CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance
Response Plan

Country:	Iran
Request Identification Number:	2015000014

Title:	Photovoltaic Solar Cell Design and Manufacturing

Project summary

The activities proposed in this Quick Response Plan will assist Iranian stakeholders to move towards building the country's first photovoltaic (PV) cell manufacturing plant (at an initial pilot scale) and build up the necessary associated capacity of the national photovoltaic industry. The response plan comprises four activities that will span about 12 months. A natural follow up (not included in this plan) of these activities would be to develop detailed technical specifications regarding the manufacturing plant as input to a tendering process for an eventual construction phase.

The three main outputs of the Response Plan encompass:

(1) A local workshop to assemble and interview the stake holders including assessment of current capacity. Initial assessment to identify status of local PV technology, material supply, knowledge infrastructure, that need to be resolved to establish a striving PV industry in Iran
(2) A report covering the assessment
(3) A detailed funding proposal to advance a striving PV industry in Iran

Partners will be from the government (notably the CITC and Ministry of Energy); research institutions and universities and other key organizations such as the Renewable Energy Organization of Iran (SUNA), as well as representatives from the private sector that are active in the PV industry in Iran.

The activities outlined in this Response plan will be refined in consultation with the above key stakeholders during initial inception missions.

1. Overview of the assistance

1.1 Objectives (outcomes)

The overall objective of the CTCN assistance is to provide capacity building and advice to guide the development of Iran's photovoltaic (PV) manufacturing industry.

Within this a number of sub-objectives can be defined:

- To improve the R&D capacity of Iranian stakeholders with regards to PV cell manufacturing and characterization
- To describe the necessary laboratory scale facilities to support this capacity
- To organize a local workshop on solar cell manufacturing technologies for Iranian stakeholders
- To establish a detailed funding proposal based on the described sub-objectives

1.2 Results (outputs)

CTCN contributes to the achievement of the above-mentioned objective by delivering the first two outputs, namely:

(4) A local workshop to assemble and interview the stake holders including assessment of current capacity. Initial assessment to identify status of local PV technology, material supply, knowledge infrastructure, that need to be resolved to establish a striving PV industry in Iran
(5) A report covering the assessment
(6) A detailed funding proposal to advance a striving PV industry in Iran

The second two stages of Recommendations for preliminary design for PV industry in Iran and a specific pilot-scale PV cell manufacturing plant and financial analysis are considered beyond the scope of a quick response, as they involve substantial financial resources.

1.3 Technology aspects

The objective of the CTCN assistance is to facilitate the transfer of the technology from foreign PV energy suppliers to Iran.

2. Description of the Assistance

2.1 Activities

Deliverables	Delivery date
1. Initial assessment of PV cell and module R&D capabilities in Iran, including compilation of information on existing PV laboratories and intellectual resources in cooperation with local technical universities	
2. Determine status on additional facility and equipment needs for the R&D phase	
3. Collection of information on existing Solar PV manufacturers, local material suppliers and resources in Iran through close cooperation with national entities	
4. Organize asset of local workshop on solar cell manufacturing technologies for Iranian stakeholders	
5. Establish a detailed funding proposal based on the stakeholder information to identify status of local PV technology, material supply, knowledge infrastructure , that need to be resolved to establish a striving PV industry in Iran	

a. Expertise required

The assistance provider should offers high-level expertise in the fields of PV materials, cell processing, cell and module design and manufacturing. Activities range from fundamental research addressing crystalline silicon solar cell and module technology to high-quality consultancy services for entities who want to invest in this asset class.

2.3 Main partners

The table below shows the stakeholders the CTCN Response Expert Team expects to engage and collaborate with during the implementation of the response. It is likely that this list will be further amended / expanded during the course of the response.

Stakeholder	Role
Ministry of Energy	Implementation of Iran government policies and regulations related to the energy sector, which encompasses renewable source of energy.
Centre of Innovation Technology Cooperation (CITC)	NDE and government research centre
Solar panel manufacturers	To manufacture solar panels locally, and to accelerate deployment.
University & Research Institutes	Research & development to increase efficiency and improve manufacturing quality
UNIDO Country Office	Coordinate and facilitate communication with stakeholders

The objective of the CTCN assistance is to facilitate the transfer of the technology from foreign suppliers to Iran. In order to do so, successful collaboration with the key stakeholders in Iran, i.e. NDE/CITC and the local PV companies and Technical Universities is essential. For this a coordination mechanism will be established to facilitate communication among them.

The central role of the NDE/CITC will be to act as facilitator and coordinator of the planned activities. These activities will also receive support from the local UNIDO office in Tehran. Knowledge regarding national circumstances would be required in order to work more efficiently.

2.4 Synergies

The Iranian government has made commitments to improve energy supply and community health care, with special focus on rural communities dependent on diesel generators, and made plans to invest in photovoltaic solar energy to achieve these goals. The CTCN intervention will make technical assistance services available to assist in realizing these plans.

The intervention can also complement the technology expertise at Iranian universities and contribute to capacity enhancement in the field of solar as key asset to further develop the industry.

2.5 Timeline

The table below illustrates the expected time frame of the project, starting with the CTCN intervention. This timeline is a first estimate and it will be discussed internally and streamlined.

	Year 1			
Output **Month:**	**1-3**	**4-6**	**7-9**	**10-12**
1: Status of PVR&D in Iran				
Activity 1.1 Establish list of PV R&D stake holders				
Activity 1.2 Interview of PV R&D (Initial assessment)				
Activity 1.3 Report				
2: Status of PV industry stake holders in Iran				
Activity 2.1 Establish list of PV industry stake holders				
Activity 2.2 Interview of PV industry (Initial assessment)				
Activity 2.3 Report				
3: Organize asset of local workshop				
Activity 3.1 Organizing workshop with stakeholders				
Activity 3.2 Workshop				
4: Establish detailed funding proposal				
Activity 4.1 Analyze output 1: to 3:				
Activity 4.2 Formulate a detailed funding proposal				

2.6 Indicative budget

The total budget dedicated by CTCN for the Quick Response, covering outputs 1 and 2, is USD 50,000. Further details on the indicative budget for the Quick Response are outlined below.

Output	**Labour CTCN ($)**	**Travel ($)**	**Other Direct Costs ($)**	**Total ($)**
1: Status of PVR&D in Iran				
Activity 1.1				
Activity 1.2				
Activity 1.3	10,000	1500	350	11,850
2: Status of PV industry stake holders in Iran				
Activity 2.1				
Activity 2.2				
Activity 2.3	10,000	1500	350	11,850
3: Organize asset of local workshop				
Activity 3.1				
Activity 3.2	8,000	1500	-	9500
4: Establish detailed funding proposal				
Activity 4.1				
Activity 4.2	16,800	-	-	16,800
TOTAL	44,800	4500	700	**50,000**

2.7 Gender considerations

The technical nature of this request, with a strong focus on solar PV technologies and R&D capabilities, means that it does not have a large gender aspect to it. However all efforts will be made to ensure that the workshop held in Tehran is inclusive.

2.8 Risk identification and risk mitigation

Risks	Consequence	Probability	Mitigation
Lack of buy-in for the developed proposal	The document cannot be proposed with the support of Iranian stakeholders to potential sources of funding	Low	Close cooperation with stakeholders; initial round of bilateral meetings with key government and non-government organizations to gauge expectations; limited validation at the workshop of key elements of future assistance
Lack of subsequent funding for the final proposal	Follow-up funding for the main body of technical assistance is not available and this cannot proceed	Moderate	In part mitigated by developing a strong proposal with buy-in from Iranian side (see above); will seek early contact with key funding bodies to ascertain interest and scope

2.9 Monitoring and Reporting

Milestones for each of the activities and deliverables will be detailed at the outset of the intervention. Regular and efficient communication will be established to allow for adaptive management and refine the approach as more information is gathered and produced. The NDE will contribute to those efforts and support the timely implementation of the activities and the reports.

3 Long-term impacts of the assistance

3.1 Expected climate benefits

There will not be any short term direct climate benefits of this assistance due to its scope and limited size. However, it lays the groundwork for increased awareness and capacity for solar PV technology and domestic manufacturing benefits. In this sense, it has the potential to contribute to substantial GHG mitigation benefits in the longer term should ongoing assistance be secured and the government of Iran continues to promote domestic solar PV production and use.

3.2 Co-benefits

The CTCN assistance will contribute to the following medium and long-term benefits in Iran, if it would end in the development of PV technology and related market introduction:

- Considerable annual energy savings, compared to conventional generation of power for the household and commercial sectors;
- Reduction of transmission losses, CO_2 emissions, NO_x emissions, and energy demand during peak usage;
- Expected huge annual opportunity cost for the government;
- Potential market share of the technology in the region;
- Creation of jobs in the industry.

3.3. Post-assistance plans and actions

The core objective of this assistance, beyond raising awareness and understanding of solar cell manufacturing technologies and benefits, is to prepare a proposal for longer term support to the Iranian solar industry. In this sense, post-assistance planning is built into the short term response.

4 Formal agreement and signatures

Signatures of the requesting country

For the NDE	**For the Request Applicant**
Name: Mr. Seyed Ali Akramifar	Name: Mr. Vahid Vahdatpour
Title: Head	Title: Managing Director
Iranian Presidential Center for Innovation and Technology Cooperation (CITC)	Dorsa Taamin Energy Co.
Date: 02.02.2016	Date: 25.01.2016
Signature:	Signature:

Signatures of the CTCN

For the CTCN Director	**For the Climate Technology Manager**
Name: Jukka Uosukainen	Name: RAJIV GEAR G
Title: CTCN Director	Title: Climate Technology Manager – Ad Interim
Date: 04.02.2016	Date: 04.02.2016
Signature:	Signature: