



Feasibility Study on Green Hydrogen Potential in Maldives and Development of a  
National Roadmap for Sustainable Energy Transition

## Stakeholder Consultation Workshop Report

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Prepared for



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Submitted by



pManifold Business Solutions Pvt. Ltd.



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# 1. Introduction

The Maldives, as a small island developing state, faces unique energy and climate challenges due to its heavy reliance on imported fossil fuels, dispersed island geography, and vulnerability to climate change impacts. While the country has made progress in expanding renewable energy, particularly solar there remain structural constraints related to land availability, storage, and grid stability. In this context, green hydrogen (GH2) is emerging globally as a potential complementary solution that can support long-term decarbonisation, enhance energy security, and enable the integration of higher shares of renewable energy.

pManifold team organised a workshop as part of a project commissioned by the UNEP Climate Technology Centre and Network (CTCN), with funding support from the European Union for Ministry of Tourism and Environment (MOTE). This workshop was designed to explore the relevance and applicability of GH2 for the Maldives by examining key drivers, challenges, and opportunities specific to the national context. The discussions focused on understanding where GH2 can add value across priority sectors such as power, transport, and tourism, while acknowledging current technical, financial, and institutional constraints. The workshop also aimed to build a shared understanding among government, utilities, industry, and other in-country stakeholders on global GH2 trends and lessons that are most relevant for island energy systems. The workshop was attended by 35+ participants with ~38% representation (13 nos.) by female participants.

The workshop further introduced a structured feasibility framework to support informed decision-making on GH2 pathways for the Maldives. Through stakeholder engagement and dialogue, the sessions focused on achieving outcomes such as identify priority sectors, enabling ecosystem requirements, and next steps for pilot projects and further assessments. The outcomes of the workshop will help inform future policy considerations, investment planning, and potential development partner support for advancing green hydrogen in the Maldives.

## AGENDA

Time	Session	Format
08:45 – 09:00	<b>Registration &amp; Tea</b>	—
09:00 – 09:15	<b>Opening Remarks</b> <i>Mr. Hussian Ageel Naseer, Deputy Minister at Ministry of Tourism and Environment</i>	Address
09:15-09:40	<b>Group Photo and Tea/ Coffee Break</b>	



<b>09:40 – 10:00</b>	<b>Welcome &amp; Context Setting</b> <i>Rahul Bagdia, pManifold</i> Ministry representative welcome	Remarks
<b>09:30 – 10:15</b>	<b>Setting the Scene: GH2 Basics &amp; Global Context</b> <i>Rahul Bagdia, pManifold</i> <ul style="list-style-type: none"> <li>• Overview of green hydrogen and its importance</li> <li>• Global trends and relevance for island nations</li> <li>• Potential role in Maldives' energy transition</li> <li>• Contours of Feasibility study</li> </ul>	Presentation (30 min) + Q&A (15 min)
<b>10:15 – 10:30</b>	<b>Tea Break &amp; Networking</b>	—
<b>10:30 – 12:00</b>	<b>Part-1: Feasibility Assessment</b> <i>Santosh Gurunath</i> Presentation: Overview of GH2 Techno-economics & Use-cases <b>Discussion prompts for stakeholders:</b> <ul style="list-style-type: none"> <li>• Which use-cases see potential for hydrogen integration?</li> <li>• Which production technology can be most relevant for Maldives?</li> <li>• What RE cost trends is envisaged in Maldives aligned to National climate goals?</li> </ul>	Presentation (25 min) + Facilitated Discussion (65 min)
<b>12:00 – 13:00</b>	<b>Lunch</b>	—
<b>13:00 – 14:30</b>	<b>Part-2: Sectoral Priorities – Stakeholder Consultation</b> <i>Santosh Gurunath</i> <ul style="list-style-type: none"> <li>• Which sectors should be prioritized for early GH2 pilots?</li> <li>• What policy or regulatory support would enable GH2 development?</li> <li>• What institutional roles and partnerships are needed?</li> <li>• What capacity building and skills development is required?</li> <li>• What would success look like in 5 years?</li> </ul>	Presentation (20 min) + Q&A (10 min)
<b>14:30 – 15:30</b>	<b>Way Forward: Enabling GH2 Transition for Maldives</b> <i>Yamini Keche, pManifold (facilitators)</i> <b>Consultation themes:</b> <ul style="list-style-type: none"> <li>• What are the enabling levers for GH2 transition?</li> <li>• What challenges will need to be addressed to enable the transition?</li> <li>• What lessons from global countries can be adopted?</li> <li>• What measures Maldives can take to initiate GH2?</li> <li>• Which projects can be prioritized for GCF Pilot in Maldives?</li> </ul>	Activity (10 min) & Discussion (45-50 min)
<b>15:00 – 15:15</b>	<b>Parallel Tea Break</b>	—
<b>15:30 – 16:00</b>	<b>Synthesis &amp; Key Takeaways</b> Facilitator summarizes key themes from discussions Participants validate/refine priority areas	Plenary



## 2. Key Takeaways of Workshop

### 2.1. Energy Landscape

- Maldives has ~600 MW installed power generation capacity, ~90% diesel-based and ~70 MW solar. An additional ~260 MW RE capacity is planned (as per the Energy Department of MOTE, we will try to get data specific to this)
- The dispersed island geography has resulted in heavy diesel dependence, convenient but extremely costly for both end-users and the government (via subsidies)
- The country aims to increase RE share from ~6% to 33% by 2028. While there is growing experience in managing RE variability in small grids (with and without batteries), deployment remains gradual

### 2.2. Green Hydrogen (GH2) Use-Case Assessment

Based on our bilateral consultations, we evaluated GH2 feasibility across sectors, in order of priority (Slide 20) and discussed it during the Workshop to validate from all the stakeholders jointly:



#### Preliminary findings indicate:

- **Remote islands:** GH2-based fuel cell systems (integrated with existing RE + batteries) could replace diesel in high-cost generation zones (Slide 20)
- **Island resorts:** Many have already achieved up to 50% solar penetration. Long-duration storage through GH2 fuel cells could enable deeper decarbonization at potentially lower lifecycle cost than lithium batteries (Slides 44, 49, 50)
- **Greater Malé Region:** Potential for a centralized green ammonia plant as a substitute for diesel or LNG (Slide 52)
- **Marine transport:** High-speed passenger boats present a viable early adoption opportunity for hydrogen fuel cells (Slide 53)
- **Aviation:** SAF blending, starting at 1% and potentially scaling to 8%, for seaplanes and domestic flights shows promise (Slide 54)

Additionally, Maldives could explore centralized GH2 production on new-energy uninhabited or reclaimed islands, leveraging floating solar and waste-to-energy. Our preliminary outlook suggests that landed hydrogen cost could decline from under USD

8/kg today to below USD 3.5/kg by 2035. Even at relatively higher prices, GH2 could meaningfully contribute to the country's energy transition.

### 2.3. Key Challenges Identified

Workshop opened discussions around challenges and below were some of the important challenges discussed:

- **Policy & Regulation:** No dedicated national GH2 policy or safety standards yet. While hydrogen is referenced in the broader energy roadmap, a clearer implementation pathway and RE-linked incentives are needed
- **Institutional Capacity:** Limited in-country technical expertise across energy, transport, and water sectors. Key stakeholders like Stelco, Fenaka, URA, Ministry emphasized on criticality of structured training and capacity-building programs
- **Market & Economics:** High upfront costs and limited local experience necessitate pilot projects to validate techno-economics and establish parity pathways with diesel
- **Infrastructure & Financing:** RE and GH2 infrastructure financing remains challenging. Past RE projects have faced after-sales and contractual issues. Grid upgrades will also be required for future integration

### 2.4. Next Steps

- Share feasibility study findings and work on developing a GCF funding concept note based on the findings from the feasibility study



Figure 1. pManifold Team with Workshop participants





## 3. Bilateral Meetings Summary

### 3.1. Day-1: Bilateral Meetings with MOTE, Stelco & Fenaka

We kickstarted our 1st day of Mission Visit, 8th Feb 2026 in Maldives. Herewith a quick summary of Day 1 of the visit,

- Conducted Stakeholder consultations with MOTE (Ministry of Tourism and Environment), FENEKA (state utility for 157 inhabited islands), and STELCO (state utility for Greater Male and 35 outer islands)
- Discussion focused on sharing the study overview/progress, validating the assumptions for the feasibility study, requesting additional data/information and getting buy-in on the approach going forward
- Hydrogen adoption in power generation was evaluated in greater detail given the consultations with the utilities, wherein a clear understanding was established on the status-quo with regards to diesel powerhouses and installed renewables, projects under construction, future expansion plan, current unit economics, technical and commercial challenges



*Meeting with MOTE Mr. Ahmed Ali & Ms. Hawwa Liuza*



*Meeting with Stelco team*



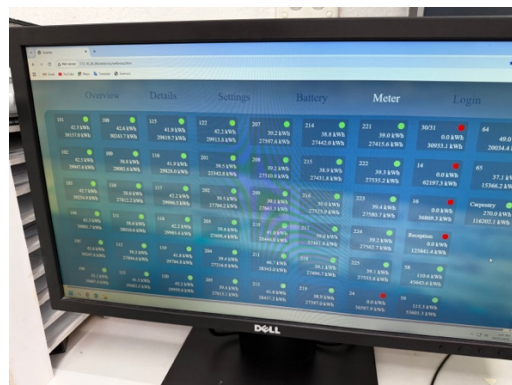
*Meeting with Fenaka Team*

### 3.2. Day-2: Bilateral Meeting with Mr. Fathuhulla Ibrahim & team at Veligandu Maldives Resort (Solar powered)

- Visited Resort Island (Veligandu) to understand their existing RE & BESS system, Diesel dependency (economics), water treatment and waste management
- Previously the resort ran on 4 diesel generators consuming over 1 million liters of diesel annually
- Current solar installation (by Swimsol):
  - 3,003 solar panels producing 1,441 kWp
  - 1,668 kWh battery energy storage system (BESS)
  - Can run on solar alone for 8–9 hours/day under optimal conditions
  - Daily CO<sub>2</sub> reduction: ~4,750 kg (~1,734 tonnes/year)
- First time in 40 years the generator room could operate in complete silence during solar hours
- This is one of the largest resort solar installations in the Maldives
- Other sustainability measures:
  - 164,980 liters of potable water daily via desalination
  - 97% LED conversion
  - Eliminated plastic bottles (glass only)
  - Travelife Gold certification



Meeting Mr. Faithulla & team at Veligandu Resort Island







### 3.4. Day-4: Stakeholder Consultation Workshop

- The consultation workshop started with a positive note by Deputy Minister, Mr. Hussain Ageel Naseer where he emphasized on the importance of making Maldives resilient and focus on energy security
- The workshop had 35+ participants with representation from Stelco, Fenaka, URL (Utility Regulatory Authority), TMA (Trans Maldivian Airways), Coast Guards, MWSC (Male Water and Sewerage Company), Ministry of Tourism & Environment, Ministry of Finance, STO (State Trading Organisation), Invest Maldives, Environmental Engineer and others. The Workshop had ~38% female participation (13 females represented by various organizations). Please find the list of attendees in the [Annexure: Attendance List of Participants in the Workshop](#)
- pManifold team gave a context setting presentation showcasing top-level insights from the feasibility analysis across use-cases including assumptions for its adoption and priority sectors to focus upon
- The next session deep dived into the feasibility results validating the assumptions used and prioritizing the potential GH2 use cases through a Q&A discussion with all the stakeholders
- The post lunch session was a discussion-oriented session to understand the challenges and enablers for GH2 adoption across use cases in Maldives. This was followed by a short group activity to list down the top 3 challenges across 4 main buckets of Policy, Institutional Capacity, Market & Economics and Infrastructure
- The workshop closed on a positive note with appreciation for the detailed analytical approach that was taken towards the study

### 3.5. Day-5: Visit to Thilafushi Industrial Island

- Visit to Thilafushi island to visit MTCC's ferry docks to look at the existing engines, machinery and equipment used for ships repair & maintenance. Team also visited the loading & unloading docks to understand the material that was being transported via Maldives (primarily construction material – gravel & sand) The visit was also intended to understand if there is a buy-in from the team and sees potential in using GH2 for the ferries/ boats and understand real-time challenge that may arise in using GH2



*Visit to Thilafushi island – MTCC Shipping dock, Ship repair & maintenance, loading & unloading docks, Cement plant, etc.*







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