

## TERMS OF REFERENCE

### Consultancy Firm for the Renewable Energy and Power Project

**Publication date:** 11<sup>th</sup> Dec 2021

**Submission date:** 14<sup>th</sup> Jan 2022

**Country:** Mongolia

**Duration:** 16 Months

#### **Description of procurement:**

Five Northeast Asian (NEA) countries—the People’s Republic of China (PRC), Japan, Mongolia, the Republic of Korea (ROK), and the Russian Federation (Russia)—have clearly voiced their interest in deepening regional energy cooperation, including electricity interconnections. Mongolia has abundant solar and wind energy endowments. High-quality resources in South Mongolia located within reach of existing 220 kilovolt (kV) substations total 22 gigawatts (GW) of wind and 484 GW of solar photovoltaics (PV). The total economically viable resources are estimated at 192 GW of wind and 1,166 GW of solar PV. In this context, the country has been identified as a potential center-point for building regional interconnection based on sustainable renewable energy (RE) sources

The Asian Development Bank’s (ADB) technical assistance (TA) for Mongolia’s Ministry of Energy (MOE) entitled Strategy for Northeast Asia Power System Interconnection (NAPSI), completed in 2020, defined a strategy for developing regional interconnectivity using Mongolia’s renewable energy resources. The NAPSI TA proposed to enhance cross-border transmission across the region and develop the RE capacity in Mongolia in three stages, (i) beginning by building sufficient capacity to be able to generate and transmit 5 (GW) of RE by 2026, (ii) increasing capacity to 10 GW (+5 GW) of RE by 2036, and thereafter (iii) building capacity for 100 GW of RE at a future period after 2036. As the first steps in NAPSI’s infrastructure development, three major components were identified: (i) development of 5 GW of solar PV and wind in the South Gobi region of Mongolia; (ii) an interconnector between the South Gobi renewable zone and the PRC; and (iii) a submarine interconnector between the PRC and the ROK

The proposed TA will focus on (i) the development of wind and solar resources in South Gobi; (ii) Mongolia-PRC interconnection; (iii) the business cases of exporting renewable electricity from Mongolia to the PRC and the possibility of linking such exports to the planned trade between the PRC and the ROK; (iv) underlying policy, regulatory and electricity market environments in Mongolia, the PRC and the ROK; and (v) evaluating other opportunities for using the South Gobi RE resources, such as for the production of green hydrogen either for exports to the PRC or Mongolia’s domestic use.

#### **Scope of Work:**

Overall, the consultancy firm is expected to:

**Activity Stream 1:** South Gobi RE Base

The purpose of this component is to increase the investment readiness of the South Gobi RE base as the foundational source of energy for the next stage of NAPSI. The analysis of the South Gobi RE base includes technical, financial, commercial, and regulatory analysis of a 500 MW RE scheme to be developed over a 5-year period and a 5 GW scheme phased over a 15-year period.

The TA Consultant shall analyze the technical, environmental aspects, financial analysis, commercial and regulatory analysis for this stream.

**Activity Stream 2: Electricity Export Infrastructure**

This activity focuses on analyzing the export markets for the clean electricity produced in the South Gobi RE base and the conceptual design and feasibility of the necessary infrastructure for exporting electricity to the PRC and the ROK.

The Consultant shall carry out conceptual technical design of the interconnection infrastructure. Additionally, consultant shall do financial analysis, Commercial structuring arrangements, environmental and social assessment, and engineering survey and data analysis.

**Activity Stream 3: Green Hydrogen**

The NAPSI Strategy TA confirmed that the RE resources of South Gobi are abundant and of high quality. Therefore, Mongolia can potentially produce solar and wind power at a cost comparable to some of the lowest-cost producers in the world. The low cost of electricity forms a sound basis for investigating the potential of green hydrogen production that would transfer renewable electricity to a chemical form. Hydrogen is a needed product in several industrial processes. In a synthesis with carbon dioxide (CO<sub>2</sub>) or nitrogen gas (N<sub>2</sub>) hydrogen can also be converted to other valuable chemicals, which may be in demand in the PRC or can be used domestically as fuels to lower the carbon intensity of Mongolian energy sector.

The Consultant shall carry out an opportunity study on green hydrogen in Mongolia.

Activity Stream 4: Continued Multilateral Dialogue 40. Continued multilateral dialogue on the regional interconnection is needed to maintain the stakeholder interest in the interconnection project and increase investment readiness for the South Gobi RE base and the Mongolia-PRC and PRC-ROK interconnections.

**Eligibility criteria:**

Proposing entities will determine the number and the nature of experts required to deliver the TA consulting activity streams, milestones, and deliverables. Proposing entities must include their technical proposal, personnel work plan, and financial proposal all experts required in accordance with the proposing entity's approach and methodology. The proposing entity must also determine and indicate the number of person-months required for each of the experts and the minimum time each of the experts will deliver their inputs to the project. The firm shall include the following key experts

1. Team leader/power system & transmission planning specialist (international),

2. Transmission planning specialist (national),
3. Assistant team leader/renewable energy expert (international),
4. Transmission system specialist (international),
5. Green hydrogen expert (international),
6. Energy economist or financial analyst (international), and
7. Power sector policy and market expert (international).

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