User Guide

Green hydrogen hub tool

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Acknowledgements

Project Team: (ISA-ADB TA) Dr Mridula Bharadwaj. (ISA) S Gautham.

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

Tool will be based on ISA's green hydrogen hub framework and provide guidance to policymakers regarding the preparedness of the proposed green hydrogen hub

Objective

To provide a comprehensive framework for determining the optimal type and location of GH Hub

Proposed methodology

1. Identification of H2 Hub type (Import, export, domestic, hybrid)
2. Identification of prerequisites in the given location
3. Formulation of logic for each type of H2 Hub
4. Provision of suitable quantitative and scientific methodology

Target audience

- National governments & planners — for strategy and investment prioritization.
- Investors & hub developers — to compare countries and sites.
- Multinationals & off-takers — to select best markets for engagement.
- DFIs & financial institutions — for feasibility and bankability assessments

Outcomes

1. Identifies a suitable hub type basis country's strategic objectives
2. Compares different hub options basis structural enablers like infrastructure, resources, government support
3. Provides initial guidance for MDBs to compare different hub options basis their own weightages
4. Helps developers identify gaps in GH-hubs and direct target actions to mitigate those gaps

Source: Framework for the development of green hydrogen hubs, ISA-ADB, released in ACEF 2025 Manila

Output screen will provide guidance for policymakers and MDBs take informed decision on green hydrogen hub establishment in a country

How the tool works?

1. **Strategic Layer:** Identifies the most aligned hub type (Export, Domestic, Import, or Hybrid) based on policy drivers
2. **Structural Layer**: Validates whether the chosen hub type is feasible given user inputs in infrastructure, resources, support etc
3. **Location Layer**: Scores candidate locations based on the selected hub type or hybrid mix
4. **Hybrid Layer:** Helps developers identify gaps in GH-hubs and direct target actions to mitigate those gaps

How the tool helps?

1. **Strategic Layer:** Identify which hub type (Export / Domestic / Import / Hybrid) a country is best suited for
2. **Structural and Location Layers**: Scores candidate locations for the chosen hub type
3. **Comparative analyses:** Useful for IFIs for comparison using same framework

Examples of GH Hubs

Hub	Country	Type	Features
SalalaH2	Oman	Export + Domestic	Strategic: Export focus + Domestic industrial demand Structural: strong RE resource + port infrastructure
Tokyo	Japan	Import	Strategic: Import focus + Domestic industrial demand Structural: Port infrastructure + Innovation + Mfg
HyVelocity	USA	Export + Domestic	Strategic: Export focus + Domestic industrial demand Structural: strong RE resource + port infrastructure + Storage Infra / Distribution Infra
NEOM	Saudi Arabia	Export	Strategic: Export focus + Domestic industrial demand Structural: strong RE resource + port infrastructure

User instructions

Key steps to navigate through the country readiness assessment tool (1/6)

Step 1:

Arrive at the opening page and click on “Begin” to start the tool operation

The tool was developed under the ISA-ADB project under the Phase 2 – Green Hydrogen Innovation Centre (GHIC)'s Upgradation, Operation and Maintenance project.
This interactive tool helps assist the users with directional inputs to arrive at the hydrogen hub type and also compare relative attractiveness of various proposed hub sites. The tool can offer guidance to the member countries, IFIs and developers on the requirements of a hydrogen hub using ISA's standardised framework. By analysing qualitative and quantitative inputs across critical parameters, it generates a readiness score based on ISA's green hydrogen hub framework. Users can explore readiness levels across various relevant factors, helping identify priority areas for interventions, policy actions, or strategic engagement. The tool also enables comparisons between countries, offering valuable insights for planning targeted country-level initiatives.

The green hydrogen (GH) hub tool works in two phases:

a) **Strategic Layer:** The tool asks specific questions to determine the best possible GH hub configuration among the GH Hub Types - Domestic, Export and Import.
b) **Structural Layer:** The tool compares between a maximum of 5 different GH Hub choices, all based on a particular fixed type of GH Hub, as determined in the strategic layer.

The GH Hub tool's output is driven by information from the user. It's output helps provide a basic guidance to the users to determine the best possible type of GH Hub suitable basis the inputs provided by the user on various parameters related to the GH value chain. The tool however is not a substitute to detailed technical, engineering or financial evaluations.

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END OF SHEET

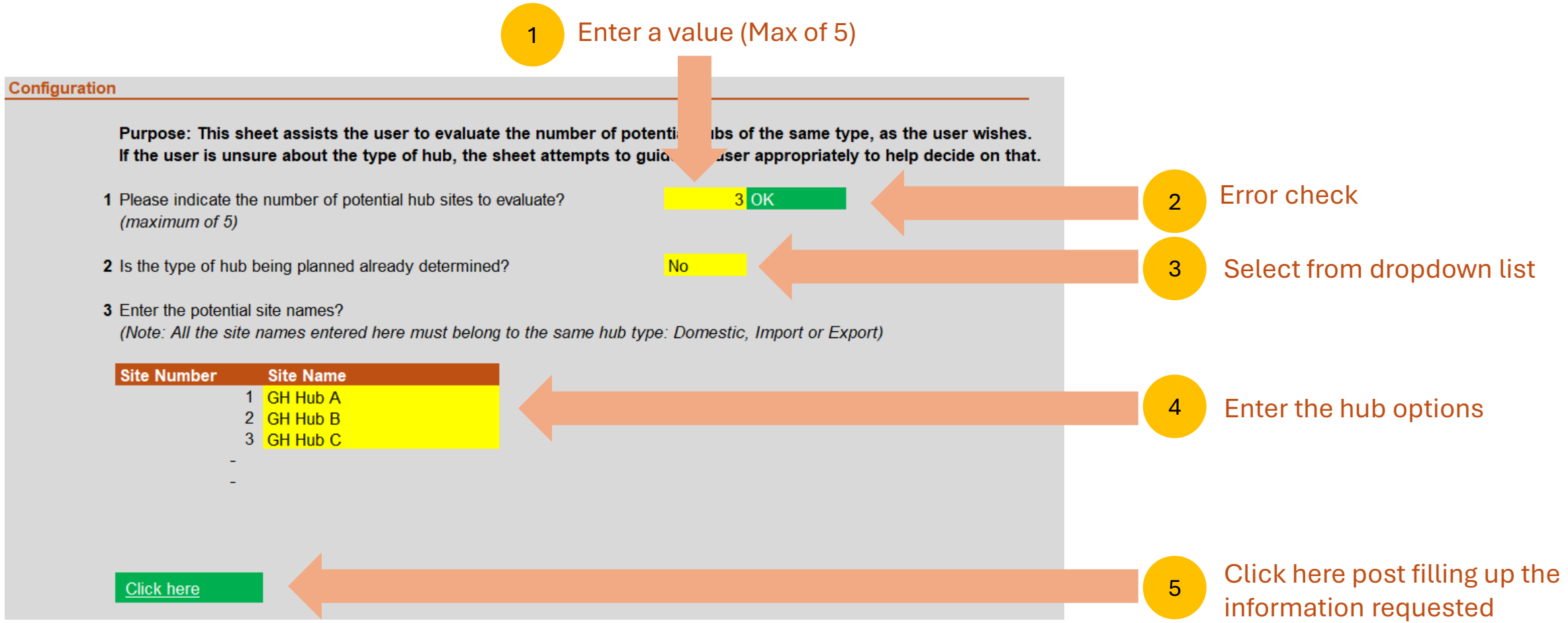
Begin

Click

Key steps to navigate through the country readiness assessment tool (1/6)

Step 2:

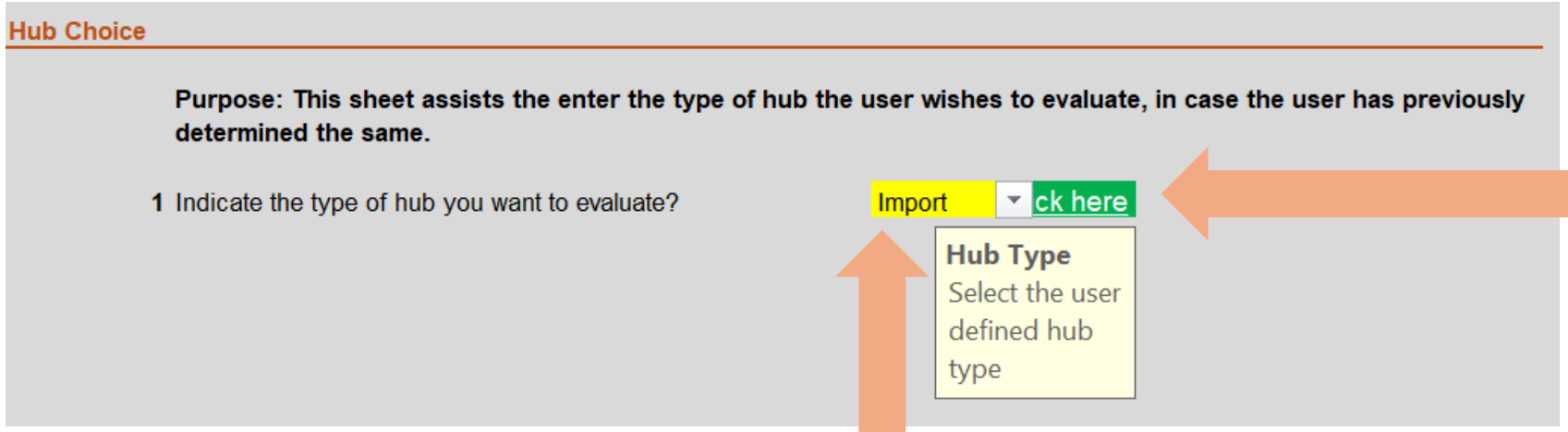
Fill up the desired information on “Configuration” of the GH Hub and click on the buttons indicated post filling up the responses



Key steps to navigate through the country readiness assessment tool (1/6)

Step 3a:

If the user has already decided on the hub option to fill, the user may indicate that choice in this sheet



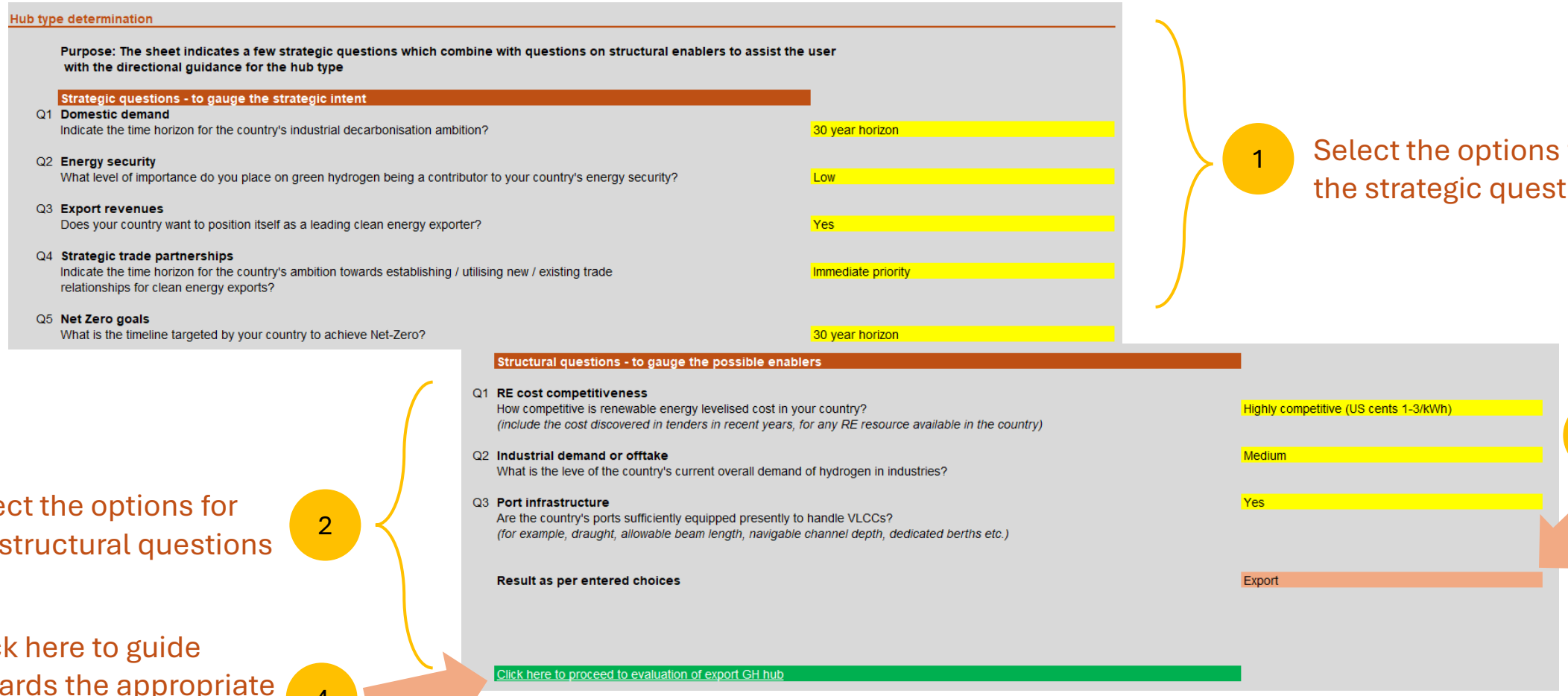
2 Click here post filling up the information requested

1 Select from dropdown list

Key steps to navigate through the country readiness assessment tool (1/6)

Step 3b:

If the user has not decided on the hub option to fill, the user may indicate her/his responses here to determine the hub type, basis the structural and strategic questions asked



Hub type determination

Purpose: The sheet indicates a few strategic questions which combine with questions on structural enablers to assist the user with the directional guidance for the hub type

Strategic questions - to gauge the strategic intent

Q1	**Domestic demand** Indicate the time horizon for the country's industrial decarbonisation ambition?	30 year horizon
Q2	**Energy security** What level of importance do you place on green hydrogen being a contributor to your country's energy security?	Low
Q3	**Export revenues** Does your country want to position itself as a leading clean energy exporter?	Yes
Q4	**Strategic trade partnerships** Indicate the time horizon for the country's ambition towards establishing / utilising new / existing trade relationships for clean energy exports?	Immediate priority
Q5	**Net Zero goals** What is the timeline targeted by your country to achieve Net-Zero?	30 year horizon

Structural questions - to gauge the possible enablers

Q1	**RE cost competitiveness** How competitive is renewable energy levelised cost in your country? *(include the cost discovered in tenders in recent years, for any RE resource available in the country)*	Highly competitive (US cents 1-3/kWh)
Q2	**Industrial demand or offtake** What is the leve of the country's current overall demand of hydrogen in industries?	Medium
Q3	**Port infrastructure** Are the country's ports sufficiently equipped presently to handle VLCCs? *(for example, draught, allowable beam length, navigable channel depth, dedicated berths etc.)*	Yes
	Result as per entered choices	Export

Click here to proceed to evaluation of export GH hub

1 Select the options for the strategic questions

2 Select the options for the structural questions

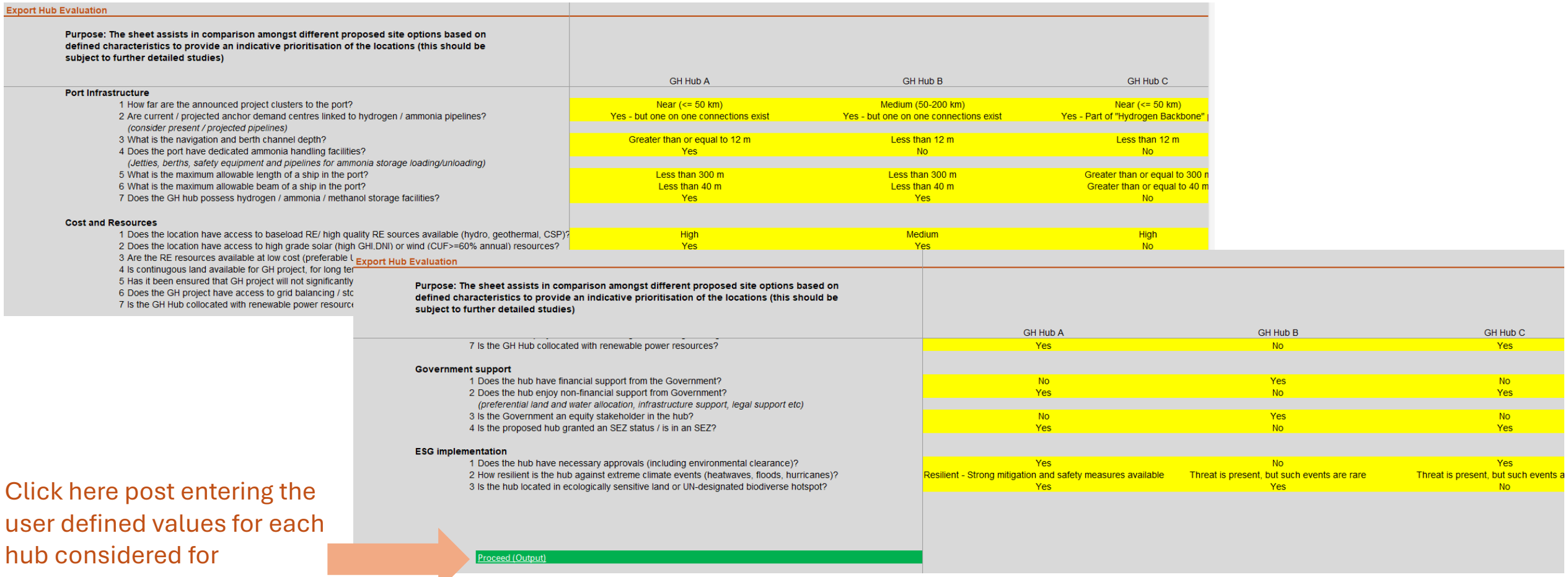
3 Indicated GH hub type basis user inputs

4 Click here to guide towards the appropriate GH hub evaluation

Key steps to navigate through the country readiness assessment tool (1/6)

Step 4:

Post determination of the GH hub type, the user needs to select from the choices given to indicate the preparedness of the GH Hub options (A,B and C in this example) basis the specific questions on infrastructure, cost, resources, ESG commitments etc.



Export Hub Evaluation

Purpose: The sheet assists in comparison amongst different proposed site options based on defined characteristics to provide an indicative prioritisation of the locations (this should be subject to further detailed studies)

	GH Hub A	GH Hub B	GH Hub C
Port Infrastructure			
1 How far are the announced project clusters to the port?	Near (<= 50 km)	Medium (50-200 km)	Near (<= 50 km)
2 Are current / projected anchor demand centres linked to hydrogen / ammonia pipelines? *(consider present / projected pipelines)*	Yes - but one on one connections exist	Yes - but one on one connections exist	Yes - Part of "Hydrogen Backbone"
3 What is the navigation and berth channel depth?	Greater than or equal to 12 m	Less than 12 m	Less than 12 m
4 Does the port have dedicated ammonia handling facilities? *(Jetties, berths, safety equipment and pipelines for ammonia storage loading/unloading)*	Yes	No	No
5 What is the maximum allowable length of a ship in the port?	Less than 300 m	Less than 300 m	Greater than or equal to 300 m
6 What is the maximum allowable beam of a ship in the port?	Less than 40 m	Less than 40 m	Greater than or equal to 40 m
7 Does the GH hub possess hydrogen / ammonia / methanol storage facilities?	Yes	Yes	No
Cost and Resources			
1 Does the location have access to baseload RE/ high quality RE sources available (hydro, geothermal, CSP)?	High	Medium	High
2 Does the location have access to high grade solar (high GHI,DNI) or wind (CUF>=60% annual) resources?	Yes	Yes	No
3 Are the RE resources available at low cost (preferable			
4 Is continugous land available for GH project, for long te			
5 Has it been ensured that GH project will not significantly			
6 Does the GH project have access to grid balancing / stc			
7 Is the GH Hub collocated with renewable power resourc			

Export Hub Evaluation

Purpose: The sheet assists in comparison amongst different proposed site options based on defined characteristics to provide an indicative prioritisation of the locations (this should be subject to further detailed studies)

	GH Hub A	GH Hub B	GH Hub C
7 Is the GH Hub collocated with renewable power resources?	Yes	No	Yes
Government support			
1 Does the hub have financial support from the Government?	No	Yes	No
2 Does the hub enjoy non-financial support from Government? *(preferential land and water allocation, infrastructure support, legal support etc)*	Yes	No	Yes
3 Is the Government an equity stakeholder in the hub?	No	Yes	No
4 Is the proposed hub granted an SEZ status / is in an SEZ?	Yes	No	Yes
ESG implementation			
1 Does the hub have necessary approvals (including environmental clearance)?	Yes	No	Yes
2 How resilient is the hub against extreme climate events (heatwaves, floods, hurricanes)?	Resilient - Strong mitigation and safety measures available	Threat is present, but such events are rare	Threat is present, but such events a
3 Is the hub located in ecologically sensitive land or UN-designated biodiverse hotspot?	Yes	Yes	No

Proceed (Output)

Click here post entering the user defined values for each hub considered for evaluation

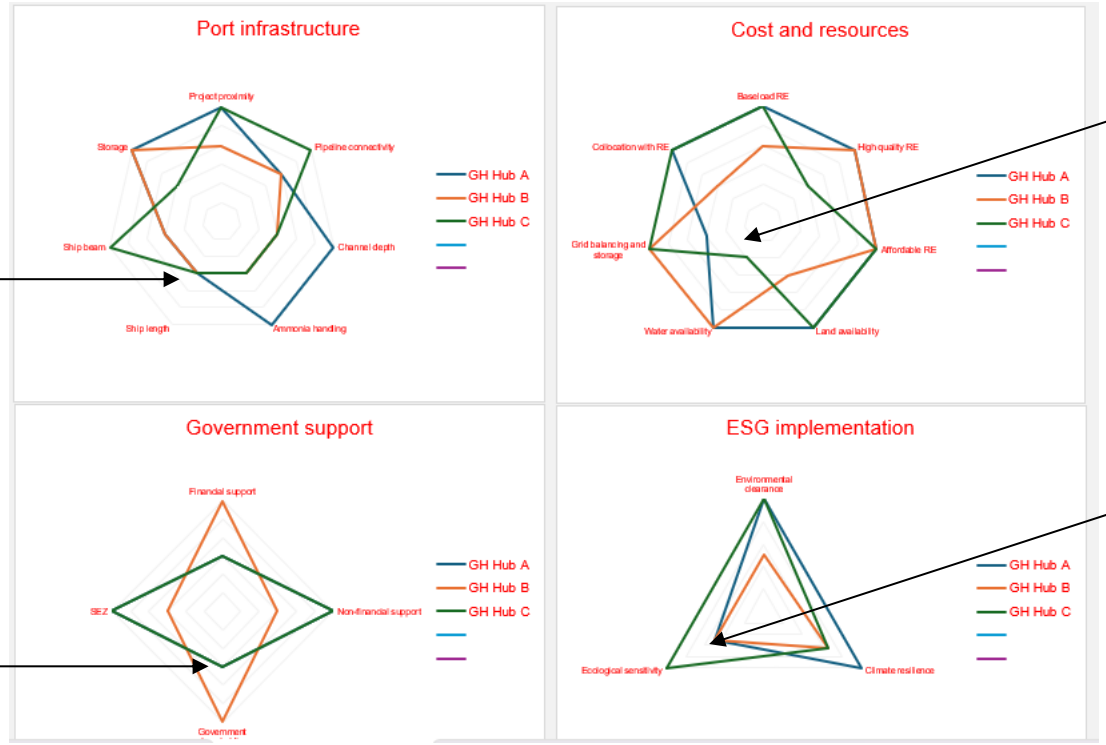
Key steps to navigate through the country readiness assessment tool (1/6)

Step 5:

Analyse the results post entering the values to assess the preparedness of the GH hub and consider taking targeted actions to mitigate gaps, if any.

For example, basis the user inputs we can find out that

Work needed on port infrastructure in all hubs to allow larger ships for ammonia trade



GH Hub C needs to ensure water availability for its GH projects

GH Hubs A and C need to work on obtaining financial support from Government

GH Hub B needs to ensure the hub does not lie in ecologically sensitive area and possesses all permits and clearances

THANK YOU

INTERNATIONAL SOLAR ALLIANCE

Contact Us
International Solar Alliance Secretariat
Surya Bhawan, National Institute of Solar Energy
Campus Gwal Pahari,
Faridabad-Gurugram Road, Gurugram,
Haryana – 122003, India
Email: info@isolaralliance.org