UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION
Progress by innovation

Submission of the United Nations Industrial Development Organization for the consideration of outputs component of the First Global Stocktake of the Paris Agreement

15 September 2023

UNIDO Climate Change Strategy

To align its operations with the climate treaties, the United Nations Industrial Development Organization (UNIDO) has developed, in close consultation with the Member States, its first ever Climate Change Strategy,[i] which was endorsed by the UNIDO Industrial Development Board in July 2023.

UNIDO's strategy envisions a world where industry drives low-emission economies, improves living standards, and preserves the environment for present and future generations, leaving no one behind. This vision will be embedded in UNIDO's activities, strategic documents, and institutional structure, forming a key pillar of engagement with Member States, the United Nations System, and other partners.

The strategy aims to:

(a) Raise the profile of inclusive and sustainable industrial development (ISID) in the international climate change discourse and engage industry stakeholders in climate advocacy;
(b) Facilitate international industrial cooperation for climate action;
(c) Promote UNFCCC- and Paris-compatible industrial policies;
(d) Provide evidence-based industrial policy advice for low greenhouse gas emissions and climate-resilient development;
(e) Facilitate technology and knowledge transfer to achieve low greenhouse gas emissions and climate-resilient development;
(f) Boost the use of renewable energies in achieving low greenhouse gas emissions and climate-resilient development;
(g) Strengthen the capacity to integrate low greenhouse gas emissions and climate-resilient good practices into ISID;
(h) Build the capacity of Member States to effectively participate in market-based mechanisms;
(i) Coordinate and leverage climate finance opportunities;
(j) Foster sustainable and digital skills to enable a just transition of the workforce.

The strategy emphasizes flexibility, adaptability, and collaboration to address emerging global trends and ensure the alignment of UNIDO's efforts with international climate agreements and sustainable development goals.

Guiding questions

In this submission UNIDO responds to the guiding questions prepared by the Chairs of the subsidiary bodies, in line with paragraph 7 of decision 19/CMA.1, that are intended to support Parties and non-Party stakeholders in preparing for the consideration of outputs component of the first global stocktake.

1) What has been the collective progress to date towards achieving the purpose and long-term goals of the Paris Agreement, including under Article 2, in the thematic areas of mitigation, adaptation, and means of implementation and support, taking into account efforts under the Agreement that address the social and economic consequences and impacts of response measures, and that avert, minimize and address loss and damage associated with the adverse effects of climate change?

The role of industry in the climate change context is threefold. Industry is one of the largest emitters of greenhouse gases; it is itself adversely affected by the changing climate and resource depletion; and it has a potential to become a leading provider of technological solutions, business models and green jobs, while influencing consumer behaviour and lifestyles.

Industry was responsible for 34 per cent of global greenhouse gas emissions in 2019, with its emissions growing faster since 2000 than emissions from any other sector, driven by increased basic materials extraction and production.[ii] Cement manufacturing alone produces a staggering 2.2 billion tons of carbon dioxide every year, 8 per cent of all global emissions, which is expected to double or quadruple by 2050. Industry fuels unprecedented consumption patterns that already exceed 100 billion tons of resources per year, further threatening terrestrial and freshwater ecosystems.[iii] Plastic waste is suffocating our oceans and killing marine biodiversity.[iv]

The industry sector in 2022 was directly responsible for emitting 9.0 Gt of CO_2, accounting for a quarter of global energy system CO_2 emissions. Annual emissions slightly declined in both 2020 and 2022, but not enough to align with the "net zero emissions by 2050 scenario", in which industrial emissions fall to about 7 Gt CO_2 by 2030.[v] To get on track with this scenario, industry's total direct emissions must decline by nearly a quarter to 2030, or about 3 per cent per year on average, requiring accelerated policy action.

The current reliance on fossil feedstock, very low recycling rates, and high emissions from petrochemical processes are challenges for reaching net zero emissions[vi] and developing inclusive and sustainable industries. Cutting industry emissions significantly and shifting consumption and production patterns will require a reorientation from the historic focus on important but incremental improvements, such as energy efficiency, to transformational changes in energy and feedstock sourcing, materials efficiency, and more circular material flows.[vii]

Climate change also creates a wide range of risks for industries and businesses, from disrupted supply chains to increased insurance costs and labour challenges. Climate-related events are already affecting more than one in four companies worldwide through the scarcity and high cost of resources, including limited access to water, and millions of dollars in infrastructure damage.[viii]

At the same time, industry has a potential to become the leading generator of transformative climate solutions by facilitating research and development, introducing disruptive technologies

and alternative materials, creating green job opportunities and new business models, shaping market-based approaches, shifting global investment patterns, and influencing consumer behaviour in a climate-positive manner. This is already evidenced from the rapidly declining costs of renewables, development of innovative technologies for hard-to-abate sectors, and growing availability of climate-friendly goods and services. Another positive trend is the increasing number of both multinationals and small enterprises adopting climate neutrality strategies.

New low-emission processes can contribute to reduced greenhouse gas emissions by fundamentally changing the underlying production processes and resources. In contrast to the prevalent linear model of production and consumption, a circular economy approach has the potential reduce global greenhouse gas emissions from key industry materials by 40 per cent or 3.7 billion tons by 2050. Circular practices such as waste minimization, reuse of products and components, and recirculation of materials, in addition to decarbonization of the energy generation, have the potential to restore a sustainable relationship between society and nature.

Reducing industry emissions will entail coordinated action throughout value chains to promote all mitigation options, including demand management, energy and materials efficiency, circular material flows, as well as abatement technologies and transformational changes in production processes. This would be enabled by using low and zero GHG electricity, low-emission hydrogen and fuels, and carbon management.

Action to reduce industry emissions may change the location of GHG intensive industries and the organisation of value chains. Regions with abundant low GHG energy and feedstocks have the potential to become exporters of hydrogen-based chemicals and materials processed using low-carbon electricity and low-emission hydrogen. Such reallocation will have global distributional effects on employment and economic structure.[ix]

Industrial development cooperation can provide multilateral solutions, guided by global solidarity and informed by science and risk assessments, as a response to the major crises of today.

Sustainable industrial development could be fostered through North-South, South-South and triangular cooperation to boost innovation and knowledge transfer, capacity-building and investments in environmentally-sound and low-emission technologies in least developed countries, middle-income countries, landlocked developing countries and small island developing States.

2) What are the opportunities for and challenges in enhancing action for collective progress in relation to the above-mentioned thematic areas, as well as possible measures, good practices and examples of international cooperation in this regard? How should contextual elements be considered in these?

Industrial Deep Decarbonisation Initiative

Steel, cement and concrete account for just over 50 per cent of all industrial emissions. Demand for steel, cement and concrete is expected to increase as many countries continue to industrialize and urbanize. However, to achieve the Paris Agreement goals, emissions from steel, cement and concrete need to decrease by more than 90 per cent by 2050.

In 2021, UNIDO and the Clean Energy Ministerial established the Industrial Deep Decarbonisation Initiative (IDDI),[x] a global coalition of governments and private sector companies. India and the United Kingdom are leading the initiative, while Brazil, Canada, Germany, Japan, Saudi Arabia, Sweden, the United Arab Emirates and the United States are members.

Governments are among the top buyers of steel, cement and concrete for major infrastructure projects, such as new roads, bridges, housing, schools and hospitals. Together, national, regional, and local government entities account for an estimated 20-30 per cent of global construction industry revenues. IDDI aims to harness this immense purchasing power to boost a thriving market for low or near-zero emission steel, cement and concrete. Estimates suggest that if even 35 per cent of the steel and 60 per cent of the cement used in public construction projects was low-emission, it could save the world 1.25 billion tonnes of CO_2 emissions a year. That is more than all the CO_2 emissions generated by commercial aviation in 2019.

IDDI's Green Public Procurement Pledge[xi] asks member governments to start, no later than 2030, requiring that steel, cement and concrete used in all public construction projects are low-emission and that 'signature projects' use near-zero emission materials. It also includes targets to require the monitoring and disclosure of embodied CO_2 emissions of steel, cement and concrete in publicly-funded construction projects by 2025. The aim is for net-zero emission steel, cement and concrete to be used in all public construction projects by 2050.

IDDI is also working towards a coherent global framework of standards in order to establish what constitutes low and near-zero emissions steel, cement and concrete, as well as a methodology for collecting and reporting data on the CO_2 embodied in these products throughout the entire value chain.

Global Programme for Hydrogen in Industry

Green hydrogen is an imperative for the energy transition, driving the proliferation of renewables and demonstrating the emerging opportunities for the phase-out of fossil fuels. It offers unique opportunities for net zero industrial development in developing countries with abundant renewable power potential. It can pave the way for job creation, skills upgrading, investment mobilization, energy security, and participation in global hydrogen trade.

To reap the multiple benefits offered by green hydrogen, its production in developing countries should be planned in a socially and environmentally responsible manner. Such plans would integrate stewardship of groundwater resources, environmentally sound treatment of wastewater, expansion of renewable energy generation and conservation of marine ecosystems. This would simultaneously improve water, energy and food security, enhance climate resilience of vulnerable communities, protect biodiversity and create green job opportunities.

In 2021, with the support of the Governments of Austria, China, Germany and Italy, UNIDO launched the Global Programme for Hydrogen in Industry.[xii] The programme assists developing countries in overcoming policy and infrastructure barriers and encourages a just hydrogen transition that puts social and environmental aspects in focus.

The Global Partnership component of the programme provides a platform for Member States, industries, private sector, investors, research and academic institutions to explore developing countries' needs, enable dialogue, exchange good practices and respond to challenges, by developing knowledge products, learning modules, and joint initiatives.

The Technical Cooperation component adapts and applies knowledge and tools developed globally to country-specific interventions for green hydrogen in industry.

The programme benefits from technical support and know-how of the International Hydrogen Energy Centre in Beijing, launched by UNIDO and the Government of China in 2021. The Centre facilitates the creation of hydrogen value chains and focuses on R&D, application, and demonstration of hydrogen technologies.

The Centre, together with UNIDO, the Shuimu Mingtuo Group and Hualu, is developong the world's first comprehensive demonstration project on green hydrogen production and application in the metallurgical and chemicals industries. Construction of an industrial site commenced in 2022 and is scheduled to be completed in 2025.

The Centre is designing a green ammonia plant is in close cooperation with Rhine Technology (Shanghai), TÜV (Germany) and Hualu Engineering Technology. The demonstration project expects to produce an annual capacity of 300,000 tons of green hydrogen, derived from China's largest 5 million KW wind power generation and 1.5 million KW photovoltaic power.

The Centre is developing a demonstration project for the operation of hydrogen fuel cell vehicles to decarbonize logistic routes. The Centre aims to develop the world's largest hydrogen refueling station, which will be built in Daxing, Beijing, China.

In August 2023, UNIDO published the Green Hydrogen Industrial Clusters Guidelines[xiii] to help governments and industries accelerate industrial decarbonization by replacing fossil fuels in hard-to-abate sectors.

Regional E-Mobility Policy for Pacific Island Countries and Territories

Promoting coherence between industrial, climate and energy policies is essential, particularity in the case of least developed countries (LDCs) and small island developing States (SIDS), where today's investment choices in the urgently needed industrial infrastructure will have long-term implications on the direction and cost of alignment to national climate commitments.

The transportation sector is among the highest emitting sectors in the global economy, second only to electricity and heat producers. In 2020, the transport sector produced 8.2 $GtCO_2eq$, or 24 per cent of total energy-related greenhouse gas emissions, comprising 57 per cent of global oil demand and 28 per cent of total global energy consumption.

Policies to green the transportation sector must be enacted if countries are to achieve their nationally determined contributions. These transformative policies will enable private and public actors to phase out fossil fuel-based transport, encourage the uptake of transportation technologies based on renewables, and expand renewable public transport and transportation infrastructure. Such a wide-ranging policy reform will inevitably affect the lives and livelihood of populations. It is the responsibility of policy-makers to ensure that reforms in the transportation sector are equitable and just, and do not disproportionately or adversely affect the most vulnerable members of their community.

Mandated by the 4th Meeting of the Pacific Energy and Transport Ministers, held in September 2019 in Samoa, UNIDO and the Pacific Centre for Renewable Energy and Energy Efficiency developed a Pacific regional policy and programme on integrated electric mobility solutions and renewable energy power systems.

Based on a comprehensive technical assessment, the regional policy includes specific targets on e-mobility to be met by 2030 and 2050. The regional e-mobility programme drives decarbonization of the transport sector in the Pacific with support of UNIDO, the World Bank, the Asian Development Bank, and the Global Green Growth Institute.

Global Ocean Energy Alliance

The preservation of the ocean health and the greening of marine and coastal industries have been acknowledged as important pillars of global climate mitigation and adaptation action. The ocean makes a significant contribution to the global economy. The projections suggest that by 2030, the ocean economy could more than double its contribution to global value added, reaching over USD 3 trillion, and creating 40 million jobs. The oceans play an essential role in climate regulation: covering 70 per cent of the planet, they absorb CO_2 and heat, and the life within the oceans produces half the oxygen we breathe.

Ocean ecosystems can provide essential services and nature-based solutions. At the same time, coastal communities particularly in SIDS are increasingly threatened by sea level rise, extreme weather events, and degradation of essential marine and freshwater resources. Therefore, to harness the benefits of their large exclusive economic zones, most SIDS have developed forward-looking green and blue economy policies, which are closely aligned with the efforts to increase the climate resilience of coastal communities.

The blue economy concept includes emerging SIDS-appropriate renewable ocean energy technologies as a nature-based solution, which can simultaneously provide energy services and contribute to the decarbonization of the expanding blue industry.

To advance such blue and green policies, the Sustainable Energy and Climate Resilience Organization and UNIDO launched the Global Ocean Energy Alliance supported by Prime Ministers of SIDS in the Pacific, the Caribbean and Africa.

The Alliance builds a bridge between the industry and research players to address barriers to technology deployment and provide support in the areas of policy, regulations and standards, knowledge management, as well as investment and business promotion. Due to their large exclusive economic zones, SIDS can become early-adopters of ocean energy solutions and drivers of the market-uptake and cost reductions of blue economy technologies.

3) What effective mechanisms and strategies exist to ensure that means of implementation and support are enhanced and flow consistently in line with the goals of the Paris Agreement and in enhancing action for collective progress.

The Private Financing Advisory Network

The Private Financing Advisory Network (PFAN)[xiv] is a global network of locally-based climate and clean energy finance experts, which offers free business coaching and investment facilitation to entrepreneurs engaged in climate and clean energy projects in developing countries. Initiated by the UNFCCC and the Climate Technology Initiative in 2006, PFAN is co-hosted by UNIDO and the Renewable Energy and Energy Efficiency Partnership.

Unlocking private sector finance in support of climate action is one of the main challenges that governments, international organisations and development banks have been grappling with

since the Paris Agreement entered into force. PFAN is tackling this challenge using small amounts of public funding to leverage large amounts of private sector investment for clean energy and climate resilience projects.

Since the finance gap for adaptation projects is even more severe than for mitigation projects, supporting adaptation and resilience projects became a significant area for PFAN services in 2014. In particular, PFAN is actively seeking to facilitate investments in adaptation projects in agriculture, agro-processing, crop storage and market linkages, water availability and wastewater management, financial services that support livelihoods, urban challenges of climate change including low-lying urban centres and climate proofing infrastructure.

In 2022, PFAN celebrated the remarkable achievement of USD 3 billion leveraged by PFAN-supported climate and clean energy projects since its inception in 2006.

Fostering green and digital skills to enable a just transition of the workforce

Addressing climate change requires a paradigm shift towards building low greenhouse gas emissions and climate-resilient economies and societies, while ensuring a just transition of the workforce that creates decent jobs, taking into consideration social dimensions of such transition. Given that many labour-intensive industries may be subject to automation in the coming decades, it is essential to equip women and men with the skills they need for the future of manufacturing. UNIDO's integrated programmes include skills development, technical and vocational training, open-access learning platforms, labs, enhanced remote learning options and innovation accelerators.

Global Network of Regional Sustainable Energy Centres

Over the past ten years, UNIDO has established the Global Network of Regional Sustainable Energy Centres (GN-SEC), a unique South-South and triangular cooperation multi-stakeholder partnership to accelerate the clean energy transition "from the regions for the regions". Under a common framework, UNIDO has assisted regional economic communities of the Global South in the creation and operation of intergovernmental centres with the mandate to promote the uptake of harmonised regional sustainable energy product and service markets. Through cross-border approaches and methodologies, the centres complement and accelerate national efforts in the areas of policy, regulations and standards, qualification, knowledge management, as well as the promotion of investment, innovation and entrepreneurship.

The GN-SEC covers 113 countries, including 41 LDCs and 34 SIDS. Through the setting of regional policies and standards and the facilitation of national follow-up, the GN-SEC platform influences the behaviour of around 1.7 billion energy consumers in the long-run. The GN-SEC facilitates triangular industrial cooperation on commonly shared sustainable energy solutions between the individual centres, regions, as well as developing country partners. The created infrastructure offers the opportunity to test, demonstrate and roll-out latest climate technology, policy and business model innovations in various regions simultaneously.

The network is an important contribution for strengthening the means of implementation and a good practice example of South-South cooperation.

4) What are key political messages for strengthening action and enhancing support and what should be the next steps and way forward in this regard?

Unlocking financing for industrial decarbonization

Recognizing the urgent need to decarbonize heavy industries and slash industrial emissions by 90 per cent by 2050, UNIDO emphasizes the necessity of driving cost reductions in decarbonization technologies and ensuring their wider market uptake.

UNIDO notes the imperative to scale up financing for these technologies and generate a robust pipeline of investment-ready projects. Building on the outcomes of the high-level dialogue on industrial decarbonization convened during the 14th Clean Energy Ministerial, hosted by the Government of India, UNIDO is calling on the global community to mobilize financing to:

i. Develop national transformation pathways to climate neutral industry by 2050 through adoption of medium-term and long-term targets, roadmaps and investment plans for reducing GHG emission in key industrial sectors;
ii. Adopt common rules and guidelines for the emissions data underpinning global markets, including on life cycle assessments, product category rules and harmonized definitions and standards for low-carbon materials;
iii. Create a pipeline of projects, especially in developing and emerging economies, and facilitate international collaboration on the implementation of breakthrough decarbonization technologies;
iv. Generate and share knowledge on available technology solutions for decarbonizing the industrial sector and tools for de-risking investments in such technologies. [xv]

[i] UNIDO Climate Change Strategy, 2023
[ii] IPCC,2022, Chapter Industry, reference to be included when permitted.
[iii] Circle Economy, 2022 The Circularity Gap Report, https://www.circularity-gap.world/2022
[iv] World Wide Fund for Nature, 2022, Impacts of plastic pollution in the oceans on marine species, biodiversity and ecosystems, https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Plastik/WWF-Impacts_of_plastic_pollution_in_the_ocean_on_marine_species__biodiversity_and_ecosystems.pdf
[v] Tracking Clean Energy Progress 2023, IEA
[vi] IPCC, 2022, Chapter Industry
[vii] IPCC, 2022, Chapter Industry
[viii] Deloitte, 2022, Global Impact Report, A year of connection, action and impact, https://www2.deloitte.com/global/en/pages/about-deloitte/articles/global-report-home.html
[ix] IPCC, 2022, Mitigation of Climate Change
[x] https://www.industrialenergyaccelerator.org/areas-of-work/the-industrial-deep-decarbonization-initiative/
[xi] https://www.industrialenergyaccelerator.org/the-gpp-pledge/
[xii] https://www.unido.org/hydrogen
[xiii] https://www.unido.org/sites/default/files/files/2023-08/GH2_ClusterGuidelines.pdf?_token=1180120735
[xiv] https://pfan.net/
[xv] https://www.industrialenergyaccelerator.org/wp-content/uploads/Call-to-action.pdf