

Public-private roundtable: Sustainable infrastructure in Mongolia – developing green hydrogen production

Summary of the discussions

Context and objectives of the Roundtable

Hydrogen produced from clean energy sources¹, and green hydrogen in particular, is currently considered as one of the key enabling technologies for the energy transition. The demand for hydrogen is projected to increase six- to eight-fold by 2050, depending on the scenario, provided competitive clean hydrogen is developed². Green hydrogen could play a central role in the decarbonisation of hard-to-abate sectors, including heavy industry (e.g., steel, cement) and transport (shipping and aviation). As a result, national hydrogen strategies and large-scale hydrogen projects have been flourishing, although these developments remain far below the needed level for getting on track to net-zero emissions by 2050 on a global scale.

Under the SIPA activity on *Aligning national policy frameworks for energy, transport and industry*, The OECD, together with UNDP's Mongolia country office and the Mongolian Hydrogen Council, organised a Roundtable to discuss the opportunity to create an enabling domestic policy framework for developing the production of green hydrogen in Mongolia. In line with the objectives of SIPA, such development could help attract investment to clean energy industries and diversify exports, decarbonising domestic heavy industries and ultimately helping to bring the national economy onto a path to net-zero.

The Roundtable brought together representatives of the government of Mongolia and relevant public authorities, representatives of the domestic energy industry, and international experts. Participants learnt about international experience in supporting and developing green hydrogen projects, and discussed ongoing projects in Mongolia, as well as related challenges and opportunities.

The discussion aimed to answer the following questions:

- How can green hydrogen contribute to shaping a low-carbon development vision for Mongolia?
- In particular, what role can it play to decarbonise domestic industries?
- What are the short-term and long-term actions that Mongolian policy-makers could undertake to support the development of green hydrogen, ensuring that it contributes to its sustainable development objectives?

¹ i.e., green (renewables-based) and blue (produced from fossil fuels combined with measures to significantly lower GHG emissions such as CCUS) hydrogen.

² <https://www.mckinsey.com/capabilities/sustainability/our-insights/five-charts-on-hydrogens-role-in-a-net-zero-future>; <https://blogs.worldbank.org/ppps/green-hydrogen-key-investment-energy-transition>.

Supported by:

Main take-aways

1. Setting the scene: why the topic is relevant for Mongolia

Reducing the energy intensity of key infrastructure in Mongolia will play a pivotal role in achieving national climate-related objectives, while also generating wider social and economic benefits. Under the Paris agreement, Mongolia has committed to reduce its GHG emissions by 22.7% by 2030 (unconditional target), and at COP27 the President highlighted the country's intention to achieve carbon neutrality by mid-century. Considering that infrastructure is responsible for a high share of GHG emissions (60% to 80% at the global scale), and given the need for infrastructure development in Mongolia, as across the whole of Asia, there is a huge opportunity for the country to work toward the realisation of these objectives by aligning its policy framework for infrastructure development with sustainability criteria that underpin long-term economic, social and environmental goals. This is particularly true in the energy, industry and water sectors, which are extremely energy intensive (according to statistics, the power and heat sector's own energy intensity is 36 times that of the economy-wide average, while the mining and water sectors' energy intensity have surpassed the economy's average in the past 5 years, although outputs in these sectors have remained relatively constant). The transport sector also stands out among the most energy-intensive sectors and offers tremendous opportunities for decarbonisation, pollution reduction and better transport outcomes (e.g., reducing traffic congestion in Ulaanbaatar).

There is an opportunity for emerging and developing economies to develop the use of green hydrogen for decarbonising infrastructure, provided they have the right policy mix in place. Under current global and national plans, green hydrogen is instrumental to reaching net-zero emissions, particularly in emerging and developing economies, where energy demand is expected to increase markedly, underpinned by population growth and economic development. According to net-zero emission pathways, hydrogen demand is expected to grow five-fold globally, from its current level of 100M tons per year, and at least 2/3rds of this demand should be covered by green hydrogen (i.e., produced by renewable power). Green hydrogen and its derivatives have the potential to decarbonise a range of sectors including heavy industries that are hard-to-abate (e.g., steel, cement), heavy-duty transport, chemicals and fertilisers. Furthermore, the potential for renewables development, which is typically high in emerging and developing countries, is an asset for the production of green hydrogen. Developing an enabling national policy framework for green hydrogen development requires consideration of the whole value chain for green hydrogen and a good understanding of the sector's economics in the domestic context. Relevant instruments cover a range of policies including tax, R&D and innovation, regulatory and legal frameworks for businesses, and public procurement. International experience and standards can support the process of green hydrogen strategy development.

2. International experience in developing green hydrogen

Today, 96 countries either have or aim to develop hydrogen policy documents. National roadmaps typically establish national targets for production capacity, for infrastructure development (refuelling stations notably), and for production costs. Japan, for example, aims to produce hydrogen at \$3/kg by 2030 and less than \$2/kg by 2050 (from \$6.5-7/kg currently). Its strategy sets production and usage targets at the horizon of 2050, with intermediate objectives set for 2030. As part of this strategy, Japan's New Energy and Industrial Technology Development Organisation (NEDO), together with Toshiba Energy Systems & Solutions Corporation (Toshiba ESS), Tohoku Electric Power Co., Inc., and Iwatani Corporation, has developed a Hydrogen research field in Fukushima, Japan's 'Hydrogen Valley', where green hydrogen-based demonstration projects are being developed. In France, the national low-carbon hydrogen strategy is structured around three pillars: i) development of electrolyser capacity that can contribute to significant decarbonisation of the domestic economy, ii) development of clean mobility, targeting heavy trucks in particular, and iii) development of a low carbon hydrogen industry with domestic technological know-how generating between 50,000 and 150,000 jobs across the national territory. Norway's roadmap for hydrogen was launched in June 2021, following the development of a strategy in 2020. The roadmap provides a detailed development plan for the next 5-10 years and is articulated around the development of hydrogen

supply hubs, a subsidy model called “contracts for difference”, targets for green hydrogen in public procurement, and R&D.

As the global hydrogen sector is fragmented, with low-carbon hydrogen technologies not yet mature nor competitive across applications, national and international initiatives promoting green hydrogen seek to establish clear framework conditions and standards. A clear and transparent policy framework for investment in green energies, including with regards to permitting, is critical to the development of green hydrogen. From the perspective of project developers, it is important that governments supply clear guidelines and reliable legal frameworks. These should notably address access to land and water, assessments of environmental impacts, and effects on local communities. The two latter points are instrumental in making sure that green hydrogen value chains respond to sustainability and environmental criteria. International standards and benchmarks are currently being developed to measure these criteria, and provide sustainability guarantees to off-takers and consumers. Current standard and certification initiatives are fragmented, but some organisations such as the Green Hydrogen Organisation are working toward consolidation. Finally, the development of the sector requires specific policies to mobilise financing by de-risking investment and helping bridge competitiveness gaps in early stages of market development. This can be done through concessional and blended finance, sovereign guarantees and other de-risking instruments.

3. Challenges and opportunities in Mongolia

There are a number of opportunities and challenges for the development of green hydrogen in Mongolia, including its huge potential for the development of renewables, and access to inner Mongolia in China, a large market with high demand for greening the steel sector. Pilot projects are being developed in the country, for export purposes but also for domestic use, and a number of research projects and studies are currently exploring production and application opportunities. Depending on the time horizon, domestic applications of green hydrogen could include the transport sector and the heating of households, subject to the development of the required infrastructure. According to the Mongolian Hydrogen Council, current domestic production costs of green hydrogen stand at \$9/kg. To become competitive, these costs need to be brought down to \$3/kg. One of the main challenges facing the development of green hydrogen in Mongolia is access to clean water, which is critical to the production of green hydrogen.

The government is willing to support the development of the low-carbon hydrogen industry in Mongolia – not through public financing, but as facilitator. It has signed MOUs for co-operation with companies developing green hydrogen projects. Green hydrogen figures as a priority of the country’s New Recovery Policy. The government acknowledges that the development of a clean energy has a key role to play in the reduction of GHG emissions and for achieving the NDC targets. The topic is new in Mongolia, and there is a need for a national reflection bringing together representatives of the private sector, representatives of the Ministries of Economy, Energy and Environment, to build knowledge, identify policy priorities and establish a vision for green hydrogen contribution to net-zero and potential domestic production. Co-operation with and support of international partners can play a key role by supporting this process.

Programme

Ulaanbaatar time (CET+7)

Moderator: William Tompson, Head of Eurasia Division, OECD

14:30-15:00	<i>Registration and welcome coffee</i>
	Welcome and introductions
15:00-15:20	Welcoming remarks <ul style="list-style-type: none"> - Bayarmagnai Myagmarsuren, Deputy Minister of Energy - Regina Rutenberg, Chargée d’Affaires, Embassy of Germany to Mongolia - Kumi Kitamori, Deputy Director, Environment Directorate, OECD (<i>online</i>) - Lin Cao, UNDP Deputy Resident Representative in Mongolia
15:20-15:40	Setting the scene <ul style="list-style-type: none"> - Peline Atamer, Head of SIPA – Central Asia, OECD - Joseph Cordonnier, Industry Analyst - CEFIM, OECD (<i>online</i>)
	Public-private dialogue: Roundtable discussions
15:40-16:30	Session 1: Policies for supporting the development of green hydrogen – international experience <ul style="list-style-type: none"> - Eiji Ohira, Strategy Architect, Fuel Cell and Hydrogen Technology Office New Energy and Industrial Technology Development Organisation (NEDO), Japan (<i>online</i>) - Mikaa Mered, Adjunct lecturer on hydrogen at Sciences Po, Member of the Steering Committee of the Task Force on Hydrogen, France (<i>online</i>) - Ines Marques, Director of the Green Hydrogen Development Plan, Green Hydrogen Organisation (<i>online</i>) - Sergei Fashevsky, Senior Advisor – Manager International Operations, and Jos van der Plas, Senior Advisor, Norsk Energi (<i>online</i>) <p><i>Open discussion</i></p>
16:30-16:45	<i>Coffee Break</i>
16:45 -17:45	Session 2: Opportunities and challenges for green hydrogen development in Mongolia <ul style="list-style-type: none"> - Byambasaikhan Bayanjargal, Chair, Mongolian Hydrogen Council - Bayasgalan Dugarjav, Professor, National University of Mongolia - Yeren-Ulzii Batmunkh, Head of the Policy Planning Department, Ministry of Energy of Mongolia - Tserendulam Shagdarsuren, Department of Climate Change, Ministry of Environment and Tourism of Mongolia - Batjargal Zamba, Director of Climate Change Research Co-operation Centre <p><i>Open discussion</i></p>

	Conclusions
17:50-18:00	<ul style="list-style-type: none">- Byambasaikhan Bayanjargal, Chair, Mongolian Hydrogen Council- Peline Atamer, Head of SIPA – Central Asia, OECD

Background

The Sustainable Infrastructure Programme in Asia (SIPA)

Infrastructure is essential for economic development but accounts for about 60% of GHG emissions globally. Given the long lifespan of infrastructure assets, the investment decisions made today could lock countries into carbon-intensive development pathways for years to come. As developing and emerging countries in Asia are witnessing an unprecedented uptick in infrastructure investment due to economic growth and their strategic location along major trade routes, national planning authorities have a central role to play to set strategic directions, plan and develop pipelines of infrastructure projects that contribute to building back better after the COVID-19 pandemic, and make sure green growth and climate goals are mainstreamed into the infrastructure investment cycle.

With financial support from the Government of Germany, the OECD **Sustainable Infrastructure Programme in Asia (SIPA)** aims to help Central and Southeast Asian countries ensure energy, transport and industry infrastructure investments are aligned with low-emission development pathways compatible with the Paris Agreement and the Sustainable Development Goals.

SIPA's activities target all stages of infrastructure development, from planning and design to financing and delivery. Its activities mainly involve six countries in Asia including three countries in Central Asia (Kazakhstan, Mongolia and Uzbekistan) and three countries in Southeast Asia (Indonesia, the Philippines and Thailand). The Programme's period of implementation is 2021 to 2025.

More information on SIPA at <https://www.oecd.org/site/sipa/>

The OECD

The Organisation for Economic Co-operation and Development (OECD) is an international organisation that works to build better policies for better lives. Our goal is to shape policies that foster prosperity, equality, opportunity and well-being for all. We draw on 60 years of experience and insights to better prepare the world of tomorrow.

Together with governments, policy makers and citizens, we work on establishing evidence-based international standards and finding solutions to a range of social, economic and environmental challenges. From improving economic performance and creating jobs to fostering strong education and fighting international tax evasion, we provide a unique forum and knowledge hub for data and analysis, exchange of experiences, best-practice sharing, and advice on public policies and international standard-setting.

The OECD brings together its 38 Member countries and a range of partners that collaborate on key global issues at national, regional and local levels. Through our standards, programmes and initiatives, we help drive and anchor reform in more than 100 countries around the world, building on our collective wisdom and shared values.

More information on the OECD at <https://www.oecd.org/>

Mongolia-OECD co-operation

Mongolia has participated in OECD thematic programmes and networks since the 1990s. Mongolia participates in several OECD activities and projects, such as the Policy Dialogue on Natural Resource-based Development, the Anti-Corruption Network for Eastern Europe and Central Asia, the OECD Eurasia Competitiveness Programme, the OECD-ITF project on Enhancing Connectivity in Central Asia, the Green Action Programme, the OECD/Korea Policy Centre (competition), and the Inclusive Framework on BEPS.

More information at <https://www.oecd.org/countries/mongolia/>