How to Unlock Financing for Green Hydrogen Projects: From Myths to Markets

Executive Summary

The concept of bankability is widely discussed in the green hydrogen industry but is often misunderstood or misused as a buzzword.

As a fundamental requirement for securing financing, bankability goes beyond financial assessments to encompass risk mitigation, regulatory compliance, and stakeholder engagement. Lessons from the photovoltaic (PV) solar industry highlight the importance of structured risk assessment frameworks and standardized investment criteria. This white paper explores the evolution of bankability, its role in project financing, and a proposed Bankability Seal that aligns hydrogen projects with financial institution requirements. Establishing a standardized bankability framework can help de-risk investments, enhance investor confidence, and accelerate the global adoption of green hydrogen.

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Introduction

The Emergence of the Hydrogen Economy

The rapid expansion of renewable energy sources, such as wind and solar, has reshaped the global energy landscape. However, critical challenges remain in effectively integrating these intermittent energy sources into existing energy infrastructures.

Hydrogen and Power-to-X (PtX) technologies offer a promising solution by storing excess renewable energy and serving as an alternative fuel for hard-to-abate sectors such as heavy industry and transportation.

Figure 1: Sectors likely to move towards low-emission hydrogen consuming technologies (DEKRA, 2024).

Investment Needs for Hydrogen Projects

The Hydrogen Council estimates that $514 billion in investments are planned to produce 48 million tons of clean hydrogen annually by 2030. However, this falls short of the 64 million tons required under the Net Zero Emissions (NZE) scenario. Despite this, only 7% of the announced investment volume has been firmly committed by investors and banks. The nascent state of the hydrogen market and the associated loan repayment risks have made financial institutions cautious in their investment decisions.

To meet the growing demand for green hydrogen, investment in production and supply, infrastructure and end-use is necessary. Moreover, supportive government policies, tax incentives, and risk-sharing mechanisms will play a pivotal role in attracting capital from both public and private investors. Addressing these financial gaps is crucial for scaling up hydrogen production and integrating it into the global energy system.

Bankability as a Gateway to Unlock Financing

Achieving financing i.a. for hydrogen production requires coordinated efforts among governments, industries, and financial institutions. While government incentives play a role in mobilizing private capital, they are not enough to fund large-scale projects. Lessons from the PV solar industry highlight how the interplay of structured risk assessment, regulatory support, and standardization can improve the bankability of projects. These insights are essential for unlocking funding for hydrogen initiatives.

The success of hydrogen financing will depend on clear investment criteria, risk allocation strategies, and stable regulatory environments. Establishing well-defined financial mechanisms such as Power Purchase Agreements (PPAs), Green Bonds, and Carbon Credit Trading can further enhance bankability by providing investors with long-term revenue predictability and reducing risk exposure.

Direct hydrogen investments until 2030, USD billion

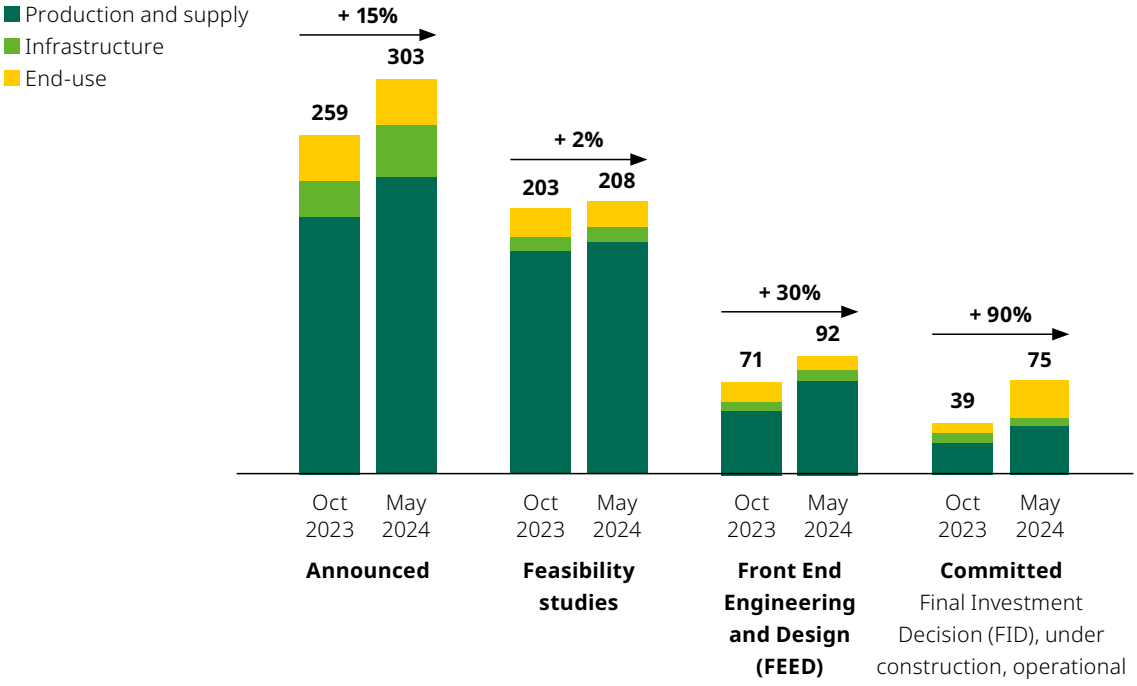

Figure 2: As of May 2024, only USD 38 billion in investments have been firmly committed by investors and banks for hydrogen production projects to be realized by 2030—representing only 7% of the total announced investment volume of USD 514 billion (Hydrogen Insights, 2024).

Understanding Bankability

The Definition of Bankability

The term “bankable” has traditionally been used in the banking and entertainment industries to denote financial reliability. In project finance, however, bankability refers to a project’s ability to attract financing by banks based on its potential to deliver stable, predictable cash flows, while effectively mitigating loan repayment risks. It is important to note that bankability is not synonymous with a sponsor’s creditworthiness or a project’s profitability. Moreover, during the 2007–2008 financial crisis, the photovoltaic (PV) industry demonstrated that bankability can be proactively managed—through transparency, risk management, and standardization—to maintain investor confidence and support industry growth.

Key Elements of Bankability

Bankability is a multidimensional concept involving

- **Financial Viability:** Predictable cash flows, robust financial models, and risk mitigation strategies.
- **Regulatory Alignment:** Compliance with policies, subsidies, and legal requirements to enhance investment attractiveness.
- **Technical Reliability:** Proven technology, quality assurance, and system performance guarantees.
- **Stakeholder Trust:** Transparent project structures that align interests across developers, investors, and financial institutions.

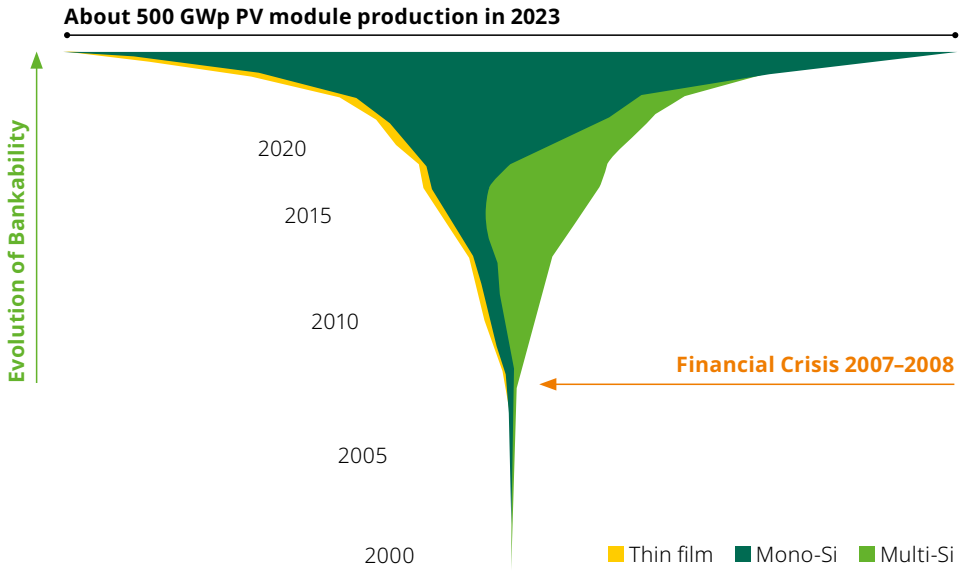

Figure 3: Success story of the photovoltaic industry overcoming the financial crisis in 2007–2008 (Fraunhofer ISE, 2024).

Risk Considerations in Bankability

- **Off-Taker Risks:** Stability of revenue agreements, regulatory changes, financial stability of off-taker, and macroeconomic factors such as taxation and exchange rate fluctuations.
- **Market Risks:** Price volatility of hydrogen and its derivatives, global competition, and supply chain vulnerabilities.
- **Political and Policy Risks:** Government incentives, international trade policies, and potential regulatory changes that impact hydrogen economics.
- **System Integration Risks:** Development risks (permits, land ownership, site selection), construction risks (track record, project management), interconnection risks (installation, commissioning), and operational risks (O&M services, spare parts availability).
- **Component Performance Risks:** Technology risks (quality, reliability, warranties), insolvency risks (financial stability of suppliers), containment risks (after-sales service reliability), and lifetime performance risks beyond warranty periods.

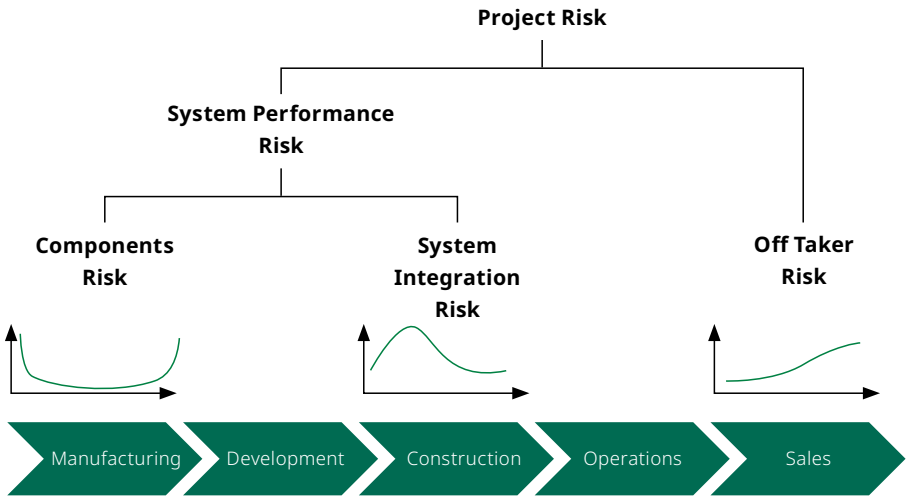

Figure 4: Generalized Risk Structure of a Project analyzing System-Performance and Off-Taker Risks, as well as Component and System Integration Risks (Flink, 2013), (Flink, 2014).

The Role of Stakeholders in Bankability

Banks & Financial Institutions

Financial institutions assess project financing by evaluating documentation, risk mitigation strategies, and projected revenue streams. They prioritize projects with stable cash flows, technical feasibility, and a well-structured risk management plan. Loan security mechanisms such as collateral guarantees, insurance-backed financing, and structured repayment plans influence their decision-making.

Investors

Equity investors seek projects with proven track records, secure off-take agreements, and favorable regulatory environments. They analyze long-term profitability and strategic alignment before committing capital. Institutional investors often require thorough due diligence before funding large-scale hydrogen projects. Risk-return trade-offs and sensitivity analyses of market fluctuations are critical to their investment strategies.

Project Developers

Developers act as architects of bankable projects. They oversee feasibility studies, engage with regulators, and secure financing partners. Their ability to align financial, technical, and policy considerations is essential for successful project execution. Developers must also navigate regularity landscape, permitting processes, and environmental impact assessments to ensure smooth project progression.

System Integrators & EPCs

Engineering, Procurement, and Construction (EPC) firms manage construction risks, ensuring projects meet technical and regulatory standards. Their role in project implementation enhances investor confidence by reducing operational uncertainties.

Component Suppliers

Technology providers must adhere to international standards, ensure reliability, and provide long-term warranties. Suppliers that meet stringent quality and safety benchmarks enhance a project's overall bankability.

Service Providers

Testing, Inspection, and Certification (TIC) firms support risk reduction by ensuring compliance with industry standards. Their role in verifying technical performance and adherence to legal requirements strengthens investor trust.

Policymakers & Regulators

Governments and policy makers influence bankability through subsidies, tax incentives, and regulatory frameworks. Clear, long-term policy commitments create stable investment environments for green hydrogen projects. Regulations on safety, emissions, and energy trade further impact project viability.

A Bankability Management System for Hydrogen

Active Management of Bankability

Bankability goes beyond financial metrics and due diligence—it encompasses qualitative factors that shape a project's attractiveness to investors and lenders. It requires aligning project components and stakeholder expectations with predefined standards to ensure financing viability.

Actively managing bankability means treating it as an ongoing, multidimensional process similar to quality management. This includes implementing performance guarantees, insurances, and stress-testing cash flow models to mitigate risk. Transparent communication with banks, investors, and regulators builds trust, while technical compliance, third-party certifications, and long-term warranties strengthen project credibility. Strong partnerships and a solid track record further enhance investor confidence. A structured approach similar to quality management systems in the automotive, aviation, and food industries can be applied to hydrogen projects.

Proposal: The Bankability Seal

To facilitate financing and increase investor confidence in hydrogen projects, a standardized Bankability Seal is proposed. This certification framework would:

- Establish clear **investment benchmarks** for hydrogen projects.
- Align **project risks, financial viability, and regulatory compliance.**
- Provide **auditable criteria** for assessing technology reliability and commercial feasibility.
- Enhance **investor confidence and streamline project financing.**
- Offer an **internationally recognized standard** that can facilitate cross-border investments and partnerships.

The next steps involve piloting the Bankability Seal with industry stakeholders, refining its criteria, and integrating it with existing regulatory frameworks to ensure broad adoption. Collaboration between financial institutions, policymakers, and industry leaders will be crucial for its success.

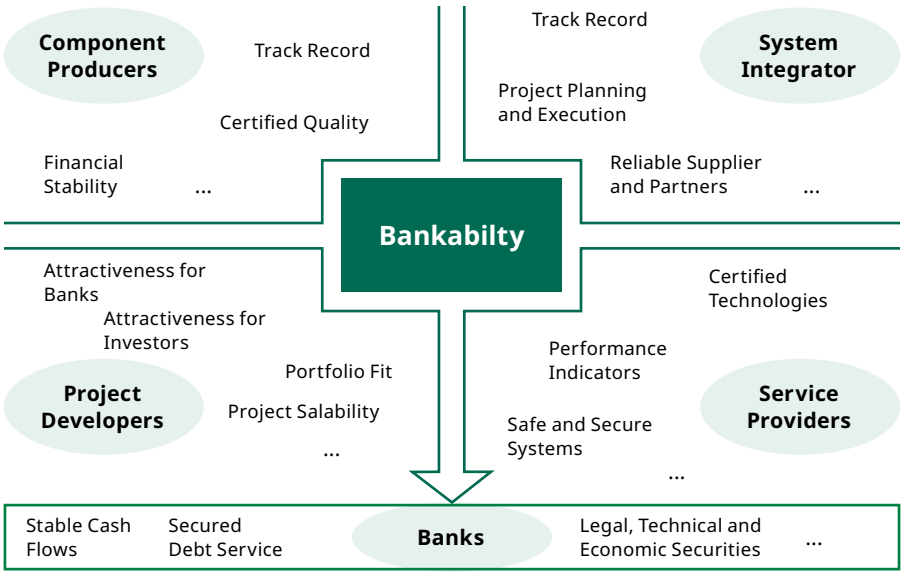

Figure 5: Active Management of Stakeholder's Bankability Requirements (Flink, 2011).

Conclusion

Bankability is critical for unlocking financing and accelerating the growth of green hydrogen projects. By learning from the PV industry's experience and adapting best practices, the hydrogen sector can build a robust financial ecosystem that supports long-term sustainability and large-scale adoption. A structured framework, such as the Bankability Seal, can help de-risk investments, improve stakeholder trust, and standardize evaluation criteria.

Key Takeaways

- **Bankability is a multi-faceted concept** that involves financial, regulatory, and technical considerations.
- **Lessons from the PV industry** can guide the development of structured risk management frameworks for hydrogen.
- **Stakeholder collaboration** is essential for defining and implementing bankability criteria.
- **A standardized Bankability Seal** can streamline hydrogen project financing, reduce risk perception, and foster investor confidence.

By addressing these critical elements, hydrogen projects can transition from uncertainty to financial viability, paving the way for a cleaner, more sustainable energy future.

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