



IRENA

International Renewable Energy Agency

#IRENA8A

IRENA Project Navigator

The role of standards and quality assurance in PV project bankability





Project development and the IRENA
Project Navigator



The role of standards and quality
assurance in risk mitigation

RESOURCE
YOUR SOURCE FOR RENEWABLE ENERGY INFORMATION

Success stories
Country profiles

GlobalAtlas
FOR RENEWABLE ENERGY

Site characterization

**Project
concept**

Deployment

Assistance to
financial closure
and debt facility

Project pipelines
Corridors, SIDS
Lighthouse,
Readiness

**Pre-
feasibility**

Bankable project development
guidelines

IRENA ADFD
Supporting Energy Transition

**Investor
ready**

Feasibility

**IRENA
PROJECT
NAVIGATOR**



Evaluate, technical assistance

**SUSTAINABLE
ENERGY MARKETPLACE**

- » Most countries know they have RE potentials. However, they lack the projects to achieve the desired deployment.
 - » Conditions inherent to certain countries/regions translate into high costs and risks, e.g. SIDS.
 - » Stakeholders involved in a project often lack the know-how to complete a bankable project proposal.
 - » This leads to higher project development costs and risks.
 - » Fund securement process and financing options themselves aren't transparent.
- ➔ **IRENA aims to strengthen the project development base and improve the bankability and visibility of projects, facilitating the financial closure process and increasing the number of successful projects on the ground.**





Learning Section

- » Project development and technical guidelines
- » Best practices
- » Examples & Case Studies

Start a Project

- » Personal and private workspace
- » Tools, templates, checklists
- » Stepwise approach
- » Track your progress
- » Export documents

Financial Navigator

- » Information on multiple funds
- » Filter by region and technology
- » Information includes fund types, requirements and contact details among others.

Objectives

- » Increase the bankability of projects by:
 - » Enhancing Technical, Environmental, Social, Economic and Financial parameters,
 - » Reducing costs and mitigating risks through proper planning and efficient use of funds
 - » Facilitating effective implementation

Renewable energy technology coverage



On-shore wind



Solar PV



Bioenergy



Small Hydro



Solar home systems



Mini-grids



Geothermal

Scope

- » Technology evaluation
- » Technical Project planning and design
- » Technical aspects for Financial closing
- » Project execution and commissioning
- » O&M

Main Features

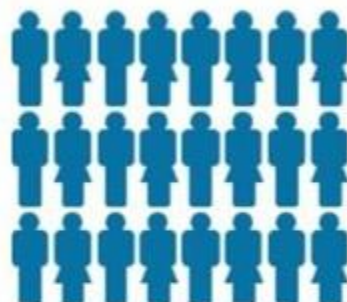
- » Minimum requirements for bankability of a project
- » Comparison of possible options
- » Case studies and tools
- » Financial model
- » Lessons learned / Do's and Don't's from previous projects
- » Applicable standards for bankability



Project Navigator in numbers



4,500 users
registered on the platform



700 developers
trained in workshops



3,000 people
reached through webinars



users from
190+ countries



1,300 projects
created on the platform



7 Technologies
and a SIDS module



Project development and the IRENA
Project Navigator



The role of standards and quality
assurance in risk mitigation and project
bankability

Technical guidance from early business idea to end of life

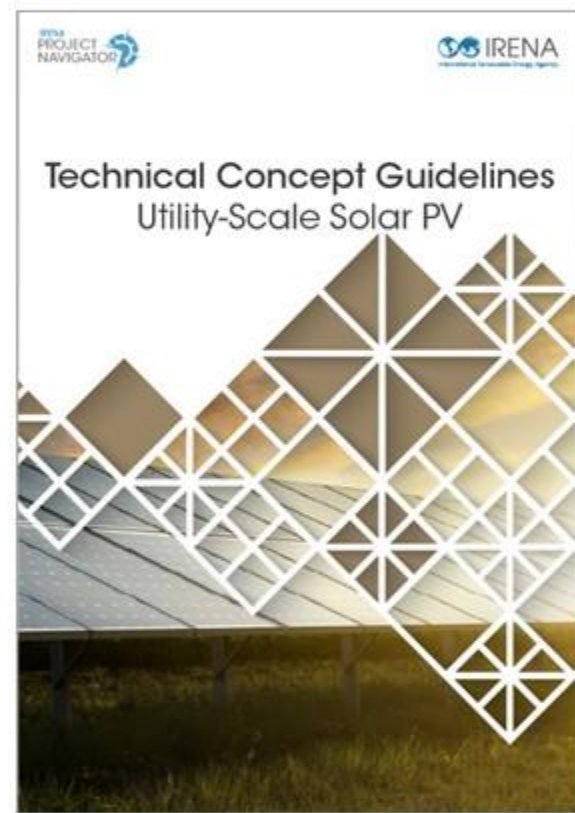
- » Project typically starting at 5 megawatts (MW) with large inverters and a connection to a high- or medium-voltage grid.

Clear stepwise process and milestones

- » Major actions to be performed, control questions to answer, list of deliverables for each phase

Tools, templates and case studies

- » Site identification checklist, siting template, bankability checklist, technical and socio-environmental assessment matrices, bankability checklist.





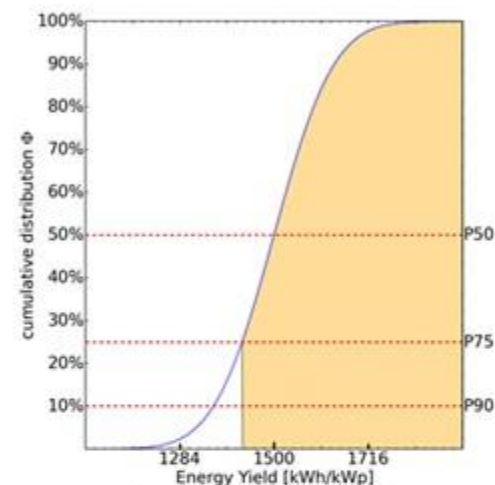
- » If a bank is willing to finance a project then this project is considered bankable
- » The willingness of a bank to finance a project will depend not only on the potential cash flows (profits) of a project but also on its risk profile
- » Bankability is perceived and managed differently by financiers
- » Financiers have stringent requirements, especially regarding technical bankability
- » Reliability, safety and good performance are essential for the bankability of the project
- » Standards and quality assurance play an important role

- » Realization of risks can affect the profitability of a project:
 - » Lower than expected revenues
 - » Higher than expected costs
 - » Delay of incoming cash flows
 - » Loss of assets
- » The bankability of a project will depend heavily on how well these risks are managed
- » Risk assessment and risk management is extremely important
- » Standards and quality assurance are essential to assure the safe and reliable performance and safety of a PV plant

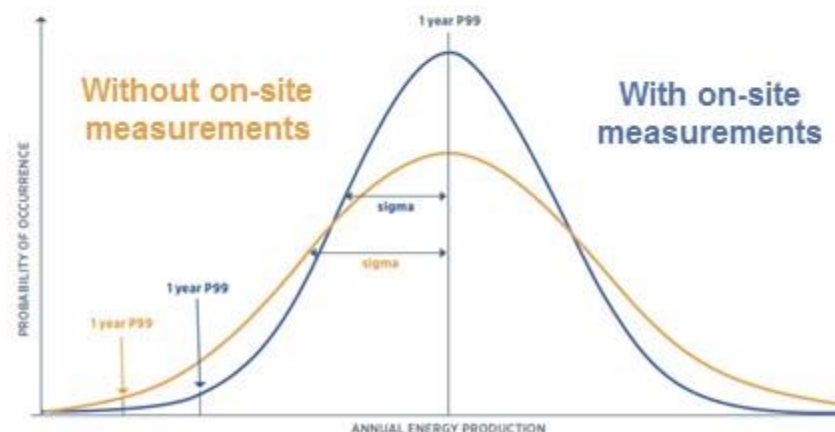


Resource Assessment

- » Yield assessment based on solar resource
- » Banks often require P50 and P90 values
- » P90 value is related to the P50 value through uncertainty.
- » Higher uncertainty = lower P90 values
- » Long-term datasets and on-site measurements reduce the uncertainty
- » Higher quality data = lower risks and better loan conditions



Source: Project Navigator



Source: Boosting solar PV Markets: The Role of Quality Infrastructure, IRENA

Technology Selection

- » Components need to be reliable and consistent
- » Integrity of the components and the bankability of the project can be ensured through:
 - » Standards and certifications
 - » Batch acceptance testing
 - » Warranties
- » Reliable components will enable the project to reach its performance objectives by minimizing losses and unforeseen costs

Typical module and manufacturer tests and certificates

Required certifications/tests	Reference
Design qualification and type approval for C-Si modules	IEC 61215
Design qualification and type approval for thin-film modules	IEC 61646
Safety qualification and mechanical operation	IEC 61730
Optional certifications/tests	
Compliance with EU legislation	CE
Standard for flat-plate PV modules and panels	UL 1703
Ammonia corrosion testing	IEC 62716
Salt mist corrosion testing	IEC 61701
Blowing sand test	IEC 60068-2-68 method Lc2
System voltage durability test for c-Si modules – qualification and type approval (PID test)	IEC/TS 62804
Module manufacturers:	
Quality management systems	ISO 9001:2008
General requirements for the competence of testing and calibration laboratories	ISO 17025:2005
Environmental management systems	ISO 14001:2004
Design and manufacturing of solar modules	BS OHSAS 18001:2007
Manufacturing of solar power devices for the automotive industry – with product design and development	ISO 16949:2009

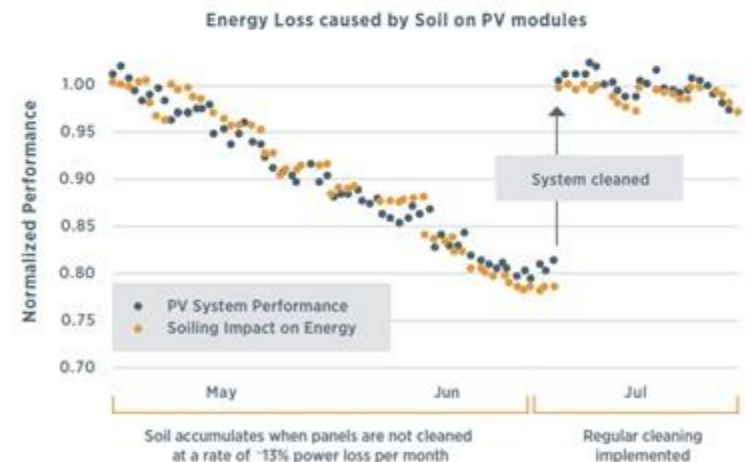
Construction

- » Performance will not only depend on the quality of panels but on quality of the installation.
- » Important for warranties:
 - » Installation must be done by capable, authorized, possibly certified contractors.
 - » Accepted mounting structures and concepts must be used.
- » Independent validation of actual output of modules (flash tests):
 - » Studies show increased power outputs when tests are required



Operation and Maintenance

- » All modules degrade, but not at the same rate
- » Output reduction can be avoided through periodic inspections:
 - » Faults
 - » Degradation
 - » Soiling
- » Well planned maintenance will ensure **peak performance at least cost**
- » Reliable performance enabled by adequate maintenance will minimize downtime and maximize the output of the power plant



Source: Boosting solar PV Markets: The Role of Quality Infrastructure, IRENA

IRENA PROJECT NAVIGATOR



Access practical information, tools and guidance for the development of bankable renewable energy projects



- 🔗 A **learning section** with easy-to-access knowledge materials
- 🔗 An **interactive workspace** to develop projects and track progress
- 🔗 An **online search engine** to find renewable energy funding sources



Obtain project development guidance with 50+ tools for:



Utility-scale
Solar PV



Onshore
Wind



Woody
Biomass



Mini/
Microgrids



Geothermal
Power



Solar Home
Systems



Small
Hydropower



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**IRENA Project
Navigator**
Supporting
renewable project
development
worldwide

