

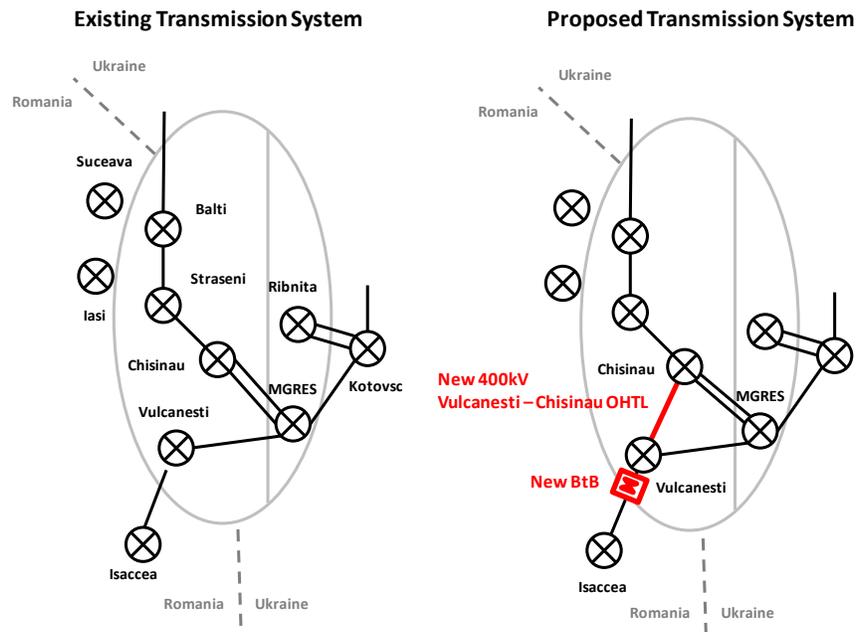
D. Concept Description

20. **Domestic transmission system reinforcement.** The CPMP will finance the construction of an overhead new high-voltage line (HVL) connecting the high-voltage substation (HVS) in Vulcanesti in Southern Moldova to HVS in the capital city of Chisinau, which is the country's main consumption center. It will also finance the upgrade and expansion of the existing HVSS in Vulcanesti and Chisinau.

21. **CPMP's and the broader Moldova – Romania power systems interconnection project.** CPMP is connected to another investment for the interconnection of Moldova's power transmission system to that of Romania, which will finance the construction of a Back-to-Back station at Vulcanesti with funding by the EBRD, EIB, and EU. The new BtB station, which consists of AC/DC converter valves, transformers, high voltage switches, protection and control devices, cooling facility, and buildings to cover the converter valves and protection and control devices, is planned to be built inside the existing 400 kV Vulcanesti substation. The overall interconnection project aims to establish access to competitively priced electricity in the European electricity markets, and to increase Moldova's security of electricity supply by diversifying its supply sources. Although part of the broader interconnection program and parallel preparatory and implementation schedules, the two projects distinct. There is no formal arrangement for co-financing or parallel financing. Figure 1 below presents a graphical image of the overall interconnection project.



Figure 1: Proposed Investments



22. **CPMP and interconnection project are based on solid analytical work.** The ESMAP funded Electric Power Market Option Study (P146401) completed in June 2015 identified the asynchronous interconnection via BtB as the most optimal option. It has also identified the optimal network configuration and BtB's technology choice, which were later confirmed based on power system analyses conducted under the Moldova Power System Interconnection Analysis (P159050), which was completed in 2016 also with funding by ESMAP.

23. **CPMP will produce benefits even if the BtB is not constructed.** The overall interconnection project will increase the security and reliability of electricity supply by diversifying the supply options in addition to existing imports from MGRES and Ukraine, through enabling electricity supply from Romania and hence form the European electricity markets. The overall interconnection project is also expected to increase competition in Moldova's wholesale electricity market by introducing competitively and transparently priced electricity by private generators/suppliers/traders from the European markets. However, the Bank investment in domestic transmission network reinforcement will provide benefits for the country even if the BtB is not built at all or is not timely commissioned, as well as in the event of future Moldova and Ukraine synchronization with ENTSO-E. Such benefits include: (i) enhanced security of supply by establishing an alternative transmission route to the existing one, which passes through Transnistria and is not under Moldovan authorities' control; (ii) improved supply reliability by complying with N-1 contingency criteria (if one line fails, the other continues to ensure uninterrupted supply); and (iii) reduced transmission system losses.

24. **Supporting Technical Assistance programs will be implemented in parallel to establish a competitive electricity market in Moldova.** The GoM committed to continue implementing the electricity sector reform with support by development partners under various initiatives such as the Power Sector Action Plan (PowerSAP). PowerSAP was developed jointly by EBRD, EIB, EU, ECS, and the Bank, and in partnership with the GoM. PowerSAP will support various reform agenda including: ME corporatization; establishment of third party access to network; drafting of Wholesale Electricity Market (WEM) rules; and capacity enhancement for ANRE. In parallel, the Bank's ongoing ESMAP funded study, Promoting Competition in Moldovan Electric Power Market through Regional



Integration (P166195) will identify an optimal electricity market design to enable the efficient operation of new infrastructure. The Bank will also start soon a new TA funded by EU, called Moldova Energy Sector Reform and Governance support Project, to support the reforms of electricity and gas sectors, energy sector regulation, and the implementation of electricity market laws and regulations.

25. CPMP has the following three components:

26. **Component 1: Construction of Vulcanesti-Chisinau overhead line and associated substation upgrade/expansion.** The estimated cost is US\$60 million. This component will construct the infrastructure that would enable the effective operation of cross-border interconnection between Moldova and Romania. Specifically, it will finance the following:

- New 400 kV Vulcanesti-Chisinau single circuit overhead line (approximately 158 km)
- Extension of 400 kV Vulcanesti substation
- Upgrade of 330 kV Chisinau substation

27. Financing from IDA will cover electrical and civil works and procurement and installation of equipment for the line and substations. The new 400 kV Vulcanesti-Chisinau line is necessary to satisfy the N-1 contingency criteria and to enable stable operations of the proposed BtB station. The extension of the Vulcanesti substation will comprise of provision of new 400 kV bays and extension of 400 kV bus bar. The upgrade of the Chisinau substation will include installation of a new 400/330 kV transformer with associated substation equipment to enable the new 400 kV line to connect to the domestic 330 kV network. Land acquisition is necessary for the new 400 kV overhead line but not expected for the substations as all equipment will be installed inside the existing land areas of the substations.

28. **Component 2: Strengthen ME's control and monitoring systems.** The estimated cost is US\$7 million. This component will finance necessary hardware and software to strengthen ME's control and monitoring systems aimed at enhancing reliable and efficiency of the transmission network. Specifically, the component will cover the construction of a new ME's building including a new dispatch center and the upgrade of existing primary SCADA system. It will also finance installation of Metering Management System (MMS), which is required for a new electricity market. The proposed new building will be constructed in a vacant land owned by ME.

29. **Component 3: Technical Assistance and Project Management.** The estimated cost is US\$3 million. This component could include: (i) consultancy to support the Project Implementation Unit (PIU) in implementing and supervising of the Project and (ii) training and capacity building for ME. The first sub-component will finance the procurement of an owner's engineer for the project, who will assist the PIU with: (a) overall project management and supervision including procurement, design, contract management, and preparation for operation and maintenance (O&M) of the completed investments; and (b) supervision and monitoring of the implementation of the ESMPs and RAPs. The second sub-component will provide capacity building and training to ME. Especially, it will target to enhance the TSO's system planning capability, which is currently missing in the organization. The scope will be explored and agreed during the project appraisal.



SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The project will construct new 400 kV 158 km overhead transmission line connecting Vulcanesti substation and Chisinau substation, and install new substation equipment in existing Vulcanesti and Chisinau substations to establish connections between the overhead line and the substations. The Vulcanesti substation is located in the Southern part of the country close to Romanian and Ukraine borders, while the Chisinau substation is located at 15 km south from the city center of Chisinau. The Project aims at increasing domestic transmission capacity and improve transmission system reliability to enable to create a transparent and competitive electric power market in Moldova and its integration into the regional electric power market, benefiting its entire electricity transmission system consumers.

The new overhead transmission line and substation modifications are necessary to enable operations of a new Back to Back (BtB) station to be installed inside the existing Vulcanesti substation. The BtB, which enables an interconnection with Romanian power grid, was identified as the optimal option by the World Bank' Electric Power Market Options Study. Initially one unit of 300 MW BtB converter will be installed as the complete project envisages the installed capacity of 600 MW (2 x 300 MW). The construction of the BtB station will be funded by EBRD, EIB and the EU NIF, while the World Bank will finance only the domestic grid reinforcement – a 400 kV high-voltage transmission line between Vulcănești and Chisinau, which would serve as enabling infrastructure for the new interconnection and enhance Moldova's access to the European electricity market.

B. Borrower's Institutional Capacity for Safeguard Policies

ME will be the implementation agency for the proposed Project for the investment components. ME has demonstrated their technical capacity to maintain, rehabilitate and invest into the transmission system, and has experience in implementing Bank funded projects, as well as EBRD/EIB funded projects. The Ministry of Economy and Infrastructure (MoEI) will take overall responsibility for project implementation, as owner of ME and chairman of ME's board. The MoEI has good and long experience in successfully overseeing implementation of Bank funded projects (e.g., Energy II project, closed on April 30, 2012; ongoing District Heating Efficiency Improvement Project (P132443), as well as supporting TA activities). The Moldovan Energy Projects Implementation Unit (MEPIU), which is the MoEI's fiduciary and safeguards agent, will lead day to daily project implementation in accordance with the Operations Manual (OM). It has over 20-year experience in implementing Bank- and other donors' funded projects, and is staffed with highly qualified and experienced professionals, including technical, fiduciary, and also safeguard aspects. MEPIU has a qualified environmental specialist and will soon hire a social specialist. ME has an environmental specialist though lacking experience in Bank and other donors' funded projects. The Bank will provide regular training and guidance on safeguards to the existing/newly recruited safeguards staff to strengthen/build their capacity to manage safeguards risks and conduct due diligence related to Bank safeguards policies.

C. Environmental and Social Safeguards Specialists on the Team

Mohamed Ghani Razaak, Social Specialist
Cesar Niculescu, Environmental Specialist



D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	<p>The project finances the construction of Chisinau-Vulcanesti 400 kV high-voltage transmission line (approximately 158 km of length) and associated substation upgrade/expansion in Vulcanesti substation, and respectively in Chisinau substation. Associated facilities, that include the Back-to-Back converter station in Vulcanesti will be financed by EBRD, EIB and EU. Although the EBRD/EIB/EU and WB projects are separate, these are based on FS prepared by EBRD which included an ESIA, Land Acquisition and Compensation Framework (LACF) and Stakeholder Engagement Plan (SEP) to meet EBRD Performance requirements, but also, based on an additional Environmental and Social assessment and update the Bank safeguards requirements. ESIA studied both investments that will be financed by EBRD/EIB/EU, but also all related and associated facilities part of the whole investment, including the transmission line that will be financed by the WB. All these documents (ESIA, LACF and SEP) were publicly disclosed and consulted for a period of 120 days. Overall the ESIA confirmed that the Project's environmental and social impacts will be site-specific and can be mitigated through the implementation of the Environmental and Social Management Plan (ESMP).</p> <p>The potential negative impacts for environment identified for this project, which besides those generated by the construction activities (dust, noise, vibration, waste, etc.), include potential damages to protected areas and/or biodiversity, including species and habitats of conservation concern. Toxic pollution from transmission lines can also result from the leakage of PCBs from equipment that contains them. Other potential impacts are related to safety and public health due to electrocution risk to the public, by direct contact with high-voltage equipment and lines, and also by induced voltages, especially in the case of vehicles and farm machinery that transit beneath transmission lines. Humans and farm animals can also risk electrocution or nuisance shock when inadequate grounding at substations energizes metal objects.</p>



Other safety threats include the collapse of transmission towers during storms.

All these environmental safeguards related aspects need to be thoroughly reviewed by the Bank, documented in a technical summary note next to the existing ESIA, and finally disclosed in-country and on the Bank's website prior to project appraisal. Site specific ESMPs will be prepared, disclosed prior to construction and implemented.

In addition, the Project's Component 2 is expected to finance the construction of a back-up dispatch center and upgrade of existing primary SCADA system, together with the relocation of other administrative functions of Moldelectrica, all to be located in a new building that will be constructed in Chisinau, on an existing land belonging to Moldelectrica. This sub-project is anticipated to have limited, reversible and insignificant environmental and social impacts due to building construction activities. Anticipated environmental impacts during the construction works will be noise pollution, emissions of particulate matter/dust to air, domestic waste water, disposal of excavation materials and hazardous materials. A site-specific ESMP will be prepared, publicly consulted and finally disclosed in-country and on the Bank's website prior to project appraisal.

Performance Standards for Private Sector Activities OP/BP 4.03

No

Not Applicable/ No private sector activities under the project.

Natural Habitats OP/BP 4.04

Yes

At this concept stage of project preparation, detailed information related to transmission line design, its exact route and associated infrastructures are not known. The project will be located in Southwest and Central Moldova and it is expected that the selected project corridor will pass mostly through agricultural land or bush land of low biodiversity value. However, environmental negative impacts may occur during the transmission line construction and maintenance and these refer mainly to the natural habitats, which can convert areas of wetland or riparian ecosystem outright, destroy or disturb plant and animal communities, and introduce invasive species. Transmission line construction can alter hydrology by compacting soil, removing plant cover, and altering



existing drainages or creating new ones. Altered hydrology can affect aquatic, wetland, and riparian habitats and species, and can affect soil moisture and surface water availability in other kinds of ecosystems. Species in small, rare, sensitive, and otherwise critical habitats may be especially affected.

The wildlife impacts of transmission line construction and operation include bird electrocutions and collisions, changes in predator-prey relations in and along the edges of rights-of-way, destruction or alteration of wetland and aquatic environments, and increases in hunting and fishing enabled by rights-of-way and construction/maintenance roads.

Although no towers will be located within State Natural Protected Areas, the line will come within 0.2 to 8.4 kilometers of several of these areas. A total of 25 towers will be within Emerald sites (sites that are proposed to become protected areas) and important forests and bird areas, including 10 towers in the Tigheci Forest.

Expected adverse environmental impacts will be avoided and/or mitigated through provisions adopted during the project preparation phase and/or the development of the transmission line route design.

Notwithstanding, line construction and maintenance activities affect vegetation and wildlife as it requires clearing of land in forested and rural areas. Roads, towers construction, and transmission line installation requires land clearance along of about 150 kilometers in length that may lead to loss of native plant species which impacts animal species in natural habitats. Hence, OP/BP 4.04 is triggered and ESIA, and respectively ESMP to be prepared, will provide mitigation measures to ensure effective compliance with the policy requirements.

Transmission line construction and maintenance may also generate negative impacts to forests and can lead to the permanent removal of woody vegetation and in some cases to the complete conversion of strips of forest ecosystem into bare land or land covered by completely different vegetation communities. Fragmentation and invasive plant species within the right-of-way can also affect surrounding forest areas.

Forests OP/BP 4.36

TBD



		Triggering of this policy will be decided during preparation mission field visits to assess the rightfulness or not to trigger this policy.
Pest Management OP 4.09	No	The project does not include any activities related with pest management.
Physical Cultural Resources OP/BP 4.11	Yes	Transmission line construction can affect cultural sites such as areas of archaeological, historical, or religious significance. Burial sites and buried artifacts may be disturbed, especially when trenches are required for transmission towers. Therefore, OP 4.11 was triggered to include procedures and responsibilities for managing works in culturally and historically significant areas and accidentally discovered or chance find cultural artifacts to ensure that Cultural Heritage assets will not be adversely affected by World Bank-financed projects.
Indigenous Peoples OP/BP 4.10	No	There are no indigenous people in the project area as defined by OP/BP 4.10.
Involuntary Resettlement OP/BP 4.12	Yes	<p>Overall, the social impact of this project is positive as it will improve the reliability and security of electricity supply in the country, enhance power system management, and support the Government efforts in ensuring adequate electricity supply at competitively set prices. The policy is triggered because the construction of a new high voltage transmission line (HVL), as well as replacement of key equipment and infrastructure facility improvements in high voltage substations may require land acquisition and potential temporary access restrictions as well as physical and economic displacement. The potential adverse social impacts including resettlement of households, access restriction and relocation of built structures within the right-of-way corridors and around the substations may occur and will be assessed prior to the appraisal.</p> <p>It is possible that a considerable number of women along the transmission line route will be affected under the project. Hence, during safeguards planning and implementation, especially in preparing environment and social safeguards instruments (ESIA, SIA, ESMP, RPF, RAPS), due attention will be paid to ensure: women who are de-facto household heads are clearly listed as beneficiaries of compensation and rehabilitation; specific consultation sessions are held through focus group (women) discussions to include</p>



women’s needs and priorities in resettlement process; additional compensations are made for single parent households (women headed families) as vulnerable groups; and joint ownership (if possible) is established in case households are relocated under the project.

Safety of Dams OP/BP 4.37

No

The project does not include any dams.

Projects on International Waterways
OP/BP 7.50

No

Project does not have any impact on international waterways. This project will not involve discharges to or extraction of water from any international waterways or any tributary or other body of surface or groundwater that is a component of any such waterway.

This project will not involve discharges to or extraction of water from any international waterways or any tributary or other body of surface or groundwater that is a component of any such waterway.

Projects in Disputed Areas OP/BP 7.60

No

The project will not be located in disputed areas as defined by OP/BP 7.60.

E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Jan 31, 2019

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

Environmental and Social Impact Assessment (ESIA) was prepared under the Feasibility Study funded by EBRD, and assessed potential social and environmental risks and to identify necessary mitigation measures. Individual consultant(s) will be hired to review the prepared ESIA to ensure the document is aligned with the Bank guidelines and to prepare additional safeguard instruments including site specific ESMP. The work is expected to be completed by October 2018. All these safeguards documents will be disclosed locally and in the InfoShop prior to the appraisal.

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