

## Summary Meeting Minutes

### Working Group 4 ‘Investment funds & Financing approaches’

14.02.2023, 2 p.m. – 3:30 p.m.

#### I. Background and Goal<sup>1</sup>:

This meeting as part of Working Group 4 “Investment funds and financing approaches” was held to showcase the results of the study titled “PtX Financing in Non-OECD Countries.” The results were presented by representatives of Frankfurt School FS-UNEP Collaborating Centre and the Perspectives Climate Group. The study sought to identify and analyze the gaps in PtX funding for non-OECD countries by analyzing perceived barriers and risks, as well as success factors. Maria Jesus Baez, Diogo da C. Rego, Vojislav Stojanovic, and Philipp Veh presented the research results and gave detailed answers to participants in the working group meeting.

#### II. Presentation:

##### 1. Project overview, structure, and assumptions (Maria Baez):

- Short listed countries include Morocco, Egypt, Brazil, India, Saudi Arabia, Namibia, South Africa, Paraguay, and Uruguay. This selection was based on the following criteria:
  - Investor appetite
  - Variable renewable energy competitiveness in terms of costs and track record
  - Potential local demand in iron, steel, and fertilizer sectors
  - Local companies and technological know-how
  - Geographic location and energy trade connections
  - Regulations and projects.

##### 2. Methodology (Maria Baez):

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<sup>1</sup> The working groups’ primary goal is to provide knowledge and recommendations to the public and, within the framework of its statutory purposes, to policy makers in order to support a rapid market ramp-up of green hydrogen and its derivatives. For compliance reasons, the accumulated knowledge will be published on our website and papers will be prepared in order to place the results in a broader context.

- The first step of the methodology includes the financing of PtX projects in non-OECD countries. Secondary sources were used to identify the business model, the value chain, and key stakeholders.
- In the second step, experiences of developers and operations in terms of projects, structuring and financing, success factors, and barriers were collected and analysed.
- Third, experiences of the main players in the financial market were collected:
  - Experiences of Development Finance Institutions (DFI) e.g., existing financing instruments and the relevant conditions for PtX projects
  - Experiences of commercial banks in terms of desire for financing PtX projects in non-OECD countries.
- The next step includes the assessment of the risk-return profile of PtX projects in non-OECD countries and estimating the WACC and hurdle rate of three countries i.e., Morocco, Brazil, and India.
- Lastly, as a result, the analysis of the financing gaps for PtX projects is carried out.

### **3. Stakeholders in a PtX project (Diogo da C. Rego):**

- Development Finance Institutions
- Commercial banks
- Financial investors
- Project developers
- Suppliers
- Regulators
- Offtakers
- Insurance providers.

### **4. PtX projects (Diogo da C. Rego):**

- There are 680 clean hydrogen projects worth USD 250 billion announced worldwide, but less than 10% i.e., USD 22 billion, have reached FID stage.
- Out of the 18 projects announced in non-OECD countries, only 6 are based outside China, and only half of those have reached FID (less than 20% of announced projects have reached FID stage).

- Of the three, two projects are under construction in India and Brazil, while the project in Saudi Arabia has been given a Limited Notice to Proceed.

#### **5. Main Barriers and Risks (Diogo da C. Rego):**

- Regulations, pricing, and standardization are areas of uncertainty.
- Lack of technical guarantees from equipment suppliers.
- Major infrastructure investments (e.g., pipelines, relevant vessels, and port infrastructure) are needed to connect supply and demand.
- Lack of a global PtX market.
- Need for local government support.

#### **6. Key Success Factors (Diogo da C. Rego):**

- Offtake agreement and long-term RE are secured.
- PtX production is remunerated at a price that is attractive for investors.
- Clear rules and regulations for PtX across the value chain.
- Instruments that de-risk investments e.g., first loss guarantees.

#### **7. Financial Instruments (Maria Baez):**

- The technology readiness level and availability of financing instruments determine the project bankability. Higher technology readiness and the availability of diverse public/private financing tools are directly related to increased bankability of the project.
- Industrial maturity stages
  1. Research and Development
  2. Demonstration/ Proof of Concept
  3. Pilot Facility/ Deployment
  4. Diffusion/ Commercialisation
  5. Commercial Maturity.
- Financing tools facilitate access to capital, fill capacity gaps, and manage perceived risks.
- Several predominantly public financing tools were identified and assigned to their maturity stages:
  - R&D Support (Stage 1 & 2)
  - Grants (Stage 1 & 2)

- Incubators (Stage 1 & 2)
  - Capacity building (Stage 1, 2 & 3)
  - Concessional loans (Stage 3 & 4)
  - Dedicated funds (Stage 3 & 4)
  - Public-Private partnerships (Stage 4 & 5).
- Several predominantly private financing tools were identified and assigned to their fitting maturity stages:
    - Business Angels (Stage 2)
    - Venture capital (Stage 3)
    - Corporate Finance (Stage 3 & 4)
    - Project bonds (Stage 5)
    - Project finance (Stage 5)
    - Institutional investors (Stage 4 & 5)
    - Insurance (Stage 4 & 5).

#### **8. Main Take-Aways (Maria Baez):**

- Financial institutions are open to – and highly interested – to get engaged in PtX financing, but no deals have been signed.
- For the PtX ramp-up debt is essential. Only with a combination of equity and debt, it will be possible to mobilize the funds needed and achieve the returns required.
- First-mover projects may require guarantees from sponsors capable of bearing risks on the supply and demand side. For larger size export-oriented projects, we see many announcements, but no FIDs because the pre-conditions to achieve bankability are very hard to attain.
- Instruments such as H2Global are perceived as game changers to address bankability.
- Once bankability is addressed and lenders become acquainted with green H2 project risks, project finance will enable the market ramp-up.

#### **III. Questions and Answers:**

- What maturity level would you categorize the current status of the H2 industry?
  - The maturity level is dependent on the part of the value chain in focus. There are many different technologies involved, and they are at different maturity

levels. Electrolyser technology is already advanced in terms of maturity. But with regards to large-scale projects, the industry is still in its infancy. Transportation systems are mature e.g., for ammonia. For the whole value chain of green hydrogen, we are at the stage of diffusion and commercialization.

- What type of guarantees do you believe are the most essential for DFIs to support?
  - Most essential are technology guarantees for electrolysers and first loss guarantees, especially for first-mover projects. This is to create confidence for banks that their debt will be repaid. In general, everything you can do to make the cash flow stable is helpful. Commercial banks only want to provide debt if they have Export Credit Agency (ECA) support from DFIs.
- Cost of financing for India appears to be very low. What year do they refer to?
  - This study was done in 2022, rates are expressed in USD and real terms, and depend on the government bond rate (not very high in India). In addition, many deals for captive projects are coming up with big companies with solid balance sheets.
- What is the targeted Weighed Average Cost of Capital (WACC) that private players are seeking to develop projects in non-OECD countries?
  - Brazil: 10-15% (all rates in USD and real terms)
  - Morocco: 9-12%
  - India 7-8%.
- What is the debt-to-equity ratio you can achieve under your example of a 10-year offtake agreement?
  - It's a negotiable process and we used 65-75% in this specific study.
- In these projects, what is the coverage for first loss guarantee? Does it cover entire collateral or is it on a case-by-case basis? What would be the approximate figure?
  - A revolving guarantee won't cover fully 100% but would be enough to give confidence to debt providers.
- The study was carried out for non-OECD countries. Would the picture be similar for OECD countries?
  - From a financing perspective, risk associated with non-OECD is higher due to country risk and currency risk, but this can be mitigated with hard currency contracts. In Brazil and in other countries, when you are exporting, there are ways

to have the contract in hard currency as an exception e.g., the aluminium industry.

- You are going into stage 4 of technology readiness and that is very important. Brazil can do a lot in policies; it has high potential for renewable projects. LCOH gets very high on different stages, but it can get low with private financing. What are the drivers of LCOH in your view?
  - The focus of this study was on the financing side. Therefore, we focused more on WACC than on LCOH. LCOH is largely influenced by the cost of renewable energy. Long-term infrastructure projects have higher interest rates and Brazil has very low RE costs. At the end, the project developer must make the decision and it depends on local demand, which can act as a natural hedge.
- What kind of advantages do first-movers have?
  - The main advantage is that a consortium of stakeholders of the whole value chain is being built.

#### **IV. Further procedure:**

If there are ideas for speakers or desirable input for the upcoming session from among the participants, participants are asked to provide feedback on them to the team of H2Global Stiftung.