SOLAR BANKABILITY

Improving the Financeability and Attractiveness of Sustainable Energy Investments in Photovoltaics: Quantifying and Managing the Technical Risk for Current and New Business Models

PRESENTED BY
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www.solarbankability.eu
Presentation Outline

- Objectives
- Approaches
- Focuses
- Expected Impacts
- Timeline
- Consortium
- Work Program
- Communication and Dissemination
Project Intro

• SOLAR BANKABILITY
  “Improving the Financeability and Attractiveness of Sustainable Energy Investments in Photovoltaics: Quantifying and Managing the Technical Risk for Current and New Business Models”

• Grant
  Horizon 2020 Work Programme (Coordination & Support Action)
TECHNICAL ASSUMPTIONS

Capacity       Yield       Availability
Performance Ratio       Module degradation       Etc.

CAPEX
- EPC
- Service agreements
- Development fees
- Bank fees
- Taxes
- Insurances
- Contingency
- Due diligences
- …

OPEX
- O&M service
- Land lease, rent
- Insurances
- Management, accounting
- Power consumption
- Taxes
- …

Reserves
- Additional maintenance expenses
- Decommissioning
- …

LCOE
Income Statement
Cash Flow
Balance Sheet
…

Background: PV Financial Model

Technical, Financial, Legal Risks
Potential Risk Mitigation Measures
Objectives

- To reduce technical risks in PV project investments by developing best practice for professional risk assessment based on technical and financial due diligence:
  - Develop, document and establish practices for evaluating and mitigating technical risks associated with investments in PV.
  - Evaluate how these risks affect electricity production and expected return on investment in different business models.
  - Develop, document and establish practices on how to reflect these risks in the financial modeling of PV projects by investors.
  - Enable key actors, and particularly the financial market actors, to widely adopt the project results as best practices for the mitigation of risk of sustainable energy investments with current and new business models.
Approaches

• Formulate recommendations based input data that are statistically significant and based on a large evidence base.

• Involve all relevant stakeholders: financial market actors, valuation and standardization entities, building and PV plant owners, PV industry players, energy prosumers and policy makers.
## Stakeholders: Target Groups & Key Actors

<table>
<thead>
<tr>
<th>Target Group / key actor</th>
<th>Financial market actors</th>
<th>Standardization and valuation entities</th>
<th>Industry</th>
<th>Active consumers</th>
<th>Owners and operators</th>
<th>Policy makers</th>
</tr>
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<tbody>
<tr>
<td>Specification</td>
<td>Lenders, institutional investors, asset managers &amp; insurance</td>
<td>Certification labs, technical and financial consultants</td>
<td>Component manufacturers, EPC contractors, O&amp;M contractors</td>
<td>Professional &amp; private prosumers, intermediaries</td>
<td>PV plant owners and investors, owners of buildings where PV is installed</td>
<td>EU and national members of parliaments and public administration</td>
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<tr>
<td>Communication Means</td>
<td>Advisory board engagement for bidirectional communication and bilateral interviews, public workshops, best-practice guide, publications, website</td>
<td>ACCELIOS, TUV-RH, EURAC and 3E are directly involved as project partners; Other actors of this group via public workshops, best-practice guide, publications, public dissemination, website</td>
<td>Advisory board engagement for bidirectional communication and bilateral interviews, public workshops, best-practice guide, publications, website; SolarPower Europe (the new EPIA) via their membership</td>
<td>Professional prosumers via public workshops, best-practice guide, publications, website; Private consumers via low-threshold professional publications; intermediary via Advisory board,</td>
<td>Bilateral interviews, public workshops, best-practice guide, publications, website; PV plant owners via Advisory board</td>
<td>Primarily bilateral interviews, publications, specific WP4 deliverables and public workshops European Commission via advisory board participation and project officer</td>
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</table>
Project Advisory Board (PAB)

- A group of 10 invited key actors.
- Provide inputs to the project consortium on practices in technical assumptions in PV project cost models, financial models or business plans.
- Advise and provide inputs to the project consortium in carrying out the activities and analysis of results and deliverables.
- Have early insight to a number of project deliverables for information and feedback.
Focuses

• PV installations on buildings or at the customer side of the electricity consumption meter and financed by professional investors; ground mount installations.

• 7 countries for analysis:
Expected Impacts

• **Reduce uncertainty**, increase investors’ confidence and trust towards PV investments.

• **Valuation methodologies** of PV investments based on standardized risk rating system.

• Standardized descriptions and proposal of **models for cost calculation** including practices for accounting of technical risks in PV energy investments.

• **National strategies** for financing solar photovoltaic energy investments.
Timeline

• Duration: 24 months
• Start – March 2015
• End – February 2017
Consortium

EURAC Institute for Renewable Energy
www.eurac.edu

3E N.V.
www.3e.eu

ACCELIOS Solar GmbH
www.accelios-solar.com

SolarPower Europe (the new EPIA)
www.solarpowereurope.org

TÜV Rheinland Energie und Umwelt GmbH
www.tuv.com/solarpower
Work Program

- WP1: Technical Risks in PV Project Development
- WP2: Technical Risks during Operation
- WP3: PV Investment Costs Elements
- WP4: PV Business Model Evaluation
- WP5: Dissemination and Exploitation, and Communication
- WP6: Project Management

- 2 technical WPs.
- 2 WPs for financial aspects.
WP1 Technical Risks in PV Project Development

• Identify and document technical risks associated with PV investments in the project development phase (feasibility, design and construction, up to pre-commissioning) of the PV project life cycle.

• Assess the effectiveness of the proposed mitigation measures.

• Develop and establish recommendations for evaluating and mitigating these technical risks.
WP2 Technical Risks during Operation

• Identify and document technical risks associated with investments in PV in the operational phase of the PV project life cycle (incl. decommissioning).

• Assess the effectiveness of the proposed mitigation measures.

• Develop and establish practices for evaluating and mitigating these technical risks.
WP3 PV Investment Cost Elements

• Gather current industry practices in PV investment cost calculation on how technical parameters and associated risks are taken into account.

• Evaluate the influence of technical assumptions and their relevancy in the PV investment cost elements (CAPEX, OPEX, yield and Performance Ratio).

• Develop guidelines on how technical risks over PV project life cycle should be taken into account in different cost elements and when evaluating the PV investment cost.

\[ LCOE = \frac{I_0 + \sum_{i=1}^{n} \frac{OM_i}{(1+r)^i}}{\sum_{i=1}^{n} \frac{P_i}{(1+r)^i}} \]
WP4 PV Business Model Evaluation

- Evaluate the influence of technical risks in PV project development and operation their effect on the expected income in different business models.

- Develop a risk rating system, to assess the technical bankability of PV systems.

- Develop mitigation mechanisms which allow for the translation of technical risks into financial provisions and/or insurance solutions.

- Assess the overall financial risk for PV investments in view of their eligibility for pension funds and life insurances.
WP5 Dissemination, Exploitation & Communication

• Ensure proper dissemination and exploitation of project knowledge and outcomes through strong and active stakeholders engagement over the duration of the project.

• Manage the communication of project results in an effective way to appropriate audiences.
WP6 Project Management

• Ensure the professional project execution in terms of time, budget and quality of results.
## Communication & Dissemination

- Project deliverables which will be made available for public.

<table>
<thead>
<tr>
<th>Deliverable name</th>
<th>WP</th>
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<tbody>
<tr>
<td>Report on technical risks in PV project development</td>
<td>WP1</td>
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<tr>
<td>Recommendations for minimizing technical risks in PV project development</td>
<td>WP1</td>
</tr>
<tr>
<td>Report on technical risks of PV plant operation</td>
<td>WP2</td>
</tr>
<tr>
<td>Recommendations for minimizing technical risks of PV plant operation</td>
<td>WP2</td>
</tr>
<tr>
<td>Review and gap analysis of technical risks throughout PV project lifecycle and their uses in PV investment cost calculation</td>
<td>WP3</td>
</tr>
<tr>
<td>Guidelines of accounting for technical risk and assumptions in PV investment cost calculation</td>
<td>WP3</td>
</tr>
<tr>
<td>Snapshot of existing and new PV business models</td>
<td>WP4</td>
</tr>
<tr>
<td>Report on financial model evaluation</td>
<td>WP4</td>
</tr>
<tr>
<td>Technical bankability guidelines</td>
<td>WP4</td>
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<tr>
<td>Best practice guidelines on accounting technical risks in present and future PV cost model and business plans</td>
<td>WP5</td>
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Communication & Dissemination

• Workshops
  • Closed workshop with Project Advisory Board.
  • Two (2) public workshops: 1 at end of first year, 1 at end of project.

• Publications at conferences.

• Project websites (news, results, general updates).
Contact

Project Coordinator

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Thank you!

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