Programme design document form for small-scale CDM programmes of activities

(Version 04.0)

PROGRAMME DESIGN DOCUMENT (PoA-DD)	
Title of the PoA	Small Hydro Power Programme of Activities in Iran
Version number of the PoA-DD	2
Completion date of the PoA-DD	28/09/15
Coordinating/ managing entity	Mehr Renewable Energy Company (MRE)
Host Party(ies)	Iran
Sectoral scope(s) and selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral scope 1, AMS-I.D

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

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Small Hydro Power Programme of Activities in Iran
Version: 02
Date: 23/09/2015

A.2. Purpose and general description of the PoA

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The power demand in Iran is increasing and so is the power generation capacity addition. However, the share of renewable energy sources in the total electricity generation in year ending to March 2014 was only 5.6%. The Iranian Government have announced many policies for the development of renewable energy. However, the renewable energy capacity development is limited due to higher capital costs, lower plant load factors, etc. Thus, CME has started a PoA to facilitate promotion of renewable energy generation.

(a) Policy/measure or stated goal of the PoA:

The objective of the Small Hydro Power Programme of Activities in Iran is to overcome institutional and financial hurdles and promote the implementation of small scale renewable energy production projects in Iran. The PoA will help reduce the CDM project development cost and reduce timeline to monetize CDM revenue compared to a standalone CDM project activity.

(b) Framework for the implementation of the proposed PoA:

The PoA will support the development of new grid connected small scale hydropower generation projects throughout Iran. Each small-scale CDM Program Activity (CPA) under this PoA will comprise one or more such power plants that its combined installed capacity does not exceed the threshold for small-scale renewable energy CDM projects (15 MW).

The PoA is a voluntary action being coordinated and managed by Mehr Renewable Energy Company (referred hereinafter as MRE), the Coordinating/Managing Entity (CME). MRE will work closely with project developers and other organizations active in the power generation sector to facilitate the development of new hydro power plants and their inclusion in this PoA.

The CME is promoting the development of renewable energies on a voluntary basis and there are no regulations in Iran mandating renewable energies development or to seek CDM support. Hence, the PoA is a purely voluntary action being coordinated and managed by MRE.

The electricity generated by the PoA will reduce anthropogenic emissions of greenhouse gases (GHGs) that otherwise is generated by the operation of existing/grid connected power plants (mostly fossil fuel based power plants). New source of generation will increase renewable energy generation capacity that is sustainable. Moreover the electricity will be available in remote areas where electricity supply from the national grid may be lacking in absence of the PoA. Also the PoA increases employment opportunities during construction and operation of power plants. New infrastructure will contribute to economic growth, improve standard of life of the local people and poverty alleviation.

By promoting the development of new grid connected hydropower plants, the proposed PoA will contribute to:

- Reducing the local and global effects of the fossil fuels combustion, i.e. reducing the emissions of greenhouse gases (GHGs) as well as SOx, NOx and particulate matter.

- Helping to satisfy the increasing demand of electricity in Iran by using clean and renewable local resources, reducing the reliance on fossil fuels.

- Increasing commercial activity through additional investment in clean and renewable source of power, leading to transfer of environmentally safe and sound technologies.

- Increasing the employment opportunities in the area where each CPA is located, leading to a general increase in local-community income.

All in all, the PoA contributes to environmental sustainability combined with technological, social and economical sustainability.

A.3. CME and participants of PoA

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Mehr Renewable Energy Company (MRE) is the Coordinating/Managing Entity (CME) of this Programme of Activities (PoA). MRE is responsible for coordinating with all the entities involved in the PoA. MRE will sign contracts with each CPA implementer and is responsible for CPAs qualification and communication with the Executive Board.

A.4. Party(ies)

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Name of Party involved (host) indicates host Party	Private and/or public entity(ies) project participants, CME (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Iran (host)	Mehr Renewable Energy Company (CME)	No
	Public entity: Iran Water and Power Development Company	No
	Private entity: Mahab Ghodss Consulting Engineering Company	No

A.5. Physical/ Geographical boundary of the PoA

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According to the applied methodology AMS-I.D, version 18.0, “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to”. Thus, the physical/geographical boundary of PoA consists of CPAs, and national grid of Iran.

All CPAs included in the PoA will be implemented within the geographical boundary of Iran. All CPAs will be implemented considering all applicable national policies and regulations of Iran.

Iran lies between 25°-40° north latitude and 44°-63°5' east longitude.

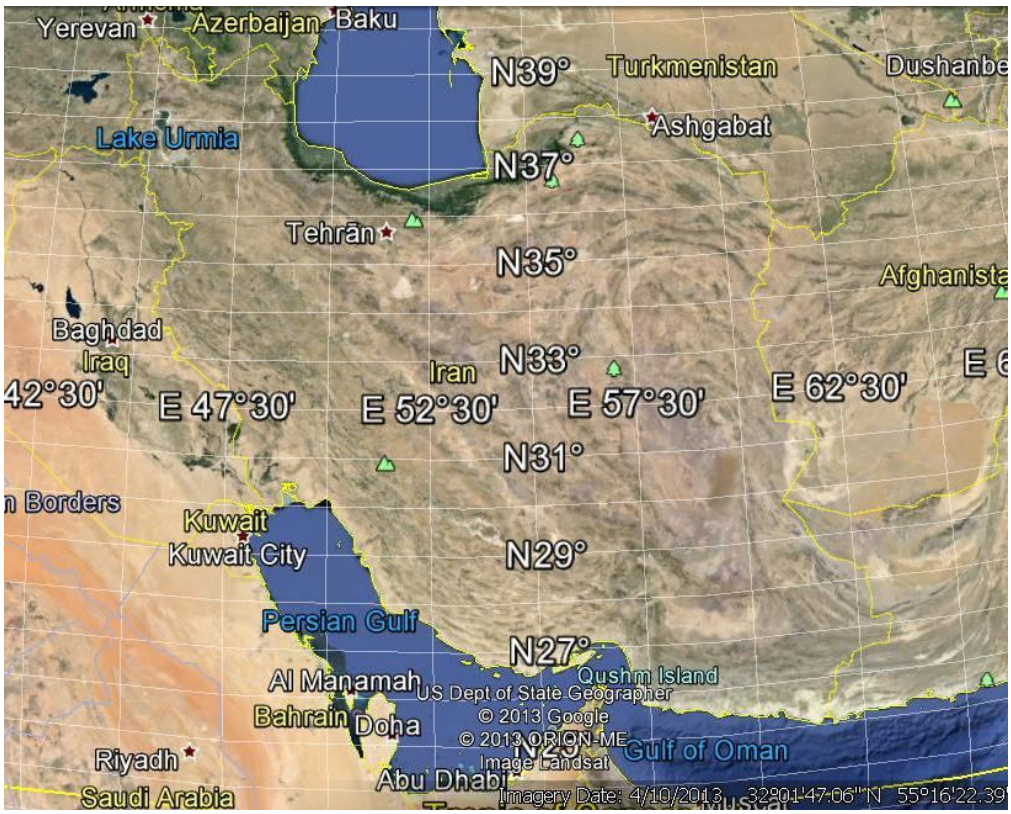

Figure A.1- Geographical boundary of the PoA

A.6. Technologies/measures

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A typical CPA under this PoA may comprise one or more Greenfield small-scale hydropower plant that is either run-of-river or with a dam with total installed capacity not exceeding 15 MW.

The electricity generated from CPAs will be fed into the national electricity grid of Iran. This PoA covers Greenfield power plants only and do not apply for capacity extension or replacement or retrofit of existing units. General characteristics of the technologies are;

Small scale hydroelectric power plants use the potential energy stored in water reservoirs or the natural course of rivers, in case of run of river plants, to produce electricity. Small scale hydroelectric plants have some differences in detail technical characteristics but in general the projects will be run-of-the-river power plants or reservoir type power plants with a power density of at least 4 W/m2.

The technology to be used in each CPA of this PoA will be described in detail in the CPA-DD.

A.7 Public funding of PoA

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The proposed PoA will not receive any public funding from Annex I countries.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

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As per “Standard for Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” Version 03.0, “Additionality shall

be demonstrated by establishing that in the absence of CDM, none of the implemented CPAs would occur."

As per guidance of the EB 47 report, paragraph 73, the additionality can be demonstrated either on a PoA level or a CPA level. Also the Annex 11 of the EB 51 states that the PoA "are required to comply with the additionality requirements of the applied methodology". For the proposed PoA, all the CPA's will apply the approved methodology AMS-I.D (version 18.0), however, as the location and characteristics of the CPA's are not yet known, the additionality will be demonstrated at the CPA level, but complying with inclusion criteria defined at PoA level.

For each CPA demonstration of the additionality will be as per guidance of the "Guidelines on the Demonstration of Additionality of Small Scale Project Activities (Version 09.0)". However following general rules will be applied;

(a) For CPA ≤ 5MW

Based on the recommendation of Iranian DNA, approved by EB, regarding of automatic additionality of micro-scale renewable energy technologies, all renewable energy technologies including geothermal, **hydro**, on-shore/off-shore wind, solar, marine and renewable biomass power plants with total installed capacity equal to or less than 5 MW are automatically additional[1].

Therefore the CPAs with total installed capacity up to 5 MW are additional and further assessment of additionality at individual CPA level is not necessary.

(b) For 5MW < CPA ≤ 15MW

Additionality should be demonstrated in CPA level based on "Guidelines on the Demonstration of Additionality of Small Scale Project Activities (Version 09.0)". The project participants shall demonstrate that the project activity would not be occurred in the absence of CDM due to at least one of the following barriers:

- Investment barrier;
- Technological barrier;
- Barrier due to prevailing practice; and
- Other barriers.

In this PoA, the investment barrier should be assessed for each CPA in this category. According to "*Tool for the demonstration and assessment of additionality, (version 07.0.0)*" the following steps are adopted for the investment analysis:

Step 1: Determine appropriate analysis method
Step 2: Option III: Apply benchmark analysis
Step 3: Calculation and comparison of financial indicators and benchmark calculation
Step 4: Sensitivity analysis

Based on the standard "Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 03.0)" when investment analysis is used for the demonstration of additionality, there are two options to meet the additionality requirement. Option (i) is chosen to meet additinality requirement of investment analysis. The input parameters that will be used in the investment analysis in the PoA-DD are as follows:

- Electricity generation
- Electricity tariff
- Operation and maintenance cost
- Total investment
- Annual running cost

B.2. Eligibility criteria for inclusion of a CPA in the PoA

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[1] https://cdm.unfccc.int/DNA/submissions/index.html

The eligibility criteria have been developed in accordance with the standard "Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 03.0)". A CPA will be included in the present PoA, provided that the CPA meets the following criteria;

The required eligibility criteria	Justification Procedure (evidence)
(A) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA;	CPA to provide detailed documentation regarding the exact geographical location of the CPA such as feasibility study report or third party assessment report or land documents to be checked and confirmed by the CME that it falls within the boundaries of the POA outlined in section A.5 above.
(B) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo);	Confirmation that the CPA is not registered or being registered as a stand-alone CDM project outside of this PoA, a bundled CDM Project Activity or a CPA under another registered PoA should be verified by; - Available information on the UNFCCC website, - Confirmation of CPA owner for the same, - Cross verification of unique geographical coordinates of CPA to confirm that the proposed CPA will be located at a site where there was no hydro power plant operating prior to the implementation of the proposed CPA (Greenfield plant).
(C) The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	The technology/measure allowed under PoA is grid connected hydropower (run-of-river type or reservoir type) based generation systems which will displace equivalent quantity of electricity from the national grid in Iran. The total capacity of each CPA will not exceed 15MW. The CPA must be a greenfield power plant generating electricity and must not involve capacity addition, retrofitting or modifying of an existing facility for renewable energy generation. All the equipment of each CPA will be complying with applicable national/ international standards. The above details may be validated from one or more of the following documents: • Detailed Project Report • Technology Specification provided by the technology supplier • Purchase order copies • EPC contracts • Power purchase agreement • Project commissioning certificates • Or other available documents.
(D) Conditions to check the start date of the CPA through documentary evidence;	The start date of the CPA should be on or after the start date of validation of the PoA, i.e. the date on which the CDM-PoA-DD is first published for global stakeholder consultation. The start date of the CPA may be confirmed by any documentary evidence including: • supply order/ purchase order/ with supplier • start of construction of project plant • commitment to implement project • or any other document in line with the start date definition as per the glossary of CDM terms
(E) Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs;	Each CPA shall meet the applicability criteria of the baseline and monitoring methodology AMS-I.D (version 18.0). There is no possibility of combination of other methodologies in the POA. For a hydropower CPA with reservoir, it must fulfill one of the following conditions: • The project activity is implemented in an existing reservoir with no change in the volume of the reservoir; • The project activity is implemented in an existing reservoir, where

	the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section of the applied methodology, is greater than 4 W/m2; • The project activity is implementing new reservoir and the power density of the power plant, as per definitions given in the project emissions section of the applied methodology, is greater than 4 W/m2.
(F) The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality as specified in Section 3.1 of "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 03.0)";	Any CPA must comply with one of the following additionality tests explained in the PoA-DD: • (a) Based on EB approval for automatic additionality of micro-scale renewable energy technologies recommended by Iranian DNA, a CPA with a capacity up to five megawatts is automatically additional and further assessment of additionality at individual CPA level is not necessary. • (b) For a hydro power CPA with an installed capacity of more than 5MW, up to 15MW, additionality demonstration should be based on the latest guidelines on the demonstration of additionality of small-scale project activities, and investment barrier analysis should be adopted to demonstrate the additionality of the CPA as per the latest guidelines on the assessment of investment analysis and any other relevant guidance from the board pertaining to investment analysis. CPA implementer will have to provide: -The approved FSR -Any supporting documents.
(G) The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;	A local stakeholders' consultation should be conducted at CPA level as per the CDM requirements to gauge the opinions and comments of the stakeholders in the immediate project area. The local stakeholder consultation shall comprise: • Identification of local stakeholders • Explain about the CPA project activity • Inviting comments from stakeholders • Recording the comments The CPA implementer must provide CME following documents: • Questionnaires of stakeholders survey • Invitation notice • Meeting minute and attendees list • Photo/ video evidence of meeting • Summary of comments received and how they have been taken into account. The hydro power generation will reduce the adverse environmental and social impacts associated with the use of fossil fuels for electricity generation. The Environmental Impact Analysis will be done in conformity with prevailing legislation in the Host Country, Iran. Based on the environmental regulation of Iran, the environmental impact analysis is not required for run-of-river hydropower plants where the installed capacity is less than 100 MW. For reservoir type hydropower plants with a dam height over 15 meter or a reservoir surface area over 400 hectares, the CPA implementer must do EIA and it should be cited in the CPA-DD.
(H) Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;	The CPA should have no public funding from Annex I countries resulting in the diversion of official development assistance. One of the following document shall be provided: - The declaration from the CPA implementer affirming that no funding from Annex I parties is used in the CPA; - Loan funding documents (if applicable)

(I) Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/ off-grid) and distribution mechanisms (e.g. direct installation);	The CPA should be a new (Greenfield) grid-connected renewable small scale hydropower project. The CME will check the FSR, power purchase agreement or approval from concerned statutory body to ensure that the power generated from the CPA is injected only to the grid system within the host country.
(J) Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities";	The POA requires all CPAs to independently monitor all electricity generation sources and no sampling method is applicable.
(K) Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or micro-scale threshold and remains within those thresholds throughout the crediting period of the CPA;	The CPA implementer should declare that CPA meets the small-scale (installed capacity over 5MW but up to 15 MW) or micro-scale (installed capacity up to 5MW) threshold criteria and remains within those thresholds throughout the crediting period of the CPA.
(L) Where applicable, the requirements for the debundling check, in case the CPA belongs to small-scale or micro-scale project categories.	CPAs should not be a debundled component of another large-scale CPA or CDM project activity. The assessment of de-bundling would be carried out as per "Guidelines on assessment of debundling for SSC project activities (version 03)". The assessment of de-bundling criteria can be confirmed from the information available in the UNFCCC website and in the form of declaration obtained from the respective CPA implementer.

B.3. Application of technologies/measures and methodologies

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The PoA involves small scale hydro electricity generation projects connected to the grid. Thus, applicable methodology is AMS-I.D, Version 18.0, 'Grid connected renewable electricity generation'.

Reference: http://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

The PoA does not involve application of multiple methodologies.

This methodology also refers to the latest approved versions of the following tool:

Tool to calculate the emission factor for an electricity system

The justification of the choice of AMS I.D is provided as following table for the CPAs that fall under this PoA.

Paragraph	AMS I.D/version 18.0 Applicability Criteria	Methodology AMS I.D (version 18.0) is applicable to an CPA included in the proposed PoA because:
2	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid. (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The CPA will consist one (or more) hydro energy generation unit(s) that supplies electricity to the national grid of Iran.
4	This methodology is applicable to project activities that: (a) Install a Greenfield plant;	All CPAs in this PoA are Greenfield project activities and fall under option (a) Install a Greenfield plant.

	(b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	
5	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: -The project activity is implemented in an existing reservoir with no change in the volume of reservoir; -The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; -The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	Most of the hydro CPAs in this PoA are run-of-river projects. If a hydro power plant with reservoir enters the programme, it must satisfy one of the three conditions specified here.
6	If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	All CPAs in this PoA will have renewable components only.
7	Combined heat and power (co-generation) systems are not eligible under this category.	The proposed PoA do not cover combined heat and power systems.
8	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	Each CPA should be a Greenfield small scale hydro electricity generation project.
9	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	Each CPA should be a Greenfield small scale hydro electricity generation project.

B.4. Date of completion of application of methodology and standardized baseline and contact information of responsible person(s)/ entity(ies)

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1. Completion of study on application of AMS-I.D is 26/09/2013
2. Mehr Renewable Energy Company (MRE) is responsible for the application of the selected methodology. Detailed contact information of MRE is provided in Annex I.

SECTION C. Management system

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According to the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities (version 03.0)”, the CME shall develop and implement a management system that includes the following made available to the DOE at the time of validation of PoA:

a. Clear definition of roles and responsibilities of personnel involved in the process of CPA inclusion, including a review of their competencies;
b. Records of arrangements for training and capacity development for personnel;
c. A procedure for technical review of inclusion of CPAs;
d. A procedure to avoid double counting;
e. Records and documentation control process for each CPA under the PoA;
f. Measures for continuous improvements of the PoA management system;
g. Any other relevant elements;

(a) Clear definition of roles and responsibilities of personnel involved in the process of CPA inclusion, including a review of their competencies

The implementation structure of the "Small Hydro Power Programme of Activities in Iran" is shown in figure C.1.

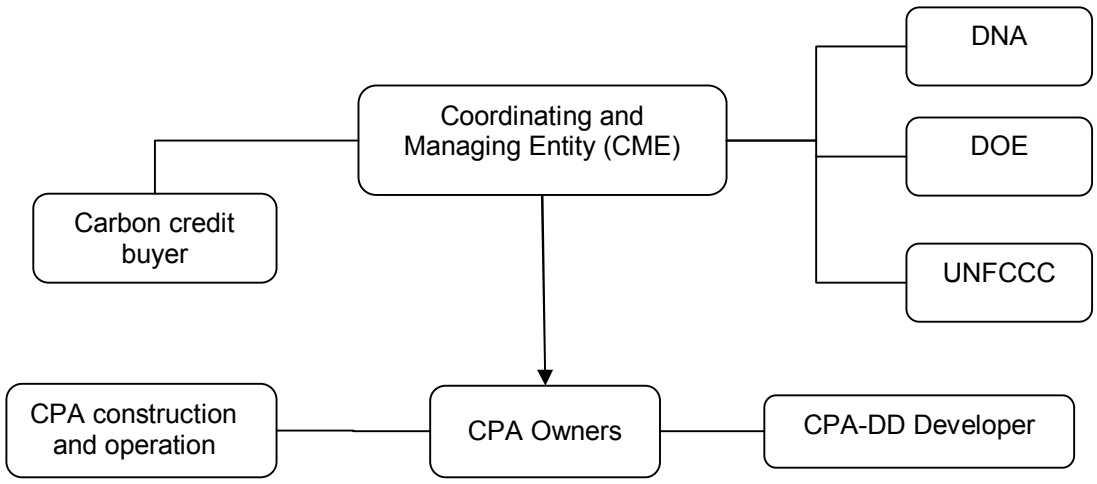

Figure C.1- Diagram of PoA implementation

The CME of this PoA is Mehr Renewable Energy Company with long term experience in development of CDM project activities in Iran. The roles and responsibilities can be defined as follows:

The CME

The CME will maintain close communications with the CPA owner before the CPA is included in the registered PoA to ensure that the CPA is eligible under the PoA. The responsibilities of CME include:

- Communication with EB in regard of registration of PoA, inclusion of CPAs and issuance of CERs
- Assessment of CPA-DD documentation,
- Management of CPA inclusion process into the PoA,
- Design of the PoA Document and Monitoring Plan,
- Provide CDM-related guidelines and guidance to the CPA Owner,
- Identify any failure or deviation from the CPA Owner in the application of the monitoring plan and request corrective actions as needed,
- Quality assurance and further processing of the gathered information,
- Follow-through with the DOE of periodical PoA verifications and CERs issuances.

The CME will develop and implement a management system for operation, management and monitoring. Details are as follows:

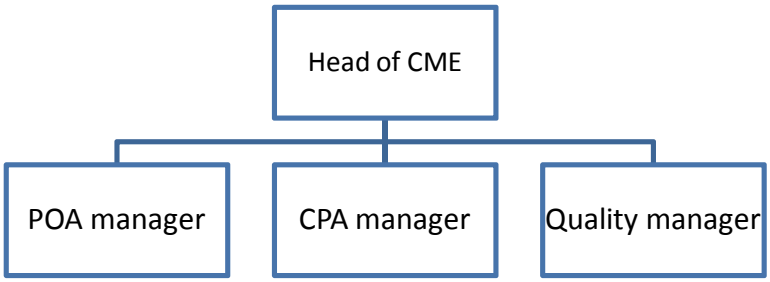

Figure C.2

Head of CME

The responsibilities of the Head of CME include:

- CPAs contracting
- Providing the CME during the PoA lifetime
- Guidance and technical assistance, including data control, management of information and Quality Assurance and Quality Control services
- Technical support to the CME during the entire PoA
- Contact with DNA, DOE and EB

PoA Manager

The responsibilities of the POA Manager include:

- Preliminary emissions reductions and carbon revenue estimation
- Initial CPA Eligibility Criteria compliance check
- Ensure high-quality implementation of all CPAs
- Coordination of validation and inclusion of the CPA in the PoA.
- Keep updated the PoA CPA Record Keeping System
- Train staff, set priorities properly, solves problems raised by the CPA Manager
- Ensure productive, efficient and inspiring working conditions for all employees
- Human Resource selection, negotiation of work contracts, proper assignment of targets and responsibilities, and conduction of evaluation process
- Ensure all administrative issues are properly dealt with, including accounting processes, office rent, legal registration / approvals, IT, social security, tax, compliance with local laws.
- Managing liaison with country DNA

CPA Manager

The responsibilities of the CPA Manager include:

- Inclusion of the CPA
- Communications with the CPA Owner
- Ensure CPA complies with eligibility criteria and that all the relevant documentation required by the DOE to validate the CPA is provided.
- Ensure that CPA-DD is written in a high quality manner.
- Ensure that the CPA is implemented in accordance to the CPA DD
- Ensure that providing the monitoring information by the CPA Owner and develops the monitoring report.
- Identification of opportunities to improve work process and propose solutions to CME upper management.
- Ensure that the CPA inclusion and implementation phases are adequately resourced

Quality manager

The responsibilities of the Quality Manager include:

- Quality control of implementation work. If necessary, reviews work of CPA Manager before submission to DOE
- Deployment of any improvements and monitoring of their impact
- After a first revision and corrections (if necessary) are made by the Project Manager, the Quality Manager is responsible for all quality checks of associated CPAs (CPA-DD, stakeholder consultation, monitoring report, etc.) as well as the PoA-DD if and when it is required.
- Supports and advices the Project Manager to ensure that the project is built as described in the CPA-DD; and that the monitoring systems are designed as per the requirements of the methodology and that are adhered to the procedures stated in the CPA-DD.

(b) Records and arrangements for training and capacity development for personnel

Training will be provided where applicable and all training and education records will be stored by the CME and will make it available to the DOE.

(c) Procedures for technical review of inclusion of CPAs

The CME will request FSR and other related documents to ensure that the CPA complies with criteria, as listed in Part II, Section B.5 of this PoA-DD. The CME should communicate with the CPA before it is included in the registered PoA to assess that the CPA is eligible under the PoA and must maintain the communication after inclusion in order to collect data during crediting period.

(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA)

The CME will create and use a database to record all CDM required information of CPAs that will be used to check double counting of each CPA. The database includes all power plant projects in the PoA that are registered or under registration. Key parameters (geographic coordinates, installed capacity, etc) of each new CPA will be compared to the projects listed in the database and at the UNFCCC website. In addition, before inclusion of each CPA, the CPA implementers will certify (as a letter) that the proposed CPA is registered neither as a single CDM project nor as a CPA under another PoA.

(e) Records and documentation control process for each CPA under the PoA

In order to ensure the quality and assurance of the information, the CME will develop and manage a data keeping system (hereinafter referred as PoA database) using Excel software. In this way, the CME will assign a unique identity code to each CPA that seeks inclusion of the proposed PoA. The PoA database contains following information:

- Identity code
- CPA name
- Implementer name, address, phone, email
- Geographic coordinates
- Technical information of the CPA (type, installed capacity, etc.)
- CPA start date
- Registration status
- Issuance status

The CME is responsible to update the PoA database. All the data will be kept at least for 2 years after the end of the crediting period.

(f) Measures for continuous improvements of the PoA management system

Continuous improvements of the PoA management system will be followed by all members involved in the PoA. The aim is correction of weaknesses and improvement of the strength and

advantages. All personnel will be encouraged to state their suggestions to the PoA manager. The PoA manager will collect and assess all recommendations and report to the head of CME. Head of CME will hold a meeting with presence of PoA manager and CPA owner(s), if necessary, to make decisions. If required, someone will be assigned to conduct needed changes and report the results.

(g) Any other relevant elements

The CPA Owner

The CPA Owner/implementer is responsible to carry-out all the activities related to the implementation and operation of the CPA; such as: obtaining applicable licenses, financing, design and engineering of the CPA, constructing and operating of the CPA, and installation of all required monitoring equipment to monitor the parameters specified in the CPA-DD. The CPA owner is also responsible to prepare the CPA-DD and provide CME all required supporting document for inclusion of CPA in the PoA.

SECTION D. Duration of PoA

D.1. Start date of PoA

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The starting date of the programme of activities is the date of publishing of the PoA for global stakeholder's comments.

D.2. Duration of the PoA

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28 years, 0 months

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

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Because of unique nature and technical conditions of each CPA, the EIA will be conducted at the CPA level. Based on "Human Environmental laws, Regulations, criteria and Standards" published by Department of Environment of Iran, 2012:

a. For run-of-river hydropower plants: there is no obligation for environmental impact analysis of these power plants if the capacity is less than 100 MW. In this case the environmental impact analysis could be optionally done by the CPA owner.
b. For hydropower plants with reservoir: the CPA implementer must do environmental impact analysis, if the CPA includes construction of a dam with height over 15 meter or a reservoir area over 400 hectares. If applicable, EIA should be cited in the CPA-DD.

E.2. Analysis of the environmental impacts

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The environmental impact analysis should be explained in the CPA-DD.

SECTION F. Local stakeholder consultation

F.1. Solicitation of comments from local stakeholders

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Since each CPA has different situation (location, capacity, equipment, etc.); the local stakeholders consultation should be hold at the CPA level as per the CDM requirements. Local stakeholder consultation meeting is organized to gauge the opinions and comments of the stakeholders in the immediate project area.

The local stakeholder consultation shall comprise:

- Identification of local stakeholders
- Explain about the CPA project activity
- Inviting comments from stakeholders
- Recording the comments

The CPA implementer will invite local stockholders by common ways such as newspaper announcement, invitation letter, questionnaire, etc. The CPA implementer must provide CME following documents:

- Invitation notice
- Meeting minute and attendees list
- Results of stakeholders survey
- Photo/ video evidence of meeting

F.2. Summary of comments received

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Local stakeholders' comments will be described in the CPA-DD, as each CPA concerns different stakeholders.

F.3. Report on consideration of comments received

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CPA owner should explain how comments received have been taken into account in the CPA-DD.

SECTION G. Approval and authorization

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Letter of Approval from DNA of Iran was received on 10/08/2015.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

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[CPA name] consists of [one or more] Greenfield small-scale [run-of-river or reservoir type] hydropower plant(s) with a total installed capacity of […] MW and delivers generated electricity to the Iran national grid. The project will be implemented by [CPA implementer name].The purpose of the Project is to generate electricity using renewable energy sources therefore it not only reduces the greenhouse gas emissions by replacing the grid electricity produced from fossil fuels but also helps achieve to sustainable development.

The CPA is located in [city, province] within the boundary of Iran and expected to reduce [...] tCO_2 every 12 months, leading to a […] tCO_2 over the first crediting period (7 years). Based on latest data, the Combined Margin emission factor of the national grid is [...] tCO_2/MWh.

SECTION B. Application of a baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology(ies) and standardized baseline(s)

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The CPA uses the approved small scale methodology AMS-I.D "*Grid connected renewable electricity generation (version 18.0)*", refer to:
http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X

And tools:
"*Tool to calculate the emission factor for an electricity system (version 04.0.0)*" refer to:
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

"*Tools for the demonstration and assessment of additionality (version 07.0.0)*" refer to:
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

Also the standard of "*Demonstration of additionality, development of eligibility criteria and application of multiples methodologies for programme of activities (version 03.0)*" refer to:
http://cdm.unfccc.int/filestorage/e/x/t/extfile-20130729142721867-meth_stan04.pdf/meth_stan04.pdf?t=b0l8bXJ2ZWZsfDAs4lCcyGw_8jEc44nmFkUB

B.2. Applicability of methodology(ies) and standardized baseline(s)

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The methodology AMS-I.D (version 18.0) is applicable for the CPA based on following reasons:

Paragraph	AMS I.D/version 18.0 Applicability Criteria	Justification:
2	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid. (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The CPA will consist one (or more) hydro energy generation unit(s) that supplies electricity to the national grid of Iran. Hence this criterion is applicable and fulfilled.
4	This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	The CPAs is a new hydropower plant at a site where there was no hydro power plant operating prior to the implementation of the project activity (Greenfield plant). Hence this criterion is applicable and fulfilled.
5	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: -The project activity is implemented in an existing reservoir with no change in the volume of reservoir; -The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; -The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2.	In case, the CPA has a reservoir, it must satisfy one of the three conditions specified here.
6	If the new unit has both renewable and non-	The CPA will have renewable

	renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	components only; hence this condition is not applicable.
7	Combined heat and power (co-generation) systems are not eligible under this category.	The CPA does not include combined heat and power systems; hence this condition is not applicable.
8	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The CPA should be a greenfield small scale hydropower generation project; hence this condition is not applicable.
9	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The CPA should be a greenfield small scale hydropower generation project; hence this condition is not applicable.

B.3. Sources and GHGs

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The emission sources and gases included in or excluded from the project boundary are listed below based on the methodology AMS-I.D (version 18.0)

Source		Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Main emission source
		N_2O	No	Main emission source
Project activity	Emissions from water reservoirs from hydro power plants	CO_2	No	Main emission source
		CH_4	Yes	Main emission source if CPA is hydro power plant with reservoir
		N_2O	No	Main emission source
	CO_2 emissions from on-site consumption of fossil fuels due to the project activity	CO_2	No	Not applicable, no fossil fuel consumption
		CH_4	No	No
		N_2O	No	No

B.4. Description of baseline scenario

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According to paragraph 19 of AMS-I.D, Version 18.0 the baseline scenario for the green field project activity that delivers electricity to the Grid is the following:

"*The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources to the grid*".

The CPA consists of a Greenfield hydropower plant that delivers electricity to the National Grid of Iran. The grid emission factor is calculated in combined margin manner according to procedures in "*Tool to Calculate the Emission Factor for an Electricity System (version 03.0.0)*".

B.5. Demonstration of eligibility for a generic CPA

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The PoA does not restrict any specific technology within main class of hydropower plants. Thus, any Greenfield hydro power plant will be eligible provided they can follow applicability conditions, baseline identification, additionality demonstration and monitoring methodology implementation as per PoA and methodology AMS-I.D Version 18.0.
In line with the Criteria as per "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA", a CPA is eligible for inclusion under the PoA, provided that the CPA fulfills the criteria mentioned in sector B.2 Part I, demonstrated through the listed evidences for each eligibility criteria, as follows:

The required eligibility criteria	Justification Procedure (evidence)
(A) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA;	CPA to provide detailed documentation regarding the exact geographical location of the CPA such as feasibility study report or third party assessment report or land documents to be checked and confirmed by the CME that it falls within the boundaries of the POA outlined in section A.5 above.
(B) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo);	Confirmation that the CPA is not registered or being registered as a stand-alone CDM project outside of this PoA, a bundled CDM Project Activity or a CPA under another registered PoA should be verified by; - Available information on the UNFCCC website, - Confirmation of CPA owner for the same, - Cross verification of unique geographical coordinates of CPA to confirm that the proposed CPA will be located at a site where there was no renewable energy power plant operating prior to the implementation of the proposed CPA (Greenfield plant).
(C) The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	The technology/measure allowed under PoA is grid connected hydro power (run-of-river type or reservoir type) which will displace equivalent quantity of electricity from the national grid in Iran. The total capacity of each CPA will not exceed 15MW. The CPA must be a greenfield power plant generating electricity and must not involve capacity addition, retrofitting or modifying of an existing facility for renewable energy generation. All the equipment of each CPA will be complying with applicable national/ international standards. The above details may be validated from one or more of the following documents: • Detailed Project Report • Technology Specification provided by the technology supplier • Purchase order copies • EPC contracts • Power purchase agreement • Project commissioning certificates • Or other available documents.
(D) Conditions to check the start date of the CPA through documentary evidence;	The start date of the CPA should be on or after the start date of validation of the PoA, i.e. the date on which the CDM-PoA-DD is first published for global stakeholder consultation. The start date of the CPA may be confirmed by any documentary evidence including: • supply order/ purchase order/ with supplier • start of construction of project plant • commitment to implement project • or any other document in line with the start date definition as per the glossary of CDM terms
(E) Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs;	Each CPA shall meet the applicability criteria of the baseline and monitoring methodology AMS-I.D (version 18.0). There is no possibility of combination of other methodologies in the POA. For a hydropower CPA with reservoir, it must fulfill one of the following conditions: • The project activity is implemented in an existing reservoir with no change in the volume of the reservoir;

	• The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section of the applied methodology, is greater than 4 W/m2; • The project activity is implementing new reservoir and the power density of the power plant, as per definitions given in the project emissions section of the applied methodology, is greater than 4 W/m2.
(F) The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality as specified in Section 3.1 of "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 03.0)";	Any CPA must comply with one of the following additionality tests explained in the PoA-DD: • (a) Based on EB approval for automatic additionality of micro-scale renewable energy technologies recommended by Iranian DNA, a CPA with a capacity up to five megawatts is automatically additional and further assessment of additionality at individual CPA level is not necessary. • (b) For a hydro CPA with an installed capacity of more than 5MW, up to 15MW, additionality demonstration should be based on the latest guidelines on the demonstration of additionality of small-scale project activities, and investment barrier analysis should be adopted to demonstrate the additionality of the CPA as per the latest guidelines on the assessment of investment analysis and any other relevant guidance from the board pertaining to investment analysis. CPA implementer will have to provide: -The approved FSR -Any supporting documents.
(G) The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;	A local stakeholders' consultation should be conducted at CPA level as per the CDM requirements to gauge the opinions and comments of the stakeholders in the immediate project area. The local stakeholder consultation shall comprise: • Identification of local stakeholders • Explain about the CPA project activity • Inviting comments from stakeholders • Recording the comments The CPA implementer must provide CME following documents: • Questionnaires of stakeholders survey • Invitation notice • Meeting minute and attendees list • Photo/ video evidence of meeting • Summary of comments received and how they have been taken into account. The renewable power generation will reduce the adverse environmental and social impacts associated with the use of fossil fuels for electricity generation. The Environmental Impact Analysis will be done in conformity with prevailing legislation in the Host Country, Iran. Based on the environmental regulation of Iran, the environmental impact analysis is not required for run-of-river hydropower plants where the installed capacity is less than 100 MW. For reservoir type hydropower plants with a dam height over 15 meter or a reservoir surface area over 400 hectares, the CPA implementer must do EIA and it should be cited in the CPA-DD.
(H) Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;	The CPA should have no public funding from Annex I countries resulting in the diversion of official development assistance. One of the following document shall be provided: - The declaration from the CPA implementer affirming that no funding from Annex I parties is used in the CPA; - Loan funding documents (if applicable)

(I) Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/ off-grid) and distribution mechanisms (e.g. direct installation);	The CPA should be a new (Greenfield) grid-connected small scale hydropower project. The CME will check the FSR, power purchase agreement or approval from concerned statutory body to ensure that the power generated from the CPA is injected only to the grid system within the host country.
(J) Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities";	The POA requires all CPAs to independently monitor all electricity generation sources and no sampling method is applicable.
(K) Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or micro-scale threshold and remains within those thresholds throughout the crediting period of the CPA;	The CPA implementer should declare that CPA meets the small-scale (installed capacity over 5MW but up to 15 MW) or micro-scale (installed capacity up to 5MW) threshold criteria and remains within those thresholds throughout the crediting period of the CPA.
(L) Where applicable, the requirements for the debundling check, in case the CPA belongs to small-scale or micro-scale project categories.	CPAs should not be a debundled component of another large-scale CPA or CDM project activity. The assessment of de-bundling would be carried out as per "Guidelines on assessment of debundling for SSC project activities (version 03)". The assessment of de-bundling criteria can be confirmed from the information available in the UNFCCC website and in the form of declaration obtained from the respective CPA implementer.

As mentioned in section B.1 PoA-DD (part I) all eligible CPAs with total installed capacity equal to or less than 5 MW are automatically additional. Just for hydro CPAs with total installed capacity >5MW and ≤15MW, investment barrier must be used.

Investment barrier:

Step 1: Determine appropriate analysis method

According to "*Tool for the demonstration and assessment of additionality, (version 07.0.0)*", Step 2, an appropriate analysis method must be chosen for demonstration of additionality.

There are three analysis methods available:

1) Simple cost analysis (Option I);
2) Investment comparison analysis (Option II);
3) Bench mark analysis (Option III).

Since the CPA has a financial benefit other than CDM related income from selling produced electricity, the benchmark analysis (option III) is applied to assess financial attractiveness of the proposed project activity.

Step 2: Option III: Apply benchmark analysis

The project internal rate of return (IRR) is considered as an appropriate financial indicator for the investment analysis of the Project. The likelihood of the development of this Project, rather than the supplying electricity from the national grid (the baseline) will be determined by comparing the IRR of the Project without CDM financing to a suitable benchmark. As per the "*Tool for the demonstration and assessment of additionality, (version 07.0.0)*", article #38, option(d) , approved benchmark by relevant national authorities is derived.

Step 3: Calculation and comparison of financial indicators and benchmark calculation

The following parameters have been used to calculate the IRR of the project activity;

Table B-1: Financial Parameters for investment analysis

Parameter	Unit	Value	Source
Electricity generation	kWh/y		FSR
Electricity tariff	Rial/kWh		FSR
O&M Costs	Rial/year		
Total investment	Rial		FSR
Annual running cost	Rial		FSR
Depreciation method	-	Linear to scrap	---
Depreciation period	year	20	FSR

The IRR of the Project with and without revenue from CDM are shown in the table B-2 bellow.

Table B-2: IRR of the Project with and without CDM

	IRR
Without revenue from CDM	
With revenue from CDM	

Step 4: Sensitivity analysis

In order to assess whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions, sensitivity analysis is undertaken for the proposed project activity.

According to the "*Guidelines on the Assessment of Investment Analysis (Version 05)*", only variables, including the construction investment, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. For the project activity, revenue stream (electricity tariff), annual running cost, the total investment are selected for variables subject to the sensitivity analysis based on their quantitative materiality following the guidance.

The table and figure below shows variation of IRR when the selected four critical variables are changed in the range of －10% and +10% (the range is equivalent to the least cover range stipulated in "*Guidelines on the Assessment of Investment Analysis (Version 05)*".

Table B-3: Results of the sensitivity analysis

	-10.0%	0.0	10.0%
Benchmark			
Electricity tariff			
Annual running cost			
Total investment			
Electricity production			

Figure B-1: Results of the sensitivity analysis of the Project

As the sensitivity analysis shows that the project is not financially attractive (the project IRR is lower than the benchmark in all cases), then the CPA is additional.

Summing up, it can be concluded that the CPA is eligible under proposed POA and it is additional as well.

B.6. Estimation of emission reductions of a generic CPA

B.6.1. Explanation of methodological choices

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The emission reduction of the CPA included in the proposed PoA is calculated according to procedures mentioned in methodology AMS-I.D (version 18.0) as follows:

Baseline emissions

Based on the methodology AMS-I.D (version 18.0), paragraph 22: Baseline emissions include only CO2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{CO_2 grid\,y} \quad (1)$$

Where:

BE_y = Baseline emissions in year *y* (tCO_2/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)

$EF_{CO2, grid,y}$ = CO_2 emission factor of the grid in year y (t CO_2/MWh)

According to the methodology AMS-I.D (version 18.0), paragraph 23, a combined margin manner(option(a)) is applied to calculate $EF_{CO2, grid,y}$.

Calculation of $EF_{CO2, grid,y}$

The Combined Margin CO_2 emission factor ($EF_{CO2, grid,y}$) for grid connected power generation is calculated following the guidance of "Tool to calculate the emission factor for an electricity system (version 04.0.0)", which consist of the weighted average of the Operating Margin CO_2 emission factor ($EF_{CO2, grid,y}$) and the Build Margin CO_2 emission factor ($EF_{CO2, grid,y}$), where the weights w_{OM} and w_{BM}, by default, are 0.5. The data used for calculation are from an official source (Tavanir) and available. According to the above Tool, the project activity shall apply the following six steps to calculate the $EF_{CO2, grid,y}$:

STEP 1. Identify the relevant electricity systems;
STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional);
STEP 3. Select a method to determine the operating margin (OM);
STEP 4. Calculate the operating margin emission factor according to the selected method;
STEP 5. Calculate the build margin (BM) emission factor;
STEP 6. Calculate the combined margin (CM) emission factor.

Step 1. Identify the relevant electricity systems

The Project will supply electricity to the National Grid of Iran (NGI) through the 230KV transmission line, so the spatial extent of the project boundary is the NGI.

The distribution network of the NGI has interconnections with electricity systems of Armenia, Azerbaijan, Turkey, Nakhichevan, Pakistan, Afghanistan, Turkmenistan and Iraq. These connections are operating both for import and export of electricity. In recent 3 years (2009-2012), the electricity has been imported only from Armenia, Azerbaijan, Nakhichevan and Turkmenistan, while electricity has been exported to all of the connected countries, except Azerbaijan.

According to requirement of the *tool to calculate the emission factor for an electricity system*, imports of electricity from connected electricity systems have been taken into account in determining the operating margin emission factor, using the procedure described in the Tool:

For the purpose of determining the operating margin emission factor, use one of the following options to determine the CO_2 emission factor(s) for net electricity imports from a connected electricity system:

(a) 0 t CO_2/MWh; or

(b) The simple operating margin emission rate of the exporting grid, determined as described in Step 4 section 6.4.1, if the conditions for this method, as described in Step 3 below, apply to the exporting grid; or

(c) The simple adjusted operating margin emission rate of the exporting grid, determined as described in Step 4 section 6.4.2 below; or

(d) The weighted average operating margin (OM) emission rate of the exporting grid, determined as described in Step 4 section 6.4.4 below.

For imports from connected electricity systems located in Annex-I country (ies), the emission factor is 0 tons CO_2 per MWh.

The simple adjusted operating margin (option c) and simple operating margin (option b) emission factors have been used for electricity imports from Armenia and Azerbaijan, respectively. These emission factors have been obtained from registered CDM projects of these countries. For electricity imports from Nakhichevan and Turkmenistan, the most conservative emission factor (0tCO_2/MWh) has been used, because of the lack of required data. The details of the calculations are provided in ER calculation spreadsheet.

Also electricity exports have not been subtracted from electricity generation data used for calculating and monitoring the electricity emission factors, according to the requirement of the Tool.

Step 2. Choose whether to include off-grid power plants in the project electricity system (optional)

In this step, the following Option has been selected to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Step 3. Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM

The simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

As shown in below table, low-cost/most-run resources constitute less than 50% of total grid generation in the five most recent years. Hence, the simple OM method is applicable in calculation of operating margin emission factor.

Table B-4: the proportion of low-cost/must-run resources in total grid electricity generation

Title	**1388** (3/21/2009-3/20/2010)	**1389** (3/21/2010-3/20/2011)	**1390** (3/21/2011-3/20/2012)	**1391** (3/21/2012-3/20/2013)	**1392** (3/21/2013-3/20/2014)
Total generation (GWh)	7,146	9,446	11,984	12377	14391

from low-cost/must-run resources (hydro)					
Total generation (GWh) from low-cost/must-run resources (others)	228	211	574	2067	4767
Total generation (GWh) from low-cost/must-run resources (total)	7,374	9,657	12,558	14444	19158
Total grid generation (GWh)	212,335	224,320	231,041	245303	252850
Ratio of total generation of low-cost/must-run resources to the total grid generation	**3.47%**	**4.31%**	**5.44%**	**5.89%**	**7.58%**

For the proposed project, the ex-ante option with using the data vintage as 3-year generation-weighted average based on the most recent data is chosen for calculation of simple OM emission factor.

Step 4. Calculate the operating margin emission factor according to the selected method

The simple OM emission factor ($EF_{grid,OMsimple,y}$) is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated by one of the following two options:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit; or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Because enough data is available for NGI, thus option A is used.

Option A - Calculation based on average efficiency and electricity generation of each plant

Under this option, the simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_{m} EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad \textbf{(2)}$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

m = All power units serving the grid in year *y* except low-cost / must-run power units

y = The relevant year as per the data vintage chosen in Step 3

Determination of $EF_{EL,m,y}$

Option A1. If for a power unit *m* data on fuel consumption and electricity generation is available, the emission factor ($EF_{EL,m,y}$) should be determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{EG_{m,y}} \quad (3)$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

$FC_{i,m,y}$ = Amount of fossil fuel type *i* consumed by power unit *m* in year *y* (Mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit)

$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

m = All power units serving the grid in year *y* except low-cost/must-run power units

i = All fossil fuel types combusted in power unit *m* in year *y*

y = The relevant year as per the data vintage chosen in Step 3

Option A2. If for a power unit *m* only data on electricity generation and the fuel types used is available, the emission factor should be determined based on the CO_2 emission factor of the fuel type used and the efficiency of the power unit, as follows:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}} \quad (4)$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

$EF_{CO2,m,i,y}$ = Average CO_2 emission factor of fuel type i used in power unit m in year y (tCO_2/GJ)

$\eta_{m,y}$ = Average net energy conversion efficiency of power unit m in year y (ratio)

m = All power units serving the grid in year *y* except low-cost/must-run power units

y = The relevant year as per the data vintage chosen in Step 3

Where several fuel types are used in the power unit, use the fuel type with the lowest CO_2 emission factor for $EF_{CO2,m,i,y}$.

Whereas the data on fuel consumption and electricity generation is available for every power plants of NGI, option A1 is used for determination of $EF_{EL,m,y}$, except in one power plant (Mes Sarcheshmeh-steam), which option A2 is used for calculation of $EF_{EL,m,y}$ in year 1390 (2011-2012) because only data on electricity generation and the fuel type used is available for this power plant.

Determination of $EG_{m,y}$

The data on net electricity generation and types and amount of fuels consumed in each power plant and also data on the net caloric values of the fuels are obtained from the National Statistics of Iran Power Industry from 2009 to 2012 (latest published data).

The emission factors of the fuels are obtained from national documents provided by Ministry of Energy of Iran (Electric Power Industry in Iran, and Iran and World Energy Facts and Figures).

The details of the calculations are provided in ER calculation spreadsheet.

Step 5. Calculate the build margin (BM) emission factor

In terms of vintage of data, project participants chooses Option 1 to calculate the BM emission factor ($EF_{grid,BM,y}$) of the national grid. The Option 1 is described as follow:

Option 1: For the first crediting period, calculate the build margin emission factor *ex ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

The sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\geq 20\%}$, in MWh);

(c) From $SET_{5\text{-units}}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. Ignore steps (d), (e) and (f).

Since the $AEG_{SET\geq 20\%}$ is larger than $AEG_{SET\text{-}5\text{-}units}$ (The details of the calculations are provided in ER calculation spreadsheet), $SET_{\geq 20\%}$ was selected as SET_{sample}.

Based on the most recent information available at the time of CDM-PDD submission to the DOE for validation, the oldest power unit in SET_{sample} has started to supply electricity to the grid since 2006. As none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, SET_{sample} was used to calculate the build margin and steps (d), (e) and (f) were ignored.

The build margin emission factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follow:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad \textbf{(5)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

m = Power units included in the build margin

y = Most recent historical year for which power generation data is available

The tools further states that "The CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) should be determined as per the guidance in Step 4 (a) for the simple OM, using options A1, A2 or A3, using for *y* the most recent historical year for which power generation data is available, and using for *m* the power units included in the build margin".

The details of the calculations are provided in ER calculation spreadsheet.

Step 6. Calculate the combined margin (CM) emissions factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

The weighted average CM method (option A) should be used as the preferred option. In this project, the combined margin emission factor is calculated using method (a), weighted average CM, as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM} \quad \textbf{(6)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y* (tCO_2/MWh)

w_{OM} = Weighting of operating margin emissions factor (%)

w_{BM} = Weighting of build margin emissions factor (%)

As indicated in the Tool, the weighting factors for hydropower projects during the first crediting period as w_{OM} and w_{BM} are 0.5 for each and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting periods.

Project activity emissions

For most renewable energy project activities, $PE_y = 0$
And, as per paragraph 39 of AMS I.D, emissions from water reservoirs of hydro power plants have to been considered the following procedure described in the ACM 0002.

According to the ACM0002(version 13.0.0), project emissions shall be accounted as:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad \textbf{(7)}$$

Where:

PE_y = Project emissions in year *y* (tCO_2e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year *y* (tCO_2/yr)

$PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows:

(a) If the power density of the project activity (*PD*) is greater than 4 W/m^2 and less than or equal to 10 W/m^2:

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000} \quad \textbf{(8)}$$

Where:

$PE_{HP,y}$ = Project emissions from water reservoirs (tCO_2e/yr)

EF_{Res} = Default emission factor for emissions from reservoirs of hydro power plants in year *y* ($kgCO_2e/MWh$)

TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y* (MWh)

(b) If the power density of the project activity (*PD*) is greater than 10 W/m^2:

$$PE_{HP,y} = 0 \quad \textbf{(9)}$$

The power density of the project activity (*PD*) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \quad \textbf{(10)}$$

Where:

PD = Power density of the project activity (W/m^2)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero

Leakage

According to the AMS.I-D/Version 18.0, leakage emissions are considered, if the energy generation equipment is transferred from another activity. Since there is not any equipment transfer in this PoA, leakage emission is zero , i.e. LE_y=0.

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \quad \textbf{(11)}$$

Where:

ER_y = Emission reductions in year *y* (t CO_2e/yr)

BE_y = Baseline emissions in year *y* (t CO_2/yr)

PE_y = Project emissions in year *y* (t CO_2e/yr)

B.6.2. Data and parameters fixed ex-ante

>>

Data / Parameter:	$FC_{i,m,y}$
Data unit:	1000 m^3 for NG and 1000 liter for Diesel Oil and Heavy Oil
Description:	Amount of fossil fuel type i consumed by power plant / unit *m* in year *y*
Source of data:	National Statistics of Iran power industry (2009-2013)
Value(s) applied:	See ER calculation spreadsheet for details
Choice of data or Measurement methods and procedures:	These data is national and official statistics
Purpose of data	calculation of baseline emissions
Additional comment:	

Data / Parameter:	$NCV_{i,y}$
Data unit:	GJ/ m^3 or GJ/ liter
Description:	Net calorific value (energy content) of fossil fuel type i in year y
Source of data:	National Statistics of Iran power industry (2010-2014)
Value(s) applied:	See ER calculation spreadsheet for details
Choice of data or Measurement methods and procedures:	These data is national and official statistics
Purpose of data	calculation of baseline emissions
Additional comment:	

Data / Parameter:	$EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$
Data unit:	tCO_2/ GJ
Description:	CO_2 emission factor of fossil fuel type *i* used in power unit *m* in year *y*
Source of data:	1. Electric Power Industry in Iran 2. Iran and World Energy Facts and Figures
Value(s) applied:	See ER calculation spreadsheet for details
Choice of data or Measurement methods and procedures:	National values are used
Purpose of data	calculation of baseline emissions
Additional comment:	

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net electricity generated by power plant/unit *m* in year *y*
Source of data:	National Statistics of Iran power industry (2009-2013)
Value(s) applied:	See ER calculation spreadsheet for details

Choice of data or Measurement methods and procedures:	These data is national and official statistics
Purpose of data	calculation of baseline emissions
Additional comment:	

Data / Parameter:	$\eta_{m,y}$
Data unit:	-
Description:	Average net energy conversion efficiency of power unit *m* in year *y*
Source of data:	National Statistics of Iran power industry (2009-2013)
Value(s) applied:	See ER calculation spreadsheet for details
Choice of data or Measurement methods and procedures:	These data is national and official statistics
Purpose of data	calculation of baseline emissions
Additional comment:	

B.6.3. Ex-ante calculations of emission reductions

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As mentioned in section B.6.1 part II, ex-ante emission reduction is estimated using equation 11:

$$ER_y = BE_y - PE_y \quad (11)$$

Calculation of project emission:

Based on methodology AMS-I.D (version 18.0), paragraph 39, for the hydropower CPA without reservoir CPAs emission reduction will be zero, $PE_y = 0$.

And according to methodology ACM0002 (version 15.0.0), for the CPA with reservoir, the power density is calculated ex-ante using equation 10.

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} = \frac{XXX - YYY}{zz - nn} = aaa$$

Therefore, the Power Density of the CPA is [aaa] W/m2.

- If the power density of the single or multiple reservoirs (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000}$$

- If the power density of the project activity (PD) is greater than 10 W/m^2:
  $PE_{HP,y} = 0$

Calculation of baseline emission:

Applying the procedure described in section B.6.1, the operating margin, built margin and combined margin emission factors of national grid of Iran are calculated as follow:

$EF_{grid,OMsimlpe,y}$ = 0.7440 tCO_2/MWh

$EF_{grid,BM,y}$= 0.6406 tCO_2/MWh

$EF_{grid,CM,y}$ = 0.5×0.7440 tCO_2/MWh+0.5×0.6406tCO_2/MWh = 0.6923 tCO_2/MWh

The annual electricity delivered by the CPA is estimated as [number] MWh/yr and will be monitored ex-post. Then the baseline emissions are calculated ex-ante using equation 1:

$BE_y=EG_{PJ,y}\times EF_{grid,CM,y}$

The details of the calculations are provided in ER calculation spreadsheet.

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	**$EG_{PJ,y}$**
Data unit:	MWh/y
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data:	Electricity meters
Value(s) applied	-
Measurement methods and procedures:	The following parameters will be measured: (i) The quantity of electricity supplied by the project to the grid (ii) The quantity of electricity delivered to the project from the grid
Monitoring frequency:	Continuous measurement and at least monthly recording
QA/QC procedures:	The meters will be checked and calibrated annually, according to the relevant national electric industry standards and regulations. Data measured by the main meter will be cross checked by the data from check meters.
Purpose of data	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	**A_{PJ}**
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data:	Project site
Value(s) applied	-
Measurement methods and procedures:	Measured from topographical surveys, maps, satellite pictures, etc.
Monitoring frequency:	Annually.
QA/QC procedures:	-
Purpose of data	Calculation of project emissions
Additional comment:	-

B.7.2. Description of the monitoring plan for a generic CPA

The monitoring plan is designed to calculate the GHG emission reductions at the CPA level. Co-operation of The CPA implementer and the CME is required to have an accurate monitoring.

1- Monitoring responsibilities

The CME is assumed responsible for:

- Being the overall supervisor of the PoA
- Preparing the operation and monitoring manual for CPAs
- Calculating emission reductions

- Providing monitoring reports periodically to the DOE

CPA implementer will be responsible for:

- Monitoring of CPA operations
- Reporting collected data to the CME periodically
- Training employees and set up a CDM team

CDM team will be responsible for data recording, collection, reporting to CME and preservation. This team will be composed by the project manager, technicians, and statisticians.

The detailed structure is shown in figure B-2

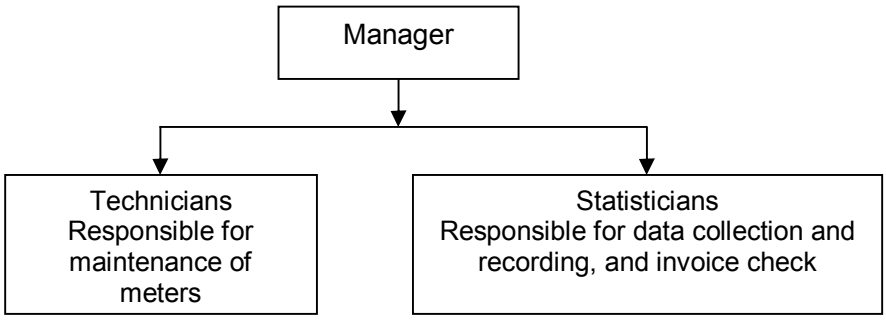

Figure B-2: Management structure of the monitoring activity

Responsibility of Statisticians:

1. Monitors the required parameters:
   - Quantity of electricity supplied to the grid by the project activity

2. Records and archiving data using computer software; the records will serve as back-up purpose and archived at Project site. All the data will be kept at least for 2 years after the end of the crediting period.
3. Compiles and analyses the monthly monitoring reports and cross-checks the monitoring report data against electricity sales receipts.
4. Elaborates an estimate of emission reduction in an Emission Reduction Monitoring Report annually.
5. Ensures that operators are appropriately trained and assigned for monitoring/checking the different parameters/meters with classes and an instruction manual.
6. Reviews the instruction manual for its effectiveness and improvement. This manual will be made available during verification.

Responsibility of maintenance Technicians:

1. Ensures that all meters installed at the plant are calibrated according to national industrial standards.
2. Ensures that all meters are operating properly, and requests to repair or replace the meters in case of any malfunction.
3. Elaborates the Calibration Report annually. The Calibration Report is composed listing all CDM-related instruments, their details, calibration status and expected error.

Responsibility of manager:

1. Manages and supervises all monitoring activities under the project.
2. Review and approve the Emission Reduction Monitoring Report with all its attachments that will be verified by the CME.
3. Subjects the Calibration Report Status to internal audit and provides as an attachment in the annual Emission Reduction Monitoring Report, for verification.

2- Training

For operation and maintenance of equipment, monitoring and recording process relevant people will be educated and qualified. All training records will be documented by CPA manager.

3- Data to be monitored

List of monitoring parameters will be determined and described in CPA level. Required data will be monitored by the CPA implementer. It will be collected manually or will be saved electronically during the crediting period.

4- A scheme of metering equipment

The CPA implementer will record electricity delivered to and imported from the grid, if any, cautiously by energy meters. The net electricity generated will be considered for emission reduction calculation. Also in order to accuracy check, there is a gateway in the nearest substation that receives the generated electricity. If there is a significant difference between energy meters records in the site and substation, an investigation must be done for explanation.

5- Examination and Calibration

The electric meters should be examined and undergo regular field calibration according to the relevant standards and regulations of the power industry. After the examination and calibration, the meters should be sealed. All the meters installed shall be tested and calibrated annually for:

(a) Detection of a difference larger than the allowable error in the readings of meters

(b) Repair of meters in case of any failure of one or more parts to operate in accordance with the specifications. In case of irreparable damage of the meters, they shall be changed.

The CPA implementer is responsible for calibration of all metering devices to relevant standards.

6- Data Management System

The data measured hourly will be monthly recorded and archived electronically or manually, in addition monthly data will be printed in paper for a backup.

The project owner will keep electricity sale and purchase invoices. All written documentation such as maps, drawings, the EIA and the feasibility study, should be stored and should be available to the verifier so that the reliability of the information could be checked. The document management system will be developed to ensure adequate document control for CDM purposes; also this system will ease verification process. The CDM Manager of the project is responsible for checking the data (according to a formal procedure) and he will be responsible for managing the collection, storage and archive of all data and records. All the data shall be kept until two years after the end of credit period

Appendix 1. Contact information of coordinating/managing entity and responsible person(s)/ entity(ies)

CME and/or responsible person/ entity	☒ CME ☒ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	Mehr Renewable Energy Company
Street/P.O. Box	24Metri Ave, Farhang Sq., Sadat Abad
Building	No. 11, Bldg. 4,
City	Tehran
State/Region	Tehran
Postcode	1998699134
Country	Iran
Telephone	+98 21 2213 6142
Fax	+98 21 2213 6271
E-mail	ahadi@mehrenergy.com
Website	www.mehrenergy.com
Contact person	Mohammad Sadegh Ahadi
Title	Managing Director
Salutation	Mister
Last name	Ahadi
Middle name	-

Appendix 2. Affirmation regarding public funding

The project has not received any type of public finding or public financial help.

Appendix 3. Applicability of methodology(ies) and standardized baseline(s)

Background information for calculation of Operating Margin Emission Factor for year 1390 (21 March 2011-20 March 2012)

No.	Type	Power Plant	owner	commissioning date of first unit	net electricity generation* (MWh)	$FC_{i,m,y}$		
						Natural Gas* ($1000m^3$)	Diesel* (1000liter)	Heavy Oil* (1000liter)
1	Steam Power Plants	Shahid Firouzi (Tarasht)	MOE	1959	206,687	106,704	0	0
2		Besat	MOE	1967	1,408,133	410,574	3,521	88,570
3		Esfahan (Eslamabad)	MOE	1969	5,052,857	658,659	0	785,069
4		Montazer Ghaem	MOE	1971	3,413,009	335,691	6,434	629,616
5		Shahid Beheshti (Loshan)	MOE	1973	1,740,190	404,093	119,373	0
6		Zarand (steam)	MOE	1973	324,550	0	0	121,790
7		Mashhad (steam)	MOE	1968	975,146	363,638	328	0
8		Shahid Salimi (Neka)	MOE	1979	10,392,089	1,561,294	0	1,151,889
9		Ramin	MOE	1979	12,027,174	2,300,098	0	882,773
10		Bandar Abbas (steam)	MOE	1980	5,537,278	820,449	28,213	859,075
11		Shahid Montazeri	MOE	1984	10,444,743	1,215,255	88	1,653,262
12		Tous (steam)	MOE	1985	3,689,035	755,864	511	345,865
13		Tabriz	MOE	1986	4,102,851	477,647	299	718,228
14		Shahid Rajaei	MOE	1992	5,785,741	496,341	0	1,030,497
15		Bistoon	MOE	1994	4,293,726	409,008	0	727,684
16		Shahid Mofateh	MOE	1994	3,981,849	334,539	0	751,197
17		Iranshahr	MOE	1995	1,075,016	0	136	359,138
18		Shazand	MOE	2000	7,915,531	924,529	1,696	1,128,441
19		Sahand	MOE	2004	3,876,925	286,349	45	785,757
20		Zargan (steam)	Private	1975	1,032,467	276,960	0	0
21		Zobahan (steam)	Industry	1970	854,452	163,020	0	0
22		Foolad Mobarakeh (steam)	Industry	1991	1,116,215	396,383	1,709	0

23		Mes Sarcheshmeh (steam)	Industry	1977	110,886	ND	ND	0
24	Gas Turbine Power Plants	Shiraz	MOE	1965	469,262	177,672	26,310	0
25		Mashhad (Gas Turbine)	MOE	1971	366,274	140,082	1,980	0
26		Boushehr	MOE	1975	153,948	74,272	0	0
27		Shahid Beheshti (Loshan)	MOE	1977	83,811	32,030	0	0
28		Doroud	MOE	1977	66,462	36,356	3	0
29		Shahid Zanbagh Yazd	MOE	1977	163,836	65,286	0	0
30		Rey	MOE	1977	1,145,507	447,137	41,772	0
31		Tabriz Jadid	MOE	1978	26,040	12,298	0	0
32		Konarak	MOE	1978	317,655	0	144,656	0
33		Oroumiyeh	MOE	1981	96,325	28,159	15,203	0
34		Shariati (Gas Turbine)	MOE	1984	20,789	9,832	116	0
35		Soufian	MOE	1984	129,262	55,091	4,562	0
36		Zahedan	MOE	1986	802,389	0	331,573	0
37		Ghaen (Gas Turbine)	MOE	1988	132,598	55,086	1,441	0
38		Hesa	MOE	1989	46,679	17,946	766	0
39		Kangan	MOE	1995	590,159	273,343	0	0
40		Yazd Gazi	MOE	1998	133,124	61,307	0	0
41		Semnan	MOE	1999	0	0	0	0
42		Forg Darab	MOE	2002	0	0	0	0
43		Bandar Abbas (Gas Turbine)	MOE	2002	72,931	42,397	0	0
44		Abadan (CC)	MOE	2002	1,754,766	391,812	141,748	0
45		Hormozgan (CC)	MOE	2004	5,399,367	1,481,935	149,698	0
46		Shirvan (CC)	MOE	2005	1,922,253	498,621	97,023	0
47		Parand	MOE	2006	2,157,443	490,219	221,610	0
48		Oroumiyeh (CC)	MOE	2006	2,111,735	476,923	217,337	0
49		Jahrom (CC)	MOE	2007	3,365,560	922,108	176,654	0
50		Sabalan (CC)	MOE	2007	1,755,844	252,725	347,308	0
51		Chabahar (Gas Turbine)	MOE	2008	1,487,502	0	510,264	0
52		Shahid Kaveh (CC)	MOE	2008	2,086,201	586,382	86,180	0
53		Zargros	MOE	2010	1,836,727	361,409	238,282	0
54		Soltanieh	MOE	2010	441,466	0	141,224	0
55		Semnan (CC)	MOE	2010	423,042	0	130,948	0

56		Bastami (CC)	MOE	2011	84,339	0	27,041	0
57		Zargan (Gas Turbine)	Private	1978	137,672	50,916	0	0
58		Chehel Stoon	Private	2005	4,036,453	835,301	422,974	0
59		Roudeshour	Private	2006	4,208,556	650,853	527,405	0
60		Asalouyeh	Private	2007	4,230,691	1,254,756	143,329	0
61		Ferdowsi	Private	2007	2,341,370	667,786	114,490	0
62		Kahnooj (private)	Private	2007	71,567	0	31,323	0
63		Khoramshahr	Private	2008	2,536,131	376,038	454,043	0
64		Kashan (CC)	Private	2009	1,052,031	134,166	199,483	0
65		Noshahr	Private	2009	30,645	14,301	3	0
66		Golestan	Private	2010	1,117,813	303,930	54,924	0
67		Pareh Sar	Private	2011	80,350	4,104	24,359	0
68		Hafez	Private	2011	168,407	49,070	5,658	0
69		Zavareh	Private	2011	373,918	1,707	122,301	0
70		Tolid Parakandeh	Private	2011	146,586	36,647	0	0
71		Teraktoursazi Tabriz	Industry	1983	0	0	0	0
72		Petroshimi Tabriz	Industry	1997	153	51	0	0
73		Zobahan (Gas Turbine)	Industry	1975	0	0	0	0
74		Foolad Mobarakeh (GT)	Industry	1991	631,166	210,611	900	0
75		Petroshimi Fajr	Industry	2005	4,051,743	1,248,628	7,666	0
76		petroshimi Mobin	Industry	2006	24,548	8,041	0	0
77		Mes Sarcheshmeh (GT)	Industry	1977	449,447	109,942	40,354	0
78		Chador Malou	Industry	2003	0	0	0	0
79		Pars Jnoobi	Industry	2008	1,714,070	514,847	0	0
80		Petroshimi Ilam	Industry	2010	132,356	40,430	0	0
81		Gaz Maye	industry	2010	541,084	162,466	0	0
82	Combined Cycle Power Plants	Gilan CC	MOE	1992	7,022,184	1,227,327	351,171	0
83		Montazer Ghaem CC	MOE	1992	5,372,010	870,899	296,148	0
84		Ghom CC	MOE	1993	4,339,790	659,733	299,371	0
85		Shahid Rajaei CC	MOE	1994	5,851,328	929,327	395,070	0
86		Neishabour CC	MOE	1994	5,222,237	1,017,823	190,843	0
87		Shariati CC	MOE	1994	2,053,274	398,213	67,828	0
88		Fars CC	MOE	1995	5,562,276	1,074,301	188,173	0

89		Khoy CC	MOE	1997	2,037,510	247,388	213,784	0
90		Shahid Salimi CC	MOE	1990	2,499,779	566,425	0	0
91		Yazd CC	MOE	2000	4,037,229	651,834	267,778	0
92		Kazeroun CC	MOE	1994	6,131,366	1,259,240	193,251	0
93		Kerman CC	MOE	2001	9,722,242	1,423,396	730,727	0
94		Damavand CC	MOE	2003	8,883,936	1,545,255	584,719	0
95		Sanandaj CC	MOE	2005	2,653,370	499,237	222,290	0
96	diesel engine	total grid connected diesel	MOE	no data	16,583	0	5,748	0
97	import	Armenia			1,508,375			
98		Azerbaijan			1,594			
99		Nakhichevan			56,791			
100		Turkmenistan			2,089,303			
Total					**222,137,780**	**38,732,512**	**9,372,165**	**12,018,851**

Reference: National Statistics of Iran Power Industry (2011-2012)

Background information for calculation of Operating Margin Emission Factor for year 1391 (21 March 2012-20 March 2013)

No.	Type	Power Plant	owner	commissioning date of first unit	net electricity generation* (MWh)	$FC_{i,m,y}$		
						Natural Gas* ($1000m^3$)	Diesel* (1000liter)	Heavy Oil* (1000liter)
1	Steam Power Plants	Shahid Firouzi (Tarasht)	MOE	1959	227,530	118,929	0	0
2		Besat	MOE	1967	1,480,437	225,355	449	303,387
3		Esfahan (Eslamabad)	MOE	1969	4,126,213	378,397	0	809,786
4		Montazer Ghaem	MOE	1971	3,377,335	284,185	6,167	654,560
5		Shahid Beheshti (Loshan)	MOE	1973	1,639,229	423,971	100,235	0
6		Zarand (steam)	MOE	1973	246,425	0	0	90,886
7		Mashhad (steam)	MOE	1968	835,519	315,364	1,345	0
8		Shahid Salimi (Neka)	MOE	1979	9,489,720	686,619	0	1,801,936
9		Ramin	MOE	1979	11,815,099	2,194,712	0	909,756
10		Bandar Abbas (steam)	MOE	1980	6,257,812	618,659	1,135	1,193,735
11		Shahid Montazeri	MOE	1984	10,735,175	702,244	0	2,335,911
12		Tous (steam)	MOE	1985	3,702,810	356,160	322	722,196
13		Tabriz	MOE	1986	3,461,510	152,334	1,344	817,426
14		Shahid Rajaei	MOE	1992	5,383,384	354,398	0	1,091,128
15		Bistoon	MOE	1994	3,814,549	298,024	0	727,963
16		Shahid Mofateh	MOE	1994	3,104,165	248,293	0	616,029
17		Iranshahr	MOE	1995	1,237,555	0	282	419,533
18		Shazand	MOE	2000	7,362,998	764,352	1,220	1,144,906
19		Sahand	MOE	2004	4,128,684	316,704	86	810,892
20		Zargan (steam)	Private	1975	681,335	184,448	0	0
21		Zobahan (steam)	Industry	1970	1,233,711	231,237	0	0
22		Foolad Mobarakeh (steam)	Industry	1991	1,053,485	308,815	19,587	0
23		Mes Sarcheshmeh (steam)	Industry	1977	89267	-	-	-

24	Gas Turbine Power Plants	Shiraz	MOE	1965	458,311	178,077	24,249	0
25		Mashhad (Gas Turbine)	MOE	1971	429,923	167,158	36	0
26		Boushehr	MOE	1975	114,604	56,659	0	0
27		Shahid Beheshti (Loshan)	MOE	1977	112,058	37,243	7,987	0
28		Doroud	MOE	1977	33,622	17,761	146	0
29		Shahid Zanbagh Yazd	MOE	1977	108,158	43,059	61	0
30		Rey	MOE	1977	1,124,641	448,397	30,711	0
31		Tabriz Jadid	MOE	1978	48,103	21,734	0	0
32		Konarak	MOE	1978	302,353	0	135,209	0
33		Oroumiyeh	MOE	1981	114,448	45,079	7,188	0
34		Shariati (Gas Turbine)	MOE	1984	47,598	20,948	1,614	0
35		Soufian	MOE	1984	248,126	112,067	2,316	0
36		Zahedan	MOE	1986	697,448	0	295,235	0
37		Ghaen (Gas Turbine)	MOE	1988	24,503	7,135	3,653	0
38		Hesa	MOE	1989	35,277	14,476	38	0
39		Kangan	MOE	1995	577,490	279,523	0	0
40		Yazd Gazi	MOE	1998	301,308	127,772	0	0
41		Semnan	MOE	1999	0	0	0	0
42		Forg Darab	MOE	2002	0	0	0	0
43		Bandar Abbas (Gas Turbine)	MOE	2002	42,112	18,057	291	0
44		Abadan (CC)	MOE	2002	1,817,569	443,105	53,881	0
45		Hormozgan (CC)	MOE	2004	5,078,429	1,461,999	80,762	0
46		Shirvan (CC)	MOE	2005	2,722,113	741,796	79,497	0
47		Parand	MOE	2006	2,841,574	798,946	160,131	0
48		Oroumiyeh (CC)	MOE	2006	2,386,173	594,370	201,265	0
49		Jahrom (CC)	MOE	2007	3,210,274	987,191	77,203	0
50		Sabalan (CC)	MOE	2007	1,985,997	490,211	171,123	0
51		Chabahar (Gas Turbine)	MOE	2008	1,516,378	0	530,740	0
52		Shahid Kaveh (CC)	MOE	2008	2,470,754	733,293	78,566	0
53		Zargros	MOE	2010	2,813,833	715,853	191,356	0
54		Soltanieh	MOE	2010	1,104,280	185,552	157,735	0
55		Semnan (CC)	MOE	2010	399,645	30,043	93,412	0

56		Bastami (CC)	MOE	2011	265,121	0	84,461	0
57		Zargan (Gas Turbine)	Private	1978	206,512	78,680	0	0
58		Chehel Stoon	Private	2005	3,584,100	908,740	210,199	0
59		Roudeshour	Private	2006	4,137,586	864,079	298,297	0
60		Asalouyeh	Private	2007	4,271,333	1,160,829	121,747	0
61		Ferdowsi	Private	2007	2,499,731	711,248	86,574	0
62		Kahnooj (private)	Private	2007	104,565	0	45,768	0
63		Khoramshahr	Private	2008	2,731,655	481,743	430,285	0
64		Kashan (CC)	Private	2009	1,299,632	355,533	70,982	0
65		Noshahr	Private	2009	29,769	14,760	1	0
66		Golestan	Private	2010	2,025,473	604,694	75,495	0
67		Pareh Sar	Private	2011	1,005,497	205,655	91,498	0
68		Hafez	Private	2011	2,332,466	693,645	40,485	0
69		Genaveh	Private	2012	198,923	0	68,960	0
70		Shirkooh	Private	2012	46,699	0	14,853	0
71		Tolid Parakandeh	Private	2011	293,244	73,311	0	0
72		Teraktoursazi Tabriz	Industry	1983	0	0	0	0
73		Petroshimi Tabriz	Industry	1997	0	0	0	0
74		Zobahan (Gas Turbine)	Industry	1975	0	0	0	0
75		Foolad Mobarakeh (GT)	Industry	1991	481,076	150,995	147	0
76		Petroshimi Fajr	Industry	2005	4,533,178	1,341,189	6,908	0
77		petroshimi Mobin	Industry	2006	0	0	0	0
78		Mes Sarcheshmeh (GT)	Industry	1977	407,214	123,474	0	0
79		Chador Malou	Industry	2003	0	0	0	0
80		Pars Jnoobi	Industry	2008	1,656,947	480,773	0	0
81		Petroshimi Ilam	Industry	2010	8,851	2,621	0	0
82		Gaz Maye	industry	2010	1,015,053	300,649	0	0
83	Combined Cycle Power Plants	Gilan CC	MOE	1992	7,323,820	1,370,255	313,715	0
84		Montazer Ghaem CC	MOE	1992	5,680,190	943,570	218,132	0
85		Ghom CC	MOE	1993	4,190,038	764,617	203,137	0
86		Shahid Rajaei CC	MOE	1994	5,904,832	929,719	375,345	0
87		Neishabour CC	MOE	1994	5,872,572	1,085,717	184,011	0
88		Shariati CC	MOE	1994	2,099,427	425,675	64,458	0

89		Fars CC	MOE	1995	5,826,676	1,205,204	120,285	0
90		Khoy CC	MOE	1997	2,155,204	334,770	158,574	0
91		Shahid Salimi CC	MOE	1990	2,098,787	436,390	0	0
92		Yazd CC	MOE	2000	4,710,815	821,562	187,021	0
93		Kazeroun CC	MOE	1994	7,094,170	1,422,761	196,957	0
94		Kerman CC	MOE	2001	8,862,737	1,342,577	477,427	0
95		Damavand CC	MOE	2003	11,936,228	2,105,574	621,560	0
96		Sanandaj CC	MOE	2005	4,451,649	743,632	264,145	0
97		Zavareh CC	private	2012	845,906	93,492	165,494	0
98	diesel engine	total grid connected diesel	MOE	no data	20,589	0	7,044	0
99	import	Armenia			1,582,000			
100		Azerbaijan			2,000			
101		Nakhichevan			60,000			
102		Turkmenistan			2,253,000			
Total					**234,756,314**	**40,518,837**	**7,720,542**	**14,450,030**

Reference: National Statistics of Iran Power Industry (2012-2013)

Background information for calculation of Operating Margin Emission Factor for year 1392 (21 March 2013-20 March 2014)

No.	Type	Power Plant	owner	commissioning date of first unit	net electricity generation* (MWh)	$FC_{i,m,y}$		
						Natural Gas* ($1000m^3$)	Diesel* (1000liter)	Heavy Oil* (1000liter)
1	Steam Power Plants	Shahid Firouzi (Tarasht)	MOE	1959	207,809	105,156	0	0
2		Besat	MOE	1967	1,095,521	213,786	558	162,573
3		Esfahan (Eslamabad)	MOE	1969	4,059,142	378,763	0	796,998
4		Montazer Ghaem	Private	1971	3,471,921	277,862	6,298	735,632
5		Shahid Beheshti (Loshan)	MOE	1973	1,651,468	289,809	232,640	0
6		Zarand (steam)	MOE	1973	193,102	0	0	70,270
7		Mashhad (steam)	Private	1968	856,419	294,998	19,257	0
8		Shahid Salimi (Neka)	MOE	1979	9,110,462	331,983	0	1,904,827
9		Ramin	MOE	1979	9,921,148	1,582,424	0	1,055,923
10		Bandar Abbas (steam)	MOE	1980	6,315,606	373,219	969	1,450,123
11		Shahid Montazeri	Private	1984	11,002,329	600,258	183	2,643,797
12		Tous (steam)	MOE	1985	3,877,448	189,084	542	912,068
13		Tabriz	Private	1986	4,248,213	113,349	518	1,068,031
14		Shahid Rajaei	MOE	1992	5,941,361	218,320	0	1,376,111
15		Bistoon	MOE	1994	3,193,757	159,930	0	711,507
16		Shahid Mofateh	MOE	1994	2,594,881	97,063	1	661,100
17		Iranshahr	MOE	1995	1,236,549	0	180	417,181
18		Shazand	MOE	2000	7,039,132	1,647,474	416	343,042
19		Sahand	MOE	2004	4,137,705	171,377	148	954,280
20		Zargan (steam)	Private	1975	616,648	166,884	0	0
21		Zobahan (steam)	Industry	1970	1,171,586	127,630	0	0
22		Foolad Mobarakeh (steam)	Industry	1991	1,079,770	374,237	25,016	0
23		Mes Sarcheshmeh (steam)	Industry	1977	97,311	-	-	-
24	Gas Turbine Power Plants	Shiraz	MOE	1965	273,318	98,626	17,363	0
25		Mashhad (Gas Turbine)	Private	1971	377,107	139,302	6,359	0
26		Boushehr	MOE	1975	90,175	45,521	0	0

27		Shahid Beheshti (Loshan)	MOE	1977	101,072	30,498	10,437	0
28		Doroud	MOE	1977	42,906	18,431	3,072	0
29		Shahid Zanbagh Yazd	Private	1977	296,107	111,067	6,683	0
30		Rey	MOE	1977	1,156,804	426,385	71,238	0
31		Tabriz Jadid	Private	1978	774	407	0	0
32		Konarak	MOE	1978	248,792	0	113,691	0
33		Oroumiyeh	MOE	1981	78,290	22,375	13,674	0
34		Shariati (Gas Turbine)	Private	1984	87,378	39,133	1,973	0
35		Soufian	MOE	1984	145,274	61,244	5,543	0
36		Zahedan	MOE	1986	689,831	0	301,124	0
37		Ghaen (Gas Turbine)	MOE	1988	18,294	6,177	1,987	0
38		Hesa	MOE	1989	13,625	4,568	836	0
39		Kangan	MOE	1995	657,211	312,534	0	0
40		Yazd Gazi	MOE	1998	289,461	121,151	0	0
41		Semnan	MOE	199	-	-	-	-
42		Forg Darab	MOE	2002	-	-	-	-
43		Bandar Abbas (Gas Turbine)	MOE	2002	75,532	30,251	0	0
44		Hormozgan (CC)	MOE	2004	4,619,263	1,289,476	112,541	0
45		Shirvan (CC)	MOE	2005	3,102,827	852,856	154,211	0
46		Parand	Private	2006	3,127,796	729,585	313,282	0
47		Oroumiyeh (CC)	Private	2006	2,868,408	506,280	413,962	0
48		Jahrom (CC)	MOE	2007	3,059,635	829,349	164,635	0
49		Sabalan (CC)	Private	2007	2,451,738	471,848	357,337	0
50		Chabahar (Gas Turbine)	Private	2008	1,832,119	0	640,535	0
51		Shahid Kaveh (CC)	MOE	2008	2,467,897	658,879	138,622	0
52		Zargros	MOE	2010	3,044,191	658,487	320,137	0
53		Soltanieh	MOE	2010	1,775,949	303,694	241,541	0
54		Semnan (CC)	Private	2010	1,392,710	332,010	91,177	0
55		Bastami (CC)	MOE	2011	783,773	67,491	172,516	0
56		Zargan (Gas Turbine)	Private	1978	288,314	114,012	0	0
57		Chehel Stoon	Private	2005	3,267,591	489,614	425,139	0
58		Roudeshour	Private	2006	3,969,081	676,179	432,513	0
59		Asalouyeh	Private	2007	4,313,377	1,142,028	106,859	0

60		Ferdowsi	Private	2007	2,651,561	732,137	165,354	0
61		Kahnooj (private)	Private	2007	155,868	0	72,012	0
62		Khoramshahr	Private	2008	2,808,203	423,957	480,256	0
63		Kashan (CC)	Private	2009	1,429,603	310,872	152,681	0
64		Noshahr	Private	2009	29,882	11,909	2,014	0
65		Golestan	Private	2010	2,554,931	646,419	209,674	0
66		Hafez	Private	2011	3,180,632	897,665	127,390	0
67		Genaveh	Private	2012	681,131	0	226,400	0
68		Tolid Parakandeh	Private	2011	506,989	126,748	0	0
69		Teraktoursazi Tabriz	Industry	1983	0	0	0	0
70		Petroshimi Tabriz	Industry	1997	0	0	0	0
71		Zobahan (Gas Turbine)	Industry	1975	0	0	0	0
72		Foolad Mobarakeh (GT)	Industry	1991	640,344	201,097	5	0
73		Petroshimi Fajr	Industry	2005	781,009	224,847	0	0
74		petroshimi Mobin	Industry	2006	0	0	0	0
75		Mes Sarcheshmeh (GT)	Industry	1977	437,265	146,639	0	0
76		Chador Malou	Industry	2003	0	0	0	0
77		Pars Jnoobi	Industry	2008	1,896,501	545,682	0	0
78		Palayeshgah Ilam	Industry	2009	9,446	2,699	0	0
79		Petroshimi Ilam	Industry	2010	0	0	0	0
80		Gaz Maye	industry	2010	201,703	57,673	0	0
81	Combined Cycle Power Plants	Gilan CC	Private	1992	8,155,806	1,368,044	490,035	0
82		Montazer Ghaem CC	Private	1992	5,320,177	859,637	312,131	0
83		Ghom CC	Private	1993	4,499,119	609,255	432,695	0
84		Shahid Rajaei CC	MOE	1994	5,602,479	754,622	496,679	0
85		Neishabour CC	Private	1994	5,907,378	880,054	341,770	0
86		Shariati CC	Private	1994	2,086,589	413,723	82,813	0
87		Fars CC	Private	1995	5,919,133	1,095,947	240,386	0
88		Khoy CC	Private	1997	2,243,986	252,248	251,595	0
89		Shahid Salimi CC	MOE	1990	1,924,970	443,274	0	0
90		Yazd CC	MOE	2000	4,639,116	763,169	232,846	0
91		Kazeroun CC	Private	1994	7,181,046	1,319,308	315,437	0
92		Kerman CC	MOE	2001	8,943,869	1,513,487	471,748	0

93		Damavand CC	Private	2003	12,483,356	1,799,786	1,012,102	0
94		Sanandaj CC	Private	2005	5,414,375	779,590	429,882	0
95		Zavareh CC	private	2012	1,465,794	282,798	147,232	0
96		Abadan	private	2002	1,999,639	538,139	45,877	0
97		Pareh Sar	private	2011	1,008,166	208,285	142,548	0
98		Shirkooh	Private	2012	778,170	0	257,044	0
99	diesel engine	total grid connected diesel	MOE	no data	28,469	0	9,394	0
100	import	Armenia			1,103,000			
101		Azerbaijan			6,000			
102		Nakhichevan			65,000			
103		Turkmenistan			2,533,000			
Total					**237,399,613**	**36,512,774**	**12,073,713**	**15,263,463**

Reference: National Statistics of Iran Power Industry (2011-2012)

Background information for calculation of Built Margin Emission Factor for year 1392 (21 March 2013-20 March 2014)

No.	Power Plant	type	unit No.	owner	start of operation		capacity (MW)	net electricity generation* (MWh)	$FC_{i,m,y}$		
									Natural Gas* ($1000m^3$)	Diesel* (1000liter)	Heavy Oil* (1000liter)
1	Bampoor	gas turbine	1	MOE	1392-12-22	3/13/2014	162	0	0	0	0
2	Parehsar	gas turbine	11-16	private	1390 - 92	2011 - 2013	968	1,008,166	208,285	142,548	0
3	Shirkooh Yazd	gas turbine	1-3	private	1391 and 1392	2013-2014	484	778,170	0	257,044	0
4	Siahbisheh	hydro	2	MOE	1392-10-07	10/2/2013	260	11,522	0	0	0
5	Siahbisheh	hydro	1	MOE	1392-02-16	5/6/2013	260	8,113	0	0	0
6	Distributed Generation	gas turbine	_	MOE	until 1392	until 2013	281	506,989	126,748	0	0
7	Petroshimi Damavand	gas turbine	1-2	MOE	1391-12-24	3/13/2013	324	0	0	0	0
8	Kahnooj	gas turbine	3	private	1391-12-19	3/8/2013	25	51,956	0	24,004	0
9	Gotvand	hydro	1	MOE	1391-11-11	1/30/2013	250	644,275	0	0	0
10	Gotvand	hydro	2	MOE	1391-06-28	9/18/2012	250	470,101	0	0	0
11	Shahid Montazeri	expansion turbine	1	MOE	1391-04-24	7/14/2012	8	0	0	0	0
12	Hafez	gas turbine	11-16	private	1390 and 91	2011 and 2012	972	3,180,632	897,665	127,390	0
13	Gotvand	hydro	3	MOE	1391-03-18	6/7/2012	250	454,673	0	0	0
14	Genaveh	gas turbine	11-12	private	1391-03-03	5/23/2012	324	Registered as CDM project			
15	Gotvand	hydro	4	MOE	1391-02-16	5/5/2012	250	343,548	0	0	0
16	Soltanieh	gas turbine	4	MOE	1391-02-02	4/21/2012	162	427,994	78,464	52,384	0
17	Kerman deisel geneators	deisel	1-18	MOE	1391	2011-2012	31	355	0	142	0
18	Petroshimi Mobin	gas turbine	7	MOE	1391	2011-2012	123	0	0	0	0
19	small scale photovoltaic	solar	-	MOE	1391	2011-2012	32	0	0	0	0
20	Isfahan incineration	incineration	1	MOE	1391	2011-2012	6	0	0	0	0
21	Teharn incineration	incineration	1	MOE	1391	2011-2012	6	0	0	0	0
22	Tehran Biogas	bio gas	1	MOE	1391	2011-2012	5	0	0	0	0
23	Khaf wind	wind	1-2	MOE	1391	2011-2012	4	6,762	0	0	0

24	Isfahan wind	wind	1	MOE	1391	2011-2012	0.66	555	0	0	0
25	Sareyn wind	wind	1	MOE	1391	2011-2012	0.66	633	0	0	0
26	Manjil	wind	16	MOE	1391	2011-2012	10.56	19,543	0	0	0
27	Shahid Montazeri	expansion turbine	2	MOE	1390-12-26	3/16/2012	8	0	0	0	0
28	Bastami	gas turbine	12	MOE	1390-12-10	2/29/2012	162	344,246	35,225	77,996	0
29	Piran	hydro	1 and 2	MOE	1390-09-07	11/28/2011	8.5	Registered as CDM project			
30	Sanandaj	combined cycle	15	MOE	1390-06-22	9/13/2011	160	Registered as CDM project			
31	Boushehr nuclear	nuclear	1	MOE	1390	2011-2012	1020	4,554,245	0	0	0
32	Bastami	gas turbine	11	MOE	1390-04-17	7/8/2011	162	439,527	32,266	94,521	0
33	Karoun 4	hydro	14	MOE	1390-04-15	7/6/2011	250	256,369	0	0	0
34	Zagros	gas turbine	14	MOE	1390-02-25	5/15/2011	162	799,103	152,493	96,987	0
35	Zavareh	gas turbine	11-12	private	1390	2011-2012	324	1,465,794	282,798	147,232	0
36	Petroshimi Fajr	gas turbine	6-11	industry	1388-1390	2009-2011	824	781,009	224,847	0	0
37	Zobahan	steam	5-6	industry	1390	2011-2012	110	1,171,586	127,630	0	0
38	Mahshahr wind	wind	1	MOE	1389-12-21	3/12/2011	0.66	351	0	0	0
39	Karoun 4	hydro	13	MOE	1389-12-19	3/10/2011	250	383,931	0	0	0
40	Zagros	gas turbine	13	MOE	1389-11-19	2/8/2011	162	711,221	160,313	64,365	0
41	Shiraz wind	wind	1	MOE	1389-11-15	2/4/2011	0.66	233	0	0	0
42	Soltanieh	gas turbine	13	MOE	1389-11-15	2/4/2011	162	372,685	70,482	43,405	0
43	Karoun 4	hydro	12	MOE	1389-11-10	1/30/2011	250	369,362	0	0	0
44	Semnan	gas turbine	12	MOE	1389-11-02	1/22/2011	162	633,444	154,648	35,605	0
45	Sabalan	gas turbine	16	MOE	1389-10-24	1/14/2011	162	451,362	87,736	61,312	0
46	Semnan	gas turbine	11	MOE	1389-10-04	12/25/2010	162	759,266	177,362	55,572	0
47	Soltanieh	gas turbine	12	MOE	1389-09-07	11/28/2010	162	441,900	75,376	60,211	0
48	Karoun 4	hydro	11	MOE	1389-09-02	11/23/2010	250	377,473	0	0	0
49	Sabalan	gas turbine	15	MOE	1389-07-08	9/30/2010	162	567,741	108,507	80,223	0
50	Oroumieh	gas turbine	16	MOE	1389-06-22	9/13/2010	162	359,870	68,621	44,815	0
51	Soltanieh	gas turbine	11	MOE	1389-06-05	8/27/2010	162	533,394	79,372	85,541	0
52	Zagros	gas turbine	12	MOE	1389-05-07	7/29/2010	162	722,531	169,467	57,463	0
53	Zagros	gas turbine	11	MOE	1389-04-24	7/15/2010	162	811,335	176,214	101,322	0
54	Oroumieh	gas turbine	15	MOE	1389-04-02	6/23/2010	162	394,571	77,986	47,706	0
55	Lavarak	hydro	2	MOE	1389-01-22	4/11/2010	22	17,739	0	0	0

56	Khoramshahr	gas turbine	11-14	private	1387-1389	2008-2011	648	2,808,203	423,957	480,256	0
57	Golestan	gas turbine	11-16	private	1389	2010-2011	972	2,554,931	646,419	209,674	0
58	Gaz Maye	gas turbine	11-12	industry	1389	2010-2011	324	201,703	57,673	0	0
59	Petroshimi Ilam	gas turbine	11-14	industry	1389	2010-2011	120	0	0	0	0
60	Palayeshgah Ilam	gas turbine	11-13	industry	1388-1389	2009-2011	75	9,446	2,699	0	0
61	Tabriz Wind	wind	1-3	MOE	1388-1389	2009-2010	1.98	2,654	0	0	0
62	Lavarak	hydro	1	MOE	1388-9-21	12/12/2009	22	61,890	0	0	0
63	Shahid Kaveh	gas turbine	14	MOE	1388-5-22	8/13/2009	159	735,557	182,389	50,509	0
64	Shahid Rajaei (Takam)	hydro	2	MOE	1388-5-18	8/9/2009	5	0	0	0	0
65	Yazd CC	gas turbine	2	MOE	1388-5-11	8/2/2009	159	566,027	120,034	58,793	0
66	Shahid Rajaei (Takam)	hydro	1	MOE	1388-4-22	7/13/2009	5	9,902	0	0	0
67	Shahid Kaveh	gas turbine	13	MOE	1388-4-2	6/23/2009	159	661,288	171,868	39,223	0
68	Chabahar (gas)	gas turbine	12	MOE	1388-2-12	5/2/2009	159	855,410	0	304,673	0
69	Shahid Kaveh	gas turbine	12	MOE	1388-2-10	4/30/2009	159	472,942	139,663	17,005	0
70	Tabriz solar	solar	1	MOE	1388	2009-2010	0.02	25	0	0	0
71	Shiraz LFG power	LFG power	1 and 2	MOE	1388	2009-2010	1.2	1,037	0	0	0
72	Mashhad LFG power	LFG power	1 and 2	MOE	1388	2009-2010	0.66	Registered as CDM project			
73	Kashan	gas turbine	11-12	private	1388	2009-2010	324	1,429,603	310,872	152,682	0
74	Pars Jnoobi	gas turbine	11-16	industry	1387-1388	2008-2010	954	1,896,501	545,682	0	0
75	Ghaenat (Shahid Kaveh)	gas turbine	11	MOE	1387-12-28	3/18/2009	159	598,110	164,959	31,885	0
76	Yazd CC	gas turbine	4	MOE	1387-12-12	3/2/2009	159	657,008	183,242	21,753	0
77	Chabahar	gas turbine	11	MOE	1387-12-10	2/28/2009	159	871,244	0	288,957	0
78	Jahrom	gas turbine	16	MOE	1387-8-14	11/4/2008	159	Registered as CDM project			
79	Sabalan	gas turbine	4	MOE	1387-6-31	9/21/2008	159	562,439	91,960	100,211	0
80	Sabalan	gas turbine	3	MOE	1387-5-10	7/31/2008	159	301,192	71,284	34,386	0
81	Mashjed Soleyman development	hydro	8	MOE	1387-4-16	7/6/2008	250	213,864	0	0	0
82	Jahrom	gas turbine	15	MOE	1387-3-27	6/16/2008	159	Registered as CDM project			
83	Sabalan	gas turbine	2	MOE	1387-2-23	5/12/2008	159	423,071	84,221	58,485	0

84	Binalood wind	wind	21-43	MOE	1386	2007-2008	15	34,223	0	0	0
85	Ramin expansion turbine	steam	1 and 2	MOE	1386	2007-2008	13	0	0	0	0
86	Neka expansion turbine	expansion turbine	1 and 2	MOE	1386	2007-2008	20	0	0	0	0
87	Sabalan CC	gas turbine	1	MOE	1386-12-28	3/18/2008	159	145,932	28,140	22,720	0
88	Mashjed Soleyman development	hydro	7	MOE	1386-12-23	3/13/2008	250	0	0	0	0
89	Jahrom	gas turbine	13	MOE	1386-11-29	2/18/2008	159	Registered as CDM project			
90	Jahrom	gas turbine	11	MOE	1386-10-10	12/31/2007	159	Registered as CDM project			
91	Jahrom	gas turbine	12	MOE	1386-6-27	9/18/2007	159	Registered as CDM project			
92	Mashjed Soleyman development	hydro	6	MOE	1386-6-5	8/27/2007	250	174,926	0	0	0
93	Oroumieh	gas turbine	14	MOE	1386-5-28	8/19/2007	159	510,940	84,377	81,109	0
94	Roodshour	gas turbine	3	private	1386-5-3	7/25/2007	791	1,452,748	252,077	150,766	0
95	Jahrom	gas turbine	14	MOE	1386-4-14	7/5/2007	159	Registered as CDM project			
96	Mashjed Soleyman development	hydro	5	MOE	1386-4-10	7/1/2007	250	250,790	0	0	0
97	Mashhad	steam	3	MOE	1386-4-1	6/22/2007	12	0	0	0	0
98	Oroumieh	gas turbine	13	MOE	1386-3-30	6/20/2007	159	599,495	104,621	89,181	0
99	Rey	gas turbine	41	MOE	1386-3-13	6/3/2007	25	0	0	0	0
100	shirvan	gas turbine	16	MOE	1386-2-17	5/7/2007	159	Registered as CDM project			
101	Molasadra	hydro	2	MOE	1386-1-19	4/8/2007	50	46,266	0	0	0
102	Molasadra	hydro	1	MOE	1386-1-15	4/4/2007	50	540	0	0	0
103	Oroumieh	gas turbine	12	MOE	1386-1-10	3/30/2007	159	576,053	94,342	90,310	0
104	Asalooyeh2	gas turbine	11-16	private	1386-1387	2007-2009	954	4,313,377	1,142,028	106,859	0
Total							**15788.68**	**49,633,612**	**8,475,012**	**4,147,225**	**0**

Reference: National Statistics of Iran Power Industry (2005-2013)

Appendix 4. Further background information on ex ante calculation of emission reductions

Appendix 5. Further background information on the monitoring plan

Appendix 6. Summary of post registration changes

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Document information

Version	*Date*	*Description*
04.0	9 March 2015	Revisions to: • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Editorial improvement.
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the programme design document form for small-scale CDM programme of activities (these instructions supersede the "Guideline: Completing the programme design document form for small-scale CDM programme of activities" (Version 03.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and **Error! Reference source not found.**; • Change the reference number from *F-CDM-SSC-PoA-DD* to *CDM-SSC-PoA-DD-FORM*; • Editorial improvement.
02.0	13 March 2012	EB 66, Annex 13 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities".
01.0	27 July 2007	EB33, Annex43 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: programme of activities, project design document, SSC project activities