

## Briefing Note

### Session 5: Renewable solutions for industry sector transformation

7 October 2020 • 8:00-11:00 AM CEST • Virtual

In partnership with:



#### Background

In 2017, the total final fuels use for energy and non-energy purposes in industry amounted to nearly 160 EJ of which, over 90% came from fossil fuels (coal, oil and natural gas), making the sector highly energy- and carbon-intensive. In the same year, industrial emissions accounted for 9.2 Gt of CO<sub>2</sub> emissions, representing over a quarter of total global energy sector CO<sub>2</sub> emissions. Of the total energy and process-related emissions in the industry sector, 85% were emitted by three industrial sub-sectors, which are usually referred to as “hard-to-decarbonise” or “hard-to-abate”, because options for their full decarbonisation are currently limited and facing significant technological and economic challenges:

- iron and steel;
- cement and lime; and
- chemical and petrochemicals.

By 2050, in IRENA’s Paris compliant scenario<sup>1</sup>, a combination of energy efficiency, renewable energy, Carbon Capture, Utilisation and Storage (CCUS), and other measures (recycling/reuse, new materials and products, etc.) are needed to reduce the industrial sectors’ CO<sub>2</sub> emissions from 9.2 Gt/year in 2017 to 6.3 Gt/year in 2050. Nevertheless, industrial sectors would still be responsible for over 50% of remaining emissions for reaching zero carbon by 2050.

Given the rapidly falling costs of renewable power generating technologies in the past decade, renewable energy can play a significant role for the decarbonisation of the industry. Although this has received less attention than the transport and power sectors, there are emerging technology-driven innovative solutions to reduce and even eliminate emissions in various industry sectors, these solutions are based on:

- electrification with renewable energy;
- the use of green hydrogen (i.e. produced from renewable energy sources); and
- the use of biomass.

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<sup>1</sup> “Transforming Energy Scenario” outlined in IRENA’s 2020 [“Global Renewables Outlook: Energy transformation 2050”](#).

Policy makers and industry stakeholders need to jointly address the urgency of decarbonizing these sub-sectors by focusing further on RD&D, investing in demonstration projects and speeding up deployment of technological solutions which are available today. Adopting a systemic innovation approach will be key to fully decarbonise the industry sectors.

### Objective of the session

This session will showcase the most promising technology-driven innovations for energy and carbon intensive industries around the world that could contribute to reducing CO2 emissions to zero by mid-century. Focusing on the iron and steel, cement and chemical sectors, expert will show what is possible now and will explore how to accelerate the development and disseminate innovative solutions based on: electrification with renewable energy, the use of green hydrogen and the use of biomass.

### Format of the session

This session features three panel discussions, each covering one of the three largest energy and carbon-intensive industry sub-sectors. The 1<sup>st</sup> discussion will cover the iron and steel sub-sector, the 2<sup>nd</sup> discussion will cover the cement and lime sub-sector, and finally, the 3<sup>rd</sup> discussion will focus on the chemical sub-sector. No slides are required from the panelists.

### Session agenda

#### Renewable solutions for industry sector transformation

Wednesday, 7 October 2020

#### Opening and scene-setting presentations

8:00 – 8:30  
 CEST

The decarbonisation of some industrial sub-sectors is key for achieving the energy transition, and overview of the session.

##### Scene-setting presentations

- **Anthony Hobley**, Executive Director of the Mission Possible Platform, World Economic Forum
- **Claire O'Neill**, Managing Director, Climate & Energy, World Business Council for Sustainable Development
- **Paul Durrant**, Senior Programme Officer, Bioenergy and End-uses, IRENA Innovation and Technology Centre

#### Panel 1 – Solutions to decarbonise the iron & steel sector (40 min)

8:30 – 9:10  
 CEST

This panel will focus on the cutting-edge technologies which address the complex iron and steel-making processes that require decarbonization to put the world on a Paris-compliant path by mid-century. After focusing on the latest developments and industrial efforts at global level, the panelists will inspire and inform the audience by discussing the prospective of two key innovative technologies which are promising to be game changers for this sub-sector, when paired with renewables: 1) smelting reduction for iron-and steel-making and 2) hydrogen-based direct reduced iron (DRI). Specific learnings from ongoing pilot projects will also feature prominently.

**Moderator:** **Faustine Delasalle**, Director, Energy Transitions Commission (ETC)

##### Panellists:

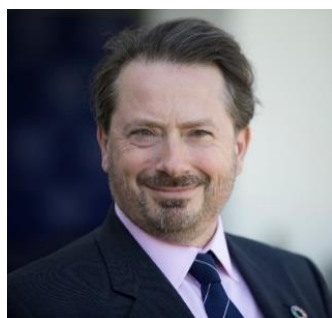
- **Åsa Ekdahl**, Head of Environment and Climate Change, World Steel Association
- **Andreas Regnell**, Chairman of the Board of Hybrit, Vatenfall
- **Yoon-Gih Ahn**, Senior Vice President, Management Consulting Center, POSRI (POSCO Research Institute)

9:10 – 9:20	Digital Break
<b>Panel 2 – Solutions to decarbonise the cement and lime sector (40 min)</b>	
9:20 – 10:00 CEST	<p>This panel will focus on the cutting-edge technologies available to reduce carbon emissions in cement and lime manufacturing. Speakers will first provide an overview of the latest developments and solutions available to decarbonize these sub-sectors at global level, including clinker and cement substitution options. Further, the speakers will discuss the potential of firing biomass in cement kilns, carbon capture, storage and utilisation (CCUS) or a combination of both. Key lessons learned from international pilot projects will feature in the debate.</p> <p><b>Moderator:</b> <b>Jim Rushworth</b>, Industrial Policy Director, CEMBUREAU</p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>• <b>Rob van der Meer</b>, Director EU Public Affairs, Heidelberg Cement</li> <li>• <b>Kiran Ananth</b>, Principal Counsellor, Confederation of Indian Industry - Godrej Green Business Centre</li> <li>• <b>Davide Zampini</b>, Head of Global R&amp;D, Cemex</li> </ul>
10:00 – 10:10	Digital Break
<b>Panel 3 – Solutions to decarbonise the chemical and petrochemical sector (40 min)</b>	
10:10 – 10:50 CEST	<p>This panel will focus on the cutting-edge technologies available to reduce fossil carbon intensity in the chemical and petrochemical sector. Speakers will first provide an overview of the latest developments and solutions available to replace fossil carbon in these sub-sectors at global level for both feedstock and energy. Further, discussions will focus on the potential of using bio-based chemicals and synthetic hydrocarbons.</p> <p><b>Moderator:</b> <b>Değer Saygın</b>, Director, SHURA Energy</p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>• <b>Florian Ausfelder</b>, Head of Energy and Climate, Dechema</li> <li>• <b>Babette Pettersen</b>, Vice-President Europe, Lanzatech</li> <li>• <b>Eelco Dekker</b>, Chief EU Representative, Methanol Institute</li> </ul>
<b>Closing remarks</b>	
10:50 – 11:00 CEST	<b>Dolf Gielen</b> , Director, IRENA Innovation and Technology Centre

## Speaker biographies

### Scene-setting and closing remarks

**Anthony Holey**, Executive Director of the Mission Possible Platform, World Economic Forum



*Anthony is the Executive Director of the Mission Possible Platform a partnership between the World Economic Forum and the Energy Transitions Commission. Anthony was Chief Executive Officer of the Carbon Tracker Initiative from February 2014 to March 2019, and now is co-chair of the Advisory Board. Previously he was a partner and Global Head of the Sustainability & Climate Finance Practice at global law firm Norton Rose Fulbright. Formerly he was General Counsel to the Climate Change Capital Carbon Fund and Director of Legal Policy for Climate Change Capital which he joined in September 2005. Anthony specialised in climate change and clean energy law as well as UK, EU and international environmental law. He has played a key role in helping to design the UK's pilot emissions trading scheme and in developing key aspects of the EU ETS. He advised a wide range of banks, trading companies, project development companies, corporates and public sector entities who were active participants in carbon markets. Anthony was seconded to Norton Rose Fulbright's Sydney office between 2010 and 2012 where he was heavily involved in the development of the emerging carbon and clean energy markets in Australia and Asia. He was a key figure behind the creation of the business advocacy group Businesses for a Clean Economy, a coalition of business arguing for a price on carbon. Anthony was behind the creation of the business group Climate Markets & Investment Association. He sat on the board of the Verified Carbon Standards Association (now Vera) between 2007 and 2015. He currently sits on the Advisory Board to the Climate Bonds Initiative and the Global Footprint Network. He has recently been a senior advisor to the UN Principles for Responsible Investment (PRI), the specialist climate events and media company Climate Action and the Global Law Firm Clyde & Co. Anthony holds a First-Class Honours Degree in Chemistry & Physics and an LLM in Environmental Law. He qualified as a solicitor of England and Wales in 1994. He writes and speaks widely on climate risk and the financial sector.*

**Claire O'Neill**, Managing Director, Climate & Energy, World Business Council for Sustainable Development



*Claire O'Neill entered politics in 2007 after a transatlantic career in consulting and finance, initially as a policy advisor to George Osborne, the then Shadow Chancellor and then as the Conservative MP for the Devezes Constituency from 2010 - 2019. She served in several Ministerial positions before becoming Climate Change Minister and then attending the UK Cabinet as Minister for Energy and Clean Growth. Claire wrote and implemented the UK's Clean Growth Strategy; formed the Green Finance Taskforce; launched the global Powering Past Coal Alliance to end coal-powered electricity generation and negotiated the UK's Offshore Wind Sector Deal that dramatically*

*dropped the cost of this vital renewable energy source. In 2019 she brought forward the ground-breaking legislation that committed the UK to be a Net Zero emissions economy by 2050 and she also formulated the UK’s successful bid to host the United Nations 2020 Climate Change Conference known as COP26. She served as COP26 President-Designate until she left politics in 2020. Ranked as one of Bloomberg’s global “Green 30 for 2020”, Claire has now joined the World Business Council for Sustainable Development (WBCSD) as the Managing Director for Climate and Energy, and Natural Climate Solutions. WBCSD is the leading voice for business sustainability and is a global CEO-led organization drawn from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees.*

**Paul Durrant, Senior Programme Officer, Bioenergy and End-uses, IRENA Innovation and Technology Centre**



*Paul Durrant joined IRENA in 2018, and is now a head of End-use sectors and bioenergy team at the IRENA Innovation and Technology Centre in Bonn. Paul Durrant brings over 20 years of experience of shaping innovation policies and programmes, technology analysis for the UK government and internationally, including establishing the Mission Innovation initiative.*

**Dolf Gielen, Director, IRENA Innovation and Technology Centre**



*As Director of the IRENA Innovation and Technology Centre in Bonn since 2011, Dolf Gielen oversees the agency’s work on advising member countries in the area of technology status and roadmaps, energy planning, cost and markets and innovation policy frameworks.*

**Panel I: Solutions to decarbonise the iron & steel sector**

**Faustine Delasalle, Director, Energy Transitions Commission (ETC)**



*Faustine is a Partner at SYSTEMIQ where she heads the Energy Transition Platform. She is also the Director of the Energy Transitions Commission (ETC), a coalition of global leaders from across the energy landscape. She focuses on building coalitions and partnerships to accelerate the transition to net-zero emissions energy systems, working closely with energy providers, energy-intensive industries, finance players and policymakers.*

*Faustine directed the publication of the ETC’s flagship reports Mission Possible (2018) and Making Mission Possible (2020), which describe how to reach net-zero emissions globally by mid-century. She co-led the design of the Mission Possible Platform, in partnership with the World Economic Forum. The Platform seeds and supports sectoral initiatives to drive decarbonisation in the harder-to-abate sectors through corporate leadership. She is a regular speaker in conferences and workshops on topics related to the energy transition.*

*Faustine joined SYSTEMIQ and the ETC in 2016. Prior to that, she worked in the public sector (Parliament, local authorities), private sector (a tech start-up) and third sector (with think-tanks and NGOs). She is an alumna of SciencesPo Paris and of the London School of Economics and holds degrees in political sciences and economics. She is also an OnPurpose Fellow.*

**Åsa Ekdahl, Head of Environment and Climate Change, World Steel Association**



*Åsa Ekdahl has worked in the steel industry for 20 years, gaining extensive experience in the environmental challenges of the industry including climate change, air emissions and co-products management and is a recognized expert in these fields. As Head of Environment and Climate Change at the World Steel Association, Åsa runs the worldsteel Environment Committee and leads the association’s engagement with International organisations such as the UNFCCC and OECD. She plays an important role in shaping the policy and advocacy actions for the industry including the promotion of industry action. She is passionate about advancing the industry’s performance to enable steel companies to align with the increasing climate and environmental demands. Providing the forum (workshops and projects) for members to be able to connect with each other to exchange good practices, learn from each other and create partnerships is a very rewarding part of the role.*

*Before joining worldsteel, Åsa worked at both Jernkontoret, the Swedish Steel Producer's Association and EUROFER, the European Steel Industry Association, where she was responsible for engaging with policy makers, most notably the European Commission and European Parliament, on the needs of the European steel industry. Åsa graduated with a Master of Science in Environmental Science from Gothenburg University in Sweden.*

**Andreas Regnell, Chairman of the Board of Hybrit, Vatenfall**





**Senior Vice President, Strategic Development Vattenfall employee since: 2010**  
**Education:** B. Sc. Econ.  
**Previous positions:** Head of Nordic Business Strategy (2014-2015). Head of Strategy and Sustainability (2010-2013). Senior Partner and Managing Director, Managing Partner of Nordic Region, The Boston Consulting Group (1992-2010). Analyst and Account Manager, Citibank (1989-1992).  
**Other assignments:** Board member of Svevia AB, Northvolt AB and Chairman of HYBRIT AB.

**Yoon-Gih Ahn, Senior Vice President, Energy and Environment business office at POSCO**



*I got the PhD degree from Erasmus University (the Netherlands) in 2007. The key contents of the doctoral degree are related to strategic sustainability management to enhance corporate value. I have worked for RIST and POSRI under the POSCO Grup after I got a master's degree in economics from Korea University in Korea since 1991. From 1993, I have been researching climate change, environmental and energy issues, and ISO 14000 series from the perspective of economic and business strategies. From 2017 to 2019, I served as the head of the energy and environment planning department (the Vice President). And since around 2000, I have been conducting energy/climate/environment-related regulations or policy committee activities organized by the Korean government and its related organization from the viewpoint of resource conservation.*

**Panel II: Solutions to decarbonise the cement and lime sector**

<p><b>Jim Rushworth, Industrial Policy Director, CEMBUREAU</b></p>	
	<p><i>Jim has an honors degree in minerals processing (Birmingham University) and a Master of Business Administration (Warwick Business School). He started his career in the gold mining industry in South Africa in 1981 and has over 38 years experience in the cement, lime and aggregates industries in both technical and operational roles. His current role is Industrial Policy Director at CEMBUREAU (EU Cement Association) where he leads the Industrial Policy team. Past roles have included Global Head Corporate Citizenship for LafargeHolcim (LH), Global Vice President Sustainable Development &amp; Public Affairs in Lafarge, Head of Sustainability in UK, Head of Emissions Trading and leading the waste fuels program in UK for Lafarge. Internationally he co-chaired taskforces for WBCSD-CSI, CEMBUREAU and UEPG (EU Aggregates Association). In UK he was also on the board of BCSD-UK and Emissions Trading Group (ETG) and chairman of working groups for MPA (Minerals Products Association) and ETG. He has been selected by the UK Government to represent EU extractive industry and UK industry on several occasions and represented LH at the UN Global Leaders assembly in New York.</i></p>
<p><b>Rob van der Meer, Director EU Public Affairs, Heidelberg Cement</b></p>	
	<p><i>Rob van der Meer is Director EU Public Affairs at HeidelbergCement. As chemical engineer he started his career in public services as responsible for environmental permitting with focus on emissions to the air, for the Provincie Limburg in the Netherlands. In 1996 he started in the cement industry as a process engineer in the Maastricht plant of ENCI. Later (2004) he was appointed CO2 coordinator for HeidelbergCement in Heidelberg (Germany). At the moment he is in charge of EU Public Affairs in the department of Group Communications &amp; Investor Relations of HeidelbergCement in Heidelberg (Germany). Rob van der Meer graduated in 1991 as a chemical engineer from the Technical University Twente in the Netherlands.</i></p>



**Kiran Ananth, Principal Counsellor, Confederation of Indian Industry - Godrej Green Business Centre**






*Kiran Ananth works as a Principal Counsellor in Confederation of Indian Industry (CII). He leads CII's engagements in Industrial & Building energy efficiency, renewable energy studies and climate change assessment. Kiran has been involved in conceptualizing, submission and execution of various energy efficiency and climate change related projects with several bilateral & multilateral agencies. He is also involved in CII's Green Entrepreneurship Council which runs a cohort to provide Business Acceleration support to cleantech start-ups. He is a Mechanical Engineer with Masters in Energy Management and is associated with CII since 2000.*

**Davide Zampini, Head of Global R&D, Cemex**



*Dr. Davide Zampini is the Head of CEMEX's Global R&D and IP Management based in Switzerland. He leads a multi disciplinary group of top scientists and specialists that spearhead new technologies and solutions for the world's building materials market. With over 30 years of experience in the construction materials industry, Davide Zampini is on a continuous and relentless quest to push the limits of innovation when it comes to cement-based products and building solutions. Through the adoption of a Design and industrialization-Driven innovation approach, Davide leads a multi-disciplinary and culturally diverse team at CEMEX's Center for Innovation and Technology. Davide's team in Switzerland does not limit itself to developing novel functionalities in cement-based materials, but CEMEX's adaptive research and development model has been conceived with a given versatility, and thus allows for the incorporation of customer-centered strategies that are designed to create strong emotional ties to a material that for ages has been considered "grey."*

**Panel III: Solutions to decarbonise the chemical and petrochemical sector**

<p><b>Değer Saygın, Director, SHURA Energy</b></p>	
	<p><i>Değer Saygın works as the Director of the SHURA Energy Transition Center. In his former role at the International Renewable Energy Agency (IRENA), Değer has developed and led the global renewable energy roadmap (REmap) programme between 2013 and 2017. This programme has assisted the world's largest energy using 70 countries in accelerating the use of renewable energy and energy efficiency technologies to operationalise the goals of the seventh Sustainable Development Goal and the Paris Agreement. Prior to joining IRENA, Değer has worked as a researcher at the Utrecht University carrying out projects for intergovernmental organisations, countries and the private sector about more sustainable uses of energy and resources in the manufacturing industry where he also received his Ph.D. He received his undergraduate degree in Environmental Engineering from the Middle East Technical University in Ankara.</i></p>
<p><b>Florian Ausfelder, Head of Energy and Climate, Dechema</b></p>	
	<p><i>Dr. Florian Ausfelder studied chemistry at the Technical University in Karlsruhe and the University of Edinburgh. He obtained his PhD in Physical Chemistry from the University of Edinburgh. He worked as a postdoc at Stanford University in California and with a Marie-Curie Fellowship to the Universidad Complutense de Madrid in Spain. He joined DECHEMA in 2007 and was in charge of several national and international research projects as well as DECHEMA's energy working groups. Since 2017 he is DECHEMA's leading subject matter expert and team leader for energy. He published several studies, including on CO2 utilization, GHG reduction potentials in the chemical industry and recently, the technology study „Low carbon energy and feedstock for the European chemical industry”, Roadmap 2050 (in German), studies on flexibility in the primary industry sector, infrastructure requirements as well as Power-to-X processes (in German).</i></p>
<p><b>Babette Pettersen, VP Europe, Lanzatech</b></p>	
	<p><i>Babette is the Vice President, Europe for LanzaTech, a pioneer in gas fermentation technology. LanzaTech converts carbon-rich gas streams into value-added products using proprietary microbes that feed on gases to provide economic routes to ethanol, jet fuel and chemicals. LanzaTech technology feeds on a variety of gases, including industrial off-gases from steel, and syngas from municipal solid waste (MSW) and biomass to reduce carbon emissions from industry, while producing platform chemicals that serve as building blocks to consumer products such as plastics, fuels and synthetic fibers. Products made from recycled carbon from industrial emissions reduce greenhouse gas (GHG) emissions by over 70% when compared to equivalent products derived from fossil fuels. Before joining LanzaTech, Babette was Director of Business Development at Ginkgo Bioworks, an early stage</i></p>

*leader in synthetic biology. Prior to this, Babette was the Chief BusinessDevelopment Officer at Capricorn Venture Partners, a European manager of venture capital and equity funds, Chief Commercial Officer for BioAmber, a market leader in renewable chemicals, and VP New Business Development for Performance Materials at Royal DSM. Prior to this, Babette held Marketing & New Business Development roles in different industry groups for over 20 years at Dow Corning. Babette has a BSc in Biology from Wellesley College, USA and an MBA from INSEAD, France. She lives and works in Brussels, Belgium, and is on the Board of the United Fund of Belgium which helps disadvantaged people and those with disabilities, by investing in projects that improve their situation and their social integration.*

**Eelco Dekker, Chief EU Representative, Methanol Institute**



*Eelco Dekker, Chief EU Representative:*

- *Joined MI in 2014 with an extensive background in European fuel blending, energy applications and regulatory affairs;*
- *Former Chief Marketing Officer at BioMCN, with over 10 years in commercial roles with DSM and Ciba Specialty Chemicals;*
- *Based in Brussels.*