Supporting Iran in implementation of an integrated energy efficiency market

2nd Steering Committee Meeting

Tehran, 18 June 2019

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

Content of presentation

- Project in a nutshell
- WP I) Concept for implementation of Article 12 and M3E
- WP II) Analysis of the energy efficiency potential @PSEEZ in Assaluyeh
- WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects
- Next steps of WP I - III and conclusion

Project in a nutshell - the approach of implementation (1)

- Regular **bi-lateral working meetings** with major policy makers involved in M3E
  - VPST:
    - Close and constructive cooperation
    - Discussion of interim project results and challenges
    - Coordination of project activities and next steps
  - PBO:
    - Continuous very close technical exchange
    - Constructive discussion of project output
    - Demand-oriented analytical work, identified in regular meetings
  - DoE
    - Discussion on MRV & content of M3E certificates

Project in a nutshell - the approach of implementation (2)

- Regular **Stakeholder Meetings** for discussion of interim project results and dissemination of information about the M3E project
- **Participants:**
  - Core-participants: representatives of the members of the Steering Committee
  - Extended participants: IFCO, SATBA, Tavanir, companies from Assaluyeh, other companies, ESCO Association, representatives of regions, potential investors etc.
- **4 Working group meetings held:** 26 Dec. 2018, 30 Jan. 2019, 13 Mar 2019, 1 May 2019
  - Growing audience: from 18 participants from 8 stakeholder organisations (Dec 2018) to 32 participants from 16 stakeholder organisations (May 2019)
  - May 2019: 3 newly established Specialized Working Groups:
    - Working Group for Technical and Financial Issues
    - Working Group for MRV and M&V (IFCO, SATBA, DoE)
    - Working Group for Pilot Projects for implementing M3E (next meeting 19 June 2019)

Project in a nutshell - the approach of implementation (3)

- Close cooperation and agreement on activities with Iranian partners
  - **Project Steering Committee (PSC)** meets twice per year
  - **Tasks:** Making important decisions on focus and on results of project activities (proposals on rules of the M3E, eligibility of developed EE projects, etc.)
  - **Participants:**
    - Vice-Presidency for Science and Technology (VPST),
    - Plan and Budget Organization (PBO),
    - Ministry of Petroleum (MoP),
    - Department of Environment (DoE),
    - Ministry of Foreign Affairs (MFA)
    - German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
    - DIW Econ

The project in a nut shell - 3 Main Work Packages (4)

IREEMA project office

I) Elaboration, in cooperation with the Iranian partners, of a concept for practical implementation of Article 12 and the Bylaws on the market for energy efficiency and environment (M3E). Initiating a continuous stakeholder dialogue regarding these instruments and supporting the main stakeholders in order to practically implement the M3E.

DIW ECON

For approval by responsible institution

II) Analysis of the energy efficiency potential of areas to be selected in the PSEEZ in Assaluyeh and development of business and financing plans for at least two projects to be eligible under Article 12.

kmw

III) Development of bankable pre-feasibility studies for energy efficiency projects eligible for Article 12 and for the M3E market and elaboration of financing concepts for these projects.

FICHTNER

- **Closely interlinking all three Work Packages – development of implementation mechanism taking into account requirements of investors for EE projects**
- **Project duration: Aug 2018 – July 2021**

WP I) Concept for implementation of Article 12 and M3E (1)

Analytical documents drafted and discussed - overview

Technical notes

- The benefits of guidelines for project implementation in the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 1)
- Establishing an MRV system in accordance with the rules of the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 2)
- Eligibility criteria for projects in the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 3)
- A draft scheme for project implementation in the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 4)
- Trade in energy savings: Overview on the mechanisms of Article 12 and the M3E (Technical Note No. 5)

Policy Paper

- Market-based instruments for energy efficiency worldwide – a review (Policy Paper No. 1)

WP I) Concept for implementation of Article 12 and M3E (2)

The benefits of guidelines for project implementation in the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 1)

- Suggestion for a structure of guidelines for M3E project implementation – outcomes:
  - Identification of the areas with key challenges for market implementation:
    - Procedures and requirements for individual projects: project implementation scheme
    - Economic viability of projects and the market as a whole
    - Monitoring, reporting and verification obligations, institutional setup
  - Providing a framework of reference for systematically identifying, discussing and solving open issues in the design of the M3E mechanism
- Presentation, feedback and discussion with Working Group Meeting (#3) participants; comments received from Ministry of Energy (MoE)
- **Result**: initiation of dedicated working groups based on the specified key working areas for market implementation

WP I) Concept for implementation of Article 12 and M3E (3)

Establishing an MRV system in accordance with the rules of the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 2)

- Support for DoE in setting up an MRV system for monitoring the M3E's impact on the environment, in line with the specifications of the *Bylaws for creating the market for energy efficiency and environment* – outcomes:
  - Outlining the principles of measurement, reporting and verification procedures and their importance for the implementation and working of the M3E
  - Requirements for institutional structures
  - Generic tasks of the DoE regarding MRV in connection with the M3E; including the requirements for data collection, methods, monitoring, reporting and a registry
- Discussion with DoE, further comments received from IFCO and Ministry of Petroleum

WP I) Concept for implementation of Article 12 and M3E (4)

Establishing an MRV system in accordance with the rules of the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 2)

- **Result**:
  - For the organization of efficient and reliable data flows, the creation of a central data registry at an independent institution is important
  - There is a need to foster the establishment of certified M&V companies and to formulate work algorithms and standards, as well as data requirements
  - Establishment of a joint working group on MRV/M&V including DoE, IFCO and SATBA

WP I) Concept for implementation of Article 12 and M3E (5)

Eligibility criteria for projects in the Market for Energy Efficiency and Environment (M3E)
(Technical Note No. 3)

- Suggestions for a set of eligibility criteria that reflect the political goals of the M3E and enable its proper functioning – outcomes:
  - Tangible criteria as a basis for further discussion and to facilitate decisionmaking
  - Drawing attention to important issues and potential consequences of project eligibility criteria for market outcomes, including dangers and pitfalls
  - Open list of possible project types to support a common market understanding and the identification of potential projects
- Presentation, feedback and discussions with
  - PBO
  - Working Group Meeting (No. 4) participants

WP I) Concept for implementation of Article 12 and M3E (6)

Eligibility criteria for projects in the Market for Energy Efficiency and Environment (M3E)
(Technical Note No. 3)

- **Results**: suggestions for a set of eligibility criteria
  1. Projects must serve the goal of raising the efficiency in using conventional energy sources.
  2. Eligibility is conditional on the saving of natural gas or grid-supplied electricity.
  3. The saved energy should be measurable, verifiable and reportable.

- Additional suggestion: include criteria to control emissions at a later stage.

WP I) Concept for implementation of Article 12 and M3E (7)

A draft scheme for project implementation in the Market for Energy Efficiency and Environment (M3E) (Technical Note No. 4)

- Outline of a condensed implementation scheme for M3E projects, in line with the institutional setup of the *Bylaws for creating the market for energy efficiency and environment* – outcomes:
  - Identification of the major implementation steps from the perspective of individual projects, under special consideration of the role of ESCOs
  - Detailed review of the steps in chronological order, their necessity, and responsible parties
- Presentation, feedback and discussions with Working Group Meeting (No. 4) participants
- **Result**: the project implementation scheme will serve as a key ingredient of the guidelines for project implementation in the M3E
- **PBO request to VPST: submit results of TN 1-4 as report to Energy Saving Commission**

WP I) Concept for implementation of Article 12 and M3E (8)

Trade in energy savings: Overview on the mechanisms of Article 12 and the M3E
(Technical Note No. 5)

- Introductory document for newcomers to make them familiar with the idea of trade in energy savings, e.g. potential investors and project developers – outcomes:
  - Explaining the background and the idea of energy savings trade in Iran
  - Describing the options granted by Article 12 and its Bylaws for the M3E, and their complementary nature
  - Providing an introduction to the complex structure of energy tariffs in Iran
- Recently shared among stakeholders and available online
  - Open to feedback
- **Result**: TN 5 supports visibility and understanding of Art. 12 and the M3E among potential market participants

WP I) Concept for implementation of Article 12 and M3E (9)

Market-based instruments for energy efficiency worldwide – a review (Policy Paper No. 1)

- Overview of international experience with market-based instruments for energy efficiency and emission reduction – outcomes:
  - Understanding how market-based mechanisms work and of their potential to achieve certain energy efficiency and environmental targets
  - Identifying learnings from international experience in implementing certificate schemes: scope for design, pitfalls and strategies, determinants of success
- Presentation and discussion with PBO
  - Available online and open to further feedback

WP I) Concept for implementation of Article 12 and M3E (10)

Market-based instruments for energy efficiency worldwide – a review (Policy Paper No. 1)

- **Result**: following worldwide experience with certificate schemes a range of key success factors were identified:
  - Clear commitment to the scheme and future strategy, strong communication with stakeholders and definition of responsibilities
  - Starting small and gradually increasing complexity, definition of standard projects
  - Clear measurement and verification methods, timely training of qualified agents
  - Dedicated efforts to prevent fraud
  - Ensuring the stability of certificate markets

WP I) Concept for implementation of Article 12 and M3E (11)

Work in progress

- Analysis of the revenue opportunities for projects and the economic potential of the market
- Definition of data requirements regarding M3E projects
  - Design of an application form
  - Structure of a project registry
- Design of Energy Saving Certificates: contents, duration, terms of tradability

WP I) Concept for implementation of Article 12 and M3E (12)

Work in progress – design of Energy Saving Certificates

Type of information required on certificates
Project title and ID
Certificate serial number
Project type - description of energy saving activity and technology implemented
Date of project approval and commissioning
Contact data of project owner and place of implementation
Date of issuance of the certificate and reference period (different options: monthly, annual accounts depending on the MRV scheme)
Verified amount of energy savings indicating the type of energy saved or replaced (kWh/m^3; allowing the option to split the amount in blocks and obtain the according number of certificates for one single project)
Tariff that is relevant for the energy savings
Name of the certificate issuer
Date of redemption

WP I) Concept for implementation of Article 12 and M3E (13)

- **Discussion of results and open points of work package I**

WP II) Analysis of the energy efficiency potential @PSEEZ in Assaluyeh (1)

Team of 3 kmw experts visited the site Assaluyeh from 17-19 of November 2018

- Meetings and open exchange with personnel, of the following plants:
  - 4th, 5th, 6th refinery
  - Mobin Power Plant
  - PARS Petrochemical Plant
  - JAM Petrochemical Plant and
  - R&D as well as HSE Unit(s)
- Presentation of details of operating units as well as areas for improvement.
- In all visited plants, projects are proposed as well are under way to reduce flaring and increase energy efficiency and operations
- Experts collected previously unknown information on the scope of the project

WP II) Analysis of the energy efficiency potential @PSEEZ in Assaluyeh (2)

What happened after site visit in November 2018?

- As discussed @PSEEZ a detailed list of data required was submitted via VPST
- Already developed EE projects in Assaluyeh have been identified by PSEEZ. kmw is awaiting the submission of these project proposals for evaluation with respect to the applicability to Article 12 / M3E
- kmw developed a model file to evaluate efficiencies from yields, flaring, costs, CO2 - emissions, and other data. Basic data on plants so far available was filled in.
- A response to the data request is overdue and still outstanding
- Several attempts to facilitate data exchange failed
- **Implementation of WP II remains effectively stalled due to outstanding data**

WP II) Data request: Level of precision (3)

Detailed data request has been defined two-fold to drive eligibility of the projects to M3E

- Data on overall system/site for generating power & steam: Source: Mobin PP, HSE data
- Data on individual refineries/units visited: Source: Refinery 4, 5, 6, Pars Petchem, JAM Petchem

Why is this data necessary:

- Overall power gen system at site may deliver significant EE opportunities itself
- Units visited present individual EE opportunities which may be generalized, thus may be regarded as models
- Interactions between both aspects need to be addressed
  - As a separate area of improvement and
  - to avoid optimization of one unit against another

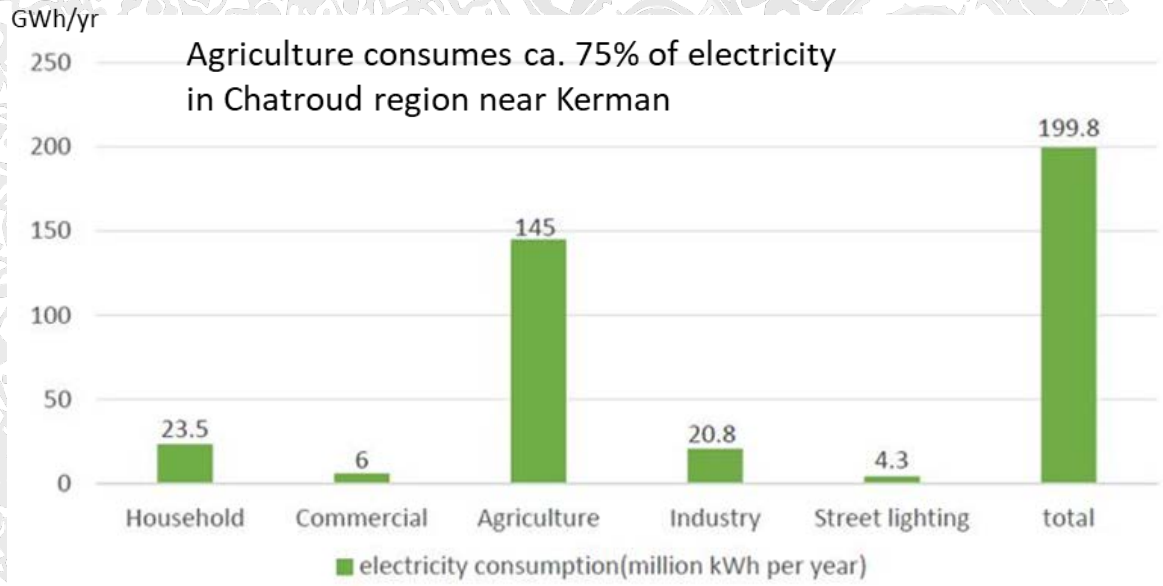
Aim is to evaluate currently developed EE projects identified by PSEEZ.

WP II) Analysis of the energy efficiency potential @PSEEZ in Assaluyeh (4)

- **Discussion of results and open points of work package II**

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (1)

- **Focus** on the regions of Busher, Kerman and Maragheh, as they
  - …have a large rural energy efficiency potential
  - …represent the variety of climatic zones and different characteristics of Iranian regions
  - …are an appropriate selection of pilot regions



WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (2)

Energy efficiency project assessment criteria

No.	Criteria / Assumption	Recommendation /Expectation
1.	Is the proposed project located in a rural area or operates in a rural context?	Yes
2.	The project is no green field project?	Yes
3.	The renewable energy project is not grid connected and cannot benefit from a a feed-in tariff?	Yes
4.	Is the project multipliable?	Yes
5.	What is the expected implementation time of the project (Start to commissioning)?	< 2 years
6.	What is the project payback period?	2 – 7 years

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (3)

Main financial assessment criteria applied: Static Payback Period

- **Static Payback Period** (years) = **Total Project Costs** (IRR) **/ Annual Project Revenues** (IRR/year)
  - 'Static': assumes temporally fixed costs and prices and no discounting
- **Total Projects Costs** estimation includes CAPEX of the project investment
  - for now: excludes OPEX, transaction cost and monitoring costs
- **Annual Project Revenues** estimation = saved energy per year x financial value received from M3E per certified saved energy
  - specific financial value from M3E = highest tariff of the saved energy carrier
    - for electricity: 4628 IRR/kWh (highest tariff: public consumer w/ less 30kw & peak hour tariff)
    - for natural gas: 9000 IRR/Nm^3 (highest tariff: feedstock for petrochemicals)
- **Co-benefits** (i.e. product quality improvements, external effects like water savings) are not included in the financial assessment; any productivity increases are however taken into account

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (4)

Selected project ideas after site visits:

- **Kerman:**
  - electric motor replacement in brick factory
  - demand-oriented irrigation of pistachio farm in Kerman region
  - PV powered irrigation pump for pistachio farm (grid remote)
- **Marageh:**
  - water pump replacing for fish breeding in Maragheh region
- **Busher:**
  - pump replacement for shrimp farms in Bushehr region

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (5)

First exemplary financial assessment of selected potential projects under static full cost approach

- Complete CAPEX for new installation is taken as project cost

Project idea	Is the proposed project located in a rural area or operates in a rural context?	The project is no green field project?	Renwable energy project is off-grid and cannot benefit from a feed-in tariff ?	Is the project multi-pliable?	What is the expected implemen-tation time of the project?	Project payback period below 7 or ca. 7 years	Investment	Saved Energy	Revenues	Payback Period
							(Mio IRR)	(kWh/a)	(Mio.IRR)	(years)
Brick factory: change of electrical drives	✓	✓	✓	✓	✓	✓	66	1,907	9	**7,5**
Pistachio Demand Oriented Irrigation	✓	✓	✓	✓	✓	✗	17,05	142,8	661	**25,8**
Irrigation Solar Pump (off-grid)	✓	✓	✓	✓	✓	✗	17,49	234,6	1,086	**16,1**
Fish Breeding Pump Replacement	✓	✓	✓	✓	✓	✓	28	2,678	12	**2,2**
Shrimp Farm Pump Replacement	✓	✓	✓	✓	✓	✗	1,815	24,21	112	**16,2**

✓ Criteria fulfilled
✗ Criteria not fulfilled

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (6)

Insights from the first assessment under the static full cost approach

- The general low energy prices are in many cases not an inherent incentive to invest in energy efficiency, because revenues from M3E on the basis of tariff spreads are also low and thus provide little additional incentive for energy efficiency projects

Further challenges for M3E projects

- Unstable macroeconomic conditions
  - Energy tariffs trailing inflation implies increasing costs for EE projects
  - The drifting spread between inflation and only smoothly increasing energy tariffs deteriorates the profitability of already comparably low revenues generating M3E projects
  - High domestic bank interest rates increase opportunity cost further
  - Volatile foreign exchange rates hamper imports and foreign investment

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (7)

The alternative: the additional cost approach

- Only applicable for projects that are going to be implemented **ANYWAY** (with or without an M3E mechanism); f. ex. existing installations beyond designed technical lifetime and in need of replacement
- In this case the incentive on energy efficiency depends only on the **additional cost** of an energy efficient alternative compared to a business as usual installation
- Accordingly, only such kind of additional cost is considered as project cost

- **With additional cost approach (where applicable), payback periods will decrease**

WP III) bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E market and elaboration of financing concepts for these projects (8)

- **Discussion of results and open points of work package III**

WP I) Concept for implementation of Article 12 and M3E – overview of next steps

Overview - Support as regards to content for

Taking into consideration project activities within Work Packages II and III

1. Continue elaboration of implementing guidelines and rules

1. Continue support to development of an MRV system for the activities under M3E

2. Economic analysis in order to show potential effects of the M3E, to support the policy development and decision making. The focus of analytical work follows demand of the Iranian political partners.

WP I) Next steps for implementation of the M3E – considerations

Implementing guidelines and rules

- Capacity building and support for the development of Energy Service Companies (ESCOs)
- Definition of rules for project proposal evaluation through specialized institutes
- Guarantee system – responsibilities for payment, compensation rules etc.
- Rules for selling/purchasing certificates at the Exchange
- Guidelines how to use and implement the Bylaws
- ……

WP I) Next steps for implementation of the M3E – considerations

Monitoring, reporting, verification

- Establishment of a registry, structure and requirements
- Definition of rules for M&V of energy savings: valid methods, parameters, baselines
- Specification of rules for data collection

Economic analysis

- Quantification of effects of energy efficiency regarding reducing energy subsidies
- Modelling the effects of energy efficiency on economic growth, employment, investment
- The role of the M3E for implementation of Iran‘s INDC
- Opportunities to raise Iran‘s ambition under the Paris Agreement
- ……

WP I) Next steps for implementation of the M3E - Capacity building

- Organisation of capacity building workshops concerning the M3E in Tehran, Assaluyeh and selected (rural) regions

  Goal: Dissemination of information to potential project developers, investors, large energy consumers) about
  - The opportunities of the M3E,
  - The requirements for application as well as
  - Its potential benefits

- Publication of results on project website www.ireema.com

WP II) Next steps for analysis of the EE potential @PSEEZ in Assaluyeh

- Elaboration of a detailed analysis of the operating performance of the production units with respect to their technical and economic potential of energy and resource efficiency in the fields of gas flaring, refining etc.
- Selection of eligible energy efficiency projects for which detailed business and financing plans shall be developed and agreement on them with the responsible stakeholders
- Elaboration of business plans for the selected projects eligible for Article 12 in close cooperation with the responsible companies in the PSEEZ.
- Support to implementation of the developed business plans by elaboration of financing concepts, as far as possible by attracting potential investors.
- Estimation of the GHG reduction potential of the developed projects and presentation of the elaborated project documents to the PSC
- Providing technical guidance for implementation of the business cases/projects and organisation of a professional training trip to Germany for selected Iranian experts.

WP III) Bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E (1)

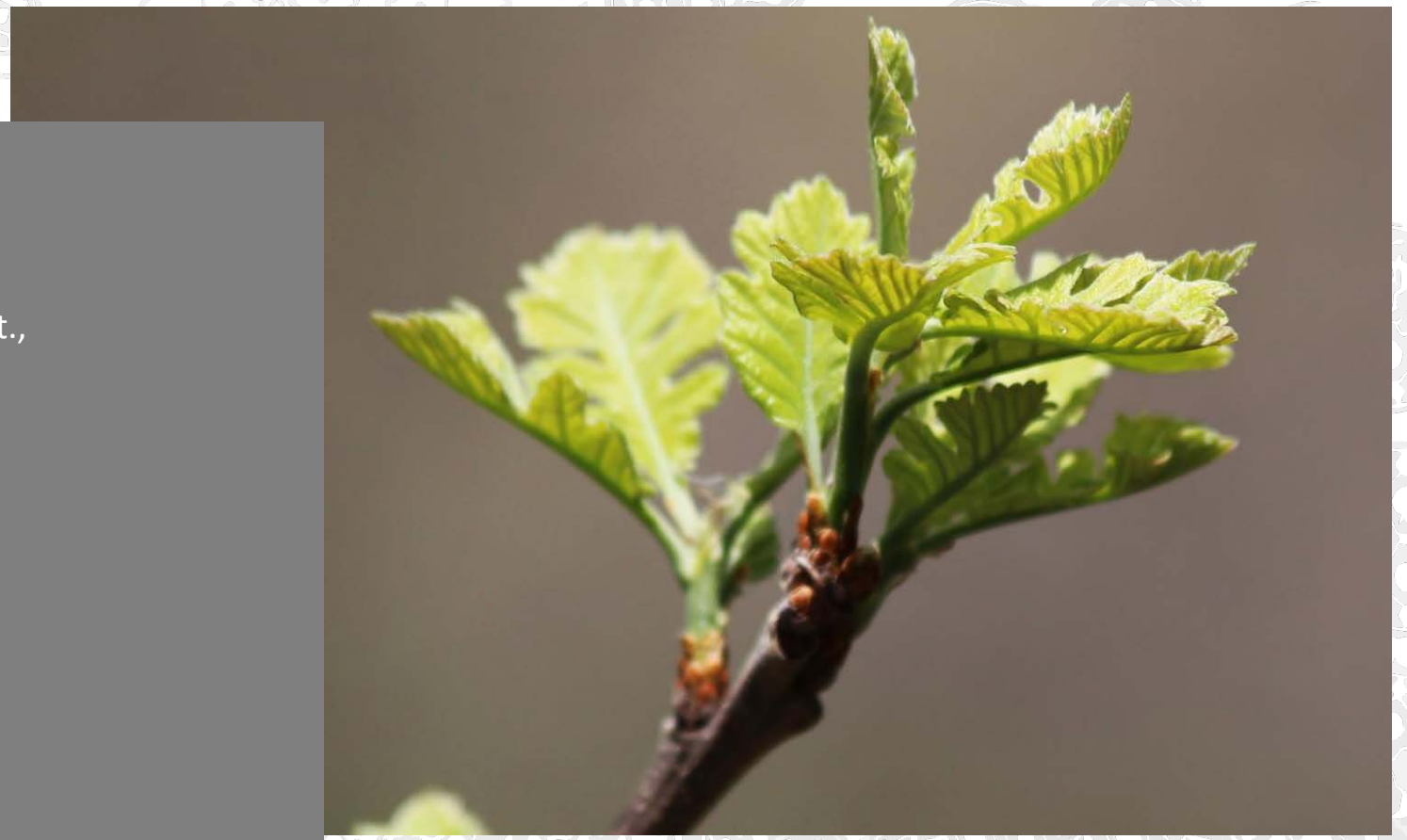
- Identification and further development of potential rural Energy Efficiency (EE) Projects for implementation under the M3E
- Definition of EE project:
  - Any investment project that leads to savings of primary and final energy consumption (conventional carriers) compared to a baseline status
  - Conventional energy: electricity, natural gas, or petroleum products (with reservation)
  - Renewable energy projects are considered if no feed-in tariff is applicable (i.e. off-grid renewable energy)
  - Savings of CO2 emissions should be considered

WP III) Bankable pre-feasibility studies for EE projects eligible for Article 12 and M3E (2)

- Development of the bankable pre-feasibility studies for selected EE projects
  - Development of a baseline of energy consumption;
  - Assessment of technology options for implementation of the projects;
  - Calculation of the expected energy savings and an economic analysis;
  - A concept for operation and maintenance as well as an implementation plan.
- Elaboration of financing concepts for the pilot projects, including an M&V concept and assessment of the benefits of the M3E

Thank you for your attention!

Contact



IREEMA
c/o
Vice-Presidency for Science and Technology
5th floor
No. 20, Ladan Alley, North Sheikh Bahayee St.,
MollaSadra St., Vanak Sq.,
Tehran, Iran

Ayda Shahrokh
Head of IREEMA Project Office
Phone: +98 (21) 8353 2075
e-Mail: service@ireema.com

Dr. Lars Handrich
Mohrenstraße 58
10117 Berlin, Germany

Phone. +49.30.20 60 972 0
Fax. +49.30.20 60 972 99
e-mail: service@ireema.com