



DECARBONIZING STEEL, CEMENT AND CONCRETE

An overview of the Industrial Deep Decarbonisation Initiative

March 2024

Steel, cement and concrete are the building blocks of our modern world and the backbone of our economies. But they 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. In fact, the world is expected to build the equivalent of another New York City every month for the next 40 years.

Most of this new construction will be developed using cement — the second most consumed product in the world after water, and the largest emitter of carbon in the built environment. Steel is also carbon intensive. The average amount of CO₂ emissions from manufacturing steel is almost double the amount of steel created: 1.85 tonnes of CO₂ per 1 tonne of steel. To achieve global climate goals, carbon emissions from steel, cement and concrete need to decrease by more than 90 per cent by 2050.

Industrialization can continue without worsening the climate crisis


Decarbonizing steel, cement and concrete can help turn the tide on climate change. Making low- and near-zero steel, cement and concrete requires whole production processes to be transformed, and this requires significant innovation, investment and alignment.

But with new technologies and growing political and industrial will, we can do it.


To drive momentum forward, in 2021 the United Nations Industrial Development Organization (UNIDO) and the Clean Energy Ministerial established the Industrial Deep Decarbonisation Initiative (IDDI), a global coalition of governments and private sector organizations. India and the United Kingdom are leading the initiative, and Brazil, Canada, Germany, Japan, Saudi Arabia, Sweden, the United Arab Emirates and the United States are members. The IDDI is now rallying other nations to join the coalition as it is only with wider global collaboration that this vital initiative will succeed.

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. The IDDI aims to harness this immense purchasing power to ignite 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 very low-emission, it could save the world 1.25 billion tonnes of carbon emissions a year.

The IDDI's three focus areas



1. Establishing an approach for collecting **data and reporting** on low and near-zero emission steel, cement and concrete, including embodied carbon.



2. Harmonizing **global standards** to allow for comparability and define low and near-zero emission steel, cement and concrete.



3. Agreeing globally recognized **targets and best practices for the public procurement** of low and near-zero emission steel, cement and concrete.

If you make it we will buy it: the IDDI's Green Public Procurement Pledge

The IDDI's **Green Public Procurement Pledge** 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 (by 2025) the monitoring and disclosure of embodied carbon emissions of steel, cement and concrete in publicly-funded construction projects (embodied carbon is all the carbon emitted by producing a material throughout its lifecycle). The aim is for net-zero emission steel, cement and concrete to be used in all public construction projects by 2050.

The Pledge sends a clear message to steel, cement and concrete manufacturers. It explicitly recognizes that

low and near-zero emission construction materials may cost more in the short-term, but governments will still buy these products for public works if they are made.

Governments starting their work on green public procurement can endorse the **GPP Statement of Intent**, which confirms governments' intentions to work towards key aspects of the Pledge.

By 2025, the IDDI expects to have enabled a minimum of ten governments to make green public procurement commitments to buy low or near-zero emission steel, cement and concrete.

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

Key facts

OVER
50%



of industrial carbon emissions are generated by steel, cement and concrete production.¹

FOR THE NEXT

40 years



the world is expected to build the equivalent of another New York City every month.²

TO ACHIEVE GLOBAL CLIMATE GOALS,

carbon emissions from steel, cement and concrete production need to decrease by more than **90%** by 2050.³

90%

APPROXIMATELY

20-30%



of global construction industry revenues come from purchases made by national, regional and local government entities together.⁴

THE WORLD COULD SAVE

1.25 billion tonnes of carbon emissions a year⁵



if 35% of the steel and 60% of the cement used in public construction projects was very low-emission. This is more than all the carbon emissions generated by the commercial aviation industry in 2019.⁶

1. Intergovernmental Panel on Climate Change (2022), *Climate Change 2022 Mitigation of Climate Change*.

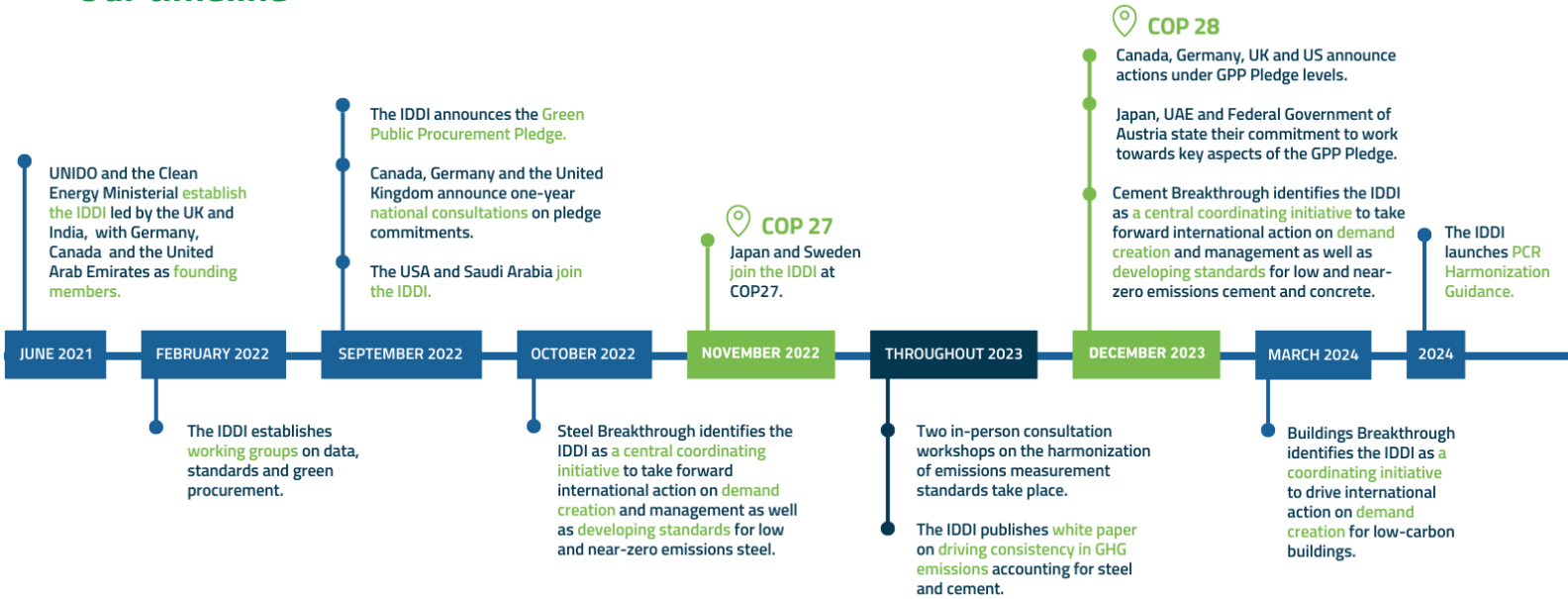
2. UNIDO, Industrial Analytics Platform (2022), '[Steel and cement can drive the decade of action on climate change. This is how](#)'.

3. Ibid.

4. World Economic Forum (2022), '[6 countries taking action to solve concrete's emissions problems](#)'.

5. UNIDO, Industrial Analytics Platform (2022), '[Consumers can play a central role in decarbonizing cement and steel](#)'.

Our timeline



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To find out more about the IDDI visit: <https://www.industrialenergyaccelerator.org/areas-of-work/heavy-industry-decarbonization/> or email: iddi@unido.org.

