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India Smart Grid Forum

India SMART UTILITY Week 2024

Supporting Ministries

Session 1: Standards and Regulations for Green Hydrogen

DEVELOPING AND SCALING THE GREEN HYDROGEN ECOSYSTEM: ISA PERSPECTIVE

Presented By

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ISA'S GOVERNANCE STRUCTURE

ISA Assembly

India  **President**

France  **Co-President**

8 Vice Presidents representing 4 regions

Asia & Pacific Region

 Tuvalu

 Bangladesh

Africa Region

 Somalia

 Mali

Latin America & the Caribbean Region

 Venezuela

 Dominica

Europe & Other regions

 Denmark

 Sweden

ISA Committees

5 Committees (1 Standing Committee and 4 Regional Committees)

To provide strategic advice and guidance on functioning of the ISA and support in facilitating implementation of various ISA programmes, projects and activities

ISA Secretariat

Providing programmatic support to Member Countries for promotion of solar solutions	Support in strategic decision making and advocacy	Facilitate engagement with diverse stakeholders for conceptualization of programs and projects

Current Membership Status

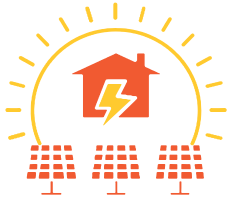
193	**Prospective Member Countries**	**97**	**No. of countries who have signed and ratified ISA framework agreement**	**21**	**No. of countries who have signed ISA framework agreement & will ratify soon**

ISA PROGRAMMES

To attain SDG 7 (universal energy access) and SDG 13 (combating climate change) goals Current Programmes (9):

Scaling Solar Applications for Agriculture Use

Affordable Financing at Scale



Scaling Solar Mini-Grids

Scaling Solar Rooftop

Scaling Solar E-Mobility and Storage

Solar Parks

Solarizing Heating and Cooling Systems

Solar PV and Battery Waste Management

Solar for Green Hydrogen

Role of ISA

Support in assessment and facilitate solar H2 readiness level in member countries related to-

01.

Enabling policy and regulatory framework

02.

Identifying technological gaps; ‘go-to’ resources

03.

Facilitating investment environment for commercially viable solar H2 projects

04.

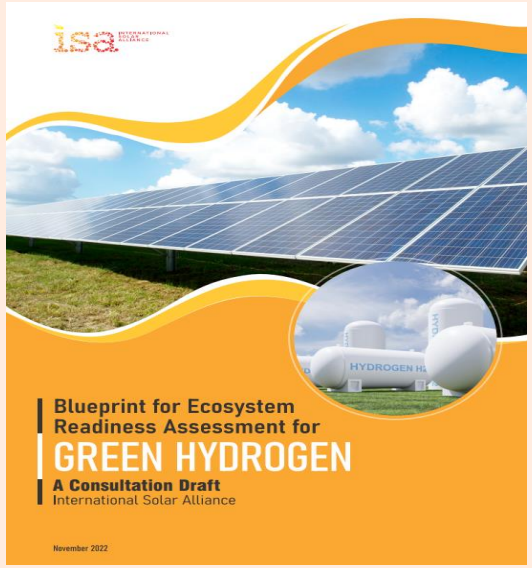
Identification of viable projects pipeline across solar hydrogen value chain

05.

Creating global synergies & leveraging partnerships with public and private sector

ISA's GH Initiatives and Updates

[Blueprint for Ecosystem Readiness Assessment for Green Hydrogen]

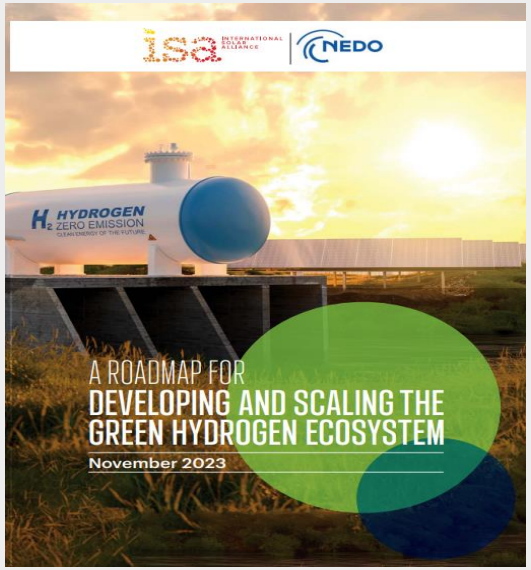


Report launch at COP27, Sharm El-Sheikh, Egypt

[Africa's Extraordinary Green Hydrogen Potential]

Report launch at COP27, Sharm El-Sheikh, Egypt

[A Roadmap for Developing and Scaling the Green Hydrogen Ecosystem]



Report launch at 6th ISA Assembly, New Delhi, India

Key Parameters for readiness level assessment

Market Overview
Holistic overview of demand and supply status and projections for GH

Green Hydrogen Pipeline
Number of projects in pipeline within the country

Strategic Intent
Net-zero commitments, Monetary commitments, Regulations and Standards, Mandates and Targets, Strategy or Roadmaps

Renewable Energy Assessment
Installed Capacity of Renewable Energy.

Solar and Wind Energy Potential

Hydrogen Consumption
Analysis of current hydrogen consumption

Potential of replacing H2/other fossil fuels with green hydrogen

Experience with Infrastructure
Fuel Handling Infrastructure: Existing Infrastructure of pipeline, storage, liquefaction, gasification and transportation within the country and its ports

REPORT-2: AFRICA'S EXTRAORDINARY GREEN HYDROGEN POTENTIAL (ISA-EIB-AU COLLABORATION)

Tapping into Africa's massive solar energy resource to produce cheap and abundant GH, delivering affordable energy, accelerating and decarbonising growth across the continent and beyond.

Focus Regions: (1) **Western Africa hub** (Morocco & Mauritania), (2) **Northern Africa hub** (Egypt) and (3) **Southern Africa hub** (South Africa & Namibia)

APPROACH AND METHODOLOGY

A. Mapping opportunities in H2 Hubs

Regional/country-specific deep dives based on prospects for GH production, utilization, and trade:

- **Upstream GH value chain:** Solar Generation, Water Desalination, Water Transportation and Electrolysis
- **Midstream and Downstream GH value chain:** GH Generation, Storage and Transportation

B. H2 Demand Assessment

Potential GH demand estimation for Vision 2030 and 2035

- Analysis on existing sites with potential H2 offtakers (e.g.: Thermal plant, and Refineries)
- Future H2 off-takers related to new green industrial sites (e.g.: Fertilizers, Chemicals and Steel plants)

C. Estimation of investment opportunities

Source: Africa Solar Hydrogen Project (ASHyP), ISA-EIB-AU: CVA Analysis

REPORT-3: A ROADMAP FOR DEVELOPING AND SCALING THE GREEN HYDROGEN ECOSYSTEM (ISA-ADB-NEDO COLLABORATION)

Technological advancements in Green Hydrogen

- *Alkaline electrolysers*
- *Proton exchange membrane (PEM)*
- *Anion exchange membrane (AEM)*

- *Green hydrogen definitions*
- *Existing green hydrogen standards*
- *Guarantees of Origin*
- *Challenges in Guarantees of Origin*

Regulations, Codes and Standards for Green Hydrogen Production and Use

Country Readiness Assessment for Green Hydrogen Ecosystem

- *Brazil*
- *Chile*
- *India*

- *Education & Awareness*
- *Market Development and Financial Incentives*
- *Research & Development*
- *International Collaboration*
- *Standardization and Certification*
- *Infrastructure*
- *Renewable Energy Generation*

Strengthening the GH supply chain

GREEN HYDROGEN INNOVATION CENTRE (GHIC)

As countries develop green hydrogen ecosystems, there is a necessity for a knowledge repository that tracks global progress and provides up-to-date information, and learning.

SNAPSHOT- GREEN HYDROGEN INNOVATION CENTRE

Source: www.isa-ghic.org

GHIC: A ONE-STOP PLATFORM WITH COUNTRY-LEVEL INSIGHTS AND KNOWLEDGE REPOSITORY

Creation of GHIC can help countries in various aspects, the three main pillars of support are detailed below

KNOWLEDGE DISSEMINATION

GHIC to serve as a one-stop knowledge repository on various topics of Green Hydrogen like:

- Global projects
- Case Studies
- Reports
- Research publications

BEST PRACTICES & LEARNINGS

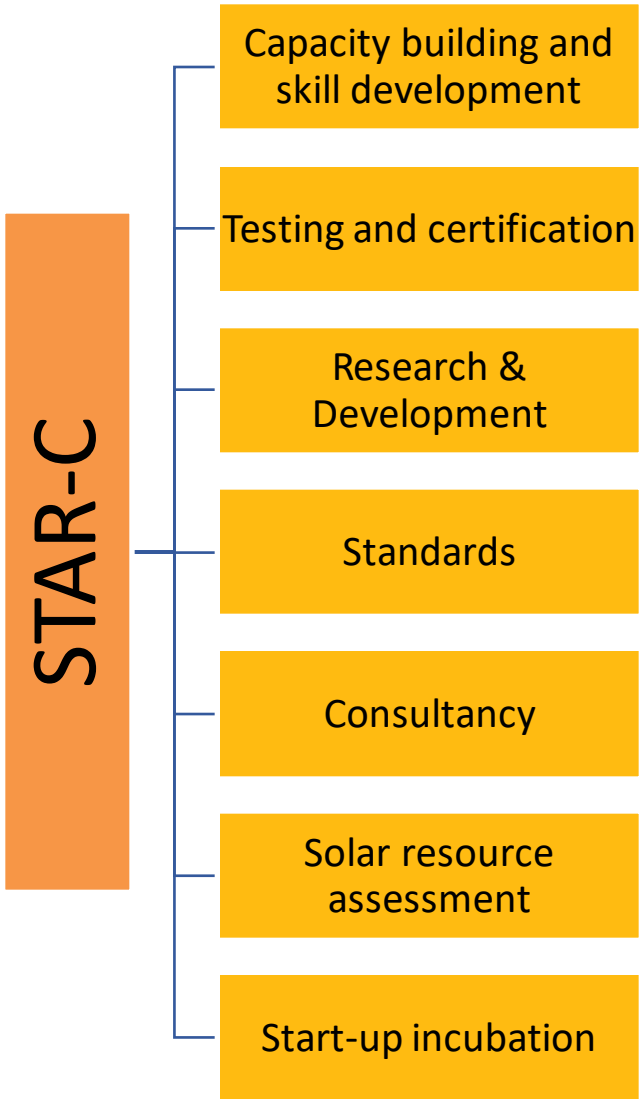
- Access country policies, regulations, standards and code through the portal
- Outreach to stakeholders
- Portal to provide country-level insights for green hydrogen along with potential and demand of the green hydrogen

NETWORK AND PARTNERS

GHIC will aid developers in providing details about OEMs for Electrolyzers, Fuel Cells, Storage providers, and their products, along with EPC/system integrators, and later identifying possible financing partners

Launched at G20 Ministerial, included in G20 Leaders' Summit Delhi Declaration

SOLAR TECHNOLOGY APPLICATIONS RESOURCE CENTRES (STAR-C)



- ***Establishing technical facilities undertaking testing/ standardisation, demonstrate and upscale replicable solar energy applications.***
- ***Undertaking training and skills development for a better-qualified workforce***
- ***Creating a global network for exchange of knowledge and expertise***

- ***2 Countries- Commissioned (Ethiopia and Somalia)***
- ***3 countries*** *are at an advanced stage (Cuba, Kiribati, and Cote d' Ivoire)*
- ***6 Countries MoUs*** *Signed (Ghana, Venezuela, Bangladesh, Uganda, Benin, and Cameroon)*
- ***EoIs*** *received from* ***7 more countries****.*
- ***368 Govt. officials*** *have been trained on developing new schemes and programs on solar energy*

THANK YOU!

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