1. Over the past decade, the Government has made remarkable strides towards improving power sector performance. Government policies to enforce financial discipline combined with public investment to repair dilapidated infrastructure have transformed a power sector on the verge of collapse to one that provides reliable electricity at reasonable cost. Collections for billed electricity have improved dramatically, from a low of 20 percent to the current level of nearly 100 percent. The enforcement of collection slowed the growth of consumption from three percent in 2005 to zero in 2006, followed by a two-percent contraction in 2007. Investments in power generation facilities increased electricity generation by 7 percent during the same period. The contraction in consumption resulting from better commercial management and increased generation capacity have minimized power shortfalls, with imported electricity sufficient to fill the supply gap, at least temporarily.

2. Although Georgia has no overall shortage of supply, it is highly dependent on imported power to meet seasonal demand, raising concerns over security of supply. Georgia has a 10 TWH power generation system, 82 percent of which comes from hydropower. The country’s power consumption peaks in the winter, when hydropower generation is at its lowest point. In the winter, Georgia must rely substantially on imported electricity and domestic thermal power generation using imported natural gas. In the winter, power from both sources amounts to roughly 49 percent of electricity supply, a stark contrast with the summer, when no imports are required and a surplus is available for export. By increasing the share of hydropower plants (most competitive and available domestic resource) preferably with seasonal storage capability, Georgia will be able to lessen its seasonal dependence on imported sources of energy, enhancing the security of supply and foreign exchange savings.

3. Without major investments in domestic seasonal generation, the security of power supply will diminish even further as Georgia’s economy grows. During the past 5 years, power demand grew in line with the economy, at an average annual rate of about 3.9 percent. Over the next 10 years, power demand is expected to increase at an average annual rate of 3 to 5 percent. Georgia relies on the export of surplus power during the summer to offset the cost of imported electricity during the winter. As power demand grows, the power surplus in summer will shrink, reducing the amount of power available for the offset. Therefore economic growth, without investments to increase domestic power generation, will undermine the security of power supply.
4. Although Georgia has large, untapped hydropower resources, most of the capacity being developed is not sufficient to reduce seasonal import dependency. The country’s economically viable hydropower potential is approximately 40 TWH. Of this potential, Georgia has harnessed roughly 8 TWH, with an estimated 2 TWH of new hydropower scheduled to come on stream by 2017. However, most of hydropower sites being developed are run-of-river operations, with limited or no seasonal storage capacity. Georgia has actively sought private investment for the development of hydropower stations with seasonal storage capacity amounting to approximately 6.4-7.9 TWH of annual electricity generation (1,800-2,000 MW). However, progress in developing this capacity has been slow because of long lead-time for the implementation of hydro projects and need for the development of cross-border infrastructure to access export markets. The eventual development of hydropower resources will expand opportunities for power trade that the existing platform for electricity exchange is insufficient to support. The development of approximately 8 TWH of hydropower, designed to meet peak demand in the winter, will result in a power surplus of about 6 TWH during the summer. However, the current power-exchange system cannot support power trade of this magnitude. In particular, the system lacks the necessary hardware and software to accommodate increased domestic generation. The existing platform for power exchange is inadequate for hourly metering and balancing necessary for the new generators to exchange summer surplus of power with Turkey, most attractive power export market in the region from the point of view of demand and prices.

5. Large share of overall energy balance of Georgia comes from non-renewable fossil fuel energy sources. Fossil fuel generated power corresponds to about 38% of total power generation. Imported gas is the main sources for thermal generation, there is about 560MW thermal power plants operational.

6. In addition to the hydropower, which is a renewable source of energy with the largest potential, there are other renewable sources of energy that yet have not been harnessed. Other renewable sources include wind and geothermal.

7. Wind power is one of the untapped renewable resources; there are no wind farms currently in operation in Georgia. The wind power potential in Georgia is relatively well studied; there are more than 150 metrological stations, which have been collecting data about the wind for decades. The wind power generation potential is conservatively estimated at up to 4 TWH, which corresponds to about 40% of current power consumption of Georgia.

8. Utilization of geothermal energy in Georgia is also very low. Currently geothermal energy is produced in the form of low and medium temperature geothermal water, which has mostly localized use. The geothermal energy is mostly used in few areas in district heating, hot water supply, and in agriculture for fish farm heating, drying, and greenhouses. The existing geothermal water production is about 160,000 m³ per day, there
are about 200 wells with temperature ranging from 30 to 110 degrees Celsius. The overall country geothermal potential is estimated at 5 TWH (thermal equivalent).1

9. Solar energy from the perspective of power generation is another alternative, although much more cost intensive compared to other sources of power generation. Along with the technology improvements and increased efficiency, there is a potential of developing small-scale solar power generation units.

BACKGROUND INFORMATION

10. The Government of Georgia requested the World Bank’s assistance in the preparation and implementation of the Transmission Grid Strengthening Project (TGSP). Loan agreement for financing of this operation is now signed between Georgia and the World Bank. The development objectives of TGSP are to provide reliable power transmission to the southwestern part of the grid, upgrade electricity exchange systems, and provide economically efficient, environmentally and socially sustainable electricity sector planning.

11. **Component 1: Transmission System Strengthening.** This component will support the construction of a high voltage transmission line from Akhaltsikhe to Batumi through: (i) the supply and installation of a double-circuit, 220 kV transmission line from Akhaltsikhe high voltage direct current converter station with back-to-back configuration and 500/400/220 kV substation (Akhaltsikhe station) to Batumi 220 kV substation; and (ii) the supervision of the supply and installation of the Akhaltsikhe Batumi transmission line.

12. **Component 2: Wholesale Power Exchange Platform.** This component will finance the design, supply and installation of a power exchange platform including: (i) the provision of hardware and software for metering, balancing, and trading systems; and (ii) supervision of the supply and installation of said platform through the carrying out of small works and the provision of goods and consultants’ services.

13. **Component 3: Power Sector Strategic Environmental and Social Assessment including associated transmission infrastructure.** This component will provide consultants’ services to prepare a strategic environmental and social assessment (for the purpose of this particular assignment further referred to as SE&A) for the power sector.

14. **Component 4: Project Management and Transmission Systems Studies.** This component will provide consultants’ services to assist the Project Implementing Entity for the purposes of: (i) effective management and implementation of Project activities; and (ii) the preparation of: (a) a new transmission-system expansion plan, (b) prospective

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1 Due to high sulfur content and low temperature of geothermal water, geothermal power generation potential is limited.
transmission line feasibility studies; and (c) preliminary designs for the prospective transmission lines.

15. Present TOR is for a consultant assignment to be performed as part of Component 3 of TGSP. The Ministry of Energy (MoE) and the Ministry of Environment and Natural Resources Protection (MoENRP) are the beneficiaries of the SESA, while the contract management for the present consultant assignment is delegated to MoE.

16. There are other multilateral and bilateral financing and development institutions involved in Georgia’s power sector through a number of investment and technical assistance projects, however for the purposes of the present assignment, several policy scenarios developed by the Ministry of Energy based on the USAID-financed Hydro Power and Energy Planning project outcomes are major inputs for the SESA. 6 Policy scenarios for the development of Georgia’s power sector include 2 demand scenarios and 6 supply scenarios (3 for each demand scenario).

17. Demand scenarios are developed based on 3% and 5% growth rate for power sector, and supply scenarios for each demand scenario focuses on 3 alternative policy priorities:
   - Business as usual (BAU) scenario based on cost effectiveness,
   - Energy Security scenario focused on reducing import dependence and domestic supply source diversification, and

18. Each policy scenario will provide the information regarding the list of current and planned generation plants and transmission projects. Although majority of these projects are the same for all the scenarios, only few projects will be introduced based on different policy options reflected in the scenarios. Each policy scenario will identify list of such generation and transmission projects and the present consultant assignment implies undertaking SESA of each scenario once received, reviewed, and provided for the assessment by the MoE.

OBJECTIVE OF THE ASSIGNMENT

19. The objective of this consultant assignment is to contribute to the decision-making by the Government of Georgia on the strategic development scenarios of Georgia’s power sector. This contribution will be made through carrying out the Strategic Environmental and Social Assessment (further referred to as SESA for the purpose of this particular assignment) of the proposed scenarios of power sector development taking into account the definitions, approaches and applicable methodologies as defined in EU Directive 2001/42/EC (Directive on the Assessment of the Effects of Certain Plans and Programs on the Environment); EU Habitats Directive 92/43/EEC and Birds Directive 2009/147/EC; take account of relevant national and international standards, industry guidelines and best practices, international experience of carrying out Strategic Environmental Assessments for energy sector and international best practice of public
outreach and consultation for Environmental Impact Assessment and Strategic Environmental Assessment. The SESA will be closely linked to the national and regional electricity development plans for Georgia and will contribute to the integration of major environmental considerations into the preparation and adoption of plans and programs with a view to promoting sustainable development and energy security. Integration of SESA outcomes into the energy security, economic and fiscal analysis of scenarios will lead to a fully informed choice of the strategic targets and development modality for the power sector.

20. SESA will identify sensitive environmental and social receptors in the power generation and transportation infrastructure corridors likely to have under the proposed scenarios; analyze expected major environmental and social impacts that the development and operation of the power generation and transportation infrastructure is likely to have under the proposed scenarios; look at the expected impacts in medium and long term; identify the major cumulative issues of developing multiple infrastructural elements and provide guidance and recommendations on how individual Environmental and Social Impact Assessment should address those issues; outline generic types of environmental and social mitigation measures that will be required under various scenarios and elaborate respective recommendations.

**TASKS AND RESPONSIBILITIES OF CONSULTANT**

**Task 1. Analysis of the Background Information**

21. Carry out desk-top study of the below basic sources of information relevant to the assignment, which is not an exhaustive list and may cover other publications and disclosed reports as deemed pertinent by the consultant:

- draft scenarios for power sector development produced to MoE under the USAID-financed Hydro Power and Energy Planning Project;
- list of potential power generation facilities compiled by MoE, including their location, designed capacity, and expected annual generation;
- Strategy for Social and Economic Development of Georgia (2014-2020);
- National Environmental Action Plan for Georgia (2012-2016);
- National Biodiversity Strategy and Action Plan for Georgia (2014-2020);
- Environmental Impact Assessment reports developed for power generation and transportation infrastructure over the last decades to identify common types of environmental and social issues covered in these documents;
- Georgia: Strategic Environmental Assessment of Power Sector Development by South East Consultants Ltd. (2007);
- The Hydropower Sustainability Assessment Protocol in World Bank Activities – Guidance and Recommendations (2014);
- Country strategies and Environmental and Social Policies of IFIs involved in the power sector.

22. Discuss with MoE the list of potential hydropower generation facilities to understand status of various possible investments: i.e. identify presence of legally binding
agreements already made for the development, existing interest from potential investors, availability of feasibility studies and/or other preparatory work undertaken, etc.

23. Discuss with MoE alternative scenarios for the development of power generation infrastructure based on the use of fossil fuels, and wind and solar energy that should form the technical basis for the SESA. Identify presence of already signed agreements for such investments, investors’ interest expressed or negotiations ongoing for specific developments, and presence of feasibility and/or other studies.

24. Discuss with MoE the decision-making process applied in Georgia to the investments into development of power generation and transportation infrastructure; understand MoE’s opinion on the pros and cons of permitting procedures currently in force; explore the mechanisms effective in the country for planning and implementing involuntary resettlement.

25. Discuss with the MoENRP what challenges does this Ministry face in the process of decision-making in regard to the development of new power generation facilities: (i) legal framework for undertaking environmental analysis of proposed investments; (ii) permitting conditions and procedures; (iii) adequacy of institutional and legal framework and capacity to monitor implementation of prescribed mitigation measures and enforce conditions of permits; (iv) other aspects that the MoENRP may raise.

26. Undertake a scoping process to establish the context of the study and identify key stakeholders (including the World Bank, EBRD, and IFC), government and non-government entities, civil society organization, scientific community, and environmental practitioners. Discuss and agree on the scope of SESA and the concept of acceptable level of residual impacts of the policy scenarios under consideration with the stakeholders during the scoping phase.

Task 2. Collection of General Baseline Environmental, Social, and Cultural Heritage Information in the Selected Watersheds and Geographic Areas Mostly Targeted for the New Power Infrastructure Development

27. The key target watersheds for technical studies are Rioni and Enguri, both located in West Georgia with associated transmission infrastructure. Most number and largest intended capacity of units of hydropower generation and transmission infrastructure are placed in these two watersheds. Other targeted basins are those of the rivers Khobi, Tergi, Natanebi, Alazani, and Mtkvari and relevant transmission corridors. Geographic areas where the MoE intends to develop generation facilities and transmission infrastructure based on fossil fuel, wind, and solar energy are to be found out through the discussions with MoE.

- Conduct desk-top review of technical literature carrying information on the biophysical environment within the above watersheds as listed in the order of priority.
- Obtain publications and other information available for the areas targeted for developing fossil fuel, wind, and solar energy-based generation and transmission infrastructure.
- Identify information gaps, plan the essential field work required for closing these gaps, agree the plan with the clients and undertake it as decided upon.
- Baseline data list has to be agreed with the client.

**General Baseline information on the biophysical environment in the target areas should include the description of:**
- landscapes, geomorphology, and soils and identification of areas of high seismic or landslide activity;
- climate, any emerging trends of its systemic change, occurrence of extreme weather events, natural and induced disasters of the past decade;
- ecosystems, flora, fauna, their populations and habitats and identification of areas of high and medium biodiversity significance (including migration corridors and terrestrial and riverine ecosystems);
- existing protected areas;
- hydrology of rivers, water quality, and aquatic habitats;
- Natural resources use, pollution, and pressure on the ecosystems (with particular emphasis on current and potential water use and water pollution, watershed/erosion management issues, e.g. current deforestation and deforestation trends).

**General Baseline information on the social environment in the target areas should include the description of:**
- population, its dynamics, in- and out-migration;
- vulnerable groups including IDPs (Internally Displaced People), unemployed, those affected with natural disasters, those in poverty, etc.;
- Social structure of communities, including traditions of community decision-making;
- economic activity and growth, potential areas of growth, types of employment and household incomes;
- land ownership and land use rights, extent of land fragmentation, land market and constraints to land parcel exchange;
- Areas with high tourist visitation and popular resorts; areas of exceptional aesthetic value.

**General Baseline information on the cultural heritage in the target areas should include the description of:**
- Overview and rapid inventory of the most valuable known physical cultural resources;
- Areas expected to carry higher than average likelihood of unexplored archeological sites.
Task 3. Identification of Sensitive Environmental and Social Receptors in the Selected Watersheds and Geographic Areas Mostly Targeted for the New Power Infrastructure Development

28. Based on the list of potential hydropower generation facilities that may be developed in Georgia and areas targeted for the development of generation facilities based on other types of renewable sources of energy and fossil fuels, as well as the alternative scenarios of power sector development, the consultant shall identify:

- Which ecosystems are expected to be affected with the potential development of power generation, evacuation, and transportation infrastructure and in what way. It should take into account approaches and applicable methodologies of relevant EU Directives, including the Habitats (92/4/EEC) and Birds (79/409/EEC) Directives;
- areas which are protected under international, national and local requirements, and which could be protected under the definitions of EU Habitats Directive or under the Georgian law;
- how the development and operation of infrastructure may affect microclimate, aesthetic value, tourist visitation, and development of other types of economic activity in the area;
- what types of social issues and tensions may arise due to resettlement and adverse economic impacts from the development of operation of infrastructure;
- where may the tangible needs for private land take and physical relocation of population arise;
- which of the known and potential physical cultural assets likely to be affected in the context of each scenario level and to what extent;
- Where and how the power generation and transportation infrastructure may be affected by the likely trends of climate change.

Task 4. Analysis of Potential Environmental and Social Impacts of Development and Operation of Power Infrastructure under Various Strategic Scenarios

29. Based on the information accumulated on the sensitive natural, social, and cultural receptors for the proposed alternative scenarios of power sector development identify the major cumulative issues and provide guidance and recommendations on how individual ESIAs should address those issues and identify and assess major long term positive and negative environmental, social, and cultural impacts of each scenario, taking into account the definitions, approaches and applicable methodologies as defined in EU Directive 2001/42/EC (Directive on the Assessment of the Effects of Certain Plans and Programs on the Environment) and respective Annexes I, II and IFI’s PRs and PSs.

Task 5. Identification of Sets of Environmental and Social Mitigation Measures Applicable to the Various Strategic Scenarios

30. Propose menu of mitigation measures to be applied to manage expected risks, minimize negative impacts, and maximize positive outcomes of the proposed scenarios taking into account the definitions, approaches and applicable methodologies as defined in EU Directive 2001/42/EC (Directive on the Assessment of the Effects of
Certain Plans and Programs on the Environment) and respective Annexes I, II as well as IFI’s PRs and PSs. Discuss the scope and nature of mitigation measures developed on the basis of the concept of acceptable level of residual impacts as agreed with the stakeholders during the scoping phase. Demonstrate expected economic gains and discuss types of benefit-sharing that the affected communities may expect.

31. While performing this task, pay attention to the ways of mitigating environmental and social impacts: (i) viability terrestrial and aquatic ecosystems, (ii) migration corridors, (iii) involuntary resettlement and economic displacement, etc.

32. Explore the country experience and legal and institutional framework in planning and undertaking involuntary resettlement, analyze its challenges that are likely to arise under the considered alternative scenarios and review it against best practices followed by IFIs.


33. Taking into account of international best practice and respective EU Directives and based on the information available on the large infrastructure projects undertaken in Georgia, provide sensitivity assessment of major environmental and social receptors for development and operation of power infrastructure under various strategic scenarios. Incorporate this assessment into the overall assessment of the considered strategic scenarios.

34. Based on the economic, fiscal and energy security analysis of the considered scenarios provided by the client, as well as on the consultant’s own sensitivity assessment of environmental and social receptors for development and operation of power infrastructure under various strategic scenarios, rank the strategic scenarios by their overall expected outcomes and provide recommendation on the preferred scenario.

**Task 7. Public Information and Consultation Associated with the Development of a SEA as required under the EU SEA Directive and IFI Policies**

35. The Consultant will:
- Develop a Stakeholder Engagement Plan ("SEP") for the SESA process;
- Carry out appropriate scoping to identify key stakeholders and issues of concern.
- Assist the client in organizing and carrying out public consultation\(^2\) in accordance with the requirements of best international practice, Georgian law, and IFIs’ Environmental and Social Policy for ESIA;

- Provide a summary of the public consultation process which includes an overview of SEP implementation, explanation of how the stakeholders’ feedback was used at various stages of SESA process, and a comment-response matrix that summarizes comments received and actions taken in response;

- In this context, to produce dissemination and presentation materials, as requested by the two beneficiary ministries and participate in public discussions led by these ministries. Present technical aspects of conducting SEA, the process of integrating environmental and social aspects into the general analysis of strategic development alternatives, and arguments behind ranking of these alternatives by key economic, fiscal, energy security, social, and environmental criteria. Participate in the question and answer sessions within the scope of public consultation meetings.

**EXPECTED OUTPUTS**

36. The consultant will be expected to produce all interim outputs in Georgian and English languages in electronic format compatible with Microsoft appliances, and in three hard copies in each language. Ten copies of the final report shall be printed in both languages.

37. The deliverables of the consultant’s work are as follows:

- Inception Report describing consultant’s approach to the given assignment and methodology of the study including the Scoping Study Report and draft SEP—within 1 month from the contract signing;

- Progress Report carrying analysis of the background information, collected baseline data, and description of the sensitive environmental, social, and cultural heritage receptors identified in the watersheds and geographic areas mostly targeted for the new power infrastructure development selected by the expected pressure from the prospective development of power generation and transportation infrastructure and finalized SEP—within 2 months from the contract signing;

- First draft SESAR report with all sections included, comprising of textual part, pictures, graphs, maps, and other visual illustrations—within 5 months from the contract signing;

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\(^2\) This should include at least two public information meetings, at both scoping and during the consultation phase of the SEA result, to be organized jointly with the Client and if possible relevant authorities. Develop and provide all necessary information material for meetings. The consultant will also meet with representatives of the Bank as needed throughout the course of the assignment.
- Second draft SESA Report, including non-technical executive summary, with comments from the MoE, MoENRP, and the IFIs (WB, EBRD, IFC) incorporated - within 7.5 months from the contract signing;

- Third revised draft SESA Report and SEP ready for disclosure and public consultation - within 8 months from the contract signing;

- Final draft SESA Report revised after public consultation process including non-technical executive summary, SEP, summary of stakeholder consultation process - within 10 months from the contract signing;

- Final SESA Report, including non-technical executive summary, SEP, summary of stakeholder consultation process, and all technical annexes revised after received comments from the MoE, MoENRP, the IFIs (WB, EBRD, IFC) and other stakeholders - within 12 months from the contract signing.

CONSULTANT’S TEAM: SKILL MIX AND QUALIFICATIONS

38. The following is the minimum experience and expertise required for this assignment:

A **senior environmental expert/team leader** with at least 15 years international experience in leading and supporting environmental projects, including expertise and experience with strategic environmental assessment in both EU and non-EU countries, environmental impact assessment, in particular with assessing impacts of Power Sector projects. Experience of at least team leader on EU regulations and practice in the region and in countries with economies in transition is also needed.

**Social and environmental scientists**/analysts with experience in characterizing baseline conditions and assessing impacts of programs and policies on people and the environment in Georgia or similar areas.

**Stakeholder Engagement expert** with experience in designing and implementing programs to identify and involve local and public stakeholders in decision-making for environmental and power sector strategic environmental and social assessment projects.

**Social assessment expert(s)**, with experience of working with rural communities and good understanding of IFI (such as World Bank, EBRD, IFC etc.) social requirements.

**Biodiversity expert(s)**, with experience and expertise in designing and interpreting monitoring results so as to assess impacts of power sector development projects on flora, fauna and habitats, and on developing appropriate mitigation for potential adverse effects. These experts should have successful experience in preparing Appropriate Assessments under the Habitats Directive.
Power Sector technical expert with at least 15 years of experience in Power engineering.

Economist with at least 10 years of experience in Power Sector planning.

GIS specialist with at least 5 years of experience in GIS/CAD mapping.

Local experts with at least 10 years of experience in environmental assessment, public consultations and environmental legislation. Strong understanding of environmental and social challenges in Georgia. These may include any or all of the experts above.