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Future-proofing solar projects: Prioritizing reliability and optimizing efficiency

25 September 2024

9:00 am – 10:00 am | EDT, New York City
10:00 am – 11:00 am | ART, Buenos Aires
3:00 pm – 4:00 pm | CEST, Berlin, Madrid

Anne Fischer
Senior Editor
pv magazine USA

Josep Tienda
Vice President of International Sales
Shoals Technologies

Francisco Ramon
International PV Product Manager
Shoals Technologies

Welcome!

Do you have any questions? ❓ 🙋

Send them in via the Q&A tab. 👉 We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 🎥

We‘ll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience. 👀 💡

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Future-Proofing Solar Projects:
prioritising reliability and optimising efficiency

Utility-Scale Solar Power Market Landscape

Overview and key challenges

MARKET CHALLENGES

- Grid Interconnection Issues
- Macroeconomic Pressures and Weakening Indicators
- Labor Shortages and Skill Gaps
- Regional Utility Solar PV Market conditions
- Repowering & Revamping of Existing Installations

Typical PV System Challenges

Top issues in field-fabricated EBOS

CHALLENGE 1

Wiring & Connectors

- Uncontrolled install environment
- Human error during install
- Poor torquing
- Serviceable in-line fuses
- Improper grounding
- Cross-matting connectors
- Wire management

CHALLENGE 2

Thermal Failures

- Hot spots
- Use of invasive/damaging technologies- IPC's
- Lack of electrical insulation
- Cable friction
- Inverter downtime

CHALLENGE 3

Long-Term Performance

- Poor design/design life
- Dependence on installer skills
- Installation complexity and susceptibility to environmental factors
- Ground/arc faults
- Lack of testing
- Increased O&M costs

CHALLENGE 4

Efficiency

- Design impacts of late-stage EBOS inclusion
- Increased specialised labor costs and availability
- Increased inspection and maintenance dependence
- Lower project yield
- Higher levelised cost of energy (LCOE)
- Trenching / un-trenching

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Solutions for PV System Challenges

Long-term performance

Reduce future defects, streamline transition to operation, and maximise system lifespan by preventing construction deficiencies:

- Comply with international standards, local electrical codes, and site conditions
- Integrate EBOS design early in the project planning stages, alongside module, tracker, and inverter selections
- Prioritise high-quality materials over low cost for long-term reliability
- Consider wire layout and stringing as key design factors
- Assess trenched and above-ground options to select the optimal solution
- Simplify installation to cut back on skilled labor and minimise delays
- Plan ahead for potential O&M expenses and catastrophic failures

Addressing PV System Challenges

Factory-built EBOS solutions

Many of these challenges can be prevented. Here is how:

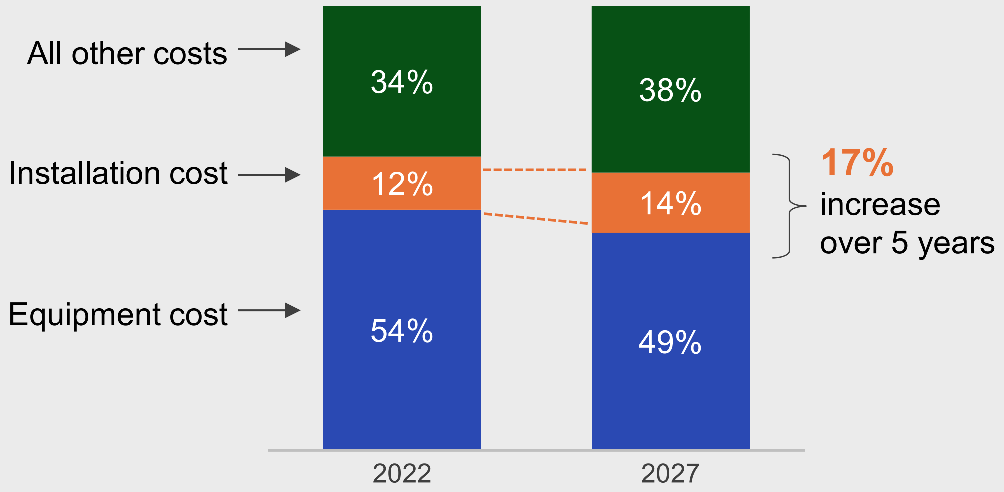
- Design using the most efficient and suitable EBOS architecture
- Focus on minimising potential critical points of failure
- Use pre-fabricated, industrial wiring solutions to ensure complete system integrity
- Opt for plug-and-play systems to simplify installation and eliminate human errors
- Rely on a fully integrated EBOS ecosystem from a single manufacturer for seamless compatibility and reliability
- Request comprehensive quality controls and extended product warranty (5 years recommended)

Labor Contribution to Total Cost of EBOS

Cost efficiency

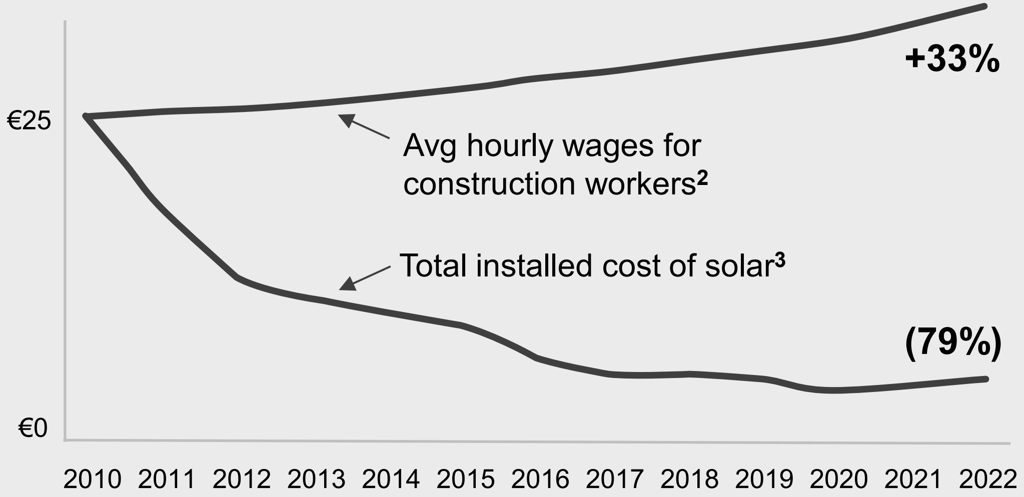
Specialised Labor Stats

Equipment cost vs. installation cost ratio of a solar energy project[1]



Field labor has become one of the largest contributors to the cost of building a solar energy project…

Hourly wages for field labor vs. total installed cost of utility-scale solar



…and hourly wages for construction workers are only rising

(1) Wood Mackenzie H2 2022 Global Solar PV System Pricing. Based on average construction cost for a 50 MW ground-mounted solar energy project using single-axis trackers in the U.S. Installation cost includes labor, civil and EPC overhead and margin categories. Equipment costs include modules, inverter, mounting system and EBOS categories.

(2) Based on Bureau of Labor Statistics, Department of Labor annual mean wage data for 47-0000 Construction and Extraction Occupations.

(3) Installed cost of utility-scale solar using single-axis trackers per BloombergNEF 1H 2023 Global. Renewable Energy Market Outlook, April 2023.

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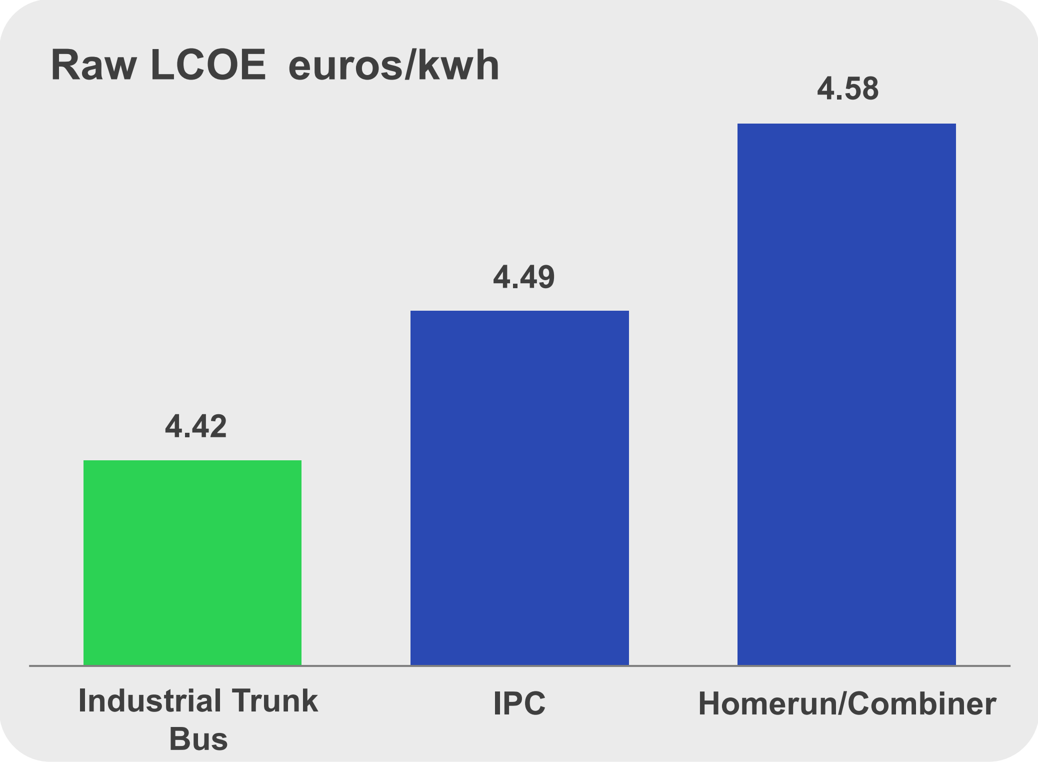
EBOS Contribution to LCOE

Cost efficiency



Source: Solvida Energy Group, DC BOS Comparison and LCOE Analysis, November 2021. Report available upon request.

Levelised Cost of Energy (LCOE) Breakdown for Utility Scale Project using Central Inverters:

- Using low-cost materials for short-term savings can exponentially increase risk
- Industrial Trunk Bus systems offer higher upfront costs, but lower risk and higher savings in the long run
- EBOS represents a small share of total cost, but its failures have 5x the impact

Future Trends in Solar PV

Where we're going

Industrial EBOS Adoption

From rapid growth in countries facing high labor costs or labor shortages to widespread global adoption

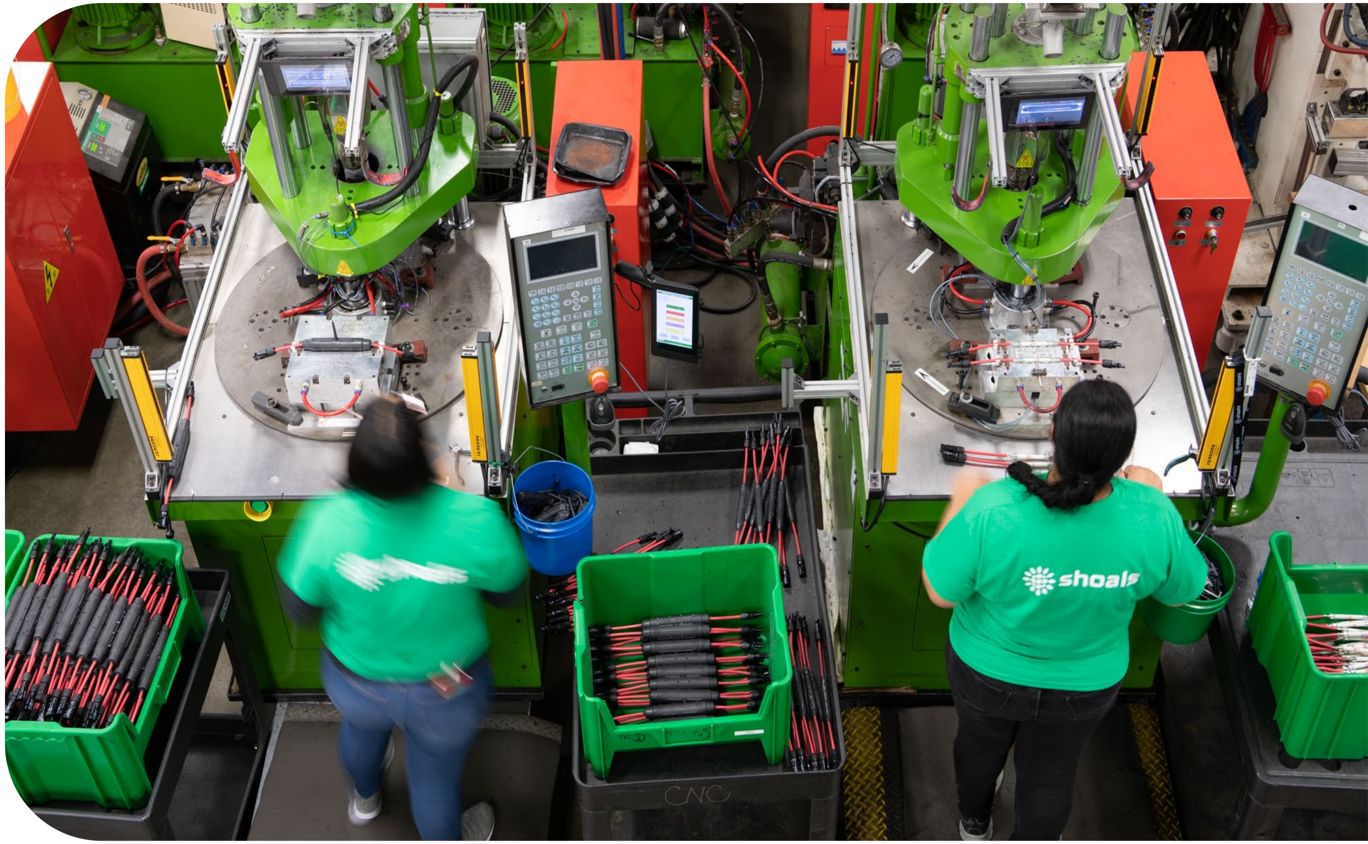
Increased involvement of Project Owners

Greater focus on the low-voltage ecosystem as a key risk factor. Starting to be considered main equipment

Transition to Medium Voltage Systems

Driven by the pursuit of higher yield and efficiency.

The 1500V era is serving as the training ground for the 2000V era, where challenges related to skilled labor are expected to increase



How to Optimise and Future-Proof Your Solar Projects

Choose the right partner with EBOS solutions and expertise

✔ Integrate EBOS Early in Project Design

- Consider EBOS as main equipment from the outset to ensure maximum standardisation and reduce variability

✔ Optimise Your Project's Layout and Performance

- Design systems to reduce the number of critical points of failure by streamlining connections and components

✔ Opt for Non-Invasive Industrial EBOS Solutions

- Pre-fabricated, industrial plug-and-play solutions improve reliability and safety of installations
- Select an experienced partner offering a wide range of industrial EBOS architectures, suitable for various project types, with a strong emphasis on quality

✔ Select an Industrial EBOS Ecosystem that Balances CAPEX and OPEX

- Opt for an EBOS ecosystem that optimises both capital and operational expenditures, ensuring long-term cost-efficiency and reduced complexity

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Thank you!

For more information, check out our eBook:

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Wednesday, 9 October 2024
11:00 am – 12:00 pm EDT, New York City
5:00 pm – 6:00 pm CEST, Berlin, Paris, Madrid

PV module quality control and testing: using data and analysis to enhance safety and performance

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Thank you for joining today!

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