



Task Force 02

SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS

Key Policy Enablers for the Implementation of G20's High Level Voluntary Principles on Hydrogen

Bárbara Neira Espinoza, Technical Advisor, H2LAC (Chile)

Constanza Meneses Santa Cruz, Coordinator, H2LAC (Chile)

Gabriela Fuentes Cortés, Communications, H2LAC (Chile)

Vicente Cuadra Núñez, Junior Technical Advisor, H2LAC (Chile)

Bradford Matteson Willis, Clean Energy & Hydrogen Lead, Accenture Development Partnerships (UAE)



TF02

Abstract

2023's G20 saw leaders agree to *High Level Voluntary Principles on Hydrogen* in order to build a sustainable and equitable global hydrogen ecosystem that benefits all member states (G20, 2023). We seek to address the implementation of these principles through policy actions in relation to TF02 and the upcoming G20 Summit in Brazil—based on broad-consensus from a wide array of stakeholders who endorsed the *Joint-Agreement on the Responsible Deployment of Renewables-Based Hydrogen* at COP28 (Willis, 2024)

Projections indicate the hydrogen sector *could* represent a \$1.4 trillion (USD) market by 2050, with a large share of proposed projects in G20 countries. Hydrogen represents both an enormous opportunity to address the wealth disparity in the global energy system (accelerating the democratic and transparent redistribution of benefits) while also introducing significant socioeconomic and environmental risks based on a range of production and consumption-related issues and their contribution to a just energy transition. Specifically, those issues are identified as follows: Reverse localisation of energy production and consumption (exports to secondary markets which increase overall GHG emissions in the global economy), cross-border carbon adjustment trade-related mechanisms which do not provide sufficient safeguards to developing economies, and the continued extraction of natural resources from the Global South which set us on a path for ecological overshoot by 2045 (Merz et al, 2023)

This document will set forth a means of implementation of the aforementioned principles through the following critical, interrelated lines of policy action (hereinafter referred to as ‘the policy recommendations’):

1. Create incentives for developing economies to produce downstream products for local offtake in alignment with the *Joint-Agreement*

2. Develop standardised, mitigation-based revenue streams through onshoring of Emissions Trading Systems for hydrogen or derivative exports to safeguard against the socioeconomic impacts of CBAM or other trade related mechanisms focused on carbon leakage in the Global North

3. Coordinate (subsidised) co-investment in the Bioeconomy to ensure new hydrogen-related industrialisation supports the commoditisation of those nature-based solutions deemed essential to deliver on a 1.5°C future

4. Achieve energy independence of developing countries through the timely deployment of multilateral climate funds in accordance with SDG7 (Yinuo, 2023).

Diagnosis of the Issue

The *High Level Voluntary Principles on Hydrogen* acknowledged the role hydrogen has in addressing both existing and future issues relating to legacy, fossil-fuel intensive infrastructure as well as new, neo-industrial developments targeting a net zero economy.

The five principles are summarized below for reference:

1. Encourage collaboration on the development of national standards and...globally harmonised approach to certification for hydrogen...and its derivatives
2. Promote free and fair trade...in line with WTO rules, supported by resilient and diversified supply chains
3. Accelerate technological innovation, business models, and R&D collaboration to enhance international cooperation
4. Promote investments, mobilise finance, and develop infrastructure
5. Support and enable voluntary information sharing, cooperation, dialogue, knowledge exchange, and capacity building...with an aim to contribute to net zero GHG emissions/carbon neutral pathways, including the development of regional and international initiatives

We recognise the significant effort that was undertaken to develop these principles which could then be communicated as a key outcome of the G20 Energy Transitions Minister's Meeting in Goa. Now, in Brazil, the imperative for implementing these principles (in addition to others) is paramount—specifically as it relates to the *Task Force for Sustainable Climate Action and Inclusive Just Energy Transitions* & the *Special Task*

Force for Global Mobilisation against Climate Change, the G20 Finance Track, as well as the Sherpa Track’s working group on Energy Transition.

Within these layers of financing, political consensus/harmonised regulation, and supporting collaboration for accelerated technological innovation and borderless capacity-building—we acknowledge the need for G20’s principles as well as the contents of the *Joint-Agreement* to establish ‘G20 country-specific guidelines’ which accelerate the just transition to a net zero economy via future-proofed, sustainable hydrogen consumption and production patterns. This guidance must also enable the development of a new bioeconomy which is critical to a 1.5°C future (as emphasised in Brazil’s *Ecological Transformation Plan*).⁵ In addition to addressing subtopic 2 of TF02, we will also provide guidance regarding the intrinsically linked components of the sub-topics *Fostering Investment and Open Innovation for Sociobioeconomy and Nature-based Solutions* as well as *Optimising Access to Multilateral and Climate Funds and Leveraging Private Capital for Climate Finance*. Both of which are a priority for Brazil in regards to the newly launched G20 Initiative on the Bioeconomy (GIB) and revitalised focus on the deployment of the four largest climate funds (GCF, CIF, Adaptation Fund, & GEF). We have identified four key, interrelated lines of policy action (i.e., the aforementioned policy recommendations) which require G20 leader’s immediate attention to ensure hydrogen plays its part in the just transition to a net zero future—while also being seamlessly embedded within the ongoing definition and development of the Bioeconomy as well as the deployment of the aforementioned funds. We recognise additional lines of policy action exist beyond these items. However, for the purposes of *TF02* and inputs to the relevant Task Forces, we will concentrate on developing recommendations which address those concerns we believe to be paramount to achieving a 1.5°C pathway as well

as the many interrelated, foundational SDGs. Our focus remains squarely on developing an equitable, just, nature-positive hydrogen economy for people and planet.

Recommendations

1) Create incentives for developing economies to produce downstream products for local offtake

G7 countries have taken significant steps to meet energy security and sustainability requirements in alignment with expected energy demand and IPCC-directed limits for greenhouse gasses. With ~700 MoUs announced globally for the production, transport, and/or offtake of hydrogen (a large portion of those being Global North-South agreements), significant safeguards are desperately needed to successfully orchestrate climate-aligned hydrogen deployment (as outlined in the *Joint-Agreement*) while simultaneously delivering associated socioeconomic benefits to those countries projected to be net exports.⁶ Additionally, it is critical that any existing industrial activity within G20 countries and/or any neo-industrialisation related to hydrogen achieves the lowest emissions levels possible as part of a just and equitable energy transition.

When considering the local use of hydrogen or derivatives in downstream products or as an energy carrier, G20 countries must ensure the necessary policy(s) is put in place both to 1) Ensure G20 countries receive a majority of the potential economic uplift associated with hydrogen-related developments as well as to 2) Achieve the lowest possible economy-wide emissions in the shortest possible time frame.

In order to do this, G20 countries must first create incentive schemes prioritising local supply chain valorisation (e.g., production tax credits for hydrogen produced for certified

supply chain partners within the local ecosystem) and downstream industry. For G20 countries, where an export-first model is becoming the predominant framework, it is critical to establish a common methodology for determining a minimum threshold for local offtake and/or local supply chain valorisation¹.

2) Develop standardised, mitigation-based revenue streams for hydrogen or derivative exports to safeguard against the socioeconomic impacts of CBAM

G20 countries—faced with increased carbon-related regulation(s) from the Global North (e.g., CBAM)—can and should design their own Emissions Trading Systems (ETS) in order to create a liquid market for carbon as it relates to nationally and internationally mandated adoption low carbon products and services (specifically those related to hydrogen) required to deliver on a net zero future. An ETS should include regulated sectors where the use of hydrogen and derivatives has potential, thus replacing carbon-intensive technologies and ensuring large multinational companies pay the cost of carbon-intensive operations to local economies. However, it is recommended that countries include a period of free allowances to allow the industry time to adapt. Depending on the design of the ETS and the country's legal system, the government can auction permits to

¹ “Ecological Transformation Plan Inclusive and Sustainable Development to Tackle Climate Change.” n.d. Accessed April 1, 2024. <https://www.gov.br/fazenda/pt-br/acesso-a-informacao/acoes-e-programas/transformacao-ecologica/english-version/documents/pte-19-10-2023-ecological-transformation-plan.pdf>.

finance renewable energy investments or low carbon technologies—such as hydrogen—as a direct beneficiary of the incoming capital which is derived from such a system.

Some countries have considered heavy-industry within their ETS—such as South Korea who (in its initial ETS phase between 2015 and 2017) included grey clinker cement, oil refineries, and domestic aviation (all of which are considered as potentially unavoidable end use sectors for hydrogen to varying degrees). Chile, in its Green Hydrogen Action Plan, outlines the use of an ETS in order to encourage the implementation of critical demand-side projects, which would be key consumers of green hydrogen and its derivatives (Sampson, 2024).

3) Coordinate (subsidised) co-investment in the Bioeconomy

Hydrogen-related incentives and/or regulations must be *coupled* with the development of a commoditised Bioeconomy in order to address broader, systemic issues related to historical resource consumption patterns and the role they play in ecological overshoot.

It is imperative that ecological restoration and transformation is part of broader energy systems planning and capital project development, so as to successfully pull forward the investment required at a rate proportional to ongoing ‘green’ industrial development². Emphasis must be put on ecological restoration which is monitored alongside avoided emissions from an aggregated volume of fuel displacement or capital spend (i.e., matched quotas). This approach ensures that annual carbon sequestration quotas meet or exceed

² “The Africa Hydrogen Opportunity the Potential, Practical Challenges, and Possible Unlocks.” 2024. <https://hydrogencouncil.com/wp-content/uploads/2024/03/Hydrogen-Council-Africa-Hydrogen-Opportunity-.pdf>.

the avoided emissions from hydrogen-related projects. As part of this calculation, lifecycle carbon assessments for hydrogen projects should further consider ‘embedded’ emissions of supply chain models in addition to the traditional focus on carbon intensity (well-to-X)³. Effective implementation could revolutionise production and consumption patterns for a truly sustainable, 1.5°C aligned future—potentially reducing the overall demand for climate-aligned hydrogen to ~30 mtpa by 2050 (Ehrenstein et al, 2020)

4) Energy independence of developing countries through the timely deployment of multilateral climate funds in accordance with SDG7

Achieving energy independence—defined as a country’s ability to meet its energy needs without importing resources—is crucial for developing countries and hinges on leveraging multilateral climate funds to support the transition to clean, reliable energy. SDG7 underscores access to clean, affordable energy, yet millions still lack electricity access and rely on polluting fuels largely due to funding gaps. To achieve energy independence in parallel to SDG7, it is necessary to strategically leverage international climate funds. These funds can bridge the financing gap between developed countries and those in the Global South, bolstering capacity building, addressing local energy needs, and securing local energy markets.

Meeting the 1.5°C target demands substantial investment, with clean energy funding needing to rise from \$1.8 trillion in 2023 to \$4.5 trillion by 2030. This is especially

³ “ETS in Industry – Implementing Effective Emissions Trading Systems – Analysis.”

n.d. IEA. <https://www.iea.org/reports/implementing-effective-emissions-trading-systems/ets-in-industry>.

challenging for developing countries as current levels of economic growth are insufficient to achieve the SDGs. Bridging the climate finance gap requires a 7-10x increase in resource mobilisation - a gap which international climate funds play a critical role in addressing (Willis, 2024). This requires the Global North to acknowledge its historical financial obligations and mobilise resources for climate adaptation and mitigation.

It is recommended multilateral funds focus on stimulating demand for renewable hydrogen and derivatives in local G20 economies for the dual purpose of achieving energy independence for the Global South as well as ensuring FDI from the Global North supports the realisation of SDG7 in the Global South. Multilateral climate funds should focus on stimulating demand within industries poised to adopt near-zero hydrogen in accordance with the *Joint-Agreement*. In addition to direct investments into hydrogen demand stimulation and/or supply chain valorisation, multilateral climate funds can catalyse the commoditisation of the Bioeconomy in accordance with aforementioned matched quotas for ecological restoration – serving as a source of transitional financing via VCMs (as well as as ITMOs) to address the ‘green premium’.

Scenario of Outcomes

1-4) All policy lines successfully implemented

G20 countries have successfully deployed the largest multilateral climate funds in the world to support the build-out of local hydrogen value chains, local offtake in G20 countries, and ecological restoration to further subsidise near-zero hydrogen deployment in accordance with the *Joint-Agreement*. Catalytic financing has been further supported by key incentives and regulations requiring the development of local supply chains and delivered volumes of hydrogen to local industry. The potential loss of revenue for G20 member states due to trade-related mechanisms implemented by the Global North (focused on carbon leakage) has been addressed through the development of national and regional ETS which set a threshold for emissions in critical end-use sectors as outlined in the *Joint-Agreement*. Multilateral climate financing, local commoditisation of mitigation-based revenue streams through ETS, and proper incentives and regulations is further supplemented by the influx of capital due to the coupling of ecological restoration with hydrogen industrialisation.

G20 countries successfully slingshot from a fossil-fuel, import/export dependent economy to a biodiverse well-being economy which sees maximum benefits delivered to local populations and ecosystems alike-while simultaneously reducing energy demand and avoiding ecological overshoot.

1) Create incentives for developing economies to produce downstream products

(Scenario 1): If countries implement policies which protect against an extractive, export-driven market-while ensuring revenues from green hydrogen produced in the

Global South are re-invested in decarbonising existing and new industry through a common framework—countries will likely experience a neo-industrial revolution which successfully aligns their economic development with a 1.5°C pathway.

(Scenario 2): Countries do not implement supportive policies for onshoring of manufacturing and local offtake—resulting in continued Global North/South relations in which the practiced export model provides no compounding value to local economy and local ecosystems.

2) Develop standardised, mitigation-based revenue streams for hydrogen or derivative exports

(Scenario 1): If countries implement ETS' properly, considering price, number of certificates, and certificate limits vs. offsets, as well as key hard-to-abate industries – companies would be immediately mandated to buy certificates or report on their adoption of new, low carbon technologies. Many of these new technologies would be hydrogen-based technologies or derivatives, thus increasing local demand in G20 countries.

(Scenario 2): In case the system is not designed properly or no system is adopted at all, it is possible that it would be cheaper for industry to buy certificates and/or pay the associated cost of carbon trade-related mechanisms from purchasing countries. Subsequently, there would be no impact on the demand for hydrogen or derivatives locally and no effective onshoring of mitigation-based revenues.

3) Coordinated, (subsidised) co-investment in the Bioeconomy

(Scenario 1): The international community aligns on embedding absolute sustainability (including supply chain models for global hydrogen and derivative trading)

in order to assess hydrogen-related deployment in alignment with a 1.5°C pathway—monitoring all ecological restoration so as to set annual, matched quotes for carbon sequestration which either meet or exceed the calculated avoided emissions of all near-zero hydrogen-related development (measured either as capital spend or volume). Thus, countries successfully develop ecological restoration patterns in alignment with consumption patterns which provide compounding benefits through increased biodiversity, climate resilience, as well as further contributing to CO₂ abatement and the mitigation required to stay within IPCC-directed limits.

(Scenario 2): Countries deploy green hydrogen successfully, but the global community fails to assess the “carbon cost” of that development and global supply chains form in a way which overshoots planetary boundaries. G20 countries will experience ‘green growth’, however this will be offset by the catastrophic (and costly) impacts of climate change on urban areas and infrastructure.

4) Energy independence of developing countries through the timely deployment of multilateral climate funds in accordance with SDG7

(Scenario 1): A financing scheme is devised with a clear focus on stimulating demand for clean energy and fostering the development of the hydrogen value chain sourced from renewable-based energy sources. This scheme is specifically tailored for adoption by developing countries, offering them a pathway to instigate crucial industrial technological advancements conducive to achieving energy independence in alignment with the SDGs.

(Scenario 2): The reluctance of multilateral banks to invest in technological upgrades within industries in developing economies exacerbates the persistent climate finance gap separating the Global South from the Global North. Consequently, developing countries

find themselves unable to fulfill their climate commitments due to insufficient resources. This shortfall not only impedes progress towards climate objectives but also undermines efforts towards achieving energy independence in harmony with the SDGs.

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