1. INTRODUCTION

The European Bank for Reconstruction and Development (“EBRD” or “the Bank”) is planning to support the Government of the Republic of Uzbekistan (“GoU” or “Uzbekistan”) in developing a roadmap for the progressive decarbonisation of its power generation sector in line with the mitigation and adaptation objectives it expressed in its Nationally Determined Contribution (NDC) and its sustainable development goals.

The country has the third highest energy intensity per GDP and the second highest carbon intensity per GDP in 2015 in all EBRD Countries of Operations. The thermal power plants fleet includes assets that were commissioned as early as in the 60s with low efficiencies and high emissions. As a result, in 2015 the power sector in Uzbekistan accounted for more than 40% of the CO₂ emissions from fuel combustion. The share of renewable energy, excluding hydro, in the power generation and total final energy consumption is less than 0.1%. The power sector in Uzbekistan is dominated by natural gas-fired electricity generation and hydropower, representing respectively 75% and 21% in 2015. According to the World Health Organisation, Uzbekistan has one of the highest numbers of deaths resulting from ambient air pollution in Central Asia, with 2,162 deaths per 100,000.

Uzbekistan signed the Paris Agreement on Climate Change in April 2017 and ratified it on September 2018. The country expressed the intention, through its NDC, to reduce its CO₂ emissions by 10% per unit of GDP by 2030 compared to 2010 level. The decarbonisation of the power sector could greatly contribute to meeting this target. It is however necessary to bring clarity over the steps that would allow the progressive decrease of power sector CO₂ emissions, while meeting electricity demand and delivering sustainable development. Currently, Uzbekistan’s stated intention is to increase the share of coal and renewables in the fuel mix of the power sector.

Low-carbon transition pathways development offers the possibility to improve the understanding of the transition toward a green economy within the boundaries of sustainable development goals and national strategic priorities. It leverages quantitative and qualitative analysis, such as integrated assessment modelling, and provides insights on cross-sectoral synergies, sector specific challenges, and the implication in terms of energy supply and demand. It assesses power generation technologies’ mitigation potential, the required enabling policies and actions, as well as the necessary financial and economic conditions.

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1 On average, the thermal power plants’ efficiency is around 34%, much lower than the best standards.
2 International Energy Agency 2016
3 http://www.who.int/gho/phe/outdoor_air_pollution/burden/en/
4 Measured in Disability-Adjusted-Life Year: One DALY can be thought of as one lost year of “healthy” life. The sum of these DALYS across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.
Applying such an approach to the power sector would allow Uzbekistan’s policymakers to better prioritise investment decisions given different plausible but diverging development scenarios. For instance, it would allow further clarification of the contribution of renewable energy generation in the sector and the associated financing needs.

While supporting Uzbekistan, the Bank will leverage previous experience in developing sector-specific low-carbon roadmaps in its countries of operations. The EBRD jointly developed a “Low-Carbon Roadmap for The Egyptian Cement Industry” in collaboration with the Egypt Ministry of Trade and Industry, the Cement Sustainability Initiative of the World Business Council for Sustainable Development. The Roadmap describes a set of policy and technology recommendations that would deliver significant CO₂ emissions reduction in the sector by 2030. Similar work was developed for Kazakhstan’s cement sector - “Technology Roadmap for a sustainable low-carbon future of the Kazakhstan cement industry”.

Uzbekistan has many policies and regulations in place in line with its effort to transition into a low-carbon economy:

- Decree of the President of the Republic of Uzbekistan No. UP-4512, dated 01 March 2013, “on measures for further development of alternative energy sources”;
- Decree of the President of the Republic of Uzbekistan No. UP-4707, dated 04 March 2015, “on program of measures for ensuring structural reformation, modernization and diversification of production for 2015-2019”;
- Resolution of the President of the Republic of Uzbekistan No. PP-2343, dated 05 May 2015, “on program of measures for reduction in energy consumption, introduction of energy saving technologies in economy sectors and social sphere for 2015-2019”;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 255, dated 29 August 2015, “on integrated program of actions for mitigation of the Aral sea disaster impacts, rehabilitation and socio-economic development of Priaralie Region for 2015-2018”;
- Decree of the President of the Republic of Uzbekistan dated 23 August 2017 ‘On measures for the further implementation of energy efficient and energy saving technology’;
- Decree of the President of Uzbekistan dated 26 May 2017 ‘On the program for the further development of Renewable Energy, Energy Efficiency in the social sectors of the economy for the period of 2017 to 2021’;

Uzbekenergo, a 100% state-owned vertically integrated power utility, requested the support of the EBRD in developing a low-carbon roadmap for the power sector in Uzbekistan. The Consultant will take on board other EBRD-supported work on the power sector in Uzbekistan, as well as the activities under the NDC support program, in order to ensure coordination.

2. OBJECTIVES

The overall aim of the assignment is to define a low-carbon roadmap for the electricity generation sector in Uzbekistan through the modelling of the country’s energy system and its evolution scenarios until 2050. Up to three scenarios could be considered each reflecting an increased level of ambition in terms of sector’s GHG emissions. It is anticipated that one scenario will capture the current and planned policies in the country and model the possible evolution of the sector under a “business as usual” (“BAU”) type of technological development and penetration of low carbon
generation sources (new build renewables or high efficiency thermal plants to displace older/less efficient existing assets). The other scenarios will progressively try to explore the possible evolution of the sector under more aggressive growth of renewables, high efficiency thermal plants, improved grid flexibility and storage. One scenario should aim at reaching carbon neutrality by 2050 (with estimation of the major bottlenecks for its viability).

Each scenario will outline the optimal power generation-mix in order to achieve a sustainable energy system by 2050. The assignment will include the evaluation of the regulatory, economic, and financial conditions associated with each of the scenarios, as well as any incremental policy recommendations considered crucial for ensuring the viability of the scenario.

The assignment, by critically analysing the above different scenarios, will result in the development of a set of policy and technology recommendations to help understand the possible contribution of the sector towards the country’s NDC targets, help to identify the possible contribution of the sector for new targets post-2030 and provide clear indications about the priorities of investment and sustainable development for the sector towards a substantial decarbonisation in the mid to long-term future.

3. SCOPE OF ASSIGNMENT

The assignment will consist of a number of tasks, including:

A. Kick-off meeting and Inception Report

- **Prepare the kick-off meeting**, in coordination with the OL and Uzbekenergo, invite key stakeholders for the assignment, who potentially can be formed into an internal working group for the duration of the assignment. Present what the assignment is about and explain the relevance and importance of the project from both international and national perspective and potential mobilisation of investments as a result of taking on this activity and the long-term development of the country – in light of increased liberalisation. Within the presentation, include a couple of case studies of other countries that have adopted the low carbon roadmap for the power sector.

- **Propose a communications strategy** for the assignment, including how the team will update on the progress of the project, addressing questions related to the assignment; take into consideration the potential language barrier. Make clear what the shared responsibilities of the focal point of Uzbekenergo and the project team are on carrying out the tasks.

- **Propose a project timeline and expected deliverables and agreeing on expected responsibilities**; agree on who the key contact for each institution/ministry will be for the assignment will be; provide the proposal for a formal working group with relevant stakeholders that Uzbekenergo will lead; collect feedback.

- **Take the opportunity to understand the governance structure and the institutional capacity of the key stakeholders**, and reflect this into the preliminary analysis.
B. Preliminary Analysis: Stocktaking of the existing models and clarification of the fundamental assumptions.

- Provide a brief overview of the Uzbekistan legal framework and policy landscape for the energy sector as well as regarding climate mitigation and adaptation in the power generation sector; and summarise related challenges (political, economic and financial, technological and social environmental).

- Identify key stakeholders of Uzbekistan’s power sector, both in the public and private sector; this should include identifying who is responsible for NDC development within the Uzbekistan government, as well as the country’s development strategy/plan.

- Explain what are the existing governance structure (including local governance) and the institutional capacity for the power sector; include mapping of decision making process within the government related to power sector measures/actions at both national and local levels.

- Review the existing models that have been developed for Central Asia and Uzbekistan’s GHG/CO₂ emissions pathways and compare the differences in approaches, sources of data/information and importantly the assumptions, especially related to the energy demand and technologies.

- Map out all the existing data bases/information platforms related to Uzbekistan’s power sector; provide brief descriptions on the reliability of the information, relevance of the information as potential input for modelling/technical analysis, where the data gap remains and potential approaches to fill the gap (e.g. use of informed assumptions, proxies, tapping into non-official academic databanks etc).

C. Modelling: Model the GHG emissions pathway of Uzbekistan until 2050.

- Develop a GHG and policy interaction model. The model should be able to answer, for example, what the GHG reduction impact would be of a certain Energy Efficiency, or Renewable Energy measure and other relevant targets.

- Engage with the relevant stakeholders in the wider economy (industry associations, national associations, NGOs, etc.) to insure the robustness of the demand forecasts of energy and electricity. This will include discussions with transport, built environment, and industry specialists or any other sector that might contribute to increasing the electrification of the economy.

- Discuss with relevant departments within Uzbekenergo, the National Energy-saving Company, relevant ministries the assumptions and take stock of where there are information gaps and mismatches.

- Identify consolidated set of scenarios, with increasing level of ambition, and use these as inputs to model the GHG emissions of Uzbekistan up to 2050; using one of the following commonly used models - LEAP, MESSAGE or TIMES (specific tool to be agreed during the implementation of the assignment).
• **Suggest the optimal power generation mix** for Uzbekistan to reach its long-term emissions reductions target in each scenario (2050 target). This should include an analysis on both power generation and demand in the country, with clearly outlined assumptions used and why.

• **Explain what would be the implications of BAU scenario** for Uzbekistan in the medium to long-term, including implications on economic competitiveness, resilience and environmental costs (including climate).

D. **Propose a roadmap consisting of a set of recommendations on what policies, technologies and legislative framework and regulations, institutional arrangements/capacity building would lead the decarbonisation of the power sector in Uzbekistan**

• Develop a *policy and technology roadmap* for one or multiple development scenarios for the power sector, as agreed with Uzbekenergo; taking into consideration on-going activities in the country, including those of other international institutions/donors.

• **Carry out policy and legal gap analysis** in relations to the proposed scenario and legislative framework that enables the adoption of technologies to reach respective targets, and identify timeline and windows of opportunities to introduce such legislative reform, based on the timelines of existing policies and expected policy reforms.

• **Estimate the current market penetration of the low carbon technologies proposed under the scenario**, and where Uzbekistan stands compared to its peers and/or neighbouring countries.

• **Explain what capacity and institutional arrangements and/or changes would be required to successfully implement the measures under the roadmap**; and which advises which stakeholders would require more capacity building and what key policy documents; budget planning processes need to reflect such considerations; provide estimated economic and social cost. This should include both at national, regional and municipal levels.

• Clarify the *process to ensure the recognition and adoption* of the low-carbon roadmap by the relevant stakeholders,

• Define the *investments necessary*, including the types of investment and estimated sizes of capital required, to deliver policies and adopt such technologies.

  *The team will pay a particular attention to the local/sub-national implications of each policy and technology choice, given the critical role of local authorities in the implementation of climate and energy policies.*

• **Prioritise the recommendations**, reflecting Uzbekistan’s policy priorities and potential to change/influence in the short-, medium- to long-term.

E. **Capacity Building and Stakeholder Engagement**
- The Consultant will hold regular consultation meetings with the relevant stakeholders and members of the working group identified in Task –A. During the consultation meeting, the Consultant will present the progress and results with the aim of communicating and addressing specific questions that arise from the analysis and challenges related to information gaps.

- **Prepare presentations and background materials that support capacity building for the working group members** and the other stakeholders on topics such as the definition and relevance of Nationally Determined Contributions under the Paris Agreement, the environmental and social cost of GHG emissions including air pollutants, the energy sector’s role in GHG emissions reduction globally and the potential contribution of Uzbekistan, and the use of low-carbon pathways in energy policy development and investment decision-making.

- **Conduct facilitative dialogue meetings with civil society representatives and NGOs** working on climate change mitigation and adaptation in Uzbekistan and the region.

- **Arrange a series of public meetings/stakeholder engagement workshops** (at least two) to solicit a broad spectrum of views from stakeholders on the findings of the draft report. **The consultant will make sure the participants in the various workshops complete evaluation forms** as a proof of attendance.

4. **IMPLEMENTATION ARRANGEMENTS**

**Duration:** It is envisaged that the Project will be launched in early 2019. The duration of the Project will be one year. It is expected that the Consultant will commence work immediately upon appointment. The Consultant will need to develop a regular engagement with the key stakeholders in the country (UzbekEnergo, the state-owned vertically integrated power utility responsible for the majority of the country’s electricity generation, transmission and distribution, as well as the most relevant Ministries and state agencies/committees). For this purpose the international experts are expected to travel regularly; it is also expected that the Consultant will rely on a strong local team for the day-to-day interactions. The list of the key stakeholders to be involved in the regular coordination meetings/discussions will be agreed with the Bank at the beginning of the assignment.

**Format:** All the deliverables will be submitted for review to the Bank first and then, once comments have been received and incorporated, to the broader country stakeholders. The deliverables should be concise and succinct, wherever possible present (also) with effective visuals, appropriate for policy-makers. Each deliverable should be reviewed, edited and presented with high professional standard/quality, including the use of language. It is expected that much of the content could be presented in table formats and other effective visual tools to make it easy to follow and digest, rather than a long text-oriented document.

Considering the nature of the assignment, the Consultant will need to ensure that the results are consistent with other policy dialogue activities supported by the EBRD in Uzbekistan in the power sector (ranging from sector reform to climate resilience) and more broadly in the context for the Bank’s “NDC support programme”.

All the deliverables are to be prepared in English and Russian.
Reporting: The Consultant will directly report to the Operational Leader (OL) in the Energy Efficiency & Climate Change (E2C2) Department, EBRD. The Consultant should also report to senior team members of E2C2 (both in London HQ, Moscow and Tashkent regional offices), especially regarding engagements with the government and other stakeholders. Upon OL’s approval, the Consultant will report to the national stakeholders whenever necessary, both in English and/or Russian.

5. DELIVERABLES

The Consultant will submit to the Bank the following outputs and reports:

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<thead>
<tr>
<th>Deliverable</th>
<th>Timing after contract signature</th>
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<tr>
<td>TASK A - Kick-off meeting and Inception Report</td>
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<td>TASK B - Stocktaking of the existing models and clarification of the fundamental assumptions.</td>
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<tr>
<td>Key stakeholders mapping</td>
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<tr>
<td>Overview of Uzbekistan policy context</td>
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<td>Review of existing models</td>
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<td>Map out all the existing data bases/information platforms related to Uzbekistan’s power sector</td>
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<td>TASK C - Model the GHG emissions pathway of Uzbekistan until 2050</td>
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<td>GHG and policy interaction model</td>
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<td>Optimal power generation mix</td>
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<td>Investment needs</td>
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<td>Task D - Propose a roadmap consisting of a set of recommendations on what policies and technologies would lead the decarbonisation of the power sector in Uzbekistan</td>
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<tr>
<td>Task D - Capacity Building and Stakeholder Engagement</td>
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<tr>
<td>Facilitative dialogue meetings and workshops (workshop reports and completed evaluation forms to be provided)</td>
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6. BENEFICIARY ENGAGEMENT

The Consultant will discuss the results of each Task with the Bank and is expected to seek validation from the national stakeholders before proceeding to the next Task.

7. CONSULTANCY PROFILE

Team Leader

- At least 10 years professional experience in the engineering consultancy of power generation and transmission assets.
- Strong experience of emerging power sector technologies.
- Working experience in strategic advising to power utilities for assets diversification, strategic investment planning, climate risks and carbon emission management.
- Previous experience in project finance with multilateral and development banks.
- Previous working experience in Central Asia.
Excellent English and Russian writing and speaking skills are a must.

**Senior international climate policy expert**

- At least ten years of professional work experience providing programme support and policy advice on major climate policy and carbon issues at different levels;
- A perfect understanding of the low carbon transition and climate policy implementation as well as the institutional context in Uzbekistan.
- A perfect understanding of UNFCCC international climate negotiations and communication framework and process.
- Experience in working with national governments of developing countries in the field of climate change, and particularly on NDC development, implementation and planning is required.
- Solid understanding of capacity building needs at country level in areas related to climate policy and NDC in particulars.
- Experience and skills in facilitating the development of multi-stakeholders processes.
- Knowledge of GHG inventories and setting up MRV systems is desirable.
- Excellent English and Russian writing and speaking skills are a must.

**Senior international modelling expert**

- At least 7 years’ experience developing country-level GHG emissions reduction scenarios.
- Proven track record in delivering strategic low-emissions development research and data analysis projects. Familiarity with existing tools to scope and develop net zero GHG emissions pathways.
- Experience developing and implementing frameworks and methodologies, ideally in the context of NDCs development, and conducting data analysis and modelling as well as actively participating in quality assurance for both inputs and outputs of data analysis.
- Experience in developing and applying mathematical modelling tools to gain strategic insights into the evolution of low-carbon technologies and their impact on the overall country/sector GHG emissions pathways.
- Experience identifying and analysing trends and developments in global energy economics, supply and demand of commodities, consumer behaviour, and climate policies that can impact Uzbekistan’s GHG emissions pathways.
- Familiarity with international best practices and methodologies to develop national carbon budgets and their allocation to the various sectors of the economy.
- Excellent English and Russian writing and speaking skills are a must.

**Senior Energy Sector Technical Experts**

- At least 10 years’ experience in the field of decarbonisation of the power generation and others key economic sectors
- Solid technical expertise of Uzbekistan in relevant fields, including supply and demand of energy and resources.
- Excellent technical expertise in energy and resource efficiency, renewables, technological solutions for decarbonisation (energy and resource efficiency measures, as well as
alternative solutions) in various key economic sectors, particularly of high energy and carbon intensities.

- Strong understanding for the domestic and international energy, resource and environmental policy/regulatory landscape and relevant markets.
- Strong understanding for various business models of each sector and relations of technological feasibility with economic viability, as well as
- Experience in developing power generation sector level targets, including energy and resource efficiency and renewable targets coherent with national GHG emissions targets and other climate goals.

**Senior international economist**

- At least 7, preferably 10 years of professional experience working on applied policy-oriented economic analysis for topics related to green investment and energy policy, working with governments or/and international organisations.
- Demonstrable expertise and publications on the knowledge of climate change and energy economics, combined with experiences of practical applications of economic data analysis and assessment to develop climate and energy policies.
- Strong technical understanding for energy economics and economic costs (and benefits e.g. economic opportunities) of climate/energy policy impact.
- Experience designing market-based mechanisms to address carbon emissions in the power generation sector.
- Experience estimating investment needs to support the mitigation and adaptation in the power sector.

**Senior international legal expert(s)**

- At least 7 years of legal experience, including experience in the development of climate policy and sector regulation and compliance systems.
- Proven track record related to analyzing regulatory processes, climate policy development and advice, drafting of legal documentations and regulation; and the development of regulatory compliance systems.
- Comprehensive understanding of Uzbekistan’s position in the context of international climate negotiations and domestic climate policy, legal and institutional contexts.
- Familiarity with international carbon markets, as well as the knowledge of both current and future environmental and energy related legislation in Uzbekistan is highly desirable.

**Local Experts**

- At least five years of professional experience in climate change and/or environmental related subjects; as well as an in-depth knowledge of climate related issue in Uzbekistan and the policy development process associated with climate change issues in the country.
- Extensive professional experiences in technical data collection and analysis across various sectors and in relations to climate policies and actions.
- Extensive professional experiences in reviewing of legal documentations and understanding of institutional and regulatory context of Uzbekistan.
• Demonstrated experience in developing and drafting action plans, indicators, monitoring plans in the local language.
• Strong reputable track record in working with partner institutions, both local and international.
• Excellent stakeholder engagement and communications skills with proven track record; ability to work closely with international teams and government officials, as well as having wide access to information/data.
• Excellent English and Russian professional language skills are a must.

Communications and Stakeholder Specialist

• At least 5 years’ experience developing strategies, key messages and vehicles for communication to support climate policy focused programmes.
• Experience serving as a spokesperson to internal and external audiences.
• Excellent coordination skills, working with wide-range of experts and stakeholders. Responsiveness and strong organisational skill are essential, with the ability to draft minutes and keeping track of progress effectively.
• Experience researching, writing, editing articles, internal/external publications, and other communication documents, especially with preference for strong professional editing skills.
• Professional fluency in English and Russian is a must with excellent writing skills.
ANNEX:

General expectation of the project timeline (subject to change and Consultant proposal)