User Guide

Green hydrogen project risk assessment tool

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Acknowledgements

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Technical Reviewers: Ashish Khanna (Director General, ISA), Dr Pradeep Tharakan (Director, Energy Transition, ADB), Tron Andre Svanes (Energy Specialist, ADB).

The International Solar Alliance extends its gratitude to Emanuele Bianco, Energy Specialist, ADB for his valuable feedback during the course of the project.

Disclaimer

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Brief description

The tool will allow to identify risk at each phase of the project and inputs individual scores of defined parameters of each category to calculate overall risk of the project

Pre-construction phase | **Construction phase** | **Operational phase**

Sectoral risk parameters

- Grid strength
- RE integration feasibility
- GH/RE Policy
- Regulations
- Trade policies

Permitting risk parameters

- Land ownership
- Ground water clearance
- Power availability
- Environmental clearance
- Consent
- Power evacuation arrangement

Sponsor risk parameters

- Credit Rating of investor
- Equity Holding Experience
- Capital Structure

Financial risk parameters

- Fund arrangement
- Internal Rate of Return (IRR)
- Levelized Cost of Hydrogen (LCOH)
- Net Present Value (NPV)
- Subsidies

Execution risk parameters

- Execution stage
- Quality of infrastructure
- Manpower
- EPC
- Track record of EPC player
- Guarantee & penalties

Technology & Market risk parameters

- Commercial availability
- Reputation of Technology Supplier
- Efficiency offered
- Performance Guarantee
- Offtake demand for excess production

Off-take risk parameters

- Offtake agreement status
- Credit Rating of off-taker
- Financials of off-taker
- Minimum offtake quantum
- Tenure
- Price certainty

Operational risk parameters

- Raw material availability
- Safety measures
- Project handling capabilities
- Storage/transportation arrangement
- Export mechanism
- Port availability
- O&M arrangement
- Experience of O&M firm

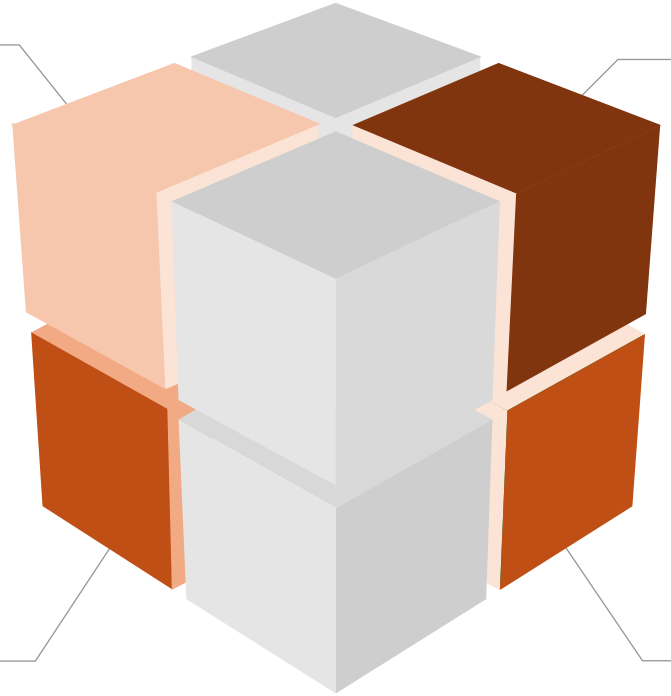
Features of the project risk assessment tool

Unique

It is the **First of a kind** tool available in public domain specifically for GH project with inherent country flexibility

Publicly available

As most of the tools are paid and developed by rating agencies/banks, this ISA **tool will be available to public at free of cost** for an overview of the risks associated



GH specific risk parameters

This tool will **parameters & weights customizable by user, tailored for GH projects** which are crucial at each stage of project

User friendly interface

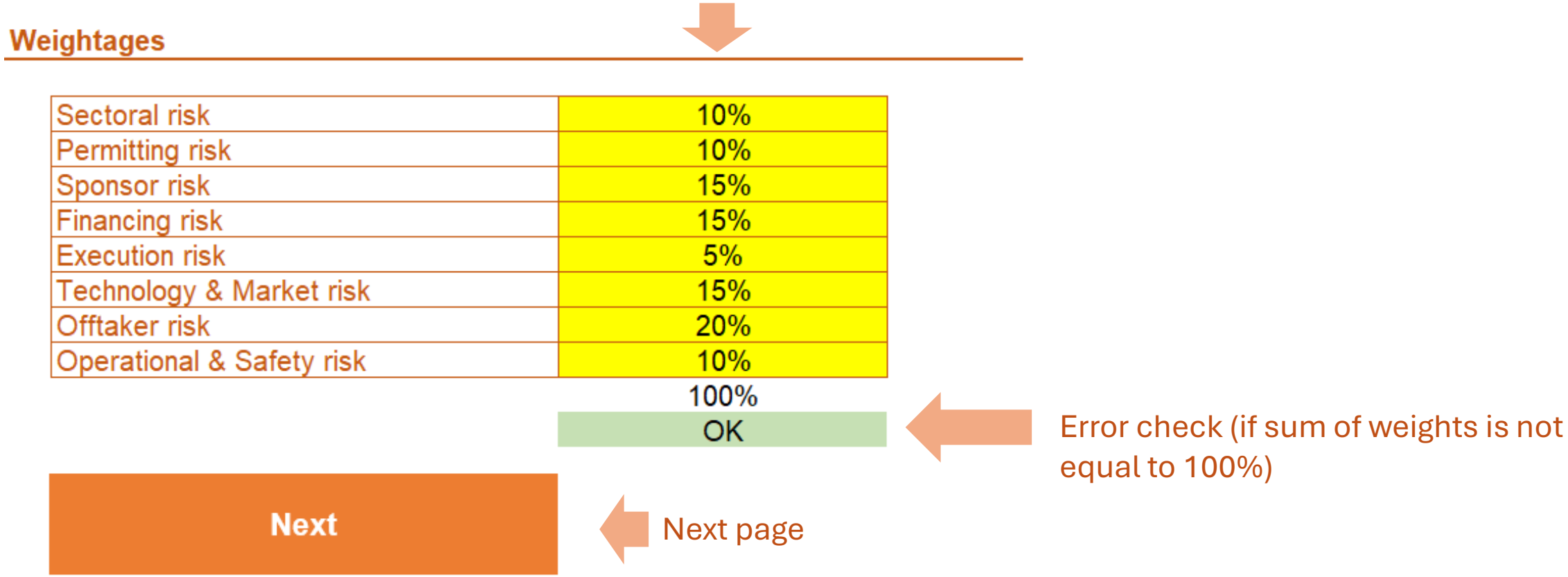
The tool will allow a plug and play interface suitable for both **offering a high degree of flexibility and ease of operations**

User instructions

Key steps to navigate through the project risk tool (1/4)

Step 1:

Input weightages for different project risks



Key steps to navigate through the project risk tool (2/4)

Step 2:

Input key weightages and parameters for sectoral risk

Sectoral risk

Parameter	Weightage	User Input	Score
Current strength of the grid and transmission infrastructure within the country	20%	Medium	13%
Accessibility/availability of grid to related new RE projects	20%	High	20%
Support from government through policies for net zero/GH/RE projects	20%	Medium	13%
Existence of regulatory frameworks to guide the development and operation of energy projects	20%	Medium	13%
Favourable international trade policies to support import/export of materials/GH	20%	Low	7%
Overall Score			**66%**
Check	OK		

Error check (if sum of weights is not equal to 100%)

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Key steps to navigate through the project risk tool (3/4)

Step 3:

Input key weightages and parameters for permitting risk (repeat for other risks as well by clicking on the next buttons

Permitting risk

Parameter	Weightage	User Input	Score
Company has secured land and premises required for the project	17%	No	6%
Ease of clearances to obtain and utilise fresh water for GH production	17%	Low	6%
Ease of getting approvals to setup / procure RE	17%	Medium	11%
Ease of getting environmental clearances	17%	Medium	11%
Ease of obtaining Consent to Operate (CTO) and Consent to Execute (CTE) from concerned authorities	17%	Low	6%
Ease of obtaining safety clearances and other regulatory approvals	17%	Low	6%
Overall Score			**44%**
Check	OK		

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Error check (if sum of weights is not equal to 100%)

Steps 4~9:

Repeat the steps for the other types of GH project risks like:

4. Sponsor risk
5. Financing risk
6. Execution risk
7. Technology & Market risk
8. Offtaker risk
9. Operational & Safety risk

Key steps to navigate through the project risk tool (4/4)

Step 10:

View the output containing the summary of all risks associated with the project basis the entered values

Sectoral risk guidance

Detailed risk guidance on individual sectors

Overall risk assessment of the proj

Category	Weightage	Score	Risk Level	
Sectoral Risk	10%	66%	MEDIUM	Revise
Permitting Risk	10%	44%	HIGH	Revise
Sponsor Risk	15%	58%	HIGH	Revise
Financing Risk	15%	45%	HIGH	Revise
Execution Risk	5%	58%	HIGH	Revise
Technology & Market Risk	15%	50%	HIGH	Revise
Offtaker Risk	20%	61%	MEDIUM	Revise
Operational & Safety Risk	10%	69%	MEDIUM	Revise
	100%	56%		
Overall Risk Assessment			HIGH	

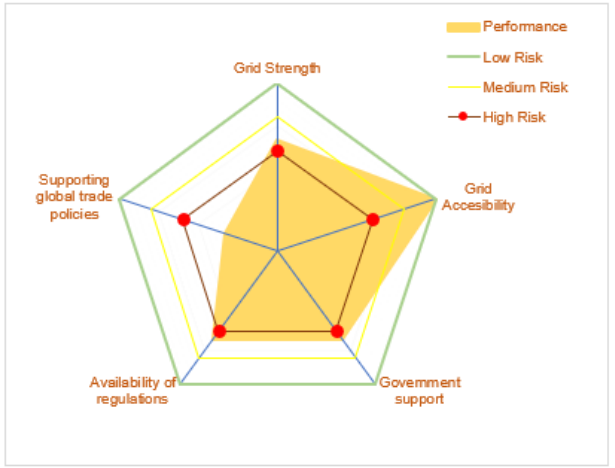
Revise

Revise button
(in case the user wants to change values)

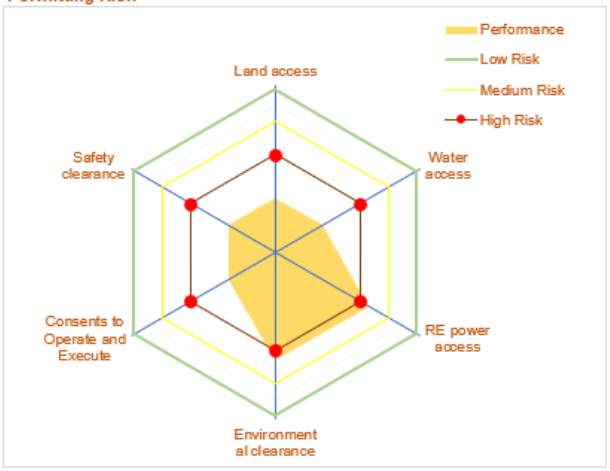
Overall risk guidance

Guidance Charts

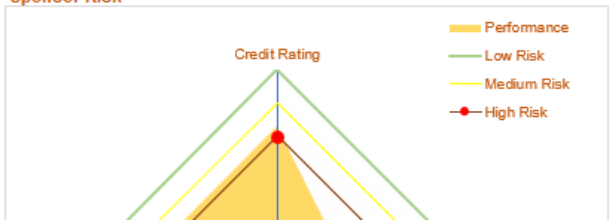
Sectoral Risk



Permitting Risk



Sponsor Risk



Financing Risk

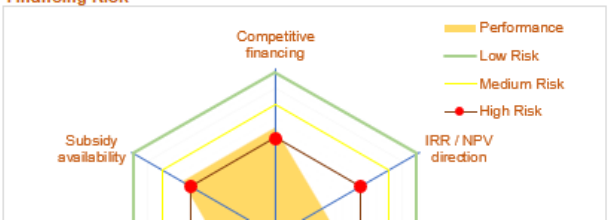
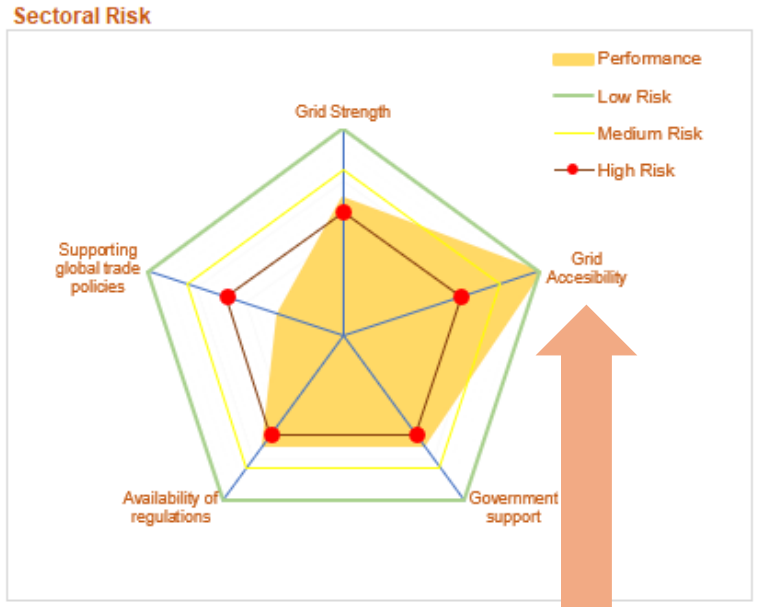
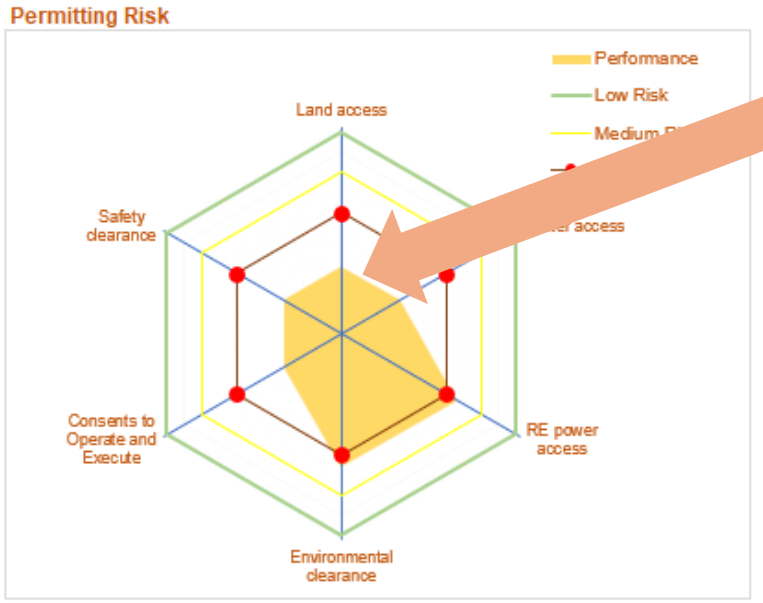


Illustration on indicative inferences from GH risk assessment tool





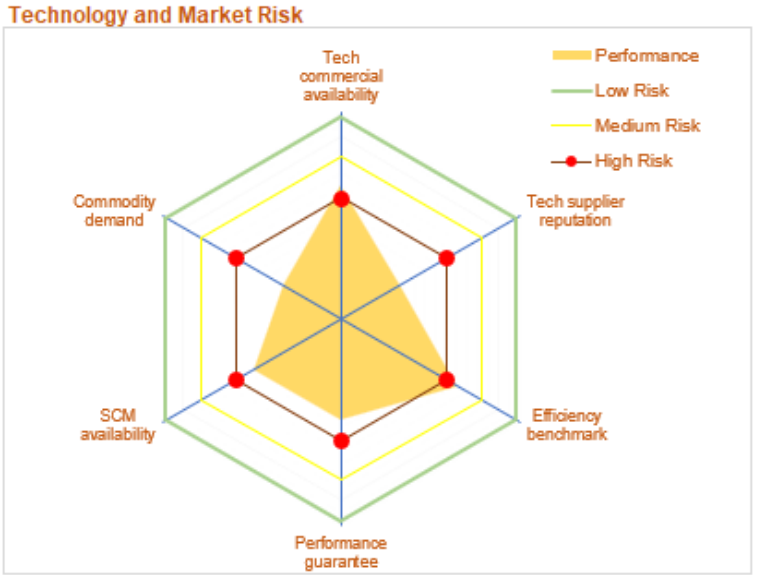
Example

High risk → Accessibility to land is a challenge

Example

Low risk → Accessibility to power grid is available

Example High risk → Electrolyser technology might be unproven so far



Illustrative video to navigate through the tool

particular, the following risks have been considered for analysis, the inputs of which would be provided by the user.

1. Pre-Construction Risks: Analyses the risks prior to the commencement of construction of green hydrogen projects, including sectoral risks, permitting risks, sponsor risks, financial risks etc.
2. Construction Risks: Analyses the risks associated with project construction phase, like execution side risks (which primarily involves the EPC contractors), market risks, technology risks etc.
3. Operational Risks: Analyses the risks associated with the operation of the green hydrogen plant, like safety risk, offtaker risk etc.

Users input project-specific data, and the tool generates an **indicative risk rating**—**High**, **Medium**, or **Low**—for each risk category. These insights might help stakeholders:
1. Identify critical risk areas early in the project lifecycle for planning deeper assessments and monitoring
2. Develop targeted mitigation strategies
3. Obtain a holistic and granular guidance on green hydrogen project risks
4. Compare different projects with respect to project risks

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Plot Area

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