

## Press release

nova-Institut GmbH ([www.nova-institute.eu](http://www.nova-institute.eu))

Hürth, 25 February 2021



## How to utilise CO<sub>2</sub>? The nominees for the innovation award “Best CO<sub>2</sub> Utilisation 2021” have the answers!

**Carbon capture and utilisation (CCU) is one of the most obvious solutions to further reduce CO<sub>2</sub> emissions, but it is yet still hardly exploited. However, these six nominated technologies turn CO<sub>2</sub> into value: ethanol, methanol, polyols, surfactants or syngas – the audience will choose the winner at the “9<sup>th</sup> Conference on CO<sub>2</sub>-based Fuels and Chemicals”, 23–24 March 2021, online!**

Recently, many projects on CO<sub>2</sub>-based fuel and chemical production, as well as efficient capture and utilisation technologies have been launched by both start-ups and established companies, ranging from pilot over demonstration to commercial scale. Even more players are now expressing interest in getting involved in this field. Great visions are becoming real business cases and companies are starting to realise their potential.

The advisory board of the “9<sup>th</sup> Conference on CO<sub>2</sub>-based Fuels and Chemicals” has now nominated six promising technologies as candidates for the innovation award “Best CO<sub>2</sub> Utilisation 2021”. After a short presentation of all six nominees, three winners will be elected by the participants on 23 March 2021, the first day of the online conference ([www.co2-chemistry.eu](http://www.co2-chemistry.eu)). The innovation award will be presented for the third time, it is sponsored by YNCORIS (Germany) and organised by nova-Institute (Germany) and CO<sub>2</sub> Value Europe (Brussels).

The transition to direct CO<sub>2</sub> utilisation as one alternative carbon source is needed to substitute fossil resources and to shift towards sustainable and climate-friendly production, paving the path to a circular economy and counteracting climate change. The internationally best-established conference on CO<sub>2</sub> offers unique networking possibilities and invites the attendees of the entire Carbon Capture & Utilisation (CCU) and Power-to-X industry to learn about the latest innovations across the sectors and vote for their favourite candidate in the competition for the title “Best CO<sub>2</sub> Utilisation 2021”. Further, the audience will be provided with most recent insights into CO<sub>2</sub>-based transport and aviation fuels and CO<sub>2</sub>-based bulk and fine chemicals. CCU technologies represent an essential contribution to a renewable carbon industry. All information, registration and the complete conference programme are available at: [www.co2-chemistry.eu](http://www.co2-chemistry.eu).

## Here are the six nominees from four different countries!

### **bse Methanol (Germany): FlexMethanol**

FlexMethanol will enable economically viable transformation of excess electrical power and off-gas CO<sub>2</sub> into methanol as chemical energy storage and feedstock within small-scale and delocalised production units. Using a tailor-made catalyst, the direct conversion of CO<sub>2</sub> is ensured without a cost-intensive water-gas-shift reactor. FlexMethanol consists of four industrially available process steps (electrolysis, CO<sub>2</sub> scrubbing, methanol synthesis and distillation) as 10 and 20 MW modules scalable up to 100 MW. FlexMethanol significantly stabilises the revenues by dynamic operation according to the power market and price conditions, e.g., switching from feed into the grid and producing methanol from hydrogen. As a result, no feed storage tanks are necessary.

More information: [www.bse-engineering.eu](http://www.bse-engineering.eu)

### **Carbon Recycling International (Iceland): Emissions-to-Liquids Technology**

Carbon Recycling International (CRI) has been developing its *Emissions-to-Liquids* (ETL) technology since 2006. CRI's first industrial demonstration plant was commissioned in Iceland in 2012. It has a capacity of 4,000 tonnes methanol per year. ETL converts CO<sub>2</sub> and hydrogen into methanol in a one-step reaction. In 2020 the company moved from industrial demonstration scale to full commercial scale with a project in Anyang, Henan province, China. A plant, which will have a capacity of 110,000 tonnes methanol per year, will be commissioned in 2021. This represents an important step for CO<sub>2</sub> hydrogenation projects worldwide. The CO<sub>2</sub>-based methanol is used for gasoline blending, biodiesel esterification, fuel cell operation, waste-water denitrification and chemicals production.

More information: [www.carbonrecycling.is](http://www.carbonrecycling.is)

### **Covestro (Germany): Washing with CO<sub>2</sub>-Technology – Surfactants based on CO<sub>2</sub>**

CO<sub>2</sub> instead of petroleum – Covestro is pursuing new avenues for turning the waste gas into a useful raw material. The goal is to use CO<sub>2</sub> as resource in as many applications as possible. And the next scope is here to come: Surfactants based on CO<sub>2</sub>! First application tests have shown that these CO<sub>2</sub>-based surfactants can be used in a standard detergent formulation. The product development process is still in progress and the boundary conditions are already set: less fossil-based, less global warming potential, readily biodegradable and comparable washing performance – a new class of more sustainable surfactants for the everyday businesses.

More information: [www.covestro.de](http://www.covestro.de)

### **Dimensional Energy (USA): HI-Light Reactor Platform**

Dimensional Energy (DE) has developed a concentrated solar fuels platform technology for converting CO<sub>2</sub> to syngas (CO + H<sub>2</sub> mixtures) with remarkable efficiency of > 50 % CO<sub>2</sub> conversion (3<sup>rd</sup> party verified by 350Solutions during the XPrize competition in Gillette, Wyoming, USA). The robust platform technology utilises DE catalysts, reactor designs, and software in an integrated unit, and was tested on-sun during the Carbon XPrize Finals. The 5

tonnes/year demonstration plant was shown to work during variable weather and with no catalyst degradation. The reactor is scalable to parabolic dish size, and the modular system can be easily expanded by additional units. Continued development of the platform will yield > 70 % conversion in 2021, and will integrate a Fischer-Tropsch reactor for kerosene production from the syngas.

More information: [www.dimensionaleenergy.com](http://www.dimensionaleenergy.com)

### **LanzaTech (USA): CarbonSmart Ethanol**

The *CarbonSmart Ethanol* technology relates to capturing carbon and creating value from waste; effectively turning pollution into products. LanzaTech uses microorganisms to make ethanol from the carbon emissions of industrial processes like steel, syngas from municipal solid waste, waste wood or waste plastics. Ethanol is a chemical building block that can be used to produce a broad range of everyday products from household cleaning products, plastic shampoo bottles, furniture and toys, to fine fragrances and sporting goods. With a commercial plant in China that has produced over 20,000 tonnes of ethanol and mitigated over 100,000 tonnes of CO<sub>2</sub> since 2018 and the first EU plant in Belgium in 2021, the technology is rapidly gaining traction in the market.

More information: [www.lanzatech.com](http://www.lanzatech.com)

### **UR One (Canada): Dissociation of Greenhouse Gas Oxides using Plaron Technology**

Commercially ready carbon capture with 80 % lower operating and capital costs and dissociation of greenhouse gases including CO<sub>2</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, SO. Carbon is captured as high value allotropes Buckminster Fullerenes with > 90 % capture rate. No consumables except electricity, and a small amount of water. All greenhouse gases from a 300 MW coal plant can be treated using only 3 MW of power and no back pressure. Only small amounts of electricity are required to separate molecules into their elemental components. Carbon is collected in water in the form of Buckminster Fullerenes (C<sub>60</sub>, C<sub>70</sub>, C<sub>80</sub> and nano tubes) and other high value carbons.

More information: [www.urone-inc.com](http://www.urone-inc.com)

### **Patronage, sponsors and partners**

The nova-Institute would like to thank Professor Dr Andreas Pinkwart, Minister of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia (Germany) for taking on the patronage of the conference.

Further, nova-Institute thanks YNCORIS (Germany) for sponsoring and CO<sub>2</sub> Value Europe (Brussels) for co-organising the innovation award “Best CO<sub>2</sub> Utilisation 2021”. The 9<sup>th</sup> Conference on CO<sub>2</sub>-based Fuels and Chemicals is supported by Gold Sponsor VTT (Finland), Silver Sponsor Covestro (Germany) and Bronze Sponsor Axel Semrau (Germany). Further information on our attractive sponsoring packages can be found at: [www.co2-chemistry.eu/sponsoring](http://www.co2-chemistry.eu/sponsoring).

The nova-Institute also thanks its partner IASA e.V. (Germany) for supporting the conference.

All information, registration and the full conference programme are available at: [www.co2-chemistry.eu](http://www.co2-chemistry.eu).

**Find all nova press releases, visuals and more free-for-press purposes at [www.nova-institute.eu/press](http://www.nova-institute.eu/press)**

**Responsible for the content under German press law (V. i. S. d. P.):**

Dipl.-Phys. Michael Carus (Managing Director)

nova-Institut GmbH, Chemiepark Knapsack, Industriestraße 300, DE-50354 Hürth (Germany)

Internet: [www.nova-institute.eu](http://www.nova-institute.eu) – all services and studies at [www.bio-based.eu](http://www.bio-based.eu)

Email: [contact@nova-institut.de](mailto:contact@nova-institut.de)

Phone: +49 (0) 22 33-48 14 40

nova-Institute is a private and independent research institute, founded in 1994; nova offers research and consultancy with a focus on the transition of the chemical and material industry to renewable carbon: How to substitute fossil carbon with biomass, direct CO<sub>2</sub> utilisation and recycling. We offer our unique understanding to support the transition of your business into a climate neutral future. nova-Institute has more than 40 employees.

**Get the latest news from nova-Institute, subscribe at [www.bio-based.eu/email](http://www.bio-based.eu/email)**