

---

# Concept Note

---

## **Solar Plus: Diversified Low-Carbon Systems to Improve Energy Supply and Climate Resilience**

Islamic Republic of Afghanistan | Asian Development Bank

20 June 2016





GREEN  
CLIMATE  
FUND



# Concept Note

**The Green Climate Fund (GCF) is seeking high-quality projects or programmes.**

Accredited entities may choose to submit a concept note, in consultation with the relevant national designated authority, to present the proposed project or programme idea in order to receive early feedback and recommendation.

Project/Programme Title: Solar Plus: Diversified Low-Carbon Systems to Improve Energy Supply and Climate Resilience

Country/Region: Islamic Republic of Afghanistan

Accredited Entity: Asian Development Bank

National Designated Authority: National Environmental Protection Agency

Please submit the completed form to [fundingproposal@gcfund.org](mailto:fundingproposal@gcfund.org)<sup>1</sup>

A. Project / Programme Information	
A.1. Project / programme title	Solar Plus Programme
A.2. Project or programme	Programme
A.3. Country (ies) / region	Islamic Republic of Afghanistan
A.4. National designated authority(ies)	National Environmental Protection Agency
A.5. Accredited entity	Asian Development Bank
A.6. Executing entity / beneficiary	Executing Entity: Da Afghanistan Breshna Sherkat Beneficiary:
A.7. Access modality	Direct <input checked="" type="checkbox"/> International <input type="checkbox"/>
A.8. Project size category (total investment, million USD)	Micro ( $\leq 10$ ) <input type="checkbox"/> Small ( $10 < x \leq 50$ ) <input type="checkbox"/> Medium ( $50 < x \leq 250$ ) <input type="checkbox"/> Large ( $> 250$ ) <input checked="" type="checkbox"/>
A.9. Mitigation / adaptation focus	Mitigation <input type="checkbox"/> Adaptation <input type="checkbox"/> Cross-cutting <input checked="" type="checkbox"/>
A.10. Public or private	Public
A.11. Results areas (mark all that apply)	<i>Which of the following targeted results areas does the proposed project/programme address?</i>
	<p>Reduced emissions from:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)</li> <li><input type="checkbox"/> Low emission transport (E.g. high-speed rail, rapid bus system, etc.)</li> <li><input type="checkbox"/> Buildings, cities, industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)</li> <li><input type="checkbox"/> Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)</li> </ul> <p>Increased resilience of:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)</li> <li><input checked="" type="checkbox"/> Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.)</li> <li><input type="checkbox"/> Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.)</li> <li><input type="checkbox"/> Ecosystems and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)</li> </ul>
A.12. Project / programme life span	7 years
A.13. Estimated implementation start and end date	Start: 2017 End: 2024

<sup>1</sup> Please use the following naming convention for the file name: “[CN]-[Agency short name]-[Date]-[Serial number]” (e.g. CN-ABC-20150101-1).

**B. Project/Programme Details**

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/programme investment. These requirements may vary depending on the nature of the project/programme.

**B.1. Project / programme description (including objectives)**

Decades of instability and conflict constrained development in Afghanistan. Nearly 36% of the 29.8 million Afghans (2012 estimates) lives below the poverty line and more than 50% are vulnerable to becoming poor.<sup>2</sup> Over 75% of Afghans lives in rural areas yet produces 67% of GDP. Despite some recent progress, the country remains among the world's poorest economies. Economic poverty is intensified by energy poverty due to aging, inefficient or lack of energy infrastructure. Afghanistan's 30% electrification rate (less than 9% in rural areas) and annual per capita energy consumption of 195 kilowatt-hours (kWh) place it in the lowest 5% in both categories globally. The current demand–supply gap results in load-shedding for extended periods.

The Asian Development Bank's (ADB) Energy Supply Improvement Investment Program (ESIIP) aims to reinforce ongoing projects and finance new investments to boost energy trade and regional cooperation, strengthen the country's energy infrastructure, increase energy supply to accelerate the electrification rate, and improve operational efficiency in the sector. The ESIIP is aligned with the priorities of the government's National Energy Supply Program of 2013–2030 (NESP), which aims to increase the electrification rate from 30% to 83%, increase domestic generation from 20% to 67%, and strengthen power exchange and trade options. The NESP roadmap, with an investment plan of \$10.1 billion, focuses on energy supply, transmission and distribution, energy efficiency, reinforcing institutions and private-sector participation, capacity support, and regulatory strengthening.

Afghanistan is among the countries most vulnerable to climate change.<sup>3</sup> The supply of energy and sustainability of economic development is at risk from the adverse effects of climate change in the coming decades. Rising mean temperature and reduced precipitation under climate change is expected to compound growing water stress and increase competition for water resources between hydropower production, irrigation, and water supply. More frequent and extreme heat waves are likely to constrain the efficiency and output of thermal power plants.

A Solar Plus programme is proposed to improve energy supply, reduce carbon emissions, build climate resilience of the energy sector, and improve water supply and irrigation systems through the development of diversified energy systems. These systems will combine solar photovoltaic (PV) generation with hydropower, diesel backup and/or battery storage, and wind power. The programme will also improve the resilience of the water supply and irrigation network, through investment in a mixed-use dam.

The programme integrates the third tranche under ADB's ESIIP and the first tranche under the Arghandab Integrated Water Resources Development Project (AIWRDP). It will install 6 large-scale photovoltaic (PV) power plants totalling 150 megawatts (MW) in selected provinces of Afghanistan and construct a 24-MW hydroelectric dam in Kandahar. The programme will demonstrate and establish proof of concept of various solar PV configurations, including integrated climate change mitigation and adaptation models such as hybrid and complementary renewable energy systems, to increase energy security and access, develop abundant yet untapped indigenous renewable energy resources, and spur private-sector participation. Table 1 shows the proposed subprojects with their indicative plant configurations, estimated cost, and implementation schedule.

Table 1: Solar Programme Indicative Pipeline and Schedule

No	Subproject Name	Capacity (MW)	Requested GCF Funding (US\$ mn)	Estimated Cost (US\$ mn)	Project Start	Commissioning	Solar Plus
1	Naghlu Solar Project (Kabul)	50	100	125	2017	2019	Hydro

<sup>2</sup> The International Monetary Fund ranks Afghanistan 175 out of 184 countries and its Human Development Index (HDI 2012) rank is 175 out of 187. Source: World Bank Data <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

<sup>3</sup> Notre Dame Global Adaptation Index (ND-GAIN) ranks Afghanistan 166 out of 182 for vulnerability (lower rank is worse) for 2014. Source: <http://index.gain.org/>

	2	Nangarhar Industrial Park Project	40	80	100	2017	2019	Diesel-battery
	3	Farah Solar-Wind Hybrid Project	10	20	25	2017	2019	Wind
	4	Daykondi Solar Mini-grid Project	10	20	25	2018	2020	Mini-grid
	5	Ghor Solar-Hydro Hybrid Project	10	20	25	2018/19	2020/21	Hydro
	6	Kandahar Solar Project and Arghandab Integrated Water Resources Project	30 24	60 200	75 430	2018/19 2017/19	2020/21 2020/21	Hydro
	<b>Total</b>	<b>Solar power plants</b>	<b>150 MW</b>	<b>300</b>	<b>370</b>			
	<b>Total</b>	<b>Solar and Arghandab projects</b>	<b>174 MW</b>	<b>500</b>	<b>800</b>			
	<p>The solar power subprojects are expected to partially, but quickly, fill the demand–supply gap, increase renewable energy generation, and improve sustainability of the energy supply in Afghanistan. The final sequence, number, configuration and size of the subprojects will depend on government priority, funding availability, and due diligence findings.</p> <p>The AIWRDP aims to address severe water and energy shortage problems in and around Kandahar City by increasing the available water resources raising the existing 50-meter high Dahla dam by 8 meters. Raising the dam height enables the reservoir to store an additional 265 million cubic meters of water, which could be utilized for irrigation, municipal water supply, and hydropower generation for some 700,000 people who face increasing threats of droughts, erratic river flows, and reduced ground water resources due to climate change. The power generation component includes construction of hydropower plant (three units of 8-MW hydro-turbines), a 45-km of transmission line (three-phase medium voltage) to Kandahar city, and some 13,300 rural electrification connections along the transmission line for an estimated population of 90,000 in Arghandab and Shah Wali Kot Districts.</p> <p>Solar Plus integrates climate change mitigation and adaptation through investments in renewable energy, development of water resources, increased irrigated agriculture, and improved watershed management. The programme is aligned with Afghanistan’s National Adaptation Plan (NAP) and Intended Nationally Determined Contribution (INDC) submitted to the UN Framework Convention on Climate Change (UNFCCC).<sup>4</sup></p>							
B.2. Background information on project/programme sponsor	<p><b>Describe project/programme sponsor’s operating experience in the host country or other developing countries. Describe financial status and how the project/programme sponsor will support the project/programme in terms of equity, management, operations, production and marketing.</b></p> <p>In 2015, ADB’s operations in Afghanistan totalled \$27.17 billion. It is the largest on-budget development partner in the energy sector, with a total approved commitment of over \$2.1 billion and nearly \$937 million grants provided to date for power transmission and distribution, power generation, gas wells rehabilitation, renewable energy development, operations and maintenance, project preparation and analytical support, and capacity development.</p>							

<sup>4</sup> Government of Afghanistan, 2015. Intended Nationally Determined Contribution, Submission to UNFCCC.

	<p>Solar Plus is in line with ADB's interim country partnership strategy 2014–2015, Afghanistan's country operations business plan 2016–2018, and the ADB-managed Afghanistan Infrastructure Trust Fund (AITF). ADB also provided support in the formulation of the NESP and provided technical assistance in the preparation of Afghanistan's power master plan and gas regulatory framework, development of the inter-ministerial commission for energy, the gas development master plan, and renewable energy projects.</p> <p>For the solar PV plants component, ADB will provide a grant of \$20 million from its Asian Development Fund (ADF) and \$30 million from the AITF while the Islamic Development Bank will provide parallel cofinancing of \$20 million. For the hydroelectric component, ADB will provide a grant of \$200 million from its ADF.</p>
<p>B.3. Market overview</p>	<p><b>Describe the market for the product(s) or services including the historical data and forecasts. Provide the key competitors with market shares and customer base (if applicable). Provide pricing structures, price controls, subsidies available and government involvement (if any).</b></p> <p>After security, energy access is the highest priority of the government, households, and businesses in Afghanistan. Growth in energy demand has been a multiple of nearly 1.8 times of economic growth during 2005–2012. In 2014, more than 80% of the country's total power supply came from Iran (17%), Tajikstan (25%), Turkmenistan (12%), and Uzbekistan (27%). The remaining 20% is generated through domestic hydropower and thermal sources.</p> <p>Between 2002 and 2015, electricity connection rates have increased from 5% to 30%, with current energy demand at 750 megawatts (MW) and power consumption is at 3,700 gigawatt-hours (GWh). Energy demand in the country's major cities is projected to grow by 25% annually and by 2032, demand is forecast to reach 3,500 MW and power consumption to 18,400 GWh.</p> <p>Lack of domestic generation remains the most critical challenge for energy access and energy security in Afghanistan. Of the 519 MW of installed capacity available, 51% is diesel- and furnace oil-powered, while 49% is from hydropower plants that were installed in the 1960s–1970s, in need of rehabilitation and operate less than 40% of installed capacity. Aside from generation shortfalls, Afghanistan's power network is split into 10 power islands, which cannot be interconnected due to differences in operational phase angles and frequency variation. This increases costs and reduces reliability of supply. Furthermore, the country's power system is not synchronized with any of the four countries it imports from. A unified grid will allow Afghanistan to secure power supply from a balanced energy mix, achieve diversification and share resource capacity within the country, as well as strengthen it to be an electricity transit corridor between energy-rich Central Asia and energy-poor South Asia.</p> <p>Current electricity tariff is at \$0.04–\$0.07 per kWh, which is far below cost-recovery when power generation costs on average is \$0.06–\$0.08 per kWh and power transmission and distribution costs is around \$0.07–\$0.10 per kWh. The weighted average tariff in 2014 was \$0.11 per kWh. Based on the country's current energy mix, tariff rates should be about \$0.15 per kWh to be cost-reflective. Import tariffs, on the other hand, range from \$0.02 to \$0.06 per kWh and are subsidized by the exporting countries.</p> <p>Household consumption levels differ substantially between provinces and grid systems. The average residential consumption is comparatively high in such main load centers as Kabul where it is slightly more than 4,000 kWh in 2014. In most provinces, average household consumption is lower, ranging from 212 kWh (Ghor) to 551 kWh (Laghman).</p> <p>Da Afghanistan Breshna Sherkat (DABS), a 100% state-owned corporatized power utility, is the sole power producer, transmitter and distributor in the country.</p>
<p>B.4. Regulation, taxation and insurance</p>	<p><b>Provide details of government licenses, or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.</b></p> <p><b>Describe applicable taxes and foreign exchange regulations. Provide details on insurance policies related to project/programme.</b></p> <p>The Power Services Regulation Act of Afghanistan, also known as the Electricity Services Law, was approved on 26 August 2015 and aims to (i) supply electricity from natural resources and imported energy, (ii) improve the quantity and quality of energy services and its development and promotion, (iii) promote economic growth and development as well as public</p>

	<p>welfare, (iv) make access to electricity and energy services available at a fair price, (v) ensure non-discriminatory access by electricity and energy service providers to the market, and (vi) regulate electricity supply throughout the country. The Energy Services Regulation Authority (the Authority) within Ministry of Energy and Water (MEW) will be responsible for implementing the provisions of the Electricity Law.</p> <p>The Authority is the government agency that will issue licenses to generate, transmit, and distribute energy. Foreign companies and investors who are interested in providing energy services in Afghanistan will need to obtain an investment license and establish a permanent local office in Afghanistan in addition to the generation, transmission, and distribution license. The Ministry of Energy and Water is yet to determine the fees applicable to obtaining licenses and the amount of financial guarantees it may offer project developers and operators, subject to approval by the government. Electricity generation and transmission licenses are valid for 25 years each, and distribution for 20 years.</p> <p>ADB's funding for the programme includes taxes and duties, such as the business receipt tax estimated at 2%, the fixed tax on imports of 2%–7%, and custom duties of 2.5%–16%.<sup>5</sup></p>																								
<p>B.5. Implementation arrangements</p>	<p><b>Describe construction and supervision methodology with key contractual agreements. Describe operational arrangements with key contractual agreements following the completion of construction. Provide a timetable showing major scheduled achievements and completion for each of the major components of the project/programme.</b></p> <p>Da Afghanistan Breshna Sherkat (DABS) will be the executing agency for the Solar Programme, while the Ministry of Energy and Water will provide oversight. A program management office (PMO) set up under ADB's earlier energy multitranches financing facility will be responsible for implementing and monitoring the programme. The PMO is fully operational and familiar with ADB policies and guidelines, but will also be provided consulting support on project implementation under the ADF and AITF grants.</p> <p>Procurement packaging will be minimized with one implementation consultant and one turnkey or design-build-operate (DBO) contract package, as appropriate, for each of the subprojects. Detailed engineering design for the hydroelectric subproject will be carried out as part of a technical assistance on project preparation. International consulting firms will be recruited to help DABS in the procurement of the turnkey/DBO contracts, supervising project implementation, and capacity development on operation and maintenance and asset management of project facilities.</p> <p><b>Table 2: Indicative Solar Subproject Implementation Timetable</b></p> <table border="1"> <tr> <td>Project preparation consultants recruited and mobilized</td> <td>Q2 2016</td> </tr> <tr> <td>Implementation and program management consultants recruited and mobilized</td> <td>Q4 2016</td> </tr> <tr> <td>Bidding documents for turnkey contracts issued</td> <td>Q3 2017-18</td> </tr> <tr> <td>Contractors mobilized</td> <td>Q3 2018-19</td> </tr> <tr> <td>Commissioning</td> <td>Q2 2019-2021</td> </tr> <tr> <td>3-year Operation and Maintenance contracts</td> <td>2019-2024</td> </tr> </table> <p><b>Table 3: Indicative Hydroelectric Subproject Implementation Timetable</b></p> <table border="1"> <tr> <td>Approval of project preparatory technical assistance (PPTA) on feasibility and engineering studies of hydroelectric facility)</td> <td>Q3 2016</td> </tr> <tr> <td>Start of PPTA</td> <td>Q1 2017</td> </tr> <tr> <td>Completion of PPTA</td> <td>Q4 2017</td> </tr> <tr> <td>Approval of hydroelectric subproject</td> <td>Q4 2017</td> </tr> <tr> <td>Start of the hydroelectric subproject</td> <td>Q1 2018</td> </tr> <tr> <td>Completion of hydroelectric subproject</td> <td>Q2 2021</td> </tr> </table>	Project preparation consultants recruited and mobilized	Q2 2016	Implementation and program management consultants recruited and mobilized	Q4 2016	Bidding documents for turnkey contracts issued	Q3 2017-18	Contractors mobilized	Q3 2018-19	Commissioning	Q2 2019-2021	3-year Operation and Maintenance contracts	2019-2024	Approval of project preparatory technical assistance (PPTA) on feasibility and engineering studies of hydroelectric facility)	Q3 2016	Start of PPTA	Q1 2017	Completion of PPTA	Q4 2017	Approval of hydroelectric subproject	Q4 2017	Start of the hydroelectric subproject	Q1 2018	Completion of hydroelectric subproject	Q2 2021
Project preparation consultants recruited and mobilized	Q2 2016																								
Implementation and program management consultants recruited and mobilized	Q4 2016																								
Bidding documents for turnkey contracts issued	Q3 2017-18																								
Contractors mobilized	Q3 2018-19																								
Commissioning	Q2 2019-2021																								
3-year Operation and Maintenance contracts	2019-2024																								
Approval of project preparatory technical assistance (PPTA) on feasibility and engineering studies of hydroelectric facility)	Q3 2016																								
Start of PPTA	Q1 2017																								
Completion of PPTA	Q4 2017																								
Approval of hydroelectric subproject	Q4 2017																								
Start of the hydroelectric subproject	Q1 2018																								
Completion of hydroelectric subproject	Q2 2021																								

<sup>5</sup> Taxes and duties costs are the business receipt tax, estimated at 2%; the fixed tax on imports of 2%–7%; and custom duties of 2.5%–16%. They do not represent an excessive share of the financing plan and are within applicable country partnership strategy parameters. ADB. 2005. *Innovation and Efficiency Initiative, Cost Sharing and Eligibility of Expenditures for Asian Development Bank Financing: A New Approach*. Manila. This aligns with ADB's Operations Manual on cost-sharing arrangements and eligible expenditures, a practice also followed by the World Bank in Afghanistan.

C. Financing / Cost Information																																																				
C.1. Description of financial elements of the project / programme	<p>Please provide:</p> <ul style="list-style-type: none"> <li>a breakdown of cost estimates analysed according to major cost categories.</li> <li>a financial model that includes projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale;</li> <li>a description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance.</li> </ul> <p>Grant funding from development partners remain the major source of financing because of limited government finances, dismal private investment outlook, and directives from the International Monetary Fund to the government against borrowing.</p> <p><b>Table 4: Tentative Investment Plan (US\$ million) – Solar Subproject</b></p> <table border="1"> <thead> <tr> <th>Item</th> <th>Amount<sup>a</sup></th> </tr> </thead> <tbody> <tr> <td><b>A. Base Cost</b></td> <td></td> </tr> <tr> <td>1. Kandahar 30 MW plant</td> <td>51.00</td> </tr> <tr> <td>2. Kabul 50 MW plant</td> <td>85.00</td> </tr> <tr> <td>3. Nangarhar 40 MW plant</td> <td>68.00</td> </tr> <tr> <td>4. Farah 10 MW plant</td> <td>17.00</td> </tr> <tr> <td>5. Daykundi 10 MW plant</td> <td>17.00</td> </tr> <tr> <td>6. Ghor 10 MW plant</td> <td>17.00</td> </tr> <tr> <td><b>Subtotal (A)</b></td> <td><b>255.00</b></td> </tr> <tr> <td><b>B. Security and project management</b></td> <td><b>20.00</b></td> </tr> <tr> <td><b>C. Contingencies<sup>b</sup></b></td> <td><b>100.00</b></td> </tr> <tr> <td><b>Total (A+B+C)</b></td> <td><b>375.00</b></td> </tr> </tbody> </table> <p><sup>a</sup> Includes taxes and duties to be financed from the grant proceeds  <sup>b</sup> Physical and price contingencies.  Source: Asian Development Bank estimates</p> <p><b>Table 5: Preliminary Investment Plan (US\$ million) – Hydroelectric Subproject</b></p> <table border="1"> <thead> <tr> <th>Item</th> <th>Amount<sup>a</sup></th> </tr> </thead> <tbody> <tr> <td><b>A. Civil works</b></td> <td></td> </tr> <tr> <td>1. Raising Dahla Dam</td> <td>230.00</td> </tr> <tr> <td>2. Distribution lines</td> <td>12.00</td> </tr> <tr> <td>3. Powerhouse</td> <td>30.00</td> </tr> <tr> <td><b>Subtotal (A)</b></td> <td><b>272.00</b></td> </tr> <tr> <td><b>B. Climate-resilient agriculture</b></td> <td><b>70.00</b></td> </tr> <tr> <td><b>C. Urban water supply</b></td> <td><b>60.00</b></td> </tr> <tr> <td><b>D. Capacity development</b></td> <td><b>6.00</b></td> </tr> <tr> <td><b>E. Project management</b></td> <td><b>22.00</b></td> </tr> <tr> <td><b>Total (A+B+C+D+E)</b></td> <td><b>430.00</b></td> </tr> </tbody> </table> <p><sup>a</sup> Includes taxes and duties to be financed from the grant proceeds  <sup>b</sup> Physical and price contingencies.  Source: Asian Development Bank estimates</p>						Item	Amount <sup>a</sup>	<b>A. Base Cost</b>		1. Kandahar 30 MW plant	51.00	2. Kabul 50 MW plant	85.00	3. Nangarhar 40 MW plant	68.00	4. Farah 10 MW plant	17.00	5. Daykundi 10 MW plant	17.00	6. Ghor 10 MW plant	17.00	<b>Subtotal (A)</b>	<b>255.00</b>	<b>B. Security and project management</b>	<b>20.00</b>	<b>C. Contingencies<sup>b</sup></b>	<b>100.00</b>	<b>Total (A+B+C)</b>	<b>375.00</b>	Item	Amount <sup>a</sup>	<b>A. Civil works</b>		1. Raising Dahla Dam	230.00	2. Distribution lines	12.00	3. Powerhouse	30.00	<b>Subtotal (A)</b>	<b>272.00</b>	<b>B. Climate-resilient agriculture</b>	<b>70.00</b>	<b>C. Urban water supply</b>	<b>60.00</b>	<b>D. Capacity development</b>	<b>6.00</b>	<b>E. Project management</b>	<b>22.00</b>	<b>Total (A+B+C+D+E)</b>	<b>430.00</b>
	Item	Amount <sup>a</sup>																																																		
<b>A. Base Cost</b>																																																				
1. Kandahar 30 MW plant	51.00																																																			
2. Kabul 50 MW plant	85.00																																																			
3. Nangarhar 40 MW plant	68.00																																																			
4. Farah 10 MW plant	17.00																																																			
5. Daykundi 10 MW plant	17.00																																																			
6. Ghor 10 MW plant	17.00																																																			
<b>Subtotal (A)</b>	<b>255.00</b>																																																			
<b>B. Security and project management</b>	<b>20.00</b>																																																			
<b>C. Contingencies<sup>b</sup></b>	<b>100.00</b>																																																			
<b>Total (A+B+C)</b>	<b>375.00</b>																																																			
Item	Amount <sup>a</sup>																																																			
<b>A. Civil works</b>																																																				
1. Raising Dahla Dam	230.00																																																			
2. Distribution lines	12.00																																																			
3. Powerhouse	30.00																																																			
<b>Subtotal (A)</b>	<b>272.00</b>																																																			
<b>B. Climate-resilient agriculture</b>	<b>70.00</b>																																																			
<b>C. Urban water supply</b>	<b>60.00</b>																																																			
<b>D. Capacity development</b>	<b>6.00</b>																																																			
<b>E. Project management</b>	<b>22.00</b>																																																			
<b>Total (A+B+C+D+E)</b>	<b>430.00</b>																																																			
C.2. Project financing information	<b>Total project financing (a) = (b) + (c)</b>	<b>Financial Instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Tenor</b>	<b>Pricing</b>																																														
			770	million USD (\$)																																																



	(b) Requested GCF amount	(i) Senior Loans	.....			
		(ii) Subordinated Loans	.....	<u>Options</u>	( ) years	( ) %
		(iii) Equity	.....	<u>Options</u>	( ) years	( ) %
		(iv) Guarantees	.....	<u>Options</u>		( ) % IRR
	(v) Reimbursable grants *			<u>Options</u>		
	(vi) Grants *			<u>USD million</u>		
			300 (Solar subproject) 200 (AIWRD subproject)			
* Please provide detailed economic and financial justification in the case of grants.						
		<b>Total Requested (i+ii+iii+iv+v+vi)</b>	500	<u>USD million</u>		
(c) Co-financing		<b>Financial Instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Name of Institution</b>	<b>Seniority</b>
		<u>Grant</u>	250	<u>USD million</u>	ADB	<u>Options</u>
		<u>Grant</u>	20	<u>USD million</u>	IsDB	<u>Options</u>
		<u>Options</u>	.....	<u>Options</u>	.....	<u>Options</u>
		<u>Options</u>	.....	<u>Options</u>	.....	<u>Options</u>
Lead financing institution: Asian Development Bank						
(d) Covenants	The government and executing agency (EA) have given ADB certain undertakings for the ESIP and AIWRDP, which are set forth in the framework financing agreements. Specific covenants agreed by the government and EA with respect to individual tranches under the programme are set forth in the grant and project agreements for the respective tranches.					
(e) Conditions precedent to disbursement	The Asian Development Fund (ADF) grant agreements will not be effective until, among others, the subsidiary loan agreement between the government and DABS, under with the proceeds of the ADF grant will be re-lent to DABS, shall have been executed and become effective in accordance with its terms.					

**D. Expected Performance against Investment Criteria**

Please explain the potential of the Project/Programme to achieve the Fund's six investment criteria as listed below.

<p>D.1. Climate impact potential <i>[Potential to achieve the GCF's objectives and results]</i></p>	<p>Specify the climate mitigation and/or adaptation impact. Provide specific values for the below indicators and any other relevant indicators and values, including those from the Fund's Performance Measurement Frameworks.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Total tonnes of CO<sub>2</sub> eq to be avoided or reduced per annum</li> <li><input type="checkbox"/> Expected total number of direct and indirect beneficiaries and number of beneficiaries relative to total population (e.g. total lives to be saved from disruption due to climate-related disasters)</li> </ul> <p>Afghanistan's per capita greenhouse gas (GHG) emissions is still among the lowest globally despite an increase from 0.2 tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) in 1990 to 0.3 tCO<sub>2</sub>e in 2010. The energy sector accounted for 13.1% of the total 2005 GHG emissions of 28.8 tCO<sub>2</sub>e. The country's growth path will likely lead to increased GHG emissions.</p> <p>The solar PV subproject is estimated to produce 273 gigawatt-hours (GWh) of clean electricity from solar PVs and avoid 174,000 tCO<sub>2</sub>e of GHG emissions per year compared with the business as usual scenario using diesel gensets.</p>
<p>D.2. Paradigm shift potential <i>[Potential to catalyze impact beyond a one-off project or programme investment]</i></p>	<p>Provide the estimates and details of the below and specify other relevant factors.</p> <ul style="list-style-type: none"> <li>• Potential for scaling-up and replication (e.g. multiples of initial impact size)</li> <li>• Potential for knowledge and learning</li> <li>• Contribution to the creation of an enabling environment</li> <li>• Contribution to the regulatory framework and policies</li> </ul> <p>The solar PV subproject will install 6 solar PV power plants in 6 provinces across Afghanistan to quickly fill the electricity demand-supply gap. It is projected to demonstrate viability of different business models, which will take advantage of or dovetail with existing power generation systems in the target provinces, and provide proof of concept for utility-scale solar PV in the country. The subproject is envisaged to initiate and spur further solar PV development through private sector investments and other donor-supported projects.</p> <p>In addition to providing reliable and affordable electricity, immediate benefits from the subproject will include strengthening the institutional capacity of DABS, MEW and other stakeholders to identify, develop, implement, manage and operate commercial-scale PV projects; promoting technology transfer through the provision of project management and supervision assistance; and enhancing the regulatory and policy framework through the full implementation of the Electricity Services Law and enactment of further laws leading to a market-oriented power sector.</p> <p>By raising the Dahla dam and building a hydroelectric facility, approximately 700,000 people will benefit from the AIWRD subproject through irrigation water and municipal water supply, and electricity generation.</p>
<p>D.3. Sustainable development potential <i>[Potential to provide wider development co-benefits]</i></p>	<p>Provide the estimates of economic, social and environmental co-benefits. Examples include the following:</p> <ul style="list-style-type: none"> <li>• Economic co-benefits <ul style="list-style-type: none"> <li>- Total number of jobs created</li> <li>- Amount of foreign currency savings</li> <li>- Amount of government's budget deficits reduced</li> </ul> </li> <li>• Social co-benefits <ul style="list-style-type: none"> <li>- Improved access to education</li> <li>- Improved regulation or cultural preservation</li> <li>- Improved health and safety</li> </ul> </li> <li>• Environmental co-benefits <ul style="list-style-type: none"> <li>- Improved air quality</li> <li>- Improved soil quality</li> <li>- Improved biodiversity</li> </ul> </li> <li>• Gender-sensitive development impact <ul style="list-style-type: none"> <li>- Proportion of men and women in jobs created</li> </ul> </li> </ul> <p>The Solar Plus programme will improve socioeconomic conditions in Afghanistan and does not entail significant impacts on affordability or operational employment opportunities. During construction, the contractor will be required to ensure equal opportunities for all social groups, equal pay for equal work regardless of gender, and prohibition of child labor. It will provide employment under the solar subproject,</p>

	<p>including 800 jobs during construction and 50 jobs during the operation and maintenance phase,<sup>6</sup> and will impact income growth and poverty reduction.</p> <p>Indirect impacts on the residents' living standards and well-being will be significant. Households will benefit from reliable access to energy and improved public services, especially in rural areas where power outages last longer, which will improve their economic and social activities and living conditions. A reliable and accessible power will also have positive impacts to poor and vulnerable groups through improved educational and health services, and more and better employment opportunities.</p> <p>Reliable power supply will improve the operations of retail and service establishments and create new business opportunities. This will improve the employment market and benefit job seekers, resulting in higher employment rates and increased income among the population</p> <p>Schools will benefit from less interrupted power supply and will be able to provide longer hours for instruction and access to technology to improve learning systems. Students will also be able to extend their learning hours at home when and where they have electricity,</p> <p>The beneficiaries' overall health outlook will improve through better health facilities and services and better heating and potable water systems. Reducing the incidence of illnesses and diseases will reduce household expenditure on medical treatment and ease the burden on women who often assume the responsibility of taking care of the sick. A healthier population will be able to participate in economic activities and to the economy in general.</p> <p>The programme is also envisioned to improve access to safe drinking water and provide more reliable and sustainable supply of electricity in Kandahar city, and increase agricultural production in the irrigated farmlands in the Arghandab river basin.</p>
<p>D.4. Needs of recipient <i>[Vulnerability to climate change and financing needs of the recipients]</i></p>	<p><b>Describe the scale and intensity of vulnerability of the country and beneficiary groups and elaborate how the project/programme addresses the issues. Examples of the issues include the following:</b></p> <ul style="list-style-type: none"> <li>• Level of exposure to climate risks for beneficiary country and groups</li> <li>• Does the country have a fiscal or balance of payment gap that prevents from addressing the needs?</li> <li>• Does the local capital market lack depth or history?</li> <li>• Needs for strengthening institutions and implementation capacity</li> </ul> <p>Afghanistan's Intended Nationally Determined Contribution (INDC) indicates there would be lower costs and a clearer development path for Afghanistan if it pursued development using mainly fossil fuels, but this would likely result in increased greenhouse gas (GHG) emissions for the period until 2025. However, given the extremely limited remaining global GHG emissions budget, Afghanistan requires the UNFCCC, the Global Environmental Facility (GEF), the Green Climate Fund (GCF), and other international institutional arrangements to provide the extra finance and other support needed to successfully implement low-emission development strategies (LEDS) across all sectors of its economy without compromising socio-economic development goals.</p> <p>Afghanistan has initiated a number of steps to promote sustainable development. Considerable emphasis has been placed on addressing environmental challenges, disaster risk reduction, food security, water security, protection of forest and rangelands, and biodiversity conservation, all of which have clear relevance to climate change adaptation. It needs to enhance its adaptive capacity and resilience, effectively respond to the vulnerabilities of critical sectors, and efficiently mainstream climate change considerations into national development policies, strategies, and plans. In order to achieve this vision, a national strategy for climate change adaptation must include community-level vulnerabilities and build up their adaptive capacities by investing in short- and long-term initiatives.</p>

<sup>6</sup> Local labor regulations prohibit exploitive labor practices, including the use of child labor. Adherence to core labor standards is included as a grant covenant.

	<p>However, the country faces a number of specific challenges in terms of addressing climate change through adaptation. These challenges include, but are not limited to, funding gaps, lack of expertise, lack of reliable historical climate data, weak public awareness about environmental issues, and security. Afghanistan has identified the key actions in its National Adaptation Plan (NAP) in order to overcome existing gaps and barriers towards sufficiently addressing its climate change adaptation needs. The total estimated cost of full implementation of the NAP is \$10.78 billion over 10 years.</p>
<p>D.5. Country ownership <i>[Beneficiary country ownership of project or programme and capacity to implement the proposed activities]</i></p>	<p><b>Provide details of the below and specify other relevant factors.</b></p> <ul style="list-style-type: none"> <li>• Coherence and alignment with the country's national climate strategy and priorities in mitigation or adaptation</li> <li>• Brief description of executing entities (e.g. local developers, partners and service providers) along with the roles they will play</li> <li>• Stakeholder engagement process and feedback received from civil society organizations and other relevant stakeholders</li> </ul> <p>One of the key development goals of the Government of Afghanistan is to rebuild its energy sector with a focus on sustainable energy. Decades of war and conflict have almost completely destroyed the country's energy infrastructure and generation, transmission, and distribution facilities. Since 2001, the major focus of efforts was on the reconstruction and expansion of the national electricity grid and power trade with Central and South Asia. Increasing energy supply and expanding the energy grid to underserved areas is a national priority. Without low-cost, reliable grid power, population centers either go without power or rely on limited amounts of high-cost and unsustainable diesel-generated power.</p> <p>The Government's National Energy Supply Program 2030 (NESP) aims to (i) increase the electrification rate from 30% to 83%, (ii) increase domestic generation from 20% to 67%, and (iii) strengthen power exchange and trade options by 2030.<sup>7</sup></p> <p>The NESP road map, 2013–2030 focuses on energy supply, transmission and distribution, energy efficiency, reinforcing institutions and private sector participation, capacity support, and regulatory strengthening. It underscores an urgent need to construct indigenous conventional generation and phased development of renewable energy projects.<sup>8,9</sup> To accelerate electrification rates and to quickly increase indigenous generation, large-scale solar photovoltaic projects are envisioned to provide proof of concept for future private sector investment through independent power producers (IPPs).</p> <p>The government is also implementing the energy sector strategy, roadmap, policy framework, and envisaged investment plan as confirmed in its power sector master plan (2012–2032) and gas development master plan (2015-2035), which build upon the Afghanistan National Development Strategy (2008-2013) integrated into NESP 2030.<sup>10</sup> The recently approved Electricity Services Law provides a legal and regulatory framework, and transparent structure for private sector participation.</p>

<sup>7</sup> Of the \$10.1 billion NESP investment plan, \$7.3 billion is for generation and network integration, \$1.7 billion for major transmission links, and \$1.1 billion for sub-transmission and distribution in provinces. Due to fiscal challenges, the government is expected to finance less than 5% (\$500 million) of the NESP.

<sup>8</sup> Gas and coal power plants are envisaged to be developed by the private sector, and development partners are assisting in rehabilitating existing and constructing new hydro plants.

<sup>9</sup> ADB. 2014. *Technical Assistance to the Islamic Republic of Afghanistan for Renewable Energy Development*. Manila (TA 8808-AFG, \$1.0 million, approved on 12 December).

<sup>10</sup> These programs are being amalgamated into an integrated national infrastructure development plan 2015

<p>D.6. Effectiveness and efficiency <i>[Economic and financial soundness and effectiveness of the proposed activities]</i></p>	<p>Provide details of the below and specify other relevant factors (i.e. debt service coverage ratio), if available.</p> <ul style="list-style-type: none"> <li>• Estimated cost per t CO<sub>2</sub> eq (total investment cost/expected lifetime emission reductions)</li> <li>• Co-financing ratio (total amount of the Fund's investment as percentage of project)</li> <li>• Economic and financial rate of return             <ul style="list-style-type: none"> <li>- With the Fund's support</li> <li>- Without the Fund's support</li> </ul> </li> </ul> <p>The programme is estimated to produce 273 gigawatt-hours (GWh) of clean electricity from solar PVs and will avoid 174,000 tCO<sub>2</sub>e of GHG emissions per year compared with the business as usual scenario using diesel gensets. Assuming a 5% annual degradation of solar panel output over 25 years, the estimated cost per tCO<sub>2</sub>e for all the solar PV installations is \$147.</p>
---	--

### E. Brief Rationale for GCF Involvement and Exit Strategy

Please specify why the GCF contribution is critical for the project/programme.

Afghanistan currently has no fiscal capability to invest in its energy infrastructure and private-sector investments and participation are limited. In order for the government to realize its implement its NESP roadmap, it will largely depend on grant funding from development partners such as ADB and the Green Climate Fund (GCF). The GCF's grant of \$500 million represents 62% of the total investment cost and will directly contribute to building clean energy projects.

Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the GCF and other sources.

The installation of solar PV systems and construction of a hydroelectric power plant are projected to demonstrate the viability of different business models that take advantage of or dovetail with existing power generation systems in the target provinces. It will also provide proof of concept for utility-scale solar PV in the country. Solar PV power plants have an economic life of 25 years and require minimal operation and maintenance. By demonstrating the viability of utility-scale solar PV, the programme is envisaged to initiate and spur further solar PV development through private sector investments and other donor-supported projects in other parts of the country.

### F. Risk Analysis

Please describe the financial and operational risks and discuss mitigating measures.

Please briefly specify the substantial environmental and social risks that the project/programme may face and the proposed risk mitigating measures.

**Table 6: Summary of Risks and Mitigating Measures**

Risks	Mitigating Measures
Procurement and implementation of turnkey contract could be delayed.	Procurement packaging will be minimized with one implementation consultant package and one turnkey contract package per subproject. International consulting firms will be recruited to help DABS in the procurement of the turnkey contracts and in supervising project implementation.
Governance and capacity issues could negatively affect the project.	All procurement and consultant recruitment will require prior approval by ADB. Procurement oversight will be complemented by a credible complaint review mechanism and access to procurement-related information on the DABS and National Procurement Commission websites. Procurement and financial management reviews by ADB and other development partners have confirmed that adequate systems have been institutionalized. DABS is gaining financial autonomy and has an independent board. An internal audit system is being strengthened by USAID intervention. Under its ongoing MFF since 2009, ADB is providing extensive capacity support to DABS to improve its technical, financial/economic, social safeguards, and procurement functions. This has strengthened the project preparation and implementation areas. A similar capacity support component has been built into this new investment programme
The project could encounter cost overruns.	The cost estimates are consistent with the engineers' design and recent turnkey contract awards. Adequate contingency is provided in the project financing plan.
Difficult security environment could affect procurement of quality contractors/consultants	While security remains a key concern, experience in attracting qualified bidders and in implementing similar projects indicates the programme can be successfully implemented. Adequate funds have been budgeted for security and demining activities during project construction and implementation. The turnkey contractors will prepare the project security plan which will be endorsed by the consultant, government and ADB

and thereby delay project implementation.

ADB = Asian Development Bank, DABS = Da Afghanistan Breshna Sherkat, MFF = multitranches financing facility, USAID = United States Agency for International Development.

Sources: Afghanistan Energy Information Center, Quarterly Reports of the Inter-Ministerial Commission for Energy.

No substantial environmental and social risks are projected. The environmental management and the land acquisition and resettlement plans to be developed will provide risk mitigating measures and action plans to mitigate any negative impacts.

Due to its post-conflict and fragile environment, implementing energy projects in Afghanistan is challenging and may take longer. International contractors and consultants need to bid in consortium with local Afghan companies to gain advantage on local knowledge and access to project sites. Additional costs, such as security and dealing with difficult terrain, need to be factored in the programme budget and timeframe. The government's lack of capacity to implement projects also needs to be addressed by either building internal capacity or outsourcing project preparation and implementation to design engineers and supervision consultants engaged on long-term contracts.

These approaches can yield results without compromising principles of governance, competition, and efficiency.

### G. Multi-Stakeholder Engagement

Please specify the plan for multi-stakeholder engagement, and what has been done so far in this regard.

Consultation with various stakeholders will be carried out during the feasibility and project preparation phases. Representatives from central and local governments, local communities, development partners and nongovernment organizations will be consulted during project preparation and implementation stages to ensure concerns and feedback are noted and/or addressed.

### H. Status of Project/Programme

- 1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section J.
- 2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes  No   
(If 'Yes', please provide them in section J.)
- 3) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)? Yes  No   
(If yes, please provide an evaluation report of the previous project in section J, if available.)

### I. Remarks

### J. Supporting Documents for Concept Note

- Map indicating the location of the project/programme
- Financial Model
- Pre-feasibility Study
- Feasibility Study (if applicable)
- Environmental and Social Impact Assessment (if applicable)
- Evaluation Report (if applicable)