USAID | GEORGIA
FROM THE AMERICAN PEOPLE

USAID ENERGY PROGRAM

FINAL SELECTION OF TEN RENEWABLE ENERGY BUSINESSES TO RECEIVE USAID ENERGY PROGRAM TECHNICAL ASSISTANCE

USAID ENERGY PROGRAM

31 May 2018

This publication was produced for review by the United States Agency for International Development. It was prepared by Deloitte Consulting LLP. The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

FINAL SELECTION OF TEN RENEWABLE ENERGY BUSINESSES TO RECEIVE USAID ENERGY PROGRAM TECHNICAL ASSISTANCE

USAID ENERGY PROGRAM

CONTRACT NUMBER: AID-OAA-I-13-00018

DELOITTE CONSULTING LLP

USAID | GEORGIA

USAID CONTRACTING OFFICER'S

REPRESENTATIVE: NICHOLAS OKRESHIDZE

AUTHOR(S): PAUL CLARK, NEKA DANELIA, DAVID MUJIRISHVILI, NINO GVAZAVA

LANGUAGE: ENGLISH

31 MAY 2018

DISCLAIMER:

This publication was produced for review by the United States Agency for International Development. It was prepared by Deloitte Consulting LLP. The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

DATA

Reviewed by: Jake Delphia

Practice Area: Renewable Energy

Key Words: Criteria, Memorandum of Understanding, Environmental Impact Assessment, Feasibility Study, Investors

ACRONYMS

AC	Alternate Current
AltE	Alternative Energy
BGEO	Bank of Georgia Group PLC
BoG	Bank of Georgia
DHI	Diffuse Horizontal Irradiance
DNI	Direct Normal Irradiance
EIA	Environmental Impact Assessment
EnCT	Energy Community Treaty
ESCO	Electricity Market Operator
ESIA	Environmental and Social Impact Assessment
GEDF	Georgia Energy Development Fund
GHI	Global Horizontal Irradiance
GIS	Geographic Information System
GJ/h	Giga-Joules/Hour
GoG	Government of Georgia
GRPC	Georgian Renewable Power Company
GSE	Georgian State Electrosystem
ha	Hectare
HPP	Hydro Power Plant
IBA	Important Bird Areas
IFI	International financial institution
InfiniteE	Infinite Energy LLC
JSC	Joint Stock Company
km	Kilometer
kV	Kilovolt
kWh	Kilowatt hour
m	Meter
masl	Metres Above Sea Level
MEPA	Ministry of Environment Protection and Agriculture of Georgia
mln	Million
MoESD	Ministry of Economy and Sustainable Development of Georgia
MoU	Memorandum of Understanding
MW	Megawatt
PLC	Public Limited Company
PPA	Power Purchase Agreement
PV	Photovoltaic
SH	Sun House
SJJ	Solar Jamjama
SPP	Solar Power Plant
SPV	Special Purpose Vehicles
TBD	To Be Determined
TPP	Thermal Power Plant
TSO	Transmission System Operator
USAID	United States Agency for International Development

USD	US Dollar
W/m^2	Watt per Square Meter
WPP	Win Power Plant
WTG	Wind Turbine Generator

CONTENTS

INTRODUCTION

The objective of USAID Energy Program (“Program”) is to support Georgia’s efforts to facilitate increased investment in power generation capacity as a means to increase national energy security and facilitate economic growth. The Program will have a significant impact on energy market reform efforts of the Government of Georgia (GoG) to comply with the country’s obligations under the Energy Community Treaty (EnCT). The investment objective will be achieved through the provision of technical assistance to a variety of stakeholders in the energy sector.

The ultimate goal of this Program is to enhance Georgia’s energy security through improved legal and regulatory framework and increased investments in the energy sector. The ultimate expected outcome of this Program is an energy legal and regulatory framework that complies with European requirements and encourages competitive energy trade and private sector investments.

BACKGROUND

This document describes the methodology and results of selecting the priority ten projects that will be assisted through Task Three of the USAID Energy Program. USAID Energy Program identified 48 non-hydro renewable energy projects (see Appendices – List of Projects. Of those 48 projects, the Program received from the renewable energy businesses detailed information on 21 of the projects. Unfortunately, the remaining projects are in the early stages of development or the businesses were not ready to share their project information with the Program.

The document provides background of the selection process, the names of the selected priority projects and 21 chapters, one chapter for each renewable energy project who submitted filled selection criteria questionnaire.

The Introduction comprises four Sections in addition to this Background. The next section describes the decision tree that was used to filter the 48 projects identified by the Program down to the top ten and four alternate projects.

The Appendices include:

- Discussion document that describes the methodology used to collect data and then select the priority non-hydro renewable energy projects;
- Master List of Projects table, which includes summary information on all the projects considered. The table starts with the ten recommended projects, followed by the four alternative projects and then basic information on the rest of the projects considered;
- Data elements used with a description of each. This data was collected for each of the projects considered;
- 21 Chapters, one per considered project. The project number shown on the Master List of Projects corresponds to the Chapter that describes that project.

Included in the Decision Tree are comments on the nature of the assistance the USAID Energy Program might provide to the project. This list for each project should be elaborated as an immediate next step and then matched against those services that the USAID Energy Program can provide. Also, nearly all projects require assistance with their Environmental and Social Impact Assessment (ESIA) studies, usually through review of their terms of reference. Since no project has prepared a final ESIA study, an immediate next step for Task Three should be a review of the materials each project has regarding environmental and social issues to ensure that any problems noted can be mitigated.

DECISION TREE

The USAID Energy Program identified 48 non-hydro renewable energy projects. They are listed in the Appendices under Master List of Projects. The following decision tree process was followed, initially starting with all 48 projects.

1) **Decision One**: Developer has been responsive to requests for information
    a) Means data status is First, Final or Opted Out;
    b) 27 projects pass (includes 6 projects Bank of Georgia (BoG) chose to prioritize (Opt Out);
    c) 21 projects fail
        i) Projects are in an early stage of development, therefore not considered;
        ii) Data requested in person from 5 projects but not yet received (*i.e.*, Pending);
        iii) Data requested by e-mail from 4 projects but not yet received (*i.e.*, Requested).
2) **Decision Two:** Developer chooses to opt out
    a) 21 projects pass
    b) 6 projects fail (for six of BoG opts out, but not all BoG projects)
        i) Akhaltsikhe Photovoltaic (PV) #1; #23; BoG; 50 MW
        ii) Akhaltsikhe PV #2; #24; BoG; 50 MW
        iii) Algeta PV; BoG; #25; 50 MW
        iv) Gldani PV; BoG; #26; 50 MW
        v) Phona Wind Farm; BoG; #27; 25 MW
        vi) Saakadze PV; BoG; #28; 50 MW
3) **Decision Three:** Size is over 5 MW (question 7)
    a) 20 projects pass
    b) 1 project fails
        i) Kareleti PV; #14; Solar Jamjama (SJJ); 2 MW
4) **Decision Four:** Expected to be online by Q1 2021 (question 16)
    a) 19 projects pass
    b) 1 project fails
        i) West Gareji PV # 21; Sun House (SH); Q4 2022
5) **Decision Five**: Wind or solar measurements done or in progress (question 12)
    a) 18 projects pass
    b) 1 project fails
        i) Zestaphoni Wind Farm; #18, Georgian Energy Development Fund (GEDF); measurement not started pending assurances from Georgian State Electrosystem (GSE) about connections
6) **Decision Six:** Areas of assistance are things USAID Energy Program can probably provide
    a) 17 projects pass
    b) 1 project fails
        i) Kutaisi Wind Farm; #6; BoG; concerns about noise pollution
7) **Decision Seven:** Likelihood will pass environmental protocol
    a) 17 projects pass (no fails)
    b) Nevertheless, all projects must go through environmental protocol step
8) **Decision Eight:** balance of projects among developers
    a) 10 projects pass (includes 2 wind farm and 2 PV for BoG)
    b) 6 projects fail (all BoG projects, to reduce BoG to four of ten projects; largely based on BoG preferences)
        i) Martkopi Wind Farm; #1; BoG; due to proximity to Tbilisi airport and concerns about navigation radar

ii) Kaspi Wind Farm; #4; BoG; 50 MW; help with mobilizing government to solve blade transport logistic problems, public meetings and ESIA
iii) Plevi Wind Farm; #5; BoG; due to recent start of wind measurement (suggesting long time horizon for project)
iv) Didgon Wind Farm; #7; BoG; Q1 2021
v) Gardabani PV 1; #10; BoG; Q1 2021
vi) Gardabani PV 1; #22; BoG; Q1 2021

c) 1 project fails (SJJ has another project in the final list; fourth BoG project prioritized over second SJJ project)

i) Plavi PV; #15; SJJ; 14 MW; help with ESIA, though project seems very well supported internally

FINAL TEN PROJECTS

The ten non-hydro projects that have been selected to receive priority support from the USAID Energy Program are listed below.

1) Tkibuli Wind Farm; # 2; BoG; 90 MW; help with: air navigation, public meetings and ESIA;
2) Tbilisi Wind Farm; #3; BoG; 100 MW; high wind cutoffs must be solved (a technical problem); help with public meetings and ESIA[1];
3) Marneuli PV; #8; BoG; 50 MW; Q1 2021; help validating the method they use for weather measurements (*i.e.*, is it best practices?)[2];
4) Kaspi PV; #9; BoG; 50 MW; Q1 2021; help with thinking about how one handles dust sources and to what extent those concerns should affect the go/no-go decision[3];
5) Gardabani Bio-Mass Cogeneration; #11; Alternative Energy (AltE); 9 MW; help with investors;
6) Imereti Wind Farm; #12; Infinite Energy LLC (InfiniteE); 150 MW; help with GSE connection and integration with related pumped storage Special Purpose Vehicles (SPV);
7) Kvernaki PV; #13; SJJ; 14 MW; help with ESIA, though project seems very well supported internally;
8) Nigoza Wind Farm; #17; GEDF and Calik Group; 50 MW; help with Power Purchase Agreement (PPA) and GSE connection;
9) Udabno PV; #19; GEDF; 5 MW; help with PPA;
10) Gareji PV; #20; SH; 15 MW; help with technical design, optimization and public meetings.

***Note**: all ten projects require an environmental screening (protocol) by USAID Energy Program as first step of technical assistance.*

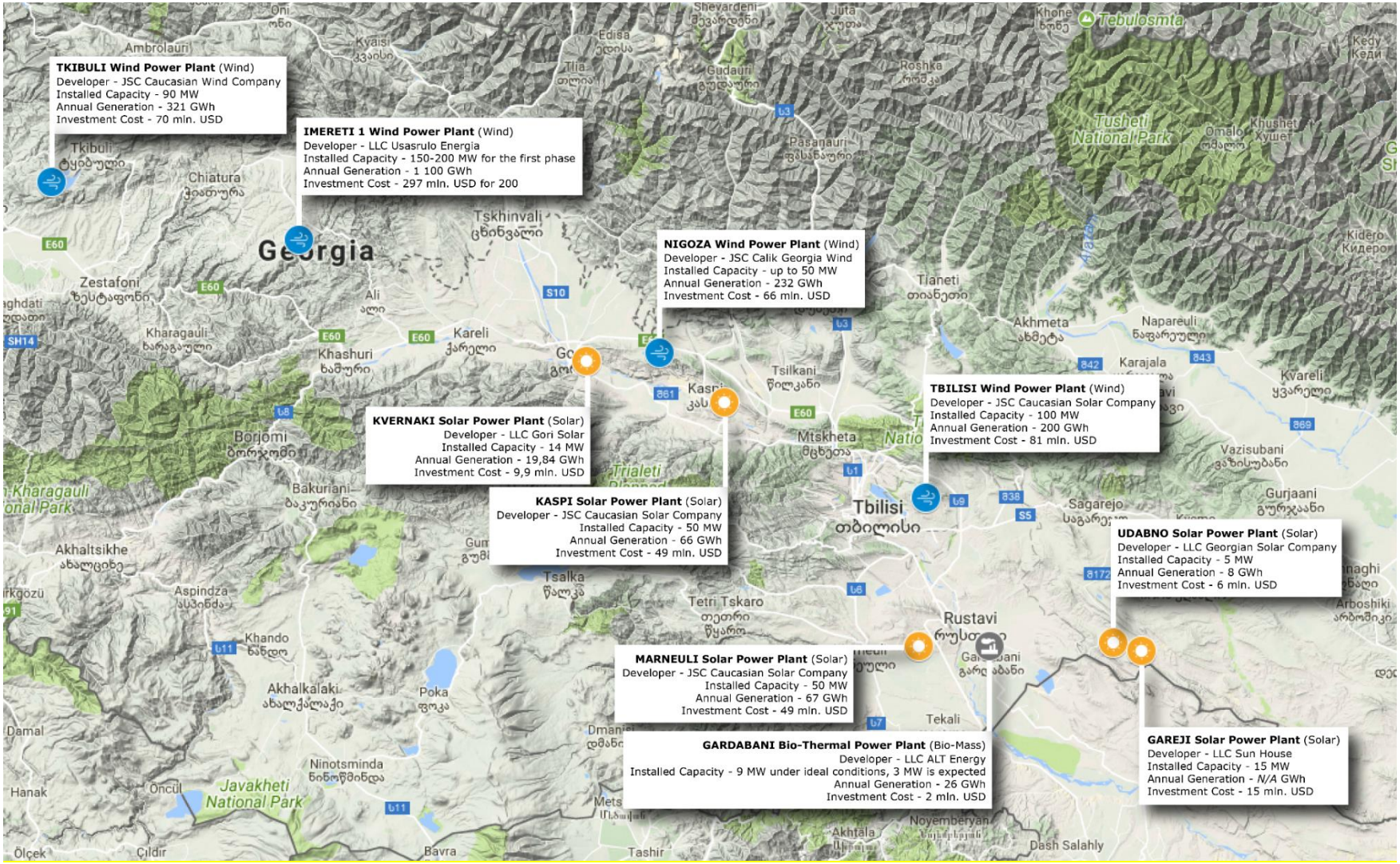
PRIORITIZED ALTERNATIVES

Four projects were selected as alternatives. If one of the top ten priority projects no longer require USAID Energy Program's direct support, then one of the four alternative projects will be selected to fill the spot voided.

11) Plavi PV; #15; Solar Jamjama; 14 MW; help with ESIA, though project seems very well supported internally[4];
12) Martkopi Wind Farm; #1; BoG; 100 MW; help with air navigation radar due to proximity to Tbilisi airport[5];
13) Kaspi Wind Farm; #4; BoG; 50 MW; help with mobilizing government to solve blade transport logistic problems, public meetings and ESIA[6];
14) Plevi Wind Farm; #5; BoG; recent start of wind measurement (suggesting long time horizon for project)[7].

[1] Initially excluded due to online date from BoG (1st Q 2021). Suggested alternative was Kaspi Wind Farm.
[2] Initially excluded due to online date from BoG (1st Q 2021). Making this substitution means that BoG will have two wind farms and two solar plants.
[3] Initially excluded due to online date from BoG (1st Q 2021). A worry for Kaspi PV is their stated problem: dust from a close-by cement plant that will increase O&M costs.
[4] Made an alternative due to wishing to have two wind and two solar projects for BoG. SJJ has one other project, so they are represented on the list of ten.
[5] Made an alternative due to their stated problem: improvements to air navigation radar systems. This problem could probably be addressed by the same expert that helps Tkibuli Wind Farm (#2) with air navigation routing.
[6] Made an alternative due to wishing to have two wind and two solar projects for BoG. Nevertheless, the administrative problems of blade transport should not be minimized; they require the cooperation of numerous governmental bodies (roads, ports, powerlines, local municipalities). This is something the USAID Energy Program could help with. This is a very strong alternative.
[7] Made an alternative due to recent start of wind measurement (January 2018) which would push online date into lae 2021 or 2022.

SELECTED PROJECTS SITES



TYPE OF SUPPORT TO BE PROVIDED BY USAID ENERGY PROGRAM

The exact nature of support to be provided by the USAID Energy Program will depend on the needs of the projects and USAID Energy Program ability to provide needed support. Some of the support provided by the USAID Energy Program brings benefit to the overall renewable energy sector, including:

- Task 4 activities to allow for better grid integration of non-hydro variable renewable;
- Support to the Ministry of Economy and Sustainable Development of Georgia (MoESD) in development of the draft Renewable Energy Law;
- Development of potential renewable energy support schemes.

Direct support to the priority projects will vary depending on many factors such as the capabilities and knowledge of the developers and the development stage of the project. The Program has been requested by the developers to provide support covering technical, economic, financial, environmental, and regulatory issues. Supporting the developers in resolving these issues will not only help them, but most likely have a knock-on effort for other projects. A sampling of the requests for specific assistance include:

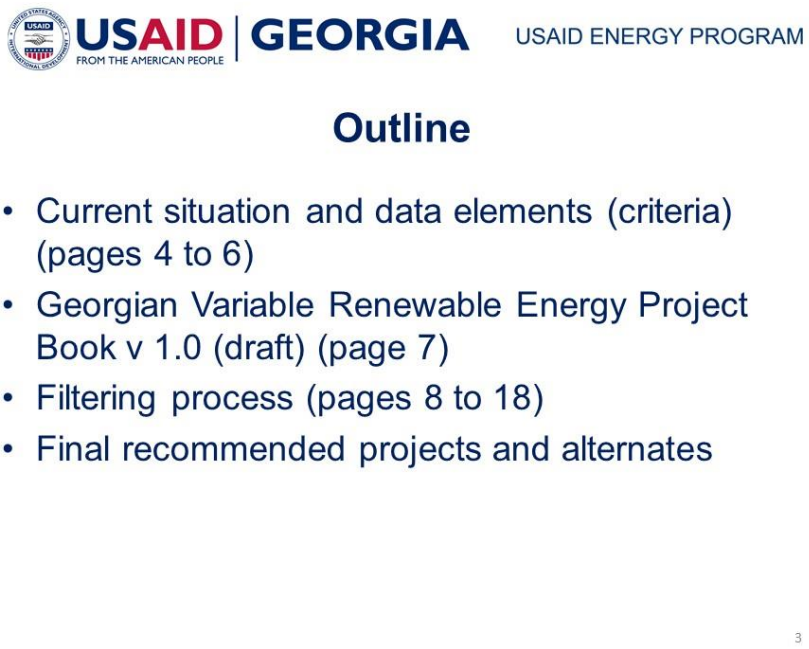
- Commercial and legal advice on contractual know-how, such as regarding PPAs;
- Commercial advice on potential markets to sell the projects' production;
- Technical consulting regarding project prefeasibility assistance;
- Technical consulting on equipment options, such as wind turbines suitable for high winds;
- Technical consulting on battery or other storage options to help manage variable production levels;
- Technical consulting on electrical network interconnections;
- Technical consulting and other consulting on environmental impacts and regulations;
- Technical and legal advice on evaluation of non-environmental regulations impacting project development such as compliance with Georgian Grid Code.

The Nigoza Wind Farm project now under development by the GEDF and Calik Group received support from USAID Energy Program concerning their interconnection agreement with GSE and the technical issues related to the physical connection. This is a late stage development project (Memorandum of Understanding (MoU) signed, PPA signed) that will be seeking financing soon and USAID Energy Program anticipates further support of the project for successful financial closure. The other nine priority projects are not in such a late stage of development and require more support in analyzing their project designs and feasibility studies. In later stages of development, similar support for financial closing will be provided.

Through this evaluation process, the Program provided many of the developers with advice and guidance. There is strong interest in distributed generation, such as solar PV installation on buildings, and could represent the largest potential for non-hydro renewable energy development in Georgia as is now seen in the US and Europe. Even though the ten projects were selected for priority advisory, USAID Energy Program will continual provide general advice and guidance to other project developers.

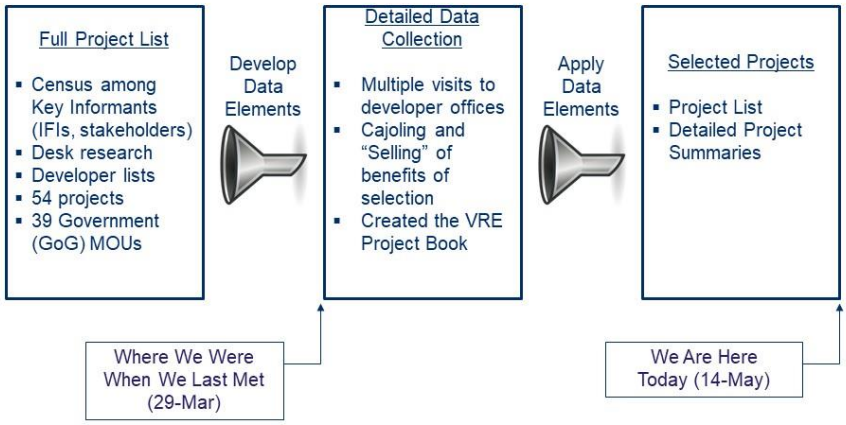
APPENDICES

DISCUSSION DOCUMENT – SELECTION METHODOLOGY



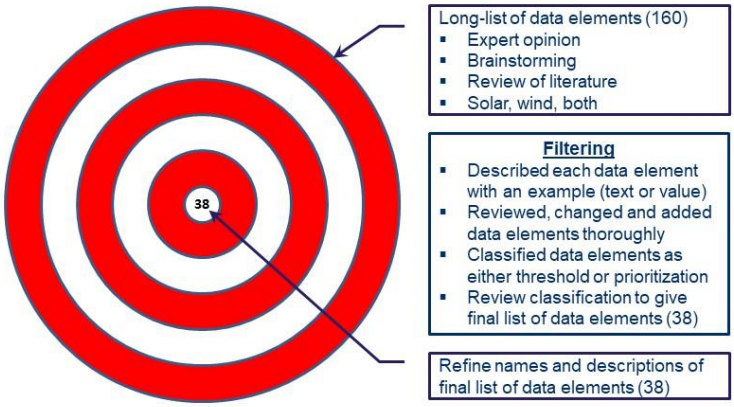
USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Task Three: help ten or so projects to give 50 MW online before end of USAID Energy Program; the project selection phase is done



USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Filtering approach to select data elements



5

USAID | GEORGIA USAID ENERGY PROGRAM

38 data elements fall into seven groups; all described in introduction to the document

- General Information (11)
- Project Status (5)
- Project Location (6)
- Project Site, Access And Internal Roads (3)
- Local Social And Economic Issues (2)
- Financing (2)
- Wind-Project Specific (7)
- Solar-Project Specific (2)

6

USAID | GEORGIA USAID ENERGY PROGRAM

Data collection created the Georgian Variable Renewable Energy Project Book v 1.0 (draft)

- Introduction
  - Table showing Selected, Alternative and Not Selected projects
  - Project selection decision-tree
  - Description of data elements (criteria)
- 21 sections on 21 projects
  - Data provided by developer against the 38 data elements

7

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

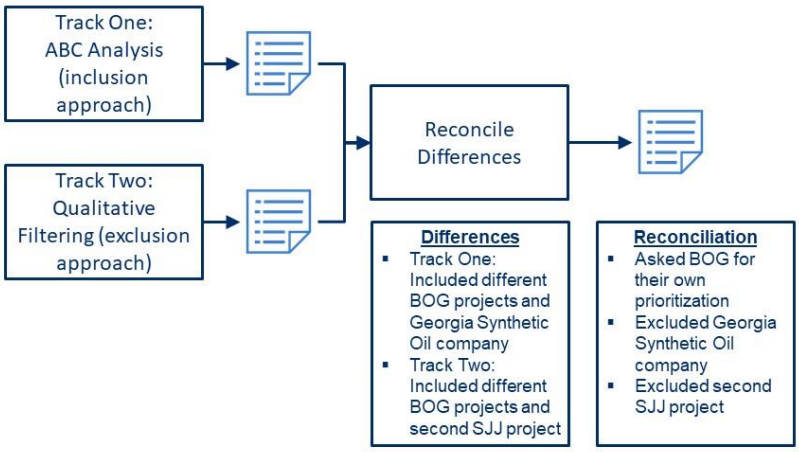
Developers

- BOG: Bank of Georgia
- AltE: Alternative Energy
- InfiniteE: Infinite Energy
- SJJ: Solar Jamjama
- GEDF: Georgia Energy Development Fund
- SH: Solar House

8

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Selection followed two tracks



9

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Track Two: Qualitative Filtering (exclusion approach)

1. Developer has been responsive to requests for information
2. Developer chooses to Opt Out
3. Size is over 5 MW (data element 7)
4. Expected to be online by Q1 2021 (data element 16)
5. Wind or solar measurements done or in progress (data element 12)
6. Areas of assistance are things USAID Energy Program can probably provide (various data elements)
7. Likelihood project will pass environmental protocol (various data elements)
8. No developer has more than four projects

10

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Decision One: Developer has been responsive to requests for information

- Means data status is First, Final or Opt Out
- 27 projects pass
- 27 projects fail
  - Data not requested from 18 projects; developer does not appear serious or projects are not suitable (*e.g.*, Synth Fuel)
  - Data requested in person from 5 projects but not yet received (*i.e.*, Pending)
  - Data requested by e-mail from 4 projects but not yet received (*i.e.*, Requested)

11

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Two: Developer chooses to Opt Out

- 21 projects pass
- 6 projects fail (BOG opts out)
  - Akhaltsikhe PV #1; #23; BOG; 50 MW
  - Akhaltsikhe PV #2; #24; BOG; 50 MW
  - Algeta PV; BOG; #25; 50 MW
  - Gldani PV; BOG; #26; 50 MW
  - Phona Wind Farm; BOG; #27; 25 MW
  - Saakadze PV; BOG; #28; 50 MW

12

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Three: Size is over 5 MW

- 20 projects pass
- 1 project fails
  - Kareleti PV; #14; SJJ; 2 MW

13

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Four: Expected to be online by Q1 2021

- 19 projects pass
- 1 project fails
  - West Gareji PV # 21; SH; Q4 2022

14

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Five: Wind or solar measurements done or in progress

- 18 projects pass
- 1 project fails
  - Zestaphoni Wind Farm; #18, GEDF; measurement not started pending assurances from GSE about connections

15

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Six: Areas of assistance are things USAID Energy Program can probably provide

- 17 projects pass
- 1 projects fail
  - Kutaisi Wind Farm; #6; BOG; concerns about noise pollution

16

USAID | GEORGIA USAID ENERGY PROGRAM

Decision Seven: Likelihood will pass environmental protocol

- 17 projects pass (no fails)
- Nevertheless, all projects must go through environmental protocol step

17

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Decision Eight: No developer has more than four projects

- 10 projects pass (includes 2 wind farm and 2 PV for BOG)
- 5 projects fails (all BOG projects, to reduce BOG to four of ten projects; largely based on BOG preferences)
  - Martkopi Wind Farm; #1; BOG; due to proximity to Tbilisi airport and concerns about navigation radar
  - Plevi Wind Farm; #5; BOG; due to recent start of wind measurement (suggesting long time horizon for project)
  - Didgon Wind Farm; #7; BOG; Q1 2021
  - Gardabani PV 1; #10; BOG; Q1 2021
  - Gardabani PV 1; #22; BOG; Q1 2021

18

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Recommended projects

LN	PLANT #	TYPE OF VRE	PROJECT NAME	RELATED PARTY	MOU INVESTMENT COST (mln USD)	SUBMITTED UNIT INVESTMENT COST (mln USD/MW)	REGION	SUBMITTED ESTIMATED INSTALLED CAPACITY (MW)	ESTIMATED ANNUAL GENERA-TION (GWh)	CAPACITY FACTOR	LEVELIZED COST OF ELECTRICITY (USD/KWhr)	MOU SIGNING DATE	DEADLINE FOR FEASIBI-LITY STUDY SUBMISSION
1	2	Wind	Tkibuli Wind Power Plant	BOG	70	1.4 mln USD/MW	Imereti	90 MW	321	40 percent	0.056 USD/kWh	Mar-17	Sep-18
2	3	Wind	Tbilisi Wind Power Plant	BOG	81	1.4 mln USD/MW	Tbilisi	100 MW	200	42 percent	0.057 USD/kWh	Mar-17	Sep-18
3	8	Solar	Mamuli Solar Power Plant	BOG	49	1 mln USD	Kvemo Kartli	50 MW	67	AC Capacity factor 22.4 percent	.0769 usd/kWh	Feb-17	Aug-18
4	9	Solar	Kaspi Solar Power Plant	BOG	49	1 mln USD	Shida Kartli	50 MW	66	AC Capacity factor 24.4 percent	.0797 usd/kWh	Feb-17	Aug-18
5	11	Bio-Mass	Gardabani Bio-Thermal Power Plant	AtE	2	1,33 ,In USD/MW	Kvemo Kartli	9 MW under ideal conditions, 3 MW is expected.	26	70-80%	0.027 USD/kWh	Jan-16	Oct-16
6	12	Wind	Imereti 1 Wind Power Plant	InfiniteE	500	297 mln for 200 MW, $1.485 mn per MW	Imereti	150 MW - 200 MW for the first phase, whereas	1 100	41% at P50	0,03665 USD/kWh with all equity assumption	Nov-15	Nov-17
7	13	Solar	Kvemaki Solar Power Plant	SJJ	14	708 000 USD/MW	Gori	14 Mw	19,84	1 600%	Not reported.	Mar-18	Sep-19
8	17	Wind	Nigoza Wind Power Plant	GEDF	66	1.44 mln USD/MW	Shida Kartli	up to 50 MW	232	up to 45%	Not reported.	Mar-18	Jun-17
9	19	Solar	Udabno Solar Power Plant	GEDF	6	850 000 - 950 000 USD MW	Kakheti	5 MW	8	15,4 percent	Not reported.	Jun-16	Jun-17
10	20	Solar	Gamji Solar Power Plant	SH	15	1 mln USD/MW	Kakheti	15 MW	-	20-25 percent	Not yet calculated. Approximately	Nov-17	May-19

19

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

Alternative projects

LN	PLANT #	TYPE OF VRE	PROJECT NAME	RELATED PARTY	MOU INVESTMENT COST (min USD)	SUBMITTED UNIT INVESTMENT COST (min USD/MW)	REGION	SUBMITTED ESTIMATED INSTALLED CAPACITY (MW)	ESTIMATED ANNUAL GENERA-TION (GWh)	CAPACITY FACTOR	LEVELIZED COST OF ELECTRICITY (USD/kWhr)	MOU SIGNING DATE	DEADLINE FOR FEASIBI-LITY STUDY SUBMISSION
11	1	Wind	Mtskopi Wind Power Plant	BOG	69	1.3 mln USD	Tbilisi	100 MW	172	30 percent	0.56 USD/kWH	Mar-17	Sep-18
12	4	Wind	Kaspi Wind Power Plant	BOG	78	1.4 mln USD/MW	Shida Kartli	50 MW	205	42 percent	0.056 USD/kWh	May-17	Nov-18
13	5	Wind	Plevi Wind Power Plant	BOG	47	1.2 mln USD	Shida Kartli	30 MW	140	42 percent	0.056 USD/kWh	Apr-17	Oct-18
14	15	Solar	Plevi Solar Power Plant	SJJ	7	708 000 USD/MW	Gori	7 MW	10,36	16 percent	0,053 USD/kWh	Mar-18	Sep-19

20

USAID | GEORGIA FROM THE AMERICAN PEOPLE USAID ENERGY PROGRAM

THANK YOU!

Presentation was prepared by:
Paul Clark, Economist, PaulC@TBSC.ge

21

MASTER LIST OF PROJECTS

LN	Plant #	Final Selection	Type of VRE	Project Name	Related Party	MoU Investment Cost (mln USD)	Submitted Unit Investment Cost (mln USD/MW)	Region	Submitted Estimated Installed Capacity (MW)	Estimated Annual Generation (GWh)	Capacity Factor	Levelized Cost of Electricity (USD/kWh)	MoU Signing Date	Deadline for Feasibility Study Submission	Estimated Operational Date
1	2	Selected	Wind	Tkibuli Wind Power Plant	BoG	70	1.4 mln USD/MW	Imereti	90 MW	321	40 percent	0.056 USD/kWh	Mar-17	Sep-18	Feb - 21
2	3	Selected	Wind	Tbilisi Wind Power Plant	BoG	81	1.4 mln USD/MW	Tbilisi	100 MW	200	42 percent	0.057 USD/kWh	Mar-17	Sep-18	Feb - 21
3	8	Selected	Solar	Marneuli Solar Power Plant	BoG	49	1 mln USD	Kvemo Kartli	50 MW	67	Alternate Current (AC) Capacity factor 22.4 percent	.0769 USD/kWh	Feb-17	Aug-18	Jan - 20
4	9	Selected	Solar	Kaspi Solar Power Plant	BoG	49	1 mln USD	Shida Kartli	50 MW	66	AC Capacity factor 24.4 percent	.0797 USD/kWh	Feb-17	Aug-18	Jan - 20
5	11	Selected	Bio-Mass	Gardabani Bio-Thermal Power Plant	AltE	2	1,33, ln USD/MW	Kvemo Kartli	9 MW under ideal conditions, 3 MW is expected. 3645 KW heat is expected. Company can also produce biofertilizers - 23 875 tons per year.	26	70-80%	Not yet calculated	Jan-16	Oct-16	Jul - 19
6	12	Selected	Wind	Imereti 1 Wind Power Plant	InfiniteE	500	297 mln for 200 MW, $1.485 mn per MW installed	Imereti	150 MW - 200 MW for the first phase, whereas the total capacity amounts to 420 MW (up to 100 turbine positions)	1,100	41% at P50	0,03665 USD/kWh with all equity assumption	Nov-15	Nov-17	Mar - 20
7	13	Selected	Solar	Kvernaki Solar Power Plant	SJJ	14	708 000 USD/MW	Gori	14 Mw	19,84	1,600%	0.00	Mar-18	Sep-19	Apr - 21
8	17	Selected	Wind	Nigoza Wind Power Plant	GEDF	66	1.44 mln USD/MW	Shida Kartli	up to 50 MW	232	up to 45%	0.00	Mar-16	Jun-17	Oct - 19
9	19	Selected	Solar	Udabno Solar Power Plant	GEDF	6	850 000 - 950 000 USD MW	Kakheti	5 MW	8	15,4 percent	n/a	Jun-16	Jun-17	Feb - 19
10	20	Selected	Solar	Gareji Solar Power Plant	SH	15	1 mln USD/MW	Kakheti	15 MW	-	20-25 percent	Not yet calculated; Approximately 0,015 USD/kWh	Nov-17	May-19	Oct - 20

Note: The estimated operational dates for selected 10 projects are roughly calculated based on the information given in MoUs

LN	Plant #	Final Selection	Type of VRE	Project Name	Related Party	MoU Investment Cost (mln USD)	Submitted Unit Investment Cost (mln USD/MW)	Region	Submitted Estimated Installed Capacity (MW)	Estimated Annual Generation (GWh)	Capacity Factor	Levelized Cost of Electricity (USD/kWh)	MoU Signing Date	Deadline for Feasibility Study Submission
11	1	Alternate	Wind	Martkopi Wind Power Plant	BoG	69	1.3 mln USD	Tbilisi	100 MW	172	30 percent	0.56 USD/kwh	Mar-17	Sep-18
12	4	Alternate	Wind	Kaspi Wind Power Plant	BoG	78	1.4 mln USD/MW	Shida Kartli	50 MW	205	42 percent	0.056 USD/kWh	May-17	Nov-18
13	5	Alternate	Wind	Plevi Wind Power Plant	BoG	47	1.2 mln USD	Shida Kartli	30 MW	140	42 percent	0.056 USD/kWh	Apr-17	Oct-18
14	15	Alternate	Solar	Plavi Solar Power	SJJ	7	708 000 USD/MW	Gori	7 MW	10,36	16 percent	0,053	Mar-18	Sep-19

				Plant								USD/kWh		
15	23	Not Selected	Solar	Akhaltsikhe Solar Power Plant 1	NA	49	NA	Samtskhe-Javakheti	NA	65	NA	NA	Feb-17	Aug-18
16	24	Not Selected	Solar	Akhaltsikhe Solar Power Plant 2	NA	49	NA	Samtskhe-Javakheti	NA	65	NA	NA	Feb-17	Aug-18
17	25	Not Selected	Solar	Algeta Solar Power Plant	NA	49	NA	Kvemo Kartli	NA	67	NA	NA	Feb-17	Aug-18
18	26	Not Selected	Solar	Gldani Solar Power Plant	NA	49	NA	Tbilisi	NA	67	NA	NA	Feb-17	Aug-18
19	27	Not Selected	Solar	Saakadze Solar Power Plant	NA	49	NA	Kvemo Kartli	NA	67	NA	NA	Feb-17	Aug-18
20	28	Not Selected	Solar	Ksani Solar Power Plant	NA	49	NA	Shida Kartli	NA	66	NA	NA	Feb-17	Aug-18
21	6	Not Selected	Wind	Kutaisi Wind Power Plant	BoG	77	1.2 mln USD	Imereti	50 MW	171	37 percent	0.056 USD/kWh	May-17	Nov-18
22	7	Not Selected	Wind	Didgori Wind Power Plant	BoG	78	1.5 mln USD	Kvemo Kartli	100 MW	193	40 percent	0.06 USD/kwh	May-17	Nov-18
23	10	Not Selected	Solar	Gardabani Solar Power Plant 1	BoG	49	1 mln USD	Samtskhe-Javakheti	50 MW	68	AC Capacity factor 24 percent	0.07561 USD/kWh	Feb-17	Aug-18
24	14	Not Selected	Solar	Karaleti Solar Power Plant	SJJ	2	708 000 USD/MW	Gori	2 MW	2,87	1,600%	0.053 USD/kW	Mar-18	Sep-19
25	18	Not Selected	Wind	Zestaphoni Wind Power Plant	GEDF	54	1.4 mln USD/MW	Imereti	up to 50 MW	165	up to 43%	n/a	Dec-17	Mar-18
26	21	Not Selected	Solar	West Gareji Solar Power Plant	SH	36	0,8 mln USD/MW	Kakheti	45 MW	-	20-25 percent	Not yet calculated; Approximately 0,015 USD/kWh	-	-
27	22	Not Selected	Solar	Gardabani Solar Power Plant 2	NA	49	NA	Samtskhe-Javakheti	NA	68	NA	NA	Feb-17	Aug-18
28		Not Selected	Wind	Phona Wind Power Plant	NA	41	NA	Shida Kartli	NA	87	NA	NA	Nov-15	May-17
29		Not Selected	Wind	Central Wind Power Plant	NA	200	NA	Imereti	NA	560	NA	NA	Mar-16	Jun-17
30		Not Selected	Wind	Kartli 2 Wind Power Plant	NA	121	NA	Shida Kartli	NA	317	NA	NA	May-16	Aug-17
31		Not Selected	Wind	Khashuri Wind PP	NA	0	NA	Khashuri	NA		NA	NA	NA	NA
32		Not Selected	Wind	Rikoti Wind Power Plants	NA	103	NA	Imereti	NA	219	NA	NA	Nov-15	May-17
33		Not Selected	Wind	Pirveli Wind Power Plant	NA	185	NA	Shida Kartli	NA	388	NA	NA	Oct-16	Jan-19
34		Not Selected	Wind	Pirveli Wind Power Plant	NA	62	NA	Kvemo Kartli	NA	114	NA	NA	Oct-16	Jan-19
35		Not Selected	Wind	Saakadze Wind Power Plant	NA	28	NA	Kvemo Kartli	NA	56	NA	NA	Nov-17	Nov-18
36		Not Selected	Wind	Zemo Wind Power Plant	NA	22	NA	Shida Kartli	NA	39	NA	NA	Nov-17	Nov-18
37		Not Selected	Wind	Central Wind Power Plant	NA	200,135,542		Imereti	NA	560			42,458	-
38		Not Selected	Solar	Algeta Solar Power Plant	NA	49,084,875		Kvemo Kartli	NA	67			42,787	-
39		Not Selected	Wind	Didgori Wind Power	NA	78,000,000		Kvemo Kartli	NA	193			42,859	-

				Plant										
40		Not Selected	Wind	Bevreti Wind Power Plant	NA	NA	NA	Mtskheta	NA	47	NA	NA	NA	NA
41		Not Selected	Wind	Lisi Wind Power Plant	NA	NA	NA	Tbilisi	NA	49	NA	NA	NA	NA
42		Not Selected	Wind	Okami 1 Wind Power Plant	NA	NA	NA	Shida Kartli	NA	85	NA	NA	NA	NA
43		Not Selected	Wind	Okami 2 Wind Power Plant	NA	NA	NA	Shida Kartli	NA	73	NA	NA	NA	NA
44		Not Selected	Wind	Opurchkheti Wind Power Plant	NA	NA	NA	Imereti	NA	31	NA	NA	NA	NA
45		Not Selected	Wind	Rustavi Wind Farm Georgia -1	NA	50	NA	Rustavi	NA	130	NA	NA	NA	NA
46		Not Selected	Wind	Senaki Wind Power Plant	NA	NA	NA	Samegrelo	NA	27	NA	NA	NA	NA
47		Not Selected	Wind	Shindisi Wind Power Plant	NA	NA	NA	Tbilisi	NA	64	NA	NA	NA	NA
48		Not Selected	Solar	Shiraki Solar Power Plant	NA	8	NA	Kakheti	NA	11	NA	NA	NA	NA
49		Not Selected	Wind	Tserovani Wind Power Plant	NA	NA	NA	Shida Kartli	NA	75	NA	NA	NA	NA
50		Not Selected	Wind	Udabno Wind Power Plant	NA	NA	NA	Kakheti	NA	44	NA	NA	NA	NA
51		Not Selected	Waste-To-Energy	Waste to Energy (Georgia Synthetic Oil Company)	NA	0	NA	Tskaltubo	NA		NA	NA	NA	NA
52		Not Selected	Wind	Bevreti Wind Power Plant	NA	-		Mtskheta	NA	47			-	-
53		Not Selected	Solar	Akhaltsikhe Solar Power Plant 1	Samtskh	49,084,875		Samtskhe-Javakheti	NA	65			42,787	-
54		Not Selected	Solar	Akhaltsikhe Solar Power Plant 2	Samtskh	49,084,875		Samtskhe-Javakheti	NA	65			42,787	-

DESCRIPTION OF DATA ELEMENTS

DATA ELEMENT	DESCRIPTION	EXAMPLE
Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201
Project Name	Name typically assigned by the developer. Text name.	Imagination
Involvement of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.
Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects in Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.
Equity-Provider and Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.
On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid
Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW
Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent
Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW
Levelized Cost of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh
Expected Months of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round
Current Status	Current status of the project. Note status of MoUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff
Apparent Level of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level
Key Reasons for Level of Activity Not Being Active	Detailed textual description of reasons Apparent Level of Activity is not Active.	Have been waiting four months for decision X from Government
Project Has Gone Through the Ministry of Environment Protection and Agriculture of Georgia (MEPA) Screening Process or Environmental Impact Assessment (EIA) (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems
Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.
Geographic Information System (GIS) Altitude of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m
Distance to Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km
Distance to Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected area.	XYZ National Park; 25 km
Description of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.
Distance to Closest Airport; Name and Likely Project Impact, If Any	Wind masts create aerial hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.
Likely Cost of Transmission Line to Existing or Planned Transmission or	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW

Distribution System Connection Point		
Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW
Presence of Rare or Endangered Flora or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of (International Financial Institutions (IFIs)) in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report
Distance to Site from Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.
Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017
General Opinions Expressed by Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project
Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender
Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh
Financial Capacity of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway
Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non-presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent of GSE's connection limits in this Region
Source and Dates of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.
Average Wind Power Density at Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at a location by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2
Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m
Height of Turbine Hub	For comparison with anemometer height. In m.	60 m
Self-Consumption and Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0
Proximity to Bird Migratory Routes or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; Important Bird Areas (IBA) and Migratory Bird migratory route maps for Georgia
Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA
Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the Direct Normal Irradiance (DNI)) and the Diffuse Horizontal Irradiance (DHI). Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2
Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years

BOG – MARTKOPI WIND FARM (01)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Martkopi Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company Joint Stock Company (JSC) established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. Georgian Renewable Power Company (GRPC) is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are Bank of Georgia Group PLC (BGEO) (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 Hydro Power Plant (HPP) with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any SPVs to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-connection to the national state
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	100 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	30 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.3 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.56 USD/kwh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	12 months

12	Current Status	Current status of the project. Note status of MoUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	The project is pending the final guidance for wind turbine configuration with potentially limited impact on the operation of the Radars. As per verbal discussions, the wind turbines interacting at the altitude of radar visibility, can't be cleared (1100 masl.). About 15 turbines are located in the spots which interact with the defined altitude. However, these are also the most rich wind resource areas. The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level of activity. However, the final (official) response from the aviation authority is required for final approval of wind turbine positions.
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	The aviation authority has not return with the final answer regarding the potential conflict of interest with Radars and which buffer zones to be considered. The third party independent opinion is required.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	According to this Preliminary ESIA, the expected impacts on the natural and social environment as a result of construction and operation of the proposed Wind Park will be minimal, local and partly reversible. Appropriate site selection exercise is crucial for overall minimization of major impacts, like noise, shadow flickering, impacts on landscape and habitats etc. Further mitigation measures for minimizing the impacts on the bird and bat population should be planned during the ESIA. At least two highly sensitive and five sites of medium sensitivity have been identified in the project area. First of all avoidance strategy will be applied to bypass the mentioned sensitive habitats during the site selection. In case if it will not be possible to avoid mentioned sites, appropriate mitigation measures and off-set programs should be planned to minimize effects of residual impacts. Based on the Preliminary ESIA proposed project can be categorized as Category B (as per IFI's classification of projects), which specifies that this project does not have any potential significant adverse social or environmental risks or/and impacts.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q2, 2020 The main milestones in the projects to be online by q3, 2020 are the following: - GSE/Transmission System Operator (TSO) announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018. Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months- Q4'2019. The lead time for WTG delivery is about 6 months. Therefore, the installation of turbines will take place in Apr-May 2020 and will be commissioned by Sep 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	About 15 wind turbines are at the altitudes between 1000-1100 masl. and about 10 turbines are in range between 650-800 masl.
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	920 m to the east is Patara Lilo 1500m to the west is Didi Lilo Airport Settlement is in 1900 m The Tbilisi Reservoir is 3 km south west from the project In case of the distance from payara Lilo raises noise issue, the silence brushes on the blades will be deployed for nearest turbines to the settlements
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Tbilisi National park which borders starts in approximately 5 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible	no impact, based on pre-ESIA

			from road.	
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	The Tbilisi International Airport is in 7 km from the project boarder. Therefore, during the layout optimization, the safety distances from the airport authority were considered.
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	In case of restriction, the project size might decrease significantly. In such a case, the connection could be at 35 kV level to the nearest distribution network in 5 km north from the site. Approx. Value of connection would be .9 mln USD In case of >40 MW (if some restriction are removed), the connection foreseen is 110 kV line to the TSO's substation 8 km North west from the site. The value approx. 5 mln USD
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8 ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	All the "highly sensitive" species are provided in the pre-ESIA report
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	1.5 km
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	0
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (Electricity Market Operator (ESCO)) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Rustavi
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	14 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines with 100 m met mast. Additional 80 m met mast to be procured in Aug 2018

33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	wind power density of 1047 W/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	100 magl.
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	100 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	8 percent
37	Proximity To Bird Migratory Routes Or IBA	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None-known, as per pre-ESIA
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	n/a
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	n/a

BOG – TKIBULI WIND FARM (02)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Tkibuli Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	90 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	40 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.4 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.056 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round

12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	The project is pending the final position from the aviation authority regarding the "Obstacle Impact Assessment on the existing flight procedures". The project foresees 21 positions of wind turbines, however 15 positions might go in conflict with the aviation routes. To be defined. The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level, however, pends the decision from the aviation
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Needs third party independent opinion on aviation re-routing
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	According to this Preliminary ESIA, the expected impacts on the natural and social environment as a result of construction and operation of the proposed Wind Park will be minimal, local and partly reversible. Appropriate site selection exercise is crucial for overall minimization of major impacts, like noise, shadow flickering, impacts on landscape and habitats etc. Further mitigation measures for minimizing the impacts on the bird and bat population should be planned during the ESIA. At least four highly sensitive and four sites of medium sensitivity have been identified in the project area. First of all avoidance strategy will be applied to bypass the mentioned sensitive habitats during the site selection. In case if it will not be possible to avoid mentioned sites, appropriate mitigation measures and off-set programs should be planned to minimize effects of residual impacts. Based on the Preliminary ESIA proposed project can be categorized as Category B (as per IFI's classification of projects), which specifies that this project does not have any potential significant adverse social or environmental risks or/and impacts. According to Georgian regulations, the project is subject for full scale (EIA). The Construction Permit should be obtained based on positive decision of the Ecological Expertise of the EIA documents submitted together with the design documentation.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	The main milestones in the projects to be online by q3, 2020 are tar following: - GSE/TSO announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018. Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months- Q3'2019. The lead time for Wind Turbine Generator (WTG) delivery is about 6 months. Therefore, the installation of turbines will take place in June-July 2020 and will be commissioned by Sep 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	770 - 820 masl.
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	1 km west v. Tsutskvati, 1 km north v. Dzuknuri, 5 km East - Akhalsopheli, 2 km south v. Separeti
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Ajameti Managed Reserve which borders starts in approximately 15 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest	Wind masts create areal hazards, particularly since the masts tend to be on	Tbilisi airport; 21 km; no	35 km from Kutaisi airport. Some turbines may be in conflict with the aircraft minimal altitude at

	Airport; Name And Likely Project Impact, If Any	ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	impact. Air traffic radar station 15 km; blades may interfere.	intermediate segment of instrument approach procedure
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	9.4 mln USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	All the "highly sensitive" species are provided in the pre-ESIA report
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	5 km
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Kutaisi
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	14 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 887 W/m2

34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	100 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	100 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	8 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

BOG – TBILISI WIND FARM (03)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Tbilisi Wind Farm

3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	100 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	42 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.4 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.057 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-around
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Due to high (extreme) wind speeds occurrence during the year, the wind turbines will reach cut-off speeds, which might negatively influence the security of supply. Solution (battery storages) and extended cut-off speed on turbines sides might be combined to tackle the issue. The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined

13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Needs specific solution on hedging the cut-off though extended power curves and battery storages
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	According to this Preliminary ESIA, the expected impacts on the natural and social environment as a result of construction and operation of the proposed Wind Park will be minimal, site specific and reversible. Appropriate site selection exercise is crucial for overall minimization of major impacts, like noise, shadow flickering, impacts on landscape and habitats etc. Further mitigation measures for minimizing the impacts on the bird and bat population should be planned during the ESIA. At least two highly sensitive and five sites of medium sensitivity have been identified in the project area. First of all avoidance strategy will be applied to bypass the mentioned sensitive habitats during the site selection. In case if it will not be possible to avoid mentioned sites, appropriate mitigation measures and off-set programs should be planned to minimize effects of residual impacts. Based on the Preliminary ESIA proposed project can be categorized as Category B (as per IFI's classification of projects), which specifies that this project does not have any potential significant adverse social or environmental risks or/and impacts. According to Georgian regulations, the project is subject for full scale EIA. The Construction Permit should be obtained based on positive decision of the Ecological Expertise of the EIA documents submitted together with the design documentation
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q2, 2020 The main milestones in the projects to be online by q3, 2020 are the following: - GSE/TSO announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018. Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months- Q4'2019. The lead time for WTG delivery is about 6 months. Therefore, the installation of turbines will take place in Jun-July 2020 and will be commissioned by Sep 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	900-1200 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	The nearest village adjusted to the site is on the northern part in 1 km from the tentative location of turbines. To reduce the risk of noise impact and shadow flicker at neighbouring villages, a minimum distance of 600 meters should be kept between the wind turbines and any populated area. The impact of shadow flicker and noise can be mitigated to a certain extent, if the impact is above the threshold value allowed for the wind farm
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Tbilisi National Park which borders starts in approximately 3 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	25 km from the Tbilisi International Airport. No impact

22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	7 mln USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8 ha.MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	All the "highly sensitive" species are provided in the pre-ESIA report
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	4 km
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated. Tentatively, Jun 2018
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	None
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent- mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Tbilisi
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	14 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines with 60 m met mast. Additional 80 m met mast to be procured in May 2018
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 1928 W/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	60 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	60 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance,	0	12 percent

		environmental, and curtailment. In percent of Designed Net Capacity.		
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

BOG – KASPI WIND FARM (04)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Kaspi Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs)	Two solar projects in EU 50 and 75 mln USD, named X	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each

	Strength	to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	and Y. No negatives in due diligence.	
6	On- Or Off-Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	42 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.4 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.056 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Due to the increased size of the Wind Turbine Generators and blades, the logistics is a critical issue in the project, which requires optimization on the unloading in the Poti Port, transportation obstacle re-evaluation, storages concepts, etc. The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level, however, pends the logistics risk analyses
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Needs third party independent opinion on logistics management plan

15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	According to this Preliminary ESIA, the expected impacts on the natural and social environment as a result of construction and operation of the proposed Wind Park will be minimal, local and partly reversible. Appropriate site selection exercise is crucial for overall minimization of major impacts, like noise, shadow flickering, impacts on landscape and habitats etc. Further mitigation measures for minimizing the impacts on the bird and bat population should be planned during the ESIA. At least four highly sensitive and four sites of medium sensitivity have been identified in the project area. First of all avoidance strategy will be applied to bypass the mentioned sensitive habitats during the site selection. In case if it will not be possible to avoid mentioned sites, appropriate mitigation measures and off-set programs should be planned to minimize effects of residual impacts. Based on the Preliminary ESIA proposed project can be categorized as Category B (as per IFI's classification of projects), which specifies that this project does not have any potential significant adverse social or environmental risks or/and impacts. According to Georgian regulations, the project is subject for full scale EIA. The Construction Permit should be obtained based on positive decision of the Ecological Expertise of the EIA documents submitted together with the design documentation.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q4, 2019 The main milestones in the projects to be online by q3, 2020 are the following: - GSE/TSO announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018. Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months- Q3'2019. The lead time for WTG delivery is about 6 months. Therefore, the installation of turbines will take place in June-July 2020 and will be commissioned by Sep 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	950-1050 masl.
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	The nearest village adjusted to the site is on the northern part in 1 km from the tentative location of turbines. To reduce the risk of noise impact and shadow flicker at neighbouring villages, a minimum distance of 600 meters should be kept between the wind turbines and any populated area. The impact of shadow flicker and noise can be mitigated to a certain extent, if the impact is above the threshold value allowed for the wind farm
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected area in approximately 20 km from the area of interest. Touristic routes are also remote from the site of interest
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	55 km from the site
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	7 mln USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8ha/MW
24	Presence Of Rare	What rare or endangered species are present. If unknown say Unknown.	Widget Grasshopper; EIA	n/a

	Or Endangered Flora Or Fauna Species	Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	report	
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	2 km
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Kaspi-Gori
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	9 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines with one 80 m met masts. Additional 2 met masts of 80 m to be procured in Jul 2018
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 829 W/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	80 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	80 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	8 percent
37	Proximity To Bird Migratory Routes Or	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant	None noted; IBA nad Migratory Bird migratory route	None noted, within the scope of Full ESIA launched

	Important Bird Areas	collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	maps for Georgia	
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

BOG – PLEVI (KHASHURI) WIND FARM (05)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Plevi Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners	Other projects the equity-provider and owners have financed in Georgia and	Two solar projects in EU	Shareholders are the equity providers in size of 25-30% of total project value.

	Financial Strength	elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	50 and 75 mln USD, named X and Y. No negatives in due diligence.	The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	30 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	42 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.2 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.056 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	There is a gas pipeline and internet fibre optic cable is crossing the site. The buffer zones to be defined The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level, however, pends the approved buffer zones between turbines and gas pipelines, and fiber optic internet cable
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Needs third party independent opinion on buffer zones to be respected in project planning
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Based on the internal evaluation, no significant impacts on environment and social aspects is expected. The Full ESIA to be launched in May 2018
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2020 The main milestones in the projects to be online by q3, 2020 are the following: - GSE/TSO announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018.

		unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.		Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months- Q3'2019. The lead time for WTG delivery is about 6 months. Therefore, the installation of turbines will take place in June-July 2020 and will be commissioned by Sep 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	830-930 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	There are several villages around the boarder of the project. The min distance of 600 m is taken for the noise reasons
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	20 km West is Borjomi National Park
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	112 km from Tbilisi International Airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	1 mln USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	n/a
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	2 km
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh

30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Mta Sabueti
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	to be launched in Mat'2018 the on ground measurement In accordance with IEC64100 and MEASNET guidelines
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 1128 W/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	100 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	100 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	7 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast	20% first five years; 13	

		efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	percent next five years; 10 percent next 15 years	

BOG – KUTAISI WIND FARM (06)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Kutaisi Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	37 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.2 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.056 USD/kWh

11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Some of the houses are in the limits of noise pollution. The projects is in its final stage of technical development and feasibility study completion. More than 12 month of measurement is available; Pre-ESIA conducted; Site surveys, adequate for the current phase of the project, are conducted; Conceptual designs for grid connection, access roads, axillary infrastructure is done; Critical issues (aviation clearance, logistics) are examined
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High level, however, pends the solution for noise reduction
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Needs third party independent opinion on noise management
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Based on the internal evaluation, no significant impacts on environment and social aspects is expected. The Full ESIA to be launched in May 2018
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2020 The main milestones in the projects to be online by q3, 2020 are the following: - GSE/TSO announced that the new capacities for wind integration will be known by end of Jul'18. - Full ESIA has been already initiated and will be finalized by May 2019 - MoU with the Government to be signed by the end of 2018. Thus, the project will be in position for financial close by Q2-Q3 2019. Contracting of main Lot contracts for procurement of the project will take additional 3-6 months-Q3'2019. The lead time for WTG delivery is about 6 months. Therefore, the installation of turbines will take place in March 2020 and will be commissioned by May 2020.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	200-360 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	In 300 m east is v. Nakhshirghele, in 800 m west is Chognari v., in 800 m South is Broliskedi
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Ajameti Managed Reserve which borders starts in approximately 3 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	23 km from Kutaisi Airport
22	Likely Cost Of	Apply rules-of-thumb to estimate likely cost of transmission line, substation or	130 000 USD/5 MW =	1 mln USD per project

	Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	upgrade of existing substation divided by net declared capacity. In USD/MW.	26 000 USD/MW	
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual descripton along with source of data.	Widget Grasshopper; EIA report	n/a
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	200 m
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Poti
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	2 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 922 W/m2

34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	80 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	80 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	7 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

BOG – DIDGORI WIND FARM (07)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Didgori Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and

				constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	100 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	40 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.5 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.06 USD/kwh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	One met mast was installed, unfortunately, was broken due to icing. Pre-FS has been conducted, pre-ESIA is in process, site surveys have been conducted. Tentative micro siting has been created.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Low level, due to high altitude and cold climate, there are concens on organization of the wind measurement campaign
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Measurement campaign in cold climate plan is needed
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No,	Result of MEPA screening or EIA show no particular environmental or social problems	No particular environmental or social problems

		then detailed textual description of why not.		
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2021
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	1500-1800 masl.
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	No villages in the vicinity
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected area in approximately 4 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	39 km from Tbilisi Airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	9 mln USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.8ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	n/a
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	200 m
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent, mixed

29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.06 USD/kWh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Paravani
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	6 months of on ground measurement In accordance with IEC64100 and MEASNET guidelines
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	The expected mean wind power density if 1383 W/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	80 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	80 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	7 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude,	1350 kWh/m2	

		latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.		
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

BOG – MARNEULI PV (08)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Marneuli PV Plant
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equilivent combination. In percent.	42 percent	AC Capacity factor 22.4 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the	0,015 USD/kWh	.0769 USD/kWh

		quantity of electricity generated. In USD/kWh.		
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Measurement met mast was installed in Jan 2018. Site specific investigation have been conducted. Pre-FS study is available (i.e. project scoping)
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Medium level,
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Measurement campaign definition is required (whether the current on-ground measurement is within the best international practices)
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	No particular environmental or social problems. Internal preliminary evaluation has been done
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2021
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	457 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	In 700 m to west is Marneuli town
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Tbilisi Protected Area which borders starts in approximately 30 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	21 km from Tbilisi Airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	2.4 USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.33 MW/ha
24	Presence Of Rare Or	What rare or endangered species are present. If unknown say Unknown. Source of	Widget Grasshopper; EIA	n/a

	Endangered Flora Or Fauna Species	information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	report	
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	500 m
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent, mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.08usd/kwh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain-Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Paravani
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	4 month of measurement from one mast
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	1871 kg/m3
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	3 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	3 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	19 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched

		large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.		
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1477 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	3.8 percent for project life

BOG – KASPI PV (09)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	f
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44 MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each

6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	AC Capacity factor 24.4 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	.0797 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Measurement met mast was installed in Jan 2018. Site specific investigation have been conducted. Pre-FS study is available (i.e. project scoping)
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Medium level,
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Due to the fact, that the project is located in vicinity of cement production facilities, there might be a negative effect of dust on power production and increased costs in O&M (i.e. cleaning).
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	No particular environmental or social problems. Internal preliminary evaluation has been done
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2021
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	530 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	The project borders Kaspi town west in 150 m and v. maelstrom in south in 250 m
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Tbilisi Protected Park and Manglisi Protected Area which borders starts in approximately 30 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for	Distance from park suggests no direct project impact; road to park	No impact detected as of now

	Project Impact, If Any	any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	is 1 km from site, so it will be visible from road.	
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	45 km from Tbilisi Airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	2.2 USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.33 MW/ha
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	n/a
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	500 m
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent, mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.08usd/kwh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Kaspi-Gori cluster
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	4 month of measurement from one mast
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	302 w/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	3 m

35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	3 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	18.9 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1497 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	3.8 percent for project life

BOG - GARDABANI PV (10)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Gardabani PV Plant
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No Caucasian Wind Company is a 100% subsidiary of the Georgian Renewable Power Company JSC established to develop power projects in Georgia. Currently Caucasian Wind Company is working on 7 wind power projects throughout the territory Georgia and has already signed pertinent MoUs with the GoG for the purposes of the development of the above said projects. GRPC is the joint stock company set up to develop the renewable energy projects in Georgia. Shareholders of the company are BGEO Group PLC (65%) and RP Global Austria GmbH (35%). RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed	Two Hydro Projects In Georgia (zz and bb; 10 MW	As a Georgian Renewable Power Company, we are constructing hydro power plants in Georgia, mainly: Mestiachala 2 HPP with total installed capacity 45 MW and Zoti HPP 44

		textual description.	and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	MW RP Global – headquartered in Vienna, Austria and Madrid, Spain – has almost 30 years of experience in the renewable energy sector on an international level. RP Global has developed and constructed more than thirty-five power plants (wind and hydro) in countries such as Portugal, France, Poland, Croatia, Georgia, Chile and Peru
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Shareholders are the equity providers in size of 25-30% of total project value. The value of HPPs under construction are, tentatively, 60 mln USD each
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	AC Capacity factor 24 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1 mln USD
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.07561 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Measurement met mast was installed in Jan 2018. Site specific investigation have been conducted. Pre-FS study is available (i.e. project scoping)
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Medium level,
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Due to the fact, that the project is located in relatively hotter climate, the selection of proper technology should be defined/assessed, including selection of fixed or tracking solutions.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	No particular environmental or social problems. Internal preliminary evaluation has been done
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description	June 2020; Flexible depending on finalizing vendor selection.	Q1, 2021

		of why it is not Firm.		
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	300 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	The project boarders with some villages (Tazakendi, Kalinino, Ahasheni) in 100 in north.
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	There are no protected areas within the borders of the project area. The nearest protected are is the Tbilisi Protected Area which borders starts in approximately 30 km from the area of interest. Touristic routes are also remote from the site of interest.
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No impact detected as of now
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	18 km from Tbilisi Airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	2.2 USD per project
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0.33 MW/ha
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	n/a
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	500 m
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Public hearings to be held in accordance with the local regulation and IFI's recommendations, within the framework of full-ESIA initiated.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	N/A
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	25-30 percent, mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0.08usd/kwh
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	8 month (Sep-Apr) PPA with the Government (ESCO) and 4 month local and/or export markets are considered

31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain-Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Rustavi cluster
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	4 month of measurement from one mast
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	302 w/m2
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	3 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	3 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	18.9 percent
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	None noted, within the scope of Full ESIA launched
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	None noted, within the scope of Full ESIA launched
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1482 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	3.8 percent for project life

ALTE – GARDABANI BIOMASS (11)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Gardabani biothermal power plant

3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No offshore company involved. Developer - Alt Energy (100%). Investor - not yet.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Company does not have any experience in energy sector as it is a newly established firm (founded in 2016). Company has experience in agriculture and its management (growing plants, cereal etc.)
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Company does not have an equity-provider yet. Project value is 4 mln USD. Company is negotiating with few companies to invest 20-30% of the value. Getting a bank loan is very hard as they are not willing to give it, other investors need to be found.
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	Off-Grid as project has not started yet. After implementing project it will be possible to make it on-grid.
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	9 MW under ideal conditions, 3 MW is expected. 3645 KW heat is expected. Company can also produce biofertilizers - 23 875 tones per year.
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	70-80%
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1,33 ,ln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	Not yet calculated
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	All aspects of MOU is accomplished and project is ready to take start if it gets access to finances. Only environmental assessment needs to be carried out. Currently, we are negotiating with LTD Gama Consulting to start environmental assessment and we are aiming to have it finished by the end of May.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Low Level
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	At this moment company is looking for the investors and is negotiating with several local companies. Company is also working on environmental assessment.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Project has not gone through any of the listed assessments but company has evaluated its environmental impacts internally. No negative impact has been shown, in opposite, this project will be beneficial for the environment. Energy that will be produced with this project will help to reduce amount of CO2 in the air by 18 000 tones approximately. We are working to have our environmental assessment ready by the end of May and send it to MoESD and MEPA.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a	June 2020; Flexible depending on finalizing vendor selection.	Questionable as the company is looking for the investors. In general, it is preferable to start this project in May as it is connected with ploughing and sowing. May 2019 will be a goal if company can allocate enough resources for that.

		date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.		
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	570 m.
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Krtsanisi 5 km, Kumisi 10km, Rustavi 15 km, Tbilisi 27 km
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	None
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	approx. 60-70 km from Tbilisi airport
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	We had negotiations with the government in the past and they said they were going to help us and finance these costs. However, changes in law also changed this situation and help from government in this regard is no longer considered. We have not calculated exact costs but approximately 90 000 USD/3 MW = 30 000 USD/MW
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	83 ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	Preliminary studies have been done internally and no rare or endangered Flora or Fauna species were found. Expert from USAID can visit the site.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	Site is right by the road, Flat road
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	No meetings have been conducted as there is no need. Settlements are at least 2-3 km away and our project will not have any kind of noise and will not affect citizens.
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	None
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	proportionally, 30% debt and 70% equity
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	6 cents on average (5 cents could also be acceptable)
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	N/A

32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	N/A
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	N/A
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	N/A
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	N/A
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	0
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Birds are not important issue for us as this project will not affect them.
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	Bats are not important issue for us as this project will not affect them.
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	N/A
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	N/A

INFINITEE – IMERETI WIND FARM (12)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Imereti Win Power Plant (WPP)
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	IVICOM Holding GmbH is Austria based company with strong track record in development of renewable energy, non-renewable energy and advisory. History of company dates back to year 1991 when IVICOM GmbH Austria (today IVICOM Holding Austria) has been established as parental company for activities in region. To the holding structure belongs IVICOM Consulting Zagreb which is a company specialized for consulting, engineering, supervision, project management and construction of various industrial plants as well as for other buildings including infrastructural projects. Zagreb Branch Office has been established in year 1999 and since then, despite recession and crises in industry, is starting with expansion by employing new experts and in same time by extending scope of services. The company structure also includes the SPVs for specific projects Gas fired power plant (500 MW) in Pogradec, Albania, Wind power plant (103 MW) in Serbia, Krivaca, Wind power plant Krnovo 2 (40 MW) and Wind power plant Imereti (400+ MW) in Georgia implemented by Infinite Energy LLC. Ivicom is 75% shareholder in Infinite Energy LLC. 25% Shareholder of Infinite Energy is

				Consulteam LLC (Capital Iberia limited after rebranding) which is specialized in developing small scale hydro power plant and currently has approx. 20 MW hydropower project under development, that are at various stages.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Strong: 1. Krnovo WPP 72 MW in Montenegro, 2. Krivaca WPP 103 MW in Serbia 3. Krnovo WPP Phase 2 40 MW in Montenegro 4. GPP Korca 500 MW combined cycle gas fired power plant in Korca Albania 5. 2MW small HPP developed and sold 6. one 10 MW HPP and five 2MW (each) small hydro power plants being developed. 7. experience in detailed designing, civil/hydr0/power engineering, project management & consulting.
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	The same as developer; total value of the projects commissioned=€150 mil; projects in development=€ 800 mln.
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	150 MW - 200 MW for the first phase, whereas the total capacity amounts to 420 MW (up to 100 turbine positions)
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	41% at P50
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	297 mln for 200 MW, $1.485 mln per MW installed
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0,03665 USD/kWh with all equity assumption
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Negotiating the Grid connection with GSE. Integration of such quantity into the system is subject to some compensatory measures, like provision of energy accumulation. We initiated hydro pump storage project with installed capacity of 89 MW, which is being implemented by separate SPV, Georgian Pump Storage Development Company. Such pump storage can provide perfect balance for Wind farm, stated in short, in case of excess energy in the system, energy is used for pumping up the water from river to lake situated at upper level (BF) and in case of shortage of output (i.e. when wind speed slows) water in the lake is used to generate electricity (compensate generation)
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	High Level (Land Registration ad Acquisition)
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Waiting to start the negotiation of implementation contract (including PPA) with MoESD. TSO, being GSE still reluctant to approve capacity and connection point.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks	Result of MEPA screening or EIA show no particular environmental or social problems	full year studies have been carried out to observe birds and bats activities on project territory. when studying the impact on activities of the BIRDS, we adhere to the following standards and guidelines: Recommended bird survey methods, Scottish Natural Heritage, 2014; Assessing the effects of onshore wind farms on birds. Natural England Technical Information Note

	Completed	screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.		TIN069, Natural England (2010); Collision risk assessment assuming no avoiding actions for birds in accordance with Scottish Natural Heritage. when studying the impact on activities of the BATS, we adhere to the following standards and guidelines: EUROBATS Publication series number 6: Guidelines for consideration of bats in wind farm projects; Bat Conservation Trust (2012). Best Practice Survey Guidelines, UK.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	September 2019
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	950 - 1200 m
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	1 km to Nigvzara, 1 km to Chalovani and 1 km to Khvani
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	Borjom-Kharagauli National Park - 35 KM; Shaori-Khikhati planned Managed Reserve - 37KM
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	There is no communication between site and protection area.
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Abandoned Sachkhere Airport (Local) 18 KM, suitable for Helicopter landing only. Kutaisi international Airport - 95 KM
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	Total 11 mln USD
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0,17 ha/MW as the area of crane pad plus access road decided by installed capacity. Rest of the territory has open access and might be useful for occasional grazing, nothing else
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	Preliminary studies have been done and no real danger to Flora or Fauna is found.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	0.8 km gravel/mud road built and currently maintained by and for BP
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Local Government, Neighbouring villages and Landlords
27	General Opinions Expressed By Local	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60	Worry about impact of project on sheep grazing;	Local inhabitants grant green light to the project and are ready to sell (as most of them already did) the land plots required for crane pads

	Citizens	minute visit.	seems mostly based on insufficient information about project	
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30/70 equity/Debt Equity comes first
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	Still in the process of negotiations and we are considering seasonal tariffs. Comfortable with 7 cents or even little less. We are thinking to have higher tariffs for 8 months (maybe 7 cents), very low in Summer (maybe 3 cents). About 6 cents on average.
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO, government and landers; usually PPA reinforced by comfort letter issued by Ministry of Finance
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Mta-Sabueti 1 and 2
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	4 met masts erected on site 22 months ago. Logging period - every 10 minutes.
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	~1.113 kg/m3
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	84 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	110 m
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	Technical unavailability of wind turbines 3.0%, Technical unavailability of MV system, substation x/110 kV and transmission network 0.6%, Regular maintenance 0.4%, Curtailment 0.2%, MV system and substation x/110 kV losses + self-consumption 2.0%, Hysteresis losses 1.4%, Power curve performance (inclined flows, turbulence losses) 2.0%, Blade degradation 0.0%, Icing 0.7% ---- TOTAL 9,9%
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Neither Primary nor Secondary Migratory route covered, full year observation has been carried out and the respective study is available. Environmental expert from USAID is welcome to visit our site or see the reports.
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain,	None noted; site study as part of EIA	full year observation has been carried out and the respective study is available.

		farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.		
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	NA
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	NA

SJJ – KVERNAKI PV (13)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Kvernaki
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Solar Jam Jama Ltd. Is Georgian resident company from 2017 year (ID: 405208797). It was established by the Solar Panel manufacturer (equity - 70%) Hanplast (Poland) and (equity 30%) individuals from EU and Georgia, which are invoved in the developing and operating of the solar and wind power generation. Full description of the parties given below.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Poland - 200 MW installed wind and power constructed and in operation. Company Polwind (www.polwind.pl) Germany - 106 MW wind constructed and in operation. Company The Wind Power Gmbh (www.thewindpower.net)
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Polwind (www.polwind.pl) and The Power Wind Gmbh (www.thepowerwind.net) Total investments in the wind and solar power generation approximately EUR 250 000 000
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	14 Mw
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	16

9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	708 000 USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	12
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	MoU is obtained and Feasibility study under the development (18 month period). Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Active. Financial model of the farm is aligned to the new regulatory conditions. Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	The project is active. EUR 250 000is already invested in the projects development. Further investments in EUR 1 200 000 are secured.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Prefeasibility study includes environmental assessment of the project and water availability. No particular environmental or social problem was found, water availability in the radius 3 km was proofed. Full feasibility study will be applied to the MEPA for the assessment of the environmental impact of the project. Allegedly at the end of 2018. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	summer of the 2019
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	604 m
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	600 m. near the city of Gori. 41° 58' 47.48" N, 44° 07' 59.51" E
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	Gori Castle - 1,9 km (between the object and site city of Gori is placed). GORIJVARI monastery - 3,7 km (between the object and site city of Gori is placed)
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No protected areas in the 1 km buffer zone
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Tbilisi airport 100 km
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	100 000 USD/14 MW

23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	2 H
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	According to the prefeasibility study including site visit no presence of rear or endangered flora or fauna was detected. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	120 m from the boundary of the lot to the secondary road
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	One public meeting held in November 2017
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No objections were expressed during the meeting with locals. Some land is used as a pasture or illegally as a season backyard gardens and could be easily transferred to the nearby land
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30 equity. Equity first.
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0,07 USD/kW
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	GoG, ESCO, MOU with EnergoPro and Telasi for the energy purchase annually. Waiting for PPA after the PPP legislation will become actual.
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	NA
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	NA
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	NA
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	NA
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	NA
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	8.7
37	Proximity To Bird Migratory	Injuries and mortalities tend to be related mostly to collisions with rotors or with	None noted; IBA nad	Most part of birds, detected on the territory for exploration, is represented by species living in

	Routes Or Important Bird Areas	other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	Migratory Bird migratory route maps for Georgia	forests and shrubs. There are also the forms connected with rocky spaces and water. There are not protected species on the territory. The territory for exploration is not an important habitat for birds and does not belong to the list of priority habitats and migration corridors.
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	No bats in the area detected during the field observations
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1721 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	16

SJJ – KARALETI PV (14)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	KARALETI
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Solar Jam Jama Ltd. Is Georgian resident company from 2017 year (ID:405208797). It was established by the Solar Panel manufacturer (equity - 70%) Hanplast (Poland) and (equity 30%) individuals from EU and Georgia, which are invoved in the developing and operating of the solar and wind power generation. Full description of the parties given below.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Poland - 200 MW installed wind and power constructed and in operation. Company Polwind (www.polwind.pl) Germany - 106 MW wind constructed and in operation. Company The Wind Power Gmbh (www.thewindpower.net)
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	Polwind (www.polwind.pl) and The Power Wind Gmbh (www.thepowerwind.net) Total investments in the wind and solar power generation approximately EUR 250 000 000
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of	35 MW	2 MW

		electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.		
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	16
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	708 000 USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0.053 USD/kW
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	12
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	MoU is obtained and Feasibility study under the development (18 month period). Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Active. Financial model of the farm is aligned to the new regulatory conditions. Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	The project is active. EUR 250 000is already invested in the projects development. Further investments in EUR 1 200 000 are secured.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Prefeasibility study includes environmental assessment of the project and water availability. No particular environmental or social problem was found, water availability in the radius 3 km was proofed. Full feasibility study will be applied to the MEPA for the assessment of the environmental impact of the project. Allegedly at the end of 2018. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	End of 2018/ beginning of 2019
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	638 m
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	2,5 km Karaleti village X- 42.040425 Y- 44.085683
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	No protected areas in the 25 km buffer zone
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No protected areas in the 1 km buffer zone
21	Distance To Closest Airport; Name And Likely	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a	Tbilisi airport; 21 km; no impact. Air traffic radar station	Tbilisi airport 100 km

	Project Impact, If Any	safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	15 km; blades may interfere.	
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	2000 USD
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	2 H
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	According to the prefeasibility study including site visit no presence of rear or endangered flora or fauna was detected. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	120 m from the boundary of the lot to the secondary road
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	One public meeting held in November 2017
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No objections were expressed during the meeting with locals. Some land is used as a pasture or illegally as a season backyard gardens and could be easily transferred to the nearby land
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30 equity. Equity first.
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0,07 USD/kW
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	GoG, ESCO, MOU with EnergoPro and Telasi for the energy purchase annually. Waiting for PPA after the PPP legislation will become actual.
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	NA
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	NA
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	NA
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	NA
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	NA
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance,	0	8.7

		environmental, and curtailment. In percent of Designed Net Capacity.		
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Most part of birds, detected on the territory for exploration, is represented by species living in forests and shrubs. There are also the forms connected with rocky spaces and water. There are not protected species on the territory. The territory for exploration is not an important habitat for birds and does not belong to the list of priority habitats and migration corridors.
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	No bats in the area detected during the field observations
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1506 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	16

SJJ – PLAVI PV (15)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	PLAVI
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Solar Jam Jama Ltd. Is Georgian resident company from 2017 year (ID: 405208797). It was established by the Solar Panel manufacturer (equity - 70%) Hanplast (Poland) and (equity 30%) individuals from EU and Georgia, which are involved in the developing and operating of the solar and wind power generation. Full description of the parties given below.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Poland - 200 MW installed wind and power constructed and in operation. Company Polwind (www.polwind.pl) Germany - 106 MW wind constructed and in operation. Company The Wind Power Gmbh (www.thewindpower.net)
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln. USD, named X and Y. No negatives in due diligence.	Polwind (www.polwind.pl) and The Power Wind Gmbh (www.thepowerwind.net) Total investments in the wind and solar power generation approximately EUR 250 000 000
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions	35 MW	7 MW

		or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.		
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	16 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	708 000 USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	0,053 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	12
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	MoU is obtained and Feasibility study under the development (18 month period). Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Active. Financial model of the farm is aligned to the new regulatory conditions. Solar farm construction design, grid connection conditions are in the development. Geodesy and geology of the site are under the investigation. Full feasibility study of the site with ecological and social impact pursued.
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	The project is active. EUR 250 000is already invested in the projects development. Further investments in EUR 1 200 000 are secured.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Prefeasibility study includes environmental assessment of the project and water availability. No particular environmental or social problem was found, water availability in the radius 3 km was proofed. Full feasibility study will be applied to the MEPA for the assessment of the environmental impact of the project. Allegedly at the end of 2018. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	summer of the 2019
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	765 m
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Coordinates: 42° 08' 17.62" N, 44° 06' 42.03" E, Plavi
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	Saint. George Church - 7 km; Trinity church - 7,4 km
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	No protected areas in the 1 km buffer zone
21	Distance To Closest	Wind masts create areal hazards, particularly since the masts tend to be on ridges.	Tbilisi airport; 21 km; no impact.	Tbilisi airport 100 km

	Airport; Name And Likely Project Impact, If Any	Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Air traffic radar station 15 km; blades may interfere.	
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	2000 USD
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	2 H
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	According to the prefeasibility study including site visit no presence of rear or endangered flora or fauna was detected. USAID environmental experts are welcome to study prefeasibility docs and visit the site.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	120 m from the boundary of the lot to the secondary road
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	One public meeting held in November 2017
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No objections were expressed during the meeting with locals. Some land is used as a pasture or illegally as a season backyard gardens and could be easily transferred to the nearby land
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30 equity. Equity first.
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	0,07 USD/kW
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	GoG, ESCO, MOU with EnergoPro and Telavi for the energy purchase annually. Waiting for PPA after the PPP legislation will become actual.
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain-Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	NA
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	NA
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	NA
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	NA

35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	NA
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	8.7
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Most part of birds, detected on the territory for exploration, is represented by species living in forests and shrubs. There are also the forms connected with rocky spaces and water. There are not protected species on the territory. The territory for exploration is not an important habitat for birds and does not belong to the list of priority habitats and migration corridors.
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	No bats in the area detected during the field observations
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1721 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	16

SJJ – KHASHURI WIND FARM (16)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	

8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	
25	Distance To Site From Closest Road That Can	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	

	Handle Construction Equipment			
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	

GEDF – NIGOZA WIND FARM (17)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Nigoza Wind Farm

3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Developer - GEDF (GEDF is owned by the MoESD, Ministry's stock and balance sheet). SPV - JSC Calik Georgia Wind (Georgian Energy Development Fund (15%) and Calik Enerji (85%)). No offshore company involved.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	**WPP**: On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW; Operation Stage (Exited projects by GEDF): Wind projects in Turkey **HPP:** Feasibility stage: Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW **Solar Power Plant (SPP):** Basic design: Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Solar projects in Turkey **Thermal Power Plant (TPP):** Operation Stage (Exited projects by GEDF): Gardabani TPP
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW, Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW, Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW; Gardabani TPP, Solar and Wind projects in Turkey
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	up to 50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	up to 45%
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.44 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	• Two 80 metres masts already at the place • Wind has been monitored for two years now • Feasibility has been finalised • All reports have been finished according to MOE • Conducted preliminary social and environmental assessment
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Low Level
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	All work that could have been done up to this moment has been carried out. Currently, waiting for PPA terms and GSE grid connection issue. We are waiting for GSE's consultants, after their answer GEDF will need to hire

				consultants as well. Even though birds and bats monitoring is crucial for this project it has not been done yet as first we need to know GSE's answer and decide whether we should continue or not.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Preliminary studies have been conducted internally. According to internal studies this project will not have any significant negative affect on environment. Expert from USAID can visit the site any time to evaluate it.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Questionable - It is not possible to indicate exact dates yet but after getting PPA from GSE it will take 6-9 months before going online.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	750-780 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Chobalauri 3km, Nigoza 4 km (small villages)
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	n/a
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Tbilisi Airport 90 KM, no impact
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	We do not know substation yet, waiting for GSE
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0,1 ha/MW (15-16 turbines)
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	We have done preliminary assessment and there are no rare or endangered species in this area. Expert from USAID can check any time.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	2,5 k/m. There are some hills and turbine layout is not finalized yet, but we will try to find more flat place for actual construction. We have previous experience in this and transportation is one of the criteria we use to determine suitable site.
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Local Citizens are informed, but there were no public meetings yet
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No worry. We also have experience in Gori WPP and locals have not made any complaints there either.

28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30/70, Equity and debt, proportionally
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	under negotiations
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Region 6
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	Two years of data collection from 2 Met Masts. Ten minute averages recorded.
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	80 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	Not yet known
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	0
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	According to preliminary studies there is no migratory route. (company will hire consultant to study this issue)
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	According to preliminary studies there is no migratory route. (company will hire consultant to study this issue)
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	N/A
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	Highest class

GEDF – ZESTAPONI WIND FARM (18)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Zestaponi Wind Farm
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Developer - GEDF (GEDF is owned by MoESD, Ministry's stock and balance sheet). SPV - Geocraft (Georgian Energy Development Fund (10%) and Denecraft (90%)). No offshore company involved.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	**WPP**: On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW; Operation Stage (Exited projects by GEDF): Wind projects in Turkey **HPP**: Feasibility stage: Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW **SPP**: Basic design: Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Solar projects in Turkey **TPP**: Operation Stage (Exited projects by GEDF): Gardabani TPP
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW, Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW, Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW;
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	up to 50 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	up to 43%
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1.4 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	n/a
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	At this stage developers are waiting for GSE studies as they need more guarantees and are not willing to spend more money yet. Company will start construction works for Met Masts only afterwards. After we have an answer from GSE it will take one year to monitor wind and at the same time we can start monitoring birds and bats as well.
13	Apparent Level Of	At any project phase, work on the project may be active or on hiatus as developer waits	Low Level	Low

	Activity	for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.		
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	At this stage developers are waiting for GSE studies as they need more guarantees and are not willing to spend more money yet. Company will start construction works for Met Masts only after that. After the answer from GSE it will take one year to monitor wind and at the same time birds and bats can be monitored.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Preliminary studies have been conducted internally. According to internal studies this project will not have any significant negative affect on environment. Expert from USAID can visit the site any time to evaluate it.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Questionable - It is not possible to say exactly at this point. GEDF is waiting answer from GSE. After GSE's response it will take an year to monitor the wind and eight more months for construction.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	500-550 masl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Chilovani, Perevisa 3-4 km (small village)
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	n/a
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Kutaisi Airport 40 KM, no impact
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	We do not know substation yet, waiting for GSE
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	0,1 ha/MW (15-16 turbines)
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	We have done preliminary assessment and there are no rare or endangered species in this area. Expert from USAID can check any time.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	2 km. Flat area
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This	Yes; Three public	Local Citizens are informed, but there were no public meetings yet

		means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	meetings held in Jan, July and Nov 2017	
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No worry. We also have experience in Gori WPP and locals have not made any complaints there either.
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30/70, Equity and then debt, proportionally
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	We do not have feasibility so we do not have expected tariff yet
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain-Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Region 4
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	Data from Satellite.
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	n/a
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	80 m
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	Not yet known
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	0
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	according to the preliminary studies there is no migratory route. (company will hire consultant to study this issue)
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to	None noted; site study as part of EIA	according to the preliminary studies there is no migratory route. (company will hire consultant to study this issue)

		be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.		
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	N/A
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	N/A

GEDF – UDABNO PV (19)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Udabno
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	Developer - GEDF (GEDF is owned by MoESD, Ministry's stock and balance sheet). SPV - LLC Georgian Solar Company (Georgian Energy Development Fund (100%)). No offshore company involved.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	**WPP**: On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW; Operation Stage (Exited projects by GEDF): Wind projects in Turkey **HPP**: Feasibility stage: Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW **SPP**: Basic design: Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Solar projects in Turkey **TPP**: Operation Stage (Exited projects by GEDF): Gardabani TPP
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	On pre-feasibility stage: Zestaponi WPP 50 MW; Feasibility stage: Nigoza WPP 50 MW, Chorula HPP 2MW, Kvirila HPP 6 MW, Borjomi HPP 12 MW, Torzila HPP 2 MW; Basic design: Lopota HPP 6 MW, Namakhvani HPP 433MW, Tsablari HPP17 MW, Udabno SPP 5 MW; Operation Stage (Exited projects by GEDF): Shilda HPP 5MW, Dariali HPP 108 MW;
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-Grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	5 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at	42 percent	15,4 percent

		Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.		
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	850 000 - 950 000 USD MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	n/a
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	All MOU requirements are done and connection topic with GSE has been discussed and closed but do not have tariff rates. If GSE provides tariffs construction process can start almost immediately (Construction MOU under negotiation). Remoteness and rodents are not factors that can prevent construction process to go as planned.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Low Level
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	Waiting for PPA. After getting tariffs it will take three months for obtaining construction permit and three more months for actual construction, six months in total.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Preliminary studies have been conducted internally. There are no agricultural lands around, no trees and it is a small portion of a large identical land. Environmental expert from USAID can visit the site any time to evaluate it.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Questionable - It is not possible to give exact answer at this point as we simply do not know. GEDF is waiting decision on tariffs and after we have that it will take about 6 months for construction.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	700 m asl
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Udabno 2 km (small village)
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	n/a
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Tbilisi Airport 70 KM, no impact

22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	0 (because it is very close to substation)
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	2 ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	We have done preliminary assessment and there are no rare or endangered species in this area. Expert from USAID can check any time.
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	0,3 km, Flat Area
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	Local Citizens are informed, but there were no public meetings yet
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	No worry. We also have experience in Gori WPP and locals have not made any complaints there either.
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	30/70, Equity and then debt, proportionally
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	Under negotiation
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	Region 4
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	Data from Satellite
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	n/a
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	n/a
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	Not needed
36	Self-Consumption And	Losses are estimates of a decrease in energy output that is known. As an	0	0

	Losses	example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.		
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Not a problem for SPP
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	Not a problem for SPP
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1471 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	up to 20%

SH – GAREJI PV (20)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Gareji Photovoltaic Power Plant
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No offshore companies involved Developer - LTD Sunhouse (100%) Several foreign companies are waiting for our feasibility studies to be finished and to have information about tariffs. This will enable them to decide whether to invest or not.
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Small Solar Power Plant projects for households and few commercial entities (12 on grid projects - on average 10 kw), We have order for one more 70 kw SPP which will be finished by the end of 2018. In the past we have also built 500 off-grid systems in Georgia, 150 kw in total.

5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	No equity provider yet but we have few foreign companies which are considering investments. LTD Sunhouse itself has built projects that are worth of 1 mln USD in total.
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity (MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.	35 MW	15 MW
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	20-25 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	1 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	Not yet calculated; Approximately 0,015 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	Prefeasibility is done 6 months of Feasibility studies (12 more months left) Project site identification and topography of the solar power station location is done (from MOU) Geology, geophysics of the solar power station location and exploring the possibility of connecting to a network will be ready at the end of May 2018
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Small Solar Power Plant projects for households and few commercial entities (12 on grid projects - on average 10 kw), We have order for one more 70 kw SPP which will be finished by the end of 2018. In the past we have also built 500 off-grid systems in
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	We are quite active at this moment and are following MOU. In the next stages we would like to get help and hear some expert opinions on following aspects of MOU: -Optimization of the solar power plant scheme -Technical design of the solar power station -Solar radiation data processing -Solar power station financial model
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Preliminary studies have been done internally and no negative affect on environment has been found.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q4 2020; Feasibility will be done in Q1 2019 Construction will start and finish in 1 or 1,5 year if there is an investor.
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	750 m
18	Distance To Closest	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt	XYZ Village 3,5 km; ABC Town	Udabno village 1 km, Sagarejo 25 km

	Settlement(s) And Their Names	economic activity in their vicinity. In km. If several settlements, name all.	7,0 km	
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	None in the closest 25 km
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Tbilisi airport 60 km, no impact
22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	50 000 USD/15 MW = 3 333 USD/MW
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	2 ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	Based on internal studies none was found
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	500 m from road, Flat area
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	None has been conducted yet
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	None
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	85-15%, mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	8-10 cents
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	N/A
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	N/A
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	N/A
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	N/A

35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	N/A
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	N/A
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies. Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Not important for Solar projects
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	Not important for Solar projects
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1387 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	20 percent first five years; 18 percent next 10 years; 17 percent next 20 years; 16 percent next 25 years;

SH – WEST GAREJI PV (21)

LN	NAME	DESCRIPTION	EXAMPLE	VALUE
1	Energy Sector Map Number	Number assigned to project on the Energy Sector Map. Start with 201 to distinguish from existing map numbers.	201	
2	Project Name	Name typically assigned by the developer. Text name.	Imagination	Gareji Photovoltaic Power Plant
3	Involvement Of Offshore Companies	USAID Energy Program needs to identify the ultimate developer and equity-provider (final owners and beneficiaries). This means the corporate veil must be penetrated. If local development company cannot or will not give information on the ultimate developer, equity-provider and owners (i.e., does not penetrate the corporate veil) then project cannot be considered by USAID Energy Program. Enter Yes (offshore company involved) or No. If Yes, explain. Detailed textual description.	Yes. ABC, Cyprus. Ultimate developer and equity-provider as shown below.	No offshore companies involved Developer - LTD Sunhouse (100%)
4	Developer Experience	Other projects the developer has in operation or under development, in Georgia and elsewhere. Purpose is to ensure developer "knows what they are doing". Detailed textual description.	Two Hydro Projects In Georgia (zz and bb; 10 MW and 17 MW); One Wind Project In Bulgaria (aa; 23 MW). No negatives in due diligence.	Small Solar Power Plant projects for households and few commercial entities (12 on grid projects - on average 10 kw), We have order for one more 70 kw SPP which will be finished by the end of 2018. In the past we have also built 500 off-grid systems in Georgia, 150 kw in total.
5	Equity-Provider And Owners Financial Strength	Other projects the equity-provider and owners have financed in Georgia and elsewhere. Penetrate corporate veil in any Special Purpose Vehicles (SPVs) to identify the actual equity-provider and owners that have the required financial resources. If same as developer, then nevertheless enter the value of the projects. Detailed textual description.	Two solar projects in EU 50 and 75 mln USD, named X and Y. No negatives in due diligence.	No equity provider yet but we have few foreign companies which are considering investments. LTD Sunhouse itself has built projects that are worth of 1 mln USD in total.
6	On- Or Off- Electricity-Grid	On-Grid or Off-Grid. If project is connected to the electricity grid for generation, then it is On-Grid. Otherwise, Off-Grid.	On-Grid	On-grid
7	Designed Net Capacity	Also termed Nameplate Capacity of proposed power plant. The maximum output of electricity	35 MW	45 MW

		(MW) or heat (GJ/h) that a power plant can produce under ideal conditions or intended full-load sustained output of a power plant. Note that plants typically do not operate at Designed Net Capacity (e.g., downtime for maintenance). See http://www.ownergy.co.uk/library/gosple/F2RCAP1d.pdf. In MW.		
8	Capacity Factor	Average utilization of plant over course of year. Ratio of its actual output over a period, to its potential output if it were possible for it to operate at full Designed Net Capacity 24/7/365. If 100 percent, then plant operates at Designed Net Capacity 24/7/365 during year. If 50 percent than plant operates at Designed Net Capacity for 12 hours a day all year (12/7/365), or at Designed Net Capacity for six months of year (24/7/182) or some other equivalent combination. In percent.	42 percent	20-25 percent
9	Cost Per Designed Net Capacity	Total Project Cost divided by Designed Net Capacity. In USD/MW.	1,36 mln USD/MW	0,8 mln USD/MW
10	Levelized Cost Of Electricity	Allows comparison of different technologies (e.g., wind, solar, natural gas) of unequal life spans, project size, different capital cost, risk, return, and capacities. Present value of investment and operating costs (life-cycle cost) divided by the quantity of electricity generated. In USD/kWh.	0,015 USD/kWh	Not yet calculated; Approximately 0,015 USD/kWh
11	Expected Months Of Operation	The months the plant is expected to operate each year. Could be Year-Round, Jan-Jun, Oct-Feb and so forth. Textual description.	Year-Round	Year-Round
12	Current Status	Current status of the project. Note status of MOUs, if any. More elaboration is better than less. If project is not moving forward and little work is being done at this moment (e.g., waiting on uncertain events or decisions by others), then show project is in Hiatus. Summary textual description.	Pipedream; in hiatus waiting for clarity on offtake tariff	We are working to apply for prefeasibility studies to the MoESD.
13	Apparent Level Of Activity	At any project phase, work on the project may be active or on hiatus as developer waits for some event or decision by others. Possible answers are Active, 50-50, Low Level and On Hiatus. Detailed textual description of work that is being done at this moment.	Low Level	Middle Level
14	Key Reasons For Level Of Activity Not Being Active	Detailed textual description of reasons Apparent Level Of Activity is not Active.	Have been waiting four months for decision X from Government	We are working to receive exact coordinates of the site and then apply for prefeasibility. Afterwards we are planning to start prefeasibility in Autumn 2019 and start Feasibility in October or November.
15	Project Has Gone Through The MEPA Screening Process Or EIA (EIA Has Been Completed	A number of other criteria require information about environmental and social matters. The source of this information is the screening application that includes details on characteristics, location and characteristics of the potential impact of projects and/or EIA report. Screening procedure takes two weeks screen projects for environmental and social issues. Screening applies to all wind projects. Screening does not apply to solar projects unless over 10 ha in size (becomes an industrial site). Yes or No. If No, then detailed textual description of why not.	Result of MEPA screening or EIA show no particular environmental or social problems	Preliminary studies have been done internally for East Gardabani and no negative affect on environment has been found.
16	Target Online Date	Target date in project plans. Date that developer is working against. Note date as being: Actual (in past), Firm (nearly certain date in future), Flexible (depends on other events happening in the normal course of business; largely in the control of developer) or Questionable (date depends on uncertain events; largely outside control of developer). If date is truly unknown, then enter To Be Determined (TBD) rather than a date. If Flexible, Questionable or TBD, show detailed textual description of why it is not Firm.	June 2020; Flexible depending on finalizing vendor selection.	Q4 2022;
17	GIS Altitude Of Project	Altitude from GIS, along with any correction needed for altitude from mean sea level. In m.	493 m	700 m
18	Distance To Closest Settlement(s) And Their Names	Name of settlements and their distance from project. Wind farms are noisy. Solar farms can disrupt economic activity in their vicinity. In km. If several settlements, name all.	XYZ Village 3,5 km; ABC Town 7,0 km	Udabno village 10 km, Sagarejo 40 km
19	Distance To Closest Protected Area(s) And Their Names	As a rule, it is better to be far from Protected Areas to minimize impact of project. Name and distance from project in km. Law generally requires a one km buffer zone around protected areas.	XYZ National Park; 25 km	None in the closest 25 km
20	Description Of Protected Area(s) And Likely Project Impact, If Any	Name of the closest Protected Area(s). Description of possible negative impacts from project. These, along with other things, should be included in the Terms of Reference for any ESIA. Nature of connecting roads between project site and Protected Area(s), if any.	Distance from park suggests no direct project impact; road to park is 1 km from site, so it will be visible from road.	None
21	Distance To Closest Airport; Name And Likely Project Impact, If Any	Wind masts create areal hazards, particularly since the masts tend to be on ridges. Solar cells can reflect sunlight and blind pilots. Both types can affect airport radars and create a safety hazard. Name and distance from project in km. Textual description of steps taken to date or that need to be taken to receive no objection from closest airport.	Tbilisi airport; 21 km; no impact. Air traffic radar station 15 km; blades may interfere.	Tbilisi airport 45-50 km, no impact

22	Likely Cost Of Transmission Line To Existing Or Planned Transmission Or Distribution System Connection Point	Apply rules-of-thumb to estimate likely cost of transmission line, substation or upgrade of existing substation divided by net declared capacity. In USD/MW.	130 000 USD/5 MW = 26 000 USD/MW	100 000 USD/45 MW = 2 222 USD/MW
23	Weighted Average Land Use	Area needed for one MW of Designed Net Capacity. In ha/MW.	1,5 ha/MW	6 ha/MW
24	Presence Of Rare Or Endangered Flora Or Fauna Species	What rare or endangered species are present. If unknown say Unknown. Source of information would be screening report, an EIA report or any other credible source (e.g. reports of research/academic institutions). Always keep requirements of IFIs in mind. Detailed textual description along with source of data.	Widget Grasshopper; EIA report	Based on internal studies in East Gardabani none was found
25	Distance To Site From Closest Road That Can Handle Construction Equipment	Distance to closest paved road suitable for construction equipment. If project is large, it is likely that permission to build the road will be required. In km. Textual description of terrain from closes paved road.	1,6 km. Steep hills.	1 km from road, Flat area
26	Informed Citizenry	The general opinion of local citizens is important when evaluating the project. This means that local citizens must be aware of project. Confirmation from developer that local government and citizens are (already) aware of project so that their opinions can be sought during site visit. Note as Yes, No or Unknown. Describe any meetings already held.	Yes; Three public meetings held in Jan, July and Nov 2017	None has been conducted yet
27	General Opinions Expressed By Local Citizens	If answer to the Informed Citizenry question is Yes, then Team will visit local villages and chat with citizens about their general opinion of project. A 60 minute visit.	Worry about impact of project on sheep grazing; seems mostly based on insufficient information about project	None
28	Expected Debt: Equity Ratio	Ratio of project debt and project equity. The greater the ratio, the more important is debt in the overall project. Reflects percentage of investment cost coming from equity-provider relative to non-equity (e.g., debt) financing. Also note timing of equity (e.g., equity before debt). Detailed description of any unknowns in this regard.	25%; All Equity Before Debt; some doubt on Debt: Equity Ratio acceptable to XYZ Lender	85-15%, mixed
29	Required Average Tariff	Single number reflecting seasonality of production and seasonality and diurnal pattern of revenue. In USD/kWh for electricity and USD/MJ for heat.	0,060 USD/kWh	8-10 cents
30	Financial Capacity Of Expected Buyer	Detailed textual description of the financial capacity of the expected buyer. If expected buyer has low financial capacity, then project will not be bankable.	Georgian Railway; Purchases will represent 3 percent of annual purchases by Railway	ESCO
31	Geographical zones for Wind project development (According the 10 Year Development Plan)	From GSE 10-Year Development Plan. 1 Poti; 2 Chorokhi; 3 Kutaisi; 4 Mountain- Sabueti I; 5 Mountain-Sabueti II; 6 Gori-Kaspi; 7 Paravani; 8 Samgori; 9 Rustavi. The integration capability of the transmission grid sets the temporal and spatial scale limitation for very capacity integration, Respectively the presence or non presence of project on those zones sets limits for their development.	Region 3; Is 50 Percent Of GSE's connection limits in this Region	N/A
32	Source And Dates Of Following Five Criteria	Textual description of the source, to permit assessing of wind-data reliability. Include an overall comment about reliability.	Six months of on-site collection. Minute-by-minute electronic logging.	N/A
33	Average Wind Power Density At Hub or Meteo Mast Height	Current average from test mast. In W/m2. Wind Power Density is used to describe wind resource as it is independent of the wind turbine characteristics. It indicates how much wind energy can be harvested at allocation by a wind turbine and has the units W m^2. Higher is the Wind Power Density, depending on the capacity factor of Wind turbine and rotor swept area more electricity can be generated. In W/m2.	300 W/m2	N/A
34	Anemometer Height (Highest)	The anemometer height is the height above ground at which the wind speed data are measured. In m.	60 m	N/A
35	Height Of Turbine Hub	For comparison with anemometer height. In m.	60 m	N/A
36	Self-Consumption And Losses	Losses are estimates of a decrease in energy output that is known. As an example, 6% is the estimate of energy loss due to wake. This is one component of the estimated loss. Other sources of losses are electrical, plant availability, turbine performance, environmental, and curtailment. In percent of Designed Net Capacity.	0	N/A
37	Proximity To Bird Migratory Routes Or Important Bird Areas	Injuries and mortalities tend to be related mostly to collisions with rotors or with other associated infrastructures such as overhead cables. Significant collision mortality risks are primarily related to topographical bottlenecks where migrating or local birds fly through a relatively confined area, for example mountain passes or land-bridges between water-bodies.	None noted; IBA nad Migratory Bird migratory route maps for Georgia	Not important for Solar projects

		Other susceptible locations are slopes with rising winds where the birds gain lift and near wetlands or shallow seas that attract large numbers of feeding or resting birds. Flight corridors between feeding areas, roosting sites or breeding sites are also particularly susceptible. Detailed textual description of proximity. Note source of information.		
38	Proximity To Roosting, Feeding Areas Or Migrating Routes Of Bats	Bats are most commonly killed by the moving rotor blades. Another cause of death is internal haemorrhaging caused by the pressure drop behind the rotor blades. To prevent/minimize bat death constructing of wind farms in areas where bats are likely to roost or routes where they migrate should be avoided. The areas where bats are most likely to roost are generally coastlines, top of distinct hills and mountains in forested areas. In comparison, flat terrain, farmed lowlands and treeless areas are considered to be safe, as bats are not likely to be there. Wind farms sited at humid areas with mild temperatures, closer than 5 km to forested areas and within 600 m of steep slopes showed higher probabilities of mortality. Detailed textual description of proximity. Note source of information.	None noted; site study as part of EIA	Not important for Solar projects
39	Global Horizontal Irradiance (GHI)	The total solar energy received in one year on a unit area of a horizontal surface. It includes energy from the sun that is received in a direct beam (the horizontal component of the DNI) and the DHI. Affected by altitude, latitude (length of sunlight), atmospheric turbidity (e.g., dust) and weather (cloud cover). In kWh/m2.	1350 kWh/m2	1387 kWh/m2
40	Cell Conversion Efficiency	Percentage of solar irradiation that is converted into electricity. If forecast efficiencies are available (as efficiency decreases with age), then show several cell conversion efficiencies along with age. If only one (average) efficiency is available then show Average plus the value.	20% first five years; 13 percent next five years; 10 percent next 15 years	20 percent first five years; 18 percent next 10 years; 17 percent next 20 years; 16 percent next 25 years;

USAID Energy Program

Deloitte Consulting Overseas Projects LLP

Address: 29 I. Chavchavadze Ave.,0179, Tbilisi, Georgia

Phone: +(995) 595 062505

E-mail: info@uep.ge