Terms of Reference

Belarus: Superfast Electric-Vehicle Charging Stations: Pre-Feasibility Study

1. Background

In December 2019, the European Bank for Reconstruction and Development (the “EBRD”, the “Bank”) together with the Government of Belarus (represented by the Ministry of Natural Resources and Environment Protection) and RUE Production Association Belorusneft, a state-owned Belarusian company active in the energy sector (“Belorusneft”, the “Customer”), signed a Memorandum of Understanding (“MoU”) to work on the planning and development of a nationwide network of charging stations for electric vehicles (“EVs”) and conducting broader policy reforms aimed at increasing the adoption rate and affordability of zero-emission vehicles to the general public in the Republic of Belarus (the “Programme”). The Programme is an important element of the Government’s long-term strategy to promote sustainable development while shifting the energy balance towards cleaner generation sources and complying with the country’s obligations under the Paris Agreement. The counterparties to the MoU have a mutual interest in cooperating on a study to facilitate the preparation of an investment project aimed at developing a national network of fast electric-vehicle charging stations in Belarus.

The Bank now wishes to engage a consultant (the “Consultant”) to carry out a pre-feasibility study resulting in a Roadmap for EV Charging Network Development for Belorusneft (the “Assignment”).

2. Assignment Objectives:

The objectives of the Assignment are to:

- Conduct an overall policy incentives review of EVs and charging infrastructure in Belarus, including electricity market policy review;
- Conduct an overall study of the EV and EV charging market in Belarus and plot the scenarios of its future development under different assessing;
- Analyse the Belarus electricity sector, including potential of renewable energy sources and energy storage systems;
- Analyse potential EV charging solutions in Belarus for the period 2020-2030, including determining the economic viability potential of own sources of electricity generation;
- Determine the most cost-effective development structure option of Belorusneft’s network of charging stations, including pricing policy and financial analysis;

3. Scope of Work

The Consultant will carry out the following tasks:

1. Context and Demand Analysis

   1.1. Policy review

   1.1.1. Review the current policy of the Government of Belarus related to EVs and charging infrastructure, including incentives for market uptake of EVs (cars, commercial and public transport);
   1.1.2. Review expected policy changes in the short term;
   1.1.3. Compare local policies with international best practice and determination of gaps versus international best practice;
   1.1.4. Review the electricity market:
structure, regulated and unregulated segments, tariff policy;
- supply/demand forecast, development plans;
- applicable framework for development generation from RES and usage of energy storage systems and application to vehicle charging infrastructure.

1.2. **EV and EV charging market review**

1.2.1. Assess the current state of the charging infrastructure market in Belarus and predict its development by 2030 by completing:
- SWOT analysis of market direction;
- PEST analysis of market influence factors;
- Assessment of existing risks and barriers to entry (including for independent charging infrastructure);
- A map of risks in the market.

1.2.2. Undertake an affordability analysis to determine the likely market for electric vehicles in Belarus, based on current policies to incentivise EVs.

1.2.3. Assess potential changes to EV policies going forward and recommend the key policies that should be considered. If Belarus is not in a position to unilaterally implement specific policies to encourage electric vehicles imports (e.g. tariffs and customs duties), then this should be expressly set out in the analysis and alternative policies should be proposed.

1.2.4. Based on global trends, develop a forecast of market changes in technological solutions for EVs in Belarus (the forecast should include an analysis of market capacity and market conditions, assessment of market trends, calculation of market capacity, market segmentation and structuring).

1.2.5. Determine the market potential for the development of EV charging infrastructure in the Republic of Belarus by:
- Assessing macroeconomic factors, strengths and weaknesses, as well as opportunities and risks (including those which are determining the market potential, based on the results obtained from the above sections of the study);
- Assessing the geographical location of Belarus – transit corridors passing through Belarus between Europe and the Russian Federation);
- Conducting customer analysis (individuals, legal entities and government agencies) including the profile of potential customers based on individual characteristics, including, but not limited to: personal income, type of housing, preferred types of cars (new/used and standard models), vehicle usage scenario and key aspects of mentality;
- Assessing the degree of investment attractiveness based on a review demonstrating the relevant influence factors;
- Analysing potential operators of a network of charging stations in the Belarus (competitive environment), with their description and structuring, as well as determining the market share by 2030.

1.3. **Electricity market review**

1.3.1. The Consultant will review the electricity sector and existing documents that are used by the transmission operator for the preparation of the electricity demand forecast and generation expansion plan. The assessment will include technical, economic, fiscal and regulatory constraints. The Consultant will assess the opportunity of energy storage in the context of the power system by:
- Reviewing energy policies, grid codes, market rules, strategies and objectives.
• Assessing the regulatory framework, the risks and barriers for the achievement of national energy objectives
• Assessing the network assets’ capacities, constraints and characteristics. Assess their operational technical and environmental performance.
• Assessing the grid procedures applied to generation dispatching and interconnectors operation and suggest operational improvements aimed particularly at improving system flexibility.
• Assessing the level of flexibility, reliability and security of supply of the system provided by the existing assets
• Reviewing the stakeholders’ assumptions on the baseline of the electricity demand scenarios and the network’s assets. Prepare the outlook for the 10-year and 20-year timeline.
• Evolving dispatch profiles to underscore the potential for EV charge and the need for systems, such as electricity storage, in order to balance additional demand.
• Concluding qualitatively on the opportunity of electric vehicle charge.
• Applying a least cost generation expansion tool over the relevant time frame, to define qualitatively and quantitatively the potential EV possibilities as well as energy storage needs. Build a simplified economic model including CAPEX, OPEX and incomes from expected services.

2. Technical and Economic Feasibility Study

2.1. Based on the previous analyses on the context and demand, study potential EV charging solutions in Belarus for the period 2020-2030.
2.1.1. Conduct a preliminary study for potential locations of EV charging stations in urban and sub-urban areas, and motorways.
2.1.2. Determine the typology of charging stations for various scenarios of the formation of demand for the electric vehicle charging service (slow – up to 22 kW, fast – up to 150 kW, superfast – from 350 kW). Including:

• Determination of relevant and promising types of charging infrastructure for residential and commercial urban areas, for main highways and transport corridors in Belarus, as well as gas stations of Belorusneft. A comparison of the types of charging infrastructure should be made based on the required power and charging characteristics. In particular, their compliance with the existing geographical and socio-economic characteristics should be ensured (assessment of potential places for charging electric vehicles: at home, at work, on the street/parking lot, during intercity and international movements, etc.). This assessment should also consider environmental and social requirements/constraints for the ultimate development of such facilities so that these issues can be considered when developing further plans. Such issues to consider include risks to be assessed as part of site selection for the ultimate infrastructure especially where land is required for a new facility
• Developing at least three scenarios for the development of electric vehicles (high, medium, low) using simulation based on the data corresponding to the main types of accommodation and the required capacity for the market of Belarus.

2.2. Assess the development potential of Belarus’s own sources of electricity generation (based on renewable energy sources), as well as electric energy storage systems for the charging network of Belorusneft.
2.2.1. Determine the economic viability, as well as the potential need for the construction of large facilities (for charging infrastructure in general) and local generation (for superfast charging stations), as well as the use of energy storage systems (including for
balancing the peaks of energy market consumption in Belarus/getting the economy from night to day). It is necessary to assess the prospects for the construction of facilities in the period 2025-2030, including:

- Create a model for the demand for the above facilities for a network of charging stations of Belorusneft taking into consideration any prospects of reducing the cost of their installed capacity.
- Identify any potential upgrades or extensions required to the distribution infrastructure to accommodate the charging infrastructure and associated renewables generation and/or storage systems.
- Consider the potential for the development of the common electricity market of the Eurasian Economic Union, as well as its impact on tariff setting.
- Consider the environmental, safety and social factors that must be assessed when developing such large facilities, especially when this calls for land acquisition to accommodate the development. Please refer to the EBRD’s Environmental and Social Policy (“ESP”) for identification of pertinent issues.

2.3. Recommendations on prospective development of the network of charging stations of Belorusneft

2.3.1. Based on the results obtained from the above sections of the study, determine the most cost-effective development structure options:

- Provide a justification of the required types, power of charging stations and their quantity for the intra-city/urban/suburban model of deploying charging stations;
- Determine the most optimal types and locations for charging systems based on the predicted traffic flows of electric vehicles (intracity and highway models);
- Analyse the prospects for the deployment of superfast charging systems in the Brest-Moscow direction in the Russian Federation, as well as in the Gomel-Kiev direction in Ukraine. Analysis should look at the adoption of EV charging infrastructure in Belarus and neighbouring countries to see if there are any synergies that can be achieved and to make sure that the proposed location of charging infrastructure close to the borders is aligned to optimize the charging infrastructure across borders and transport corridors;
- Determine an economic justification for the construction of own sources of generation based on renewable energy sources;
- Determine an economic justification for the use of electrical energy storage systems.

2.4. Pricing policy and financial analysis

2.4.1. Assess the factors affecting the price of a charge service, cost of a charge service and optimal pricing levels for different alternatives of charging services in order to establish potential profitability for a network of charging stations of Belorusneft.

3. Roadmap for EV Charging Network Development

3.1. Based on the results obtained from the above sections of the study, the Consultant will make recommendations on the development of charging infrastructure of Belorusneft, and provide forecasted indicators regarding the development of the charging infrastructure market and relevant conclusions.

4. Implementation Arrangements

The Consultant will report on all aspects of the Assignment to the Bank’s Operation Leader (the “OL”).
The Consultant will attend a kick-off meeting with Belarusneft’s main project coordinators within ** weeks of the Assignment Start Date. The meeting will be held at the central office of Belorusneft at: 9 Rogachevskaya Str. Gomel, 246003, Republic of Belarus.

The Consultant will coordinate the Project from its beginning to its completion, incl. provides interim reporting on the results of the implementation of each of the stages of the study, as well as those upon the request of the Customer.

Belorusneft will provide all the necessary input data for the Assignment at the request of the Consultant.

5. Deliverables

The Consultant will submit the following deliverables to the Bank’s OL.

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<th>No.</th>
<th>Deliverable</th>
<th>Timing</th>
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<tr>
<td>1.</td>
<td>Policy Review</td>
<td>Within 3 weeks of the Assignment Start Date</td>
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<td>2.</td>
<td>EV and EV charging market review</td>
<td>Within 5 weeks of the Assignment Start Date</td>
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<td>3.</td>
<td>Electricity market review</td>
<td>Within 7 weeks of the Assignment Start Date</td>
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<td>4.</td>
<td>Technical and Economic Feasibility Study</td>
<td>Within 9 weeks of the Assignment Start Date</td>
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<td>5.</td>
<td>Recommendations on prospective development of the network of charging stations of Belorusneft</td>
<td>Within 11 weeks of the Assignment Start Date</td>
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<td>6.</td>
<td>Pricing policy and financial analysis</td>
<td>Within 12 weeks of the Assignment Start Date</td>
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<td>7.</td>
<td>Roadmap for the prospective development of EV charging infrastructure in Belarus for Belorusneft</td>
<td>Within 14 weeks of the Assignment Start Date</td>
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<td>8.</td>
<td>Final report on Phase 1, incorporating deliverables 1-7 and addressing the Bank’s and the Company’s comments on those deliverables</td>
<td>Within 2 weeks of receiving the Bank’s and the Company’s final comments</td>
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Consultants may propose different timing for completion of the deliverables if they consider it possible to deliver each phase in a shorter time-frame than indicated above.

6. CONSULTANT PROFILE

The Consultant will be a firm or group of firms with significant expertise and experience in:

- Strategic consultancy:
  - pre-feasibility and feasibility studies;
  - analysis of EV charging behavior;
  - modelling and forecasting vehicle trends;
  - development of e-mobility strategies;
  - development of renewable energy sources strategies.

Policy:
• climate, energy and transport policy;
• electricity market design and policy;
• regulations to support the transition to EVs: grants for EV purchase, tax exceptions, free parking, privileged road use, restrictions on diesel and petrol cars in city centers, etc.;
• regulations to support the transition to EV charging: grants for installation of EV charging equipment, making land available for charging equipment, etc.

Market:
• financing and pricing EV vehicles;
• charging infrastructure and range forecasting models;
• electricity fundamentals with pricing/tariffs;
• economic viability potential of renewable energy sources.

Technical:
• charging infrastructure;
• battery technology (including storage system);
• grid connection;
• renewable energy sources;
• environmental assessments;
• data analytics (EV telematics);
• charging time calculator.

Rollout and implementation:
• experience on charging infrastructure;
• procurement and operations;
• EV Fleet assessments;
• EV business cases.

Stakeholder engagement:
• demonstrated experience working with manufacturers; charge point providers; network operators and Government bodies;
• organizing events, workshops and meetings;
• public and private partnerships;
• training;
• media relations on EV public awareness.

Monitoring:
• analysis on uptake, utilisation and reliability.

7. KEY EXPERT PROFILES

The Consultant’s key experts will comprise the following:

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<th>Roles</th>
<th>Experience / Qualifications</th>
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| Key Expert 1: Project Manager/Coordinator | • Preferably 10 years in a senior project management role with experience managing complex EV charging infrastructure projects in different countries.  
• Master’s in transport/automotive engineering/energy technologies/economics or similar  
• Preferably 15 years of experience in developing business plans,                                      |
feasibility studies, conducting surveys/market researches
- Fluency in written and spoken English is essential.

**Key Expert 2: eMobility Specialist**
- Preferably 5-10 years in a technical/operational role dealing with one or more of the following areas: charging infrastructure; battery technology (energy storage systems); RES; grid connection; environmental assessments
- Master’s in transport/automotive engineering/energy technologies or similar;
- 10 years’ experience in transport, of which 5 years for EV/EV charging investment projects;
- Fluency in written and spoken English is essential.

**Key Expert 3: Energy Specialist**
- Preferably 5-10 years in a technical/operational role dealing with one or more of the following areas: charging infrastructure; battery technology (energy storage systems); RES; grid connection; environmental assessments
- Master’s in electrical engineering/energy or similar;
- 10 years’ experience in energy projects, of which preferably 5 years for EV charging projects.
- Fluency in written and spoken English is essential.

**Key Expert 4: Transport Modeller/Economist**
- Preferably 5-10 years working on market issues related to EV charging with significant experience of analyzing EV charging behaviour and forecasting vehicle trends; electricity market impacts; and pricing
- Master’s in transport/economics/planning/industrial engineering or similar;
- 10 years’ experience in transport infrastructure projects;
- Hands on experience in development of feasibility studies, economic modelling and investment planning for EV charging projects;
- Hands on experience in modelling EV charging locations.
- Fluency in written and spoken English is essential.

**Key Expert 5: Analyst(s)**
- Preferably 5 years providing a support function with the PMO or to the Technical or Market lead. May also have specific expertise on EV finance, communications etc.
- Fluency in written and spoken English is essential.

**Key Expert 6: Project Finance Specialist**
- Master’s in finance/economics/business administration or similar
- 10 years of experience in investment project finance, of which 5 years of relevant experience in relation to financial advisory in the transport sector
- Having project finance expertise in PPP projects is an asset
- Having project finance expertise in eMobility is an asset
- Fluency in written and spoken English is essential.

Detailed CVs should be provided for all of the Consultant’s key experts to include relevant work experience; country experience; education; membership/affiliation with any relevant EV organizations; and languages. Each CV should set out the number of years in each role and the level of seniority.