INTERNATIONAL RENEWABLE ENERGY AGENCY

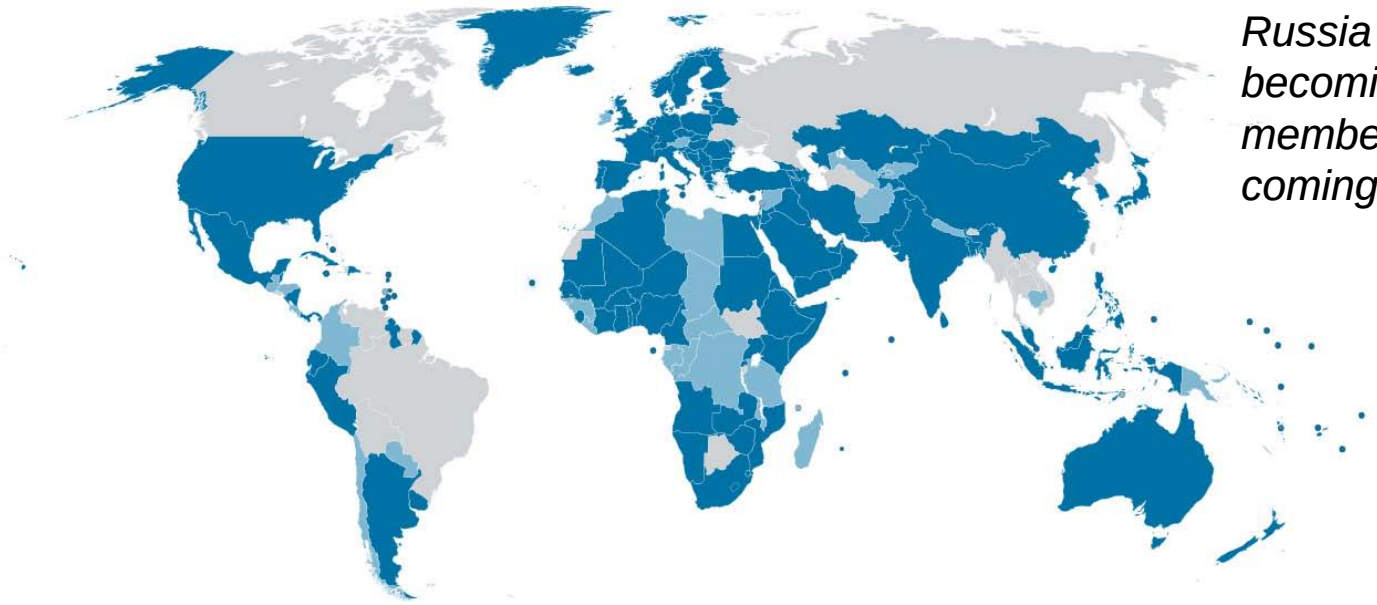
IRENA – Off-Grid-Systems work

Roland Roesch

Intersolar / Bundesverband Solarwirtschaft (BSW)
Munich, Germany, 11 June 2015

The International Renewable Energy Agency

The Voice, Advisory Resource and Knowledge Hub for 171 Governments



Russia will becoming a member in the coming weeks

Renewable energy can:

- Meet our goals for ***secure***, ***reliable*** and ***sustainable*** energy
- Provide ***electricity access*** to 1.3 billion people
- Promote ***economic development***
- At an ***affordable cost***

Structure and Membership

Headquarters:

Abu Dhabi,

United Arab Emirates

Three Programmes:

•Innovation and Technology Centre (IITC) in Bonn, Germany

•Knowledge, Finance and Policy Centre in Abu Dhabi

•Country Support Programme in Abu Dhabi

Foundation

26 January 2009 in Bonn
International Agency since April 2011
The only international RE agency worldwide

Scope

Hub, voice and source of objective information for renewable energy

Mandate

Sustainable deployment of the six forms of renewable energy resources
(Biomass, Geothermal, Hydro, Ocean, Solar, Wind)

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Innovation Technology Outlook of Renewable Energy based Mini-Grids

PROSPECTS FOR DEPLOYMENT IN THE NEXT TWO DECADES

June 2015

Objectives

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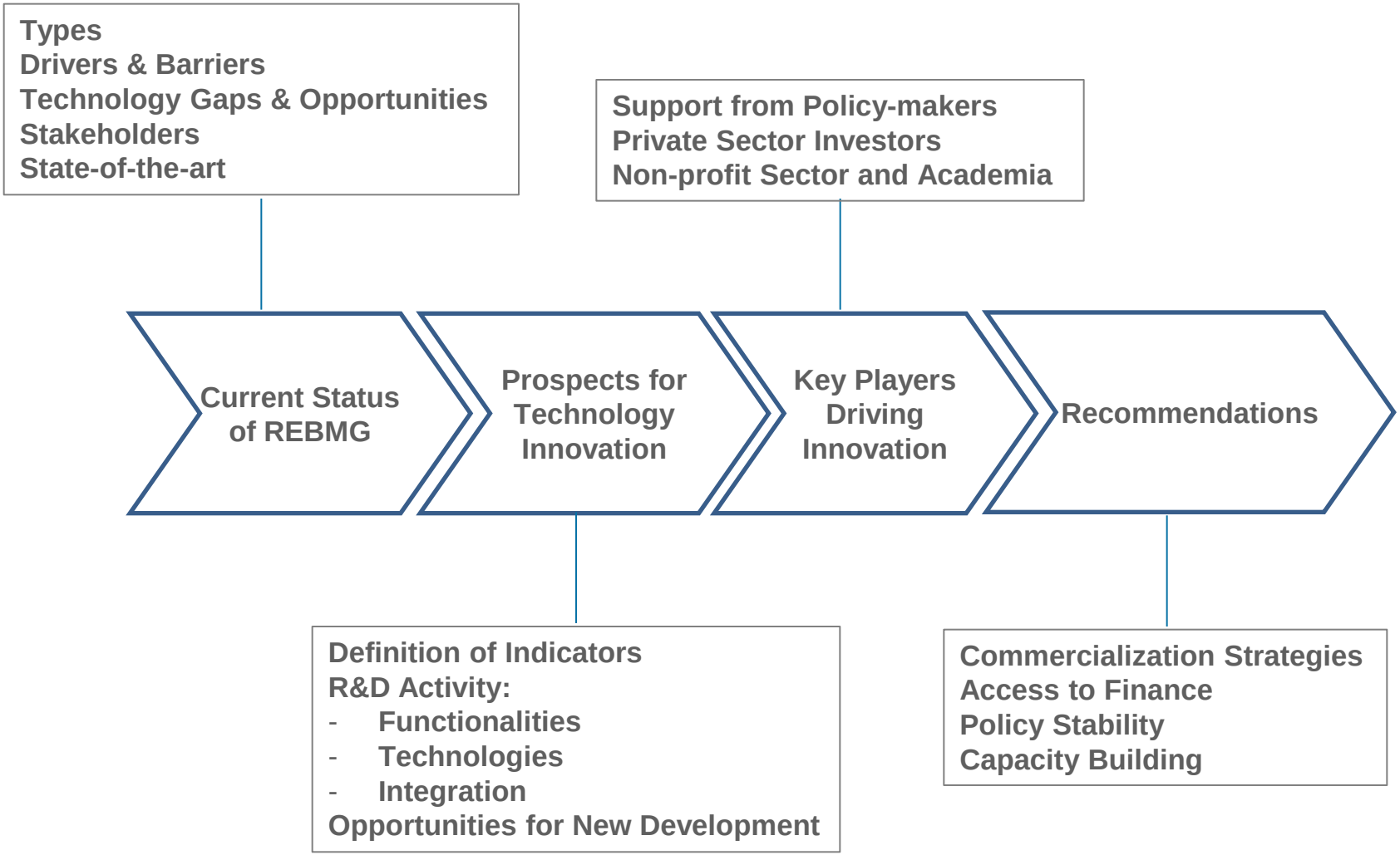
“This report evaluates technology innovations and mechanisms for successful implementation of renewable energy based mini-grids. It answers the following key questions:

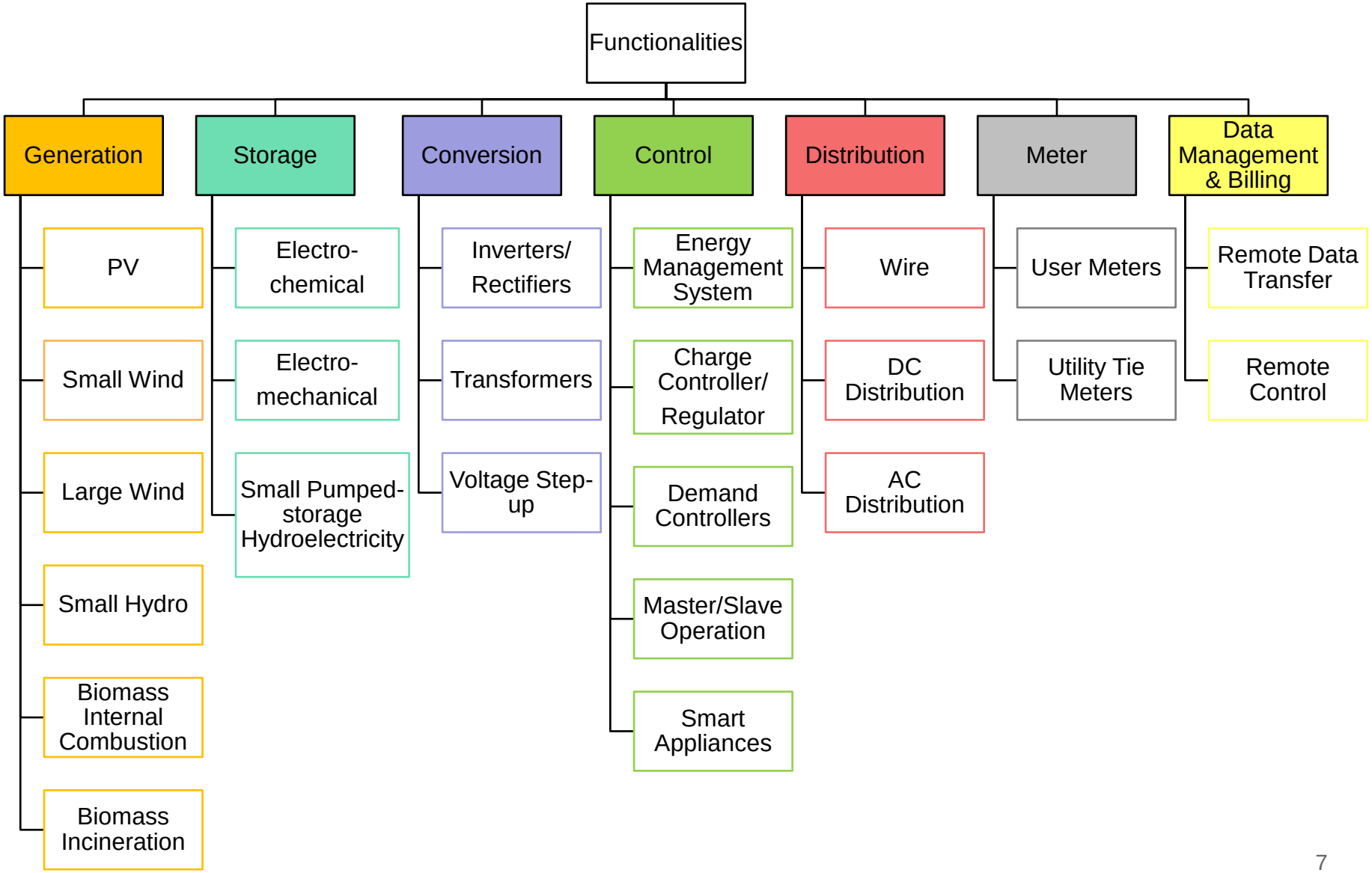
- **What is the current status of the renewable energy based mini-grids?**
- **What technology innovations are expected in the next two decades?**
- **What role could policy-makers, the private sector and other key players play in order to support innovation in mini-grids technology?”**

Report coming up in 2015

Contents


Types
Drivers & Barriers
Technology Gaps & Opportunities
Stakeholders
State-of-the-art
Support from Policy-makers
Private Sector Investors
Non-profit Sector and Academia
Current Status of REBMG
Prospects for Technology Innovation
Key Players Driving Innovation
Recommendations
Definition of Indicators
R&D Activity:
- Functionalities
- Technologies
- Integration
Opportunities for New Development
Commercialization Strategies
Access to Finance
Policy Stability
Capacity Building

State-of-the-art: Database



The IRENA Project Navigator – a platform to develop renewable energy projects

www.irena.org/navigator

What is the IRENA Project Navigator?

The Challenge of Renewable Energy Technology (RET) projects:

- Failures to prove bankability to funding institutions
- Insufficient knowledge on project proposal development
- Higher project development costs
- High risk of project failure

Objectives of the Project Navigator:

- Improvement of RET project proposals
- High quality implementation of RET project proposals
- Adaptation to the project's specific conditions, aims and framework
- Efficient use of funds

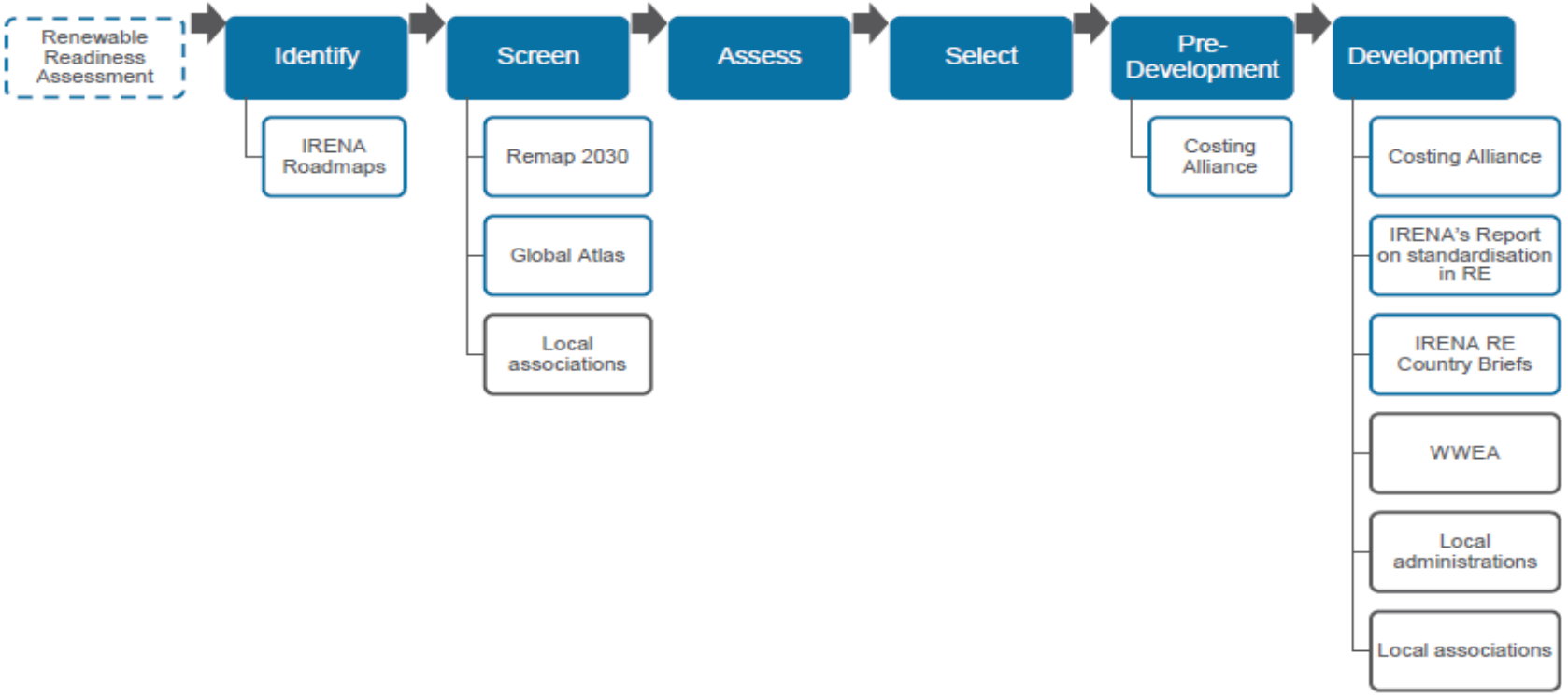
Scope: IRENA Project Navigator includes

- All RETs
- Different finance types: grants, loans, equity
- Project sizes: from individual use to utility scale projects
- Global: all geographical regions

What is the IRENA Project Navigator?

The Project Navigator is a modular approach

The Project Navigator uses a modular approach and can be linked to many activities inside of IRENA as well as outside of the organization.



Who will benefit from the IRENA Project Navigator?

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Member Countries

- Compliance with stakeholders requirements
- Higher quality of RET projects
- Lower implementation costs
- Understandable administrative processes
- Efficient administration
- Capacity building

Project Developers

- Best practices
- Identification of needs/gaps
- Easier and faster funding opportunities
- Higher quality of RET projects

Municipalities

- Capacity building
- Spread social awareness
- Decision-making and investment participation

Academia

- RET project planning guidance
- Input for curriculum development
- Capacity building

Financing Sector

- Easier and faster project evaluation
- Identification of bankable projects

Sources:
- Conserve-Energy-Future. July 5, 2013; http://conserve-energy-future.com/Images/SolarEnergy_Advantage.jpg
- Ecodyfi. July 5, 2013; http://www.ecodyfi.org.uk/images/turbineandshareholders.jpg
- Cloudfront. July 5, 2013; http://dqbasmyouzti2.cloudfront.net/content/images/articles/coins-310x224.png
- OLX. December 4, 2013; http://peshawar.olx.com.pk/academic-learning-centre-iid-153763443

The RET Project Development Communication and Coordination Platform

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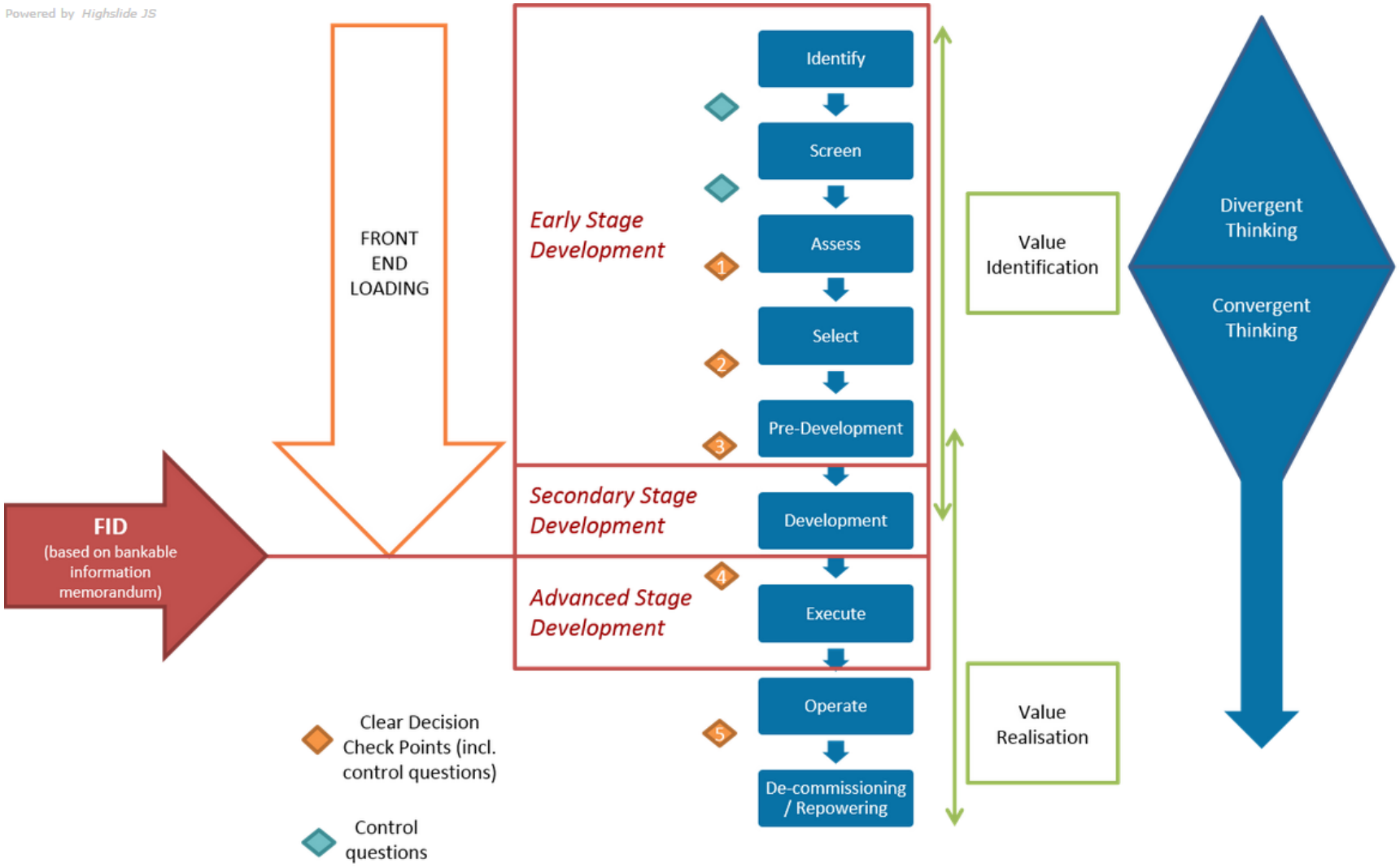
Process Overview



IRENA Project Navigator's Dimensions

Technical Concepts

Regional Adaptations

RE Funds Database

Technical Concept Guidelines Mini/Micro-grid Applications

Why?

- Technical Concept Guidelines should facilitate project development and deployment of all technologies.
- Developers and Member states have shown interest in Mini/micro grids

Objective

- To show project developers how to select plan a successful Mini/Micro-grid project, taking into account external influences, such as legislation, stakeholders or contracts

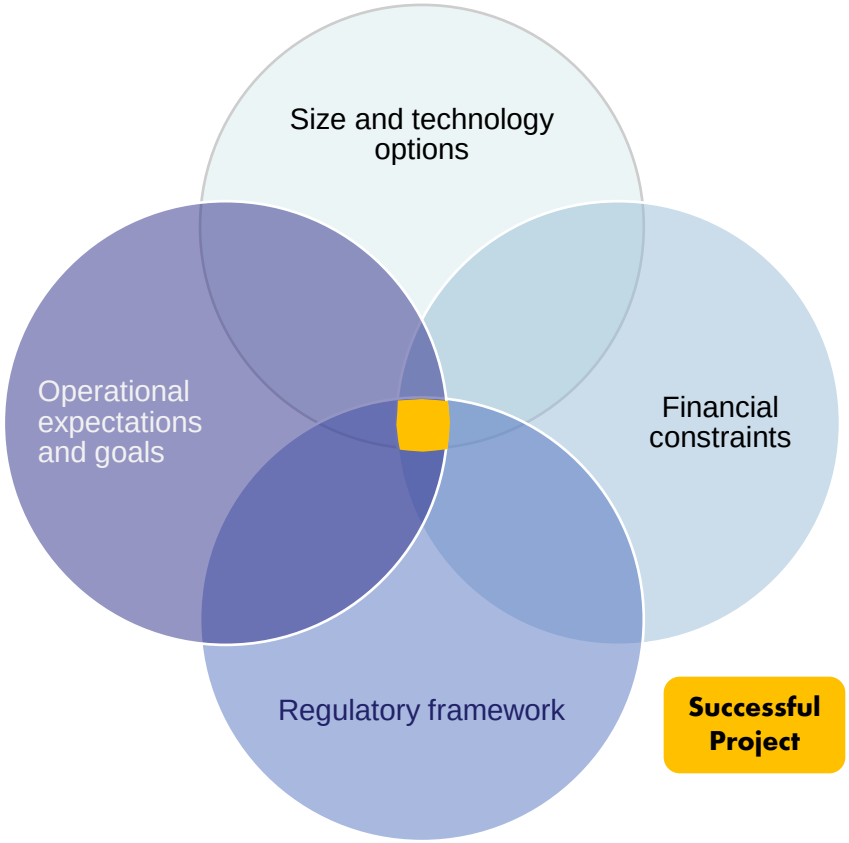
Technical Concept Guidelines
Mini/Micro-grid Applications

Scope

- Technology overview
- Project planning and design
- Financial assessment
- Project execution and commissioning
- O&M

Main Features

- Minimum requirements for bankability of a Mini/Micro-grid project
- Comparison of possible options
- Case studies and tools
- Financial model
- Lessons learned / Do's and Don't's from previous projects



Next Steps: 2015

- Technical Concepts:
  - June, 2015: Photovoltaic Technical Concept
  - Mini hydro
  - Mini-grid applications
  - Bioenergies
- 6 Pilot studies in cooperation with member countries and with developers in member countries
- Regional Adaptation
  - 2015: Adapted version for Small Island Development States (SIDS) and West Africa
  - Other regional adaptations (LAC, MENA, Pacific regions)
- Constant and continuous improvement of the tool
- Continued identifcation of partners to progress the tool

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Developing Quality Infrastructure for Renewable Energies

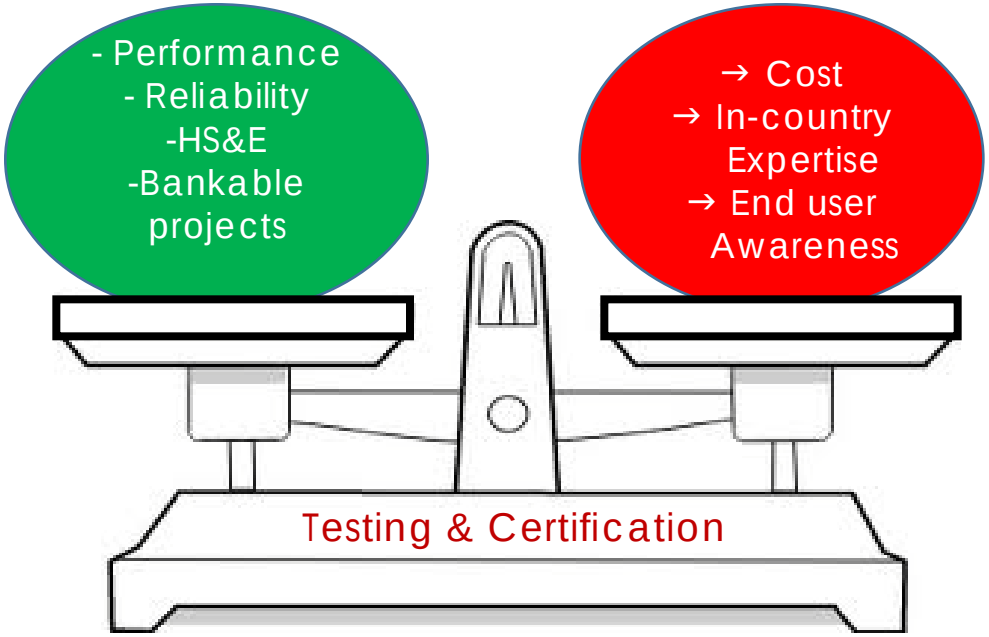
PROSPECTS FOR DEPLOYMENT IN THE NEXT TWO DECADES

October 2015

IRENA's Study on Developing Quality Infrastructure for solar water heaters

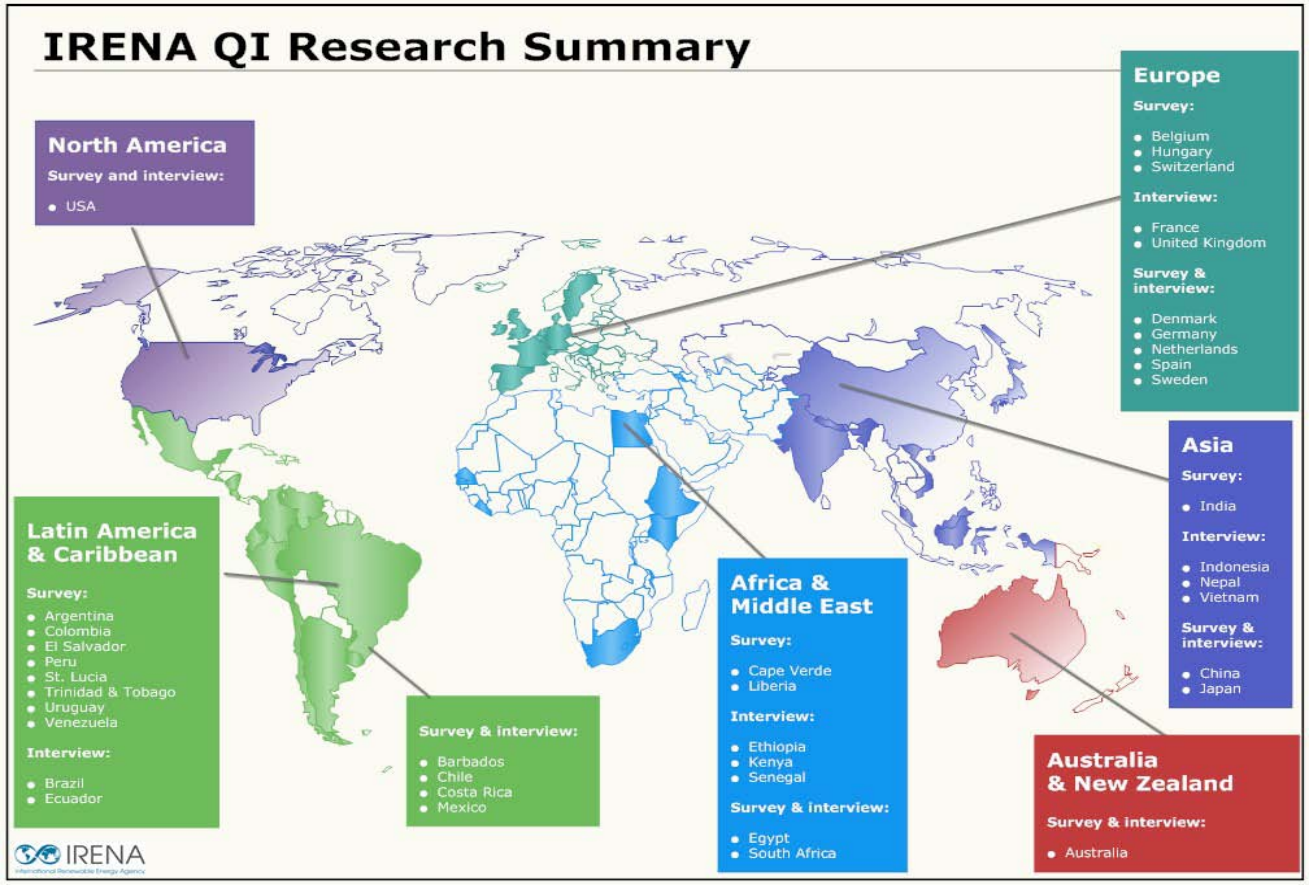
Key question of the study:

- How to develop and implement QA mechanisms while balancing costs and benefits?



Report expected to be released in October 2015

Study is based on experience from international experts in SWH technologies



QI experts, project developers, manufacturers, policy-makers (>40 countries)

- 83 survey respondents
- Invaluable feedback from interviews with 34 experts

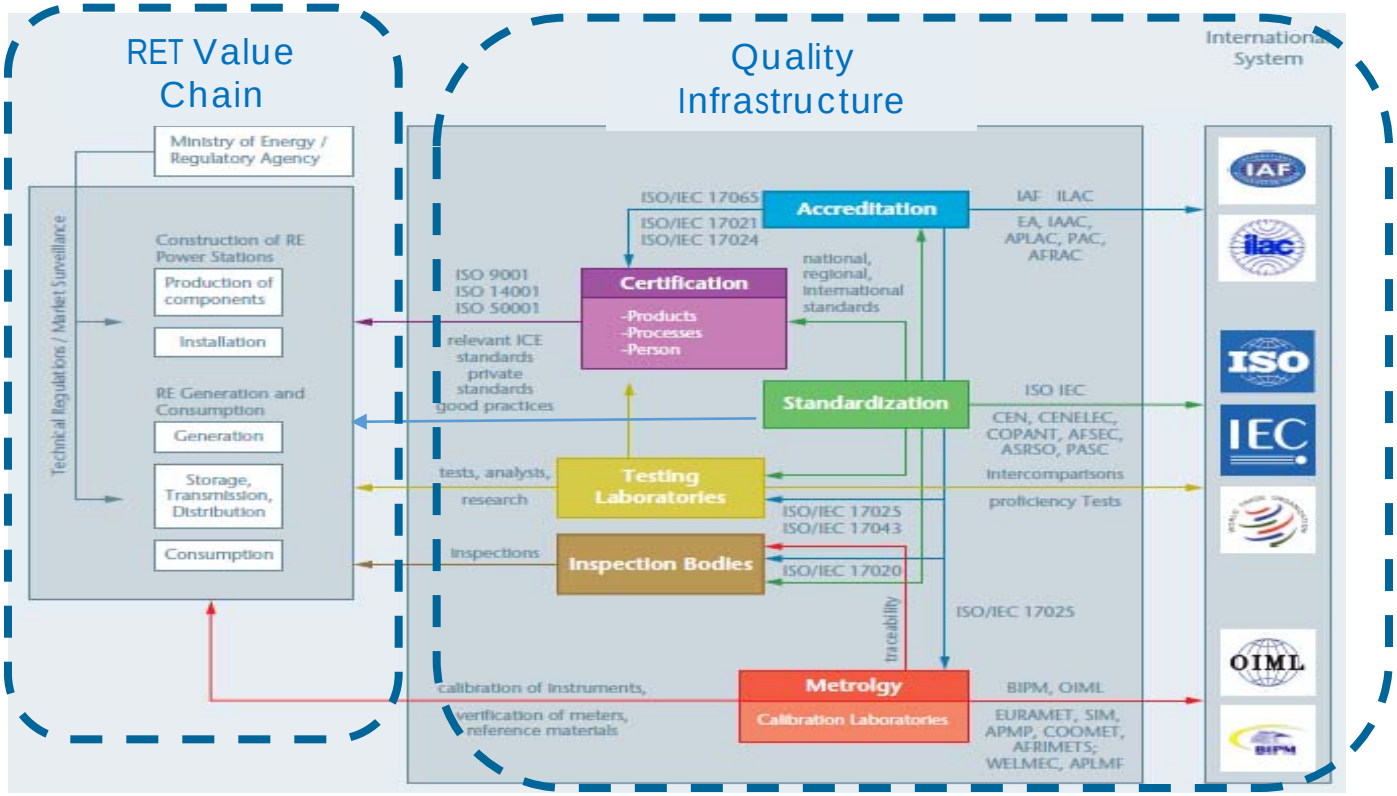
QA is based on sound standards (ISO TC 180)…

Identification of the Standard	Title of the Standard Solar Thermal Products and Components	Status/Comments
Solar Thermal Collectors		
ISO 9806: 2013	Solar energy - Solar thermal collectors - Test methods	Recently revised and published. Considers performance and durability
Solar Thermal Systems		
ISO 9459-3: 2005	Solar heating - domestic water heating systems - Part 3: Outdoor test methods for **system performance characterization** and yearly performance prediction of solar-only systems	Only performance. Daily time steps. Does not treat auxiliary interactions
ISO 9459-4: 2013	Solar heating - domestic water heating systems - Part 4: **System performance** by means of component tests and computer simulation	Only performance. Simplifications discussed in Annex C
ISO 9459-5: 2007	Solar heating - Domestic water heating systems - Part 5: **System performance characterization** by means of whole-system tests and computer simulation	Only performance. Dynamic System Test Method

ISO TC 180
Standards for SWH

...but also requires an infrastructure to be operationalised

- Testing laboratories
- Certification bodies
- Accreditation bodies
- Calibration laboratories



Source: Physikalisch-Technische Bundesanstalt

Country experiences

USA

Challenges:

- Existence of two standards: ICC/SRCC and IAPMO

Possible scenarios:

- Both SRCC and IAPMO are considering

Brazil

Challenges:

- Only two testing labs for >100 manufacturers
- Lack of regional harmonisation

Possible scenarios:

- Ongoing work on regional harmonisation

China

Challenges:

- More than 2,000 SWH manufacturers many in rural area
- Lack of a sufficient

Possible scenarios:

- Adopt ISO standards but requires work

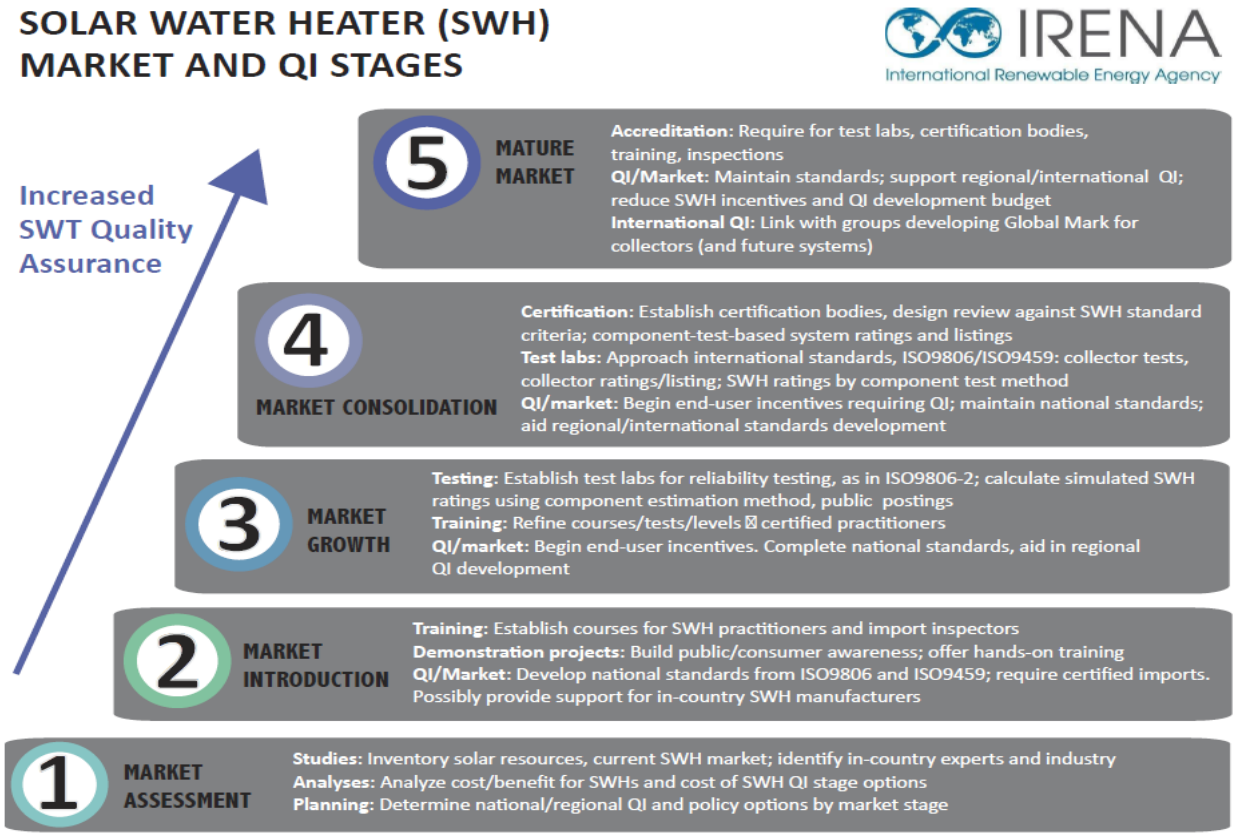
More country cases available in the report

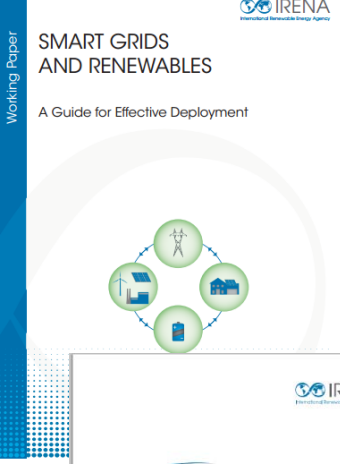
coalesce around only one national standard

tube systems

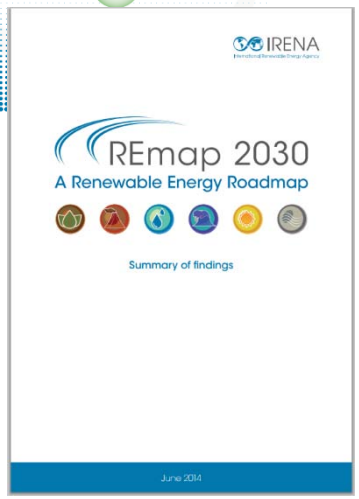
Proposed approach to develop quality infrastructure - Incremental approach

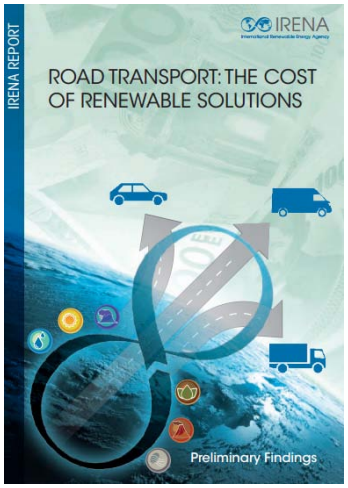
Quality infrastructure to be developed hand-in-hand with country context and market stage for SWH technologies

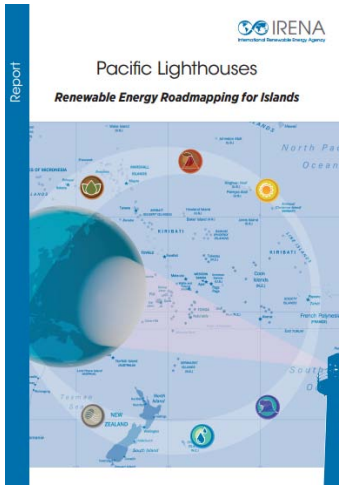


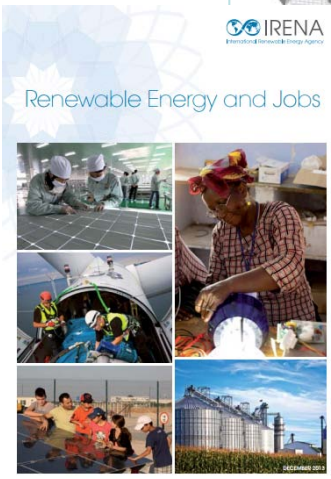


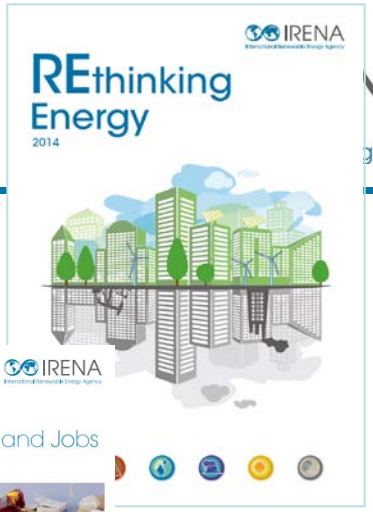
Thank You











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