

Collaborative Innovation for Low-Carbon Emitting Technologies

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Initiative Overview

The objective

The objective of the World Economic Forum's Collaborative Innovation for Low-Carbon Emitting Technologies (LCET) initiative is to accelerate the development and upscaling of low-carbon emitting technologies for chemical production and related value chains. The ambition of the initiative is to set the industry on a path to net-zero emissions by 2050.

Background

Due to global population growth and a rising middle class, it is expected that demand for chemicals and materials will quadruple by 2050. At the same time, the Paris Agreement has strengthened the global response to climate change and the Intergovernmental Panel on Climate Change (IPCC), released a Special Report in 2018 urging the world to aim for 1.5°C and achieve net-zero CO₂ emissions globally by 2050 to avoid even more dramatic consequences of climate change.

Despite a continuous reduction of CO₂ emissions associated with chemical operations, the industry will not be able to fulfil climate goals without the adoption of new low-carbon emitting technologies as the optimization of current production processes has technical limitations.

At the Annual Meeting 2019, the Chemical and Advanced Materials Industry Governors Community agreed to the creation of an expert working group to assess potential technologies and initiate collaborations which could help further reduce the industry's CO₂ footprint.

The opportunity

Chemical companies continue to advance individual efforts to reduce their GHG footprint and set ambitious targets such as CO₂-neutral growth until 2030 by BASF or climate neutrality by 2040 by LANXESS. However, in order to transform the entire sector, collaborative efforts are needed as technology upscaling entails high risk and massive costs.

Several technological challenges common for the sector could be more efficiently addressed in intra-industry collaboration. Furthermore, cross-industry and value-chain collaborations are needed to advance the electrification of

processes, use of alternative feedstocks, or alternative hydrogen production.

As a prerequisite, the design of new collaborative innovation models (e.g. with joint IP schemes) is needed. In such collaborations, partners could benefit from:

- Reduction of technological and investment risks
- Co-investment into large projects which could not be financed by one party
- Significant acceleration of technology development by knowledge sharing and deployment of partners' complementary expertise
- Joint development of standards and well-defined interfaces to other partners in the value-chain including the energy sector to ensure supply of renewable energy and the key customer industries to create demand for low-carbon products
- Joint engagement with policy-makers, financial sector and civil society organizations
- Foster the development of an infrastructure that enables the use of low carbon emitting technologies, e.g. electrical grids, pipeline systems.

Our approach

The LCET initiative is a CEO-led initiative of climate action champions.

A series of low-carbon emitting technologies have been identified and prioritized, and five parallel technology clusters have been created:

- Carbon Capture Utilization led by Total
- Biomass Utilization led by Clariant, co-led by Royal DSM
- Electrification led by BASF
- Alternative Hydrogen Production led by Air Liquide
- Waste Processing led by SABIC

While the major focus of the initiative is GHG emission reduction in the chemical production, cross-industry and value-chains dialogues and collaborations are being established to leverage synergies and cater for the cross-cutting character of the technologies required.

The initiative aims to foster the formation of alliances for the collaborative implementation of the prioritized technologies, potentially structured as joint ventures, start-ups, alliances and others.

Progress through 2019

The initiative community was convened, consultations were performed and high-level proposals for collaboration were collected. Five parallel technology clusters have been created. Each technology cluster advanced the development of preliminary roadmaps for potential collaborations including the scope, state-of-the art, challenges, opportunities, timeline and resources needed.

Additionally, the initiative has been included in a broader [Mission Possible Platform](#), hosted by the Forum supporting alliances across the hard-to-abate sectors: aviation, heavy-duty trucking, shipping, chemicals, steel, aluminium and cement.

Current activities and next steps

Each technology cluster advances their own work stream(s) with regular calls and meetings in order further develop their roadmaps and implement the actions identified such as joint studies and pilot projects.

The teams will also address cross-cluster regulation, funding, market and collaboration challenges to accelerate the development and deployment of prioritized technologies.

Calendar

2020-2021 key events:

- The Governors Community for the Chemical and Advanced Materials Industry convened at the Annual Meeting of the World Economic Forum held in Davos-Klosters (19-24 January 2020)
- The Third Technology Meeting will take place in June 2020 (tbc)
- The Fourth Technology Meeting will take place in October 2020 (tbc)
- The Governors Community for the Chemical and Advanced Materials Industry will convene at the Annual Meeting of the World Economic Forum in Davos-Klosters (26-29 January 2021)

Participants

Each cluster is composed of chief technology officers and senior technology experts from partner organizations in the chemicals, materials, oil and gas and other related industries, experts in process technology, and selected emerging technology leaders.

Partner Organizations

- Air Liquide
- Arcelor Mittal
- BASF
- Borealis
- BP Chemicals
- Clariant
- Covestro

- Dow
- Johnson Matthey
- LANXESS
- Linde
- Mitsubishi Chemical Holdings Corporation
- Occidental Chemical
- Repsol
- Royal DSM
- SABIC
- SIBUR
- Solvay
- Total
- Versalis
- Wacker Chemie

How to engage?

Companies from relevant industries are invited to join the relevant clusters groups. This includes, but is not limited to, grid operators for the electrification cluster, food and consumer goods companies for the biomass cluster, waste management and recycling companies for the waste processing cluster and others.

Other organizations such as governments, knowledge partners, start-ups, research institutes, universities and NGOs are invited to join the initiative activities and dialogues.

For more information on this initiative and to engage, please visit the [LCET initiative webpage](#) or contact:

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