

## Press release

nova-Institut GmbH ([www.nova-institute.eu](http://www.nova-institute.eu))  
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## The “Top 6” candidates are nominated for the first innovation award “Best CO<sub>2</sub> Utilisation 2019”

**Biotechnological CO<sub>2</sub> conversion. High value-added chemicals. Concrete. CO<sub>2</sub>-based fertilizer production. CO<sub>2</sub> utilisation for cosmetic waxes. Even an independent system for homeowners to produce fuel from CO<sub>2</sub>. Everything and more is possible right now!**

Six new technologies and products from five different countries have been selected out of 20 applications and are now nominated for the innovation award of the “7<sup>th</sup> Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers”, 20-21 March 2019 in Cologne, Germany ([www.co2-chemistry.eu](http://www.co2-chemistry.eu)). The Innovation Award is sponsored by Covestro and organised by nova-Institute.

The call for the first innovation award “Best CO<sub>2</sub> Utilisation 2019” has attracted a tremendous number of outstanding innovations in the field of Carbon Capture & Utilisation (CCU) highlighting how active companies are in the implementation of CCU. The abundance and quality of the applications have surprised and inspired the advisory board and made the selection of the nominees a hard piece of work. This sparked the decision to not only introduce the “Top 6” candidates in detail, but also briefly present the other 14 outstanding applications that regrettably were not selected as finalists.

After a short presentation of all nominees, the three winners will be elected by the participants of the “7<sup>th</sup> Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers”. The award ceremony takes place in the evening of the 20<sup>th</sup> of March.

Take part in this unique event and elect the innovation winner!

The “Top 6” candidates in detail:

### **b.fab GmbH (Germany): Process for Formate Bioeconomy**

b.fab has developed a disruptive process technology to efficiently convert CO<sub>2</sub>, water and renewable energy into value-added chemicals. CO<sub>2</sub> and water are abundantly available and therefore it is the starting point to build a sustainable bioeconomy. Via electrochemistry, b.fab convert and store CO<sub>2</sub> and H<sub>2</sub> (made from water) in liquid form as formate. The formate is the feedstock for the bioprocesses and b.fab uses synthetic biology to design specific pathways and to convert formate into value-added chemicals. b.fab is dedicated to establishing a formate-based bioeconomy in the coming years, and thus, providing an economical and sustainable new way to produce value-added chemicals for various industries. One of the first products will be lactic acid which can be further processed to produce PLA biopolymers.

[www.bfab.bio](http://www.bfab.bio)

**Carbicrete Inc. (Canada): Carbicrete**

Carbicrete's patented process enables the production of cement-free, carbon-negative concrete. Cement is replaced in the concrete mix with ground steel slag and the concrete is cured with CO<sub>2</sub> instead of heat and steam. Their concrete has lower material costs (steel slag is less expensive than cement because it is essentially industrial waste) and better mechanical and durability properties (can withstand more freeze/thaw cycles and have up to 30 % higher compressive strength) than cement-based concrete. A standard-size 18 kg concrete masonry unit (CMU) made using this process captures 1 kg of CO<sub>2</sub> (2 kg of emissions are also avoided for every block produced). Adoption of this technology by a plant producing 25,000 CMUs per day would result in the use of 25,000 kg of captured CO<sub>2</sub> per day.

[www.carbicrete.com](http://www.carbicrete.com)

**CCm Technologies Ltd. (United Kingdom): CCm Growth**

CCm fertiliser production systems combine captured carbon dioxide with waste resources to produce a range of nitrogen-based biogenic fertilisers for agriculture and horticultural applications. CCm Growth has had five years of trials on agricultural land for a range of commodity crops. Trials were compared with industry standard, carbon intensive fertilisers. Results have shown growth yields of crops to be the same and in some cases better with CCm Growth product. Early soil trials show that CCm growth makes a significant impact on soil health; improved water retention, improved pH levels and increased families of microorganisms to name just a few benefits. 50 CCm Growth systems would save 2.3mT of CO<sub>2</sub> per annum. CCm Growth will contribute to a circular economy and to achieving future carbon reduction targets.

[www.ccmtechnologies.co.uk](http://www.ccmtechnologies.co.uk)

**Gensoric GmbH (Germany): willpower energy®**

With the willpower energy project, the company Gensoric wants to make private homeowners completely independent of conventional fuel like natural gas or heating oil. For the first time, the developed system can produce your own fuel, in form of methanol, locally from CO<sub>2</sub> in order to have enough energy for hot water and heating supply. This technology, in combination with renewable electricity systems installed at your house, allows for complete self-sufficiency. At the same time, willpower energy can be considered a seasonal storage. If more energy is generated than is consumed in the summer, it can store this energy into the winter. So, it can be used when it is most needed. Under mild conditions (room temperature / low pressure) with relatively simple process technology, this can also take place in a non-industrial environment and private households.

[www.willpower-energy.eu](http://www.willpower-energy.eu)

**LanzaTech (United States): Isopropanol and acetone**

LanzaTech have developed a process for direct CO<sub>2</sub> capture and utilisation in valuable chemical intermediates. This combines reduction of CO<sub>2</sub> to CO via zero carbon electrolysis with their CO fermentation capability. Chemical products, in this case acetone and isopropanol (IPA), are used in durable materials such as acrylic and polypropylene plastics, respectively. Given the longevity of these materials in the environment, this process valorises CO<sub>2</sub> while also sequestering it into materials. The process is unique as it enables 100 % conversion of CO<sub>2</sub> into products, which is not easily achieved in chemo-catalytic or biocatalytic processes.

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

**Nordic Blue Crude AS (Norway): Nordic Blue Crude**

The Nordic Blue Crude AS (NBC) business plan is to produce synthetic crude from renewable power, water and CO<sub>2</sub>. The product is named Blue Crude and consists of high value wax for use in the cosmetics industry, middle distillate usable as high performance and quality diesel and kerosene and naphtha, refine-able to gasoline. NBC has an exclusive license agreement with Sunfire AG for the use of their technology in Scandinavia, and agreements for localisation of a production unit at Herøya, Norway's largest industrial park. NBC has secured an off-take agreement for their entire production for different clients. Nordic Blue Crude AS has experienced management and board. They claim a sustainable competitive advantage with securing favourably priced renewable power and operating at a site with all industrial infrastructure.

[www.nordicbluecrude.no](http://www.nordicbluecrude.no)

The 14 other submitted – great – applications in brief (one not publicly named):

**ATMOSTAT: METHAMOD®**

ATMOSTAT solution is a methanation unit named METHAMOD® based on its very compact exchangers reactors technology.

[www.atmostat-alcen.com/fr](http://www.atmostat-alcen.com/fr)

**bse Engineering Leipzig GmbH: FlexSynthesis**

FlexSynthesis, a skid mounted methanol reactor and the core of power-based CO<sub>2</sub> utilising methanol plants, was developed from the need for high flexibility.

[www.bse-leipzig.de](http://www.bse-leipzig.de)

**Carboclave Corp.: Carboclave**

Carboclave's patented technology is an adaptable system and process that uses carbon dioxide for enhanced concrete production.

[www.carboclave.com](http://www.carboclave.com)

**Carbon Upcycling Technologies Inc.: Fine nanoparticles**

Portfolio of fine nanoparticles through CO<sub>2</sub> adsorption into exfoliated solid feedstock.

[www.carbonupcycling.com](http://www.carbonupcycling.com)

**Climeworks AG: Renewable Methane**

Climeworks captures CO<sub>2</sub> from ambient air with the world's first commercial carbon dioxide removal technology. The air-captured CO<sub>2</sub> can be used for methanation.

[www.climeworks.com](http://www.climeworks.com)

**CO2 in Clean Technologies: Shaire**

Shaire is a brand that aims at mitigating climate change through the reinsertion of carbon into the productive chain.

[www.co2in.com.br](http://www.co2in.com.br)

**ECOGALACTICA-UNIPESSOAL LDA: Solar reactor**

Solar reactor with a device for collecting and concentrating solar energy with a circular viewing angle of 360 degrees.

### **Green Minerals: Mineral CO<sub>2</sub> (Green Minerals)**

CO<sub>2</sub> can also be used to manufacture solid carbonates and use these products. Making solid carbonates is nature's way of safely storing CO<sub>2</sub>.

[www.green-minerals.nl](http://www.green-minerals.nl)

### **ICC2R s.r.l.: Chemicals made from solar energy and CO<sub>2</sub>**

ICC2R targets CO<sub>2</sub> conversion into added value chemicals or fuels, powered by solar energy.

### **Industrial Climate Solutions Inc.: RFC-Enabling Technology for CO<sub>2</sub> utilisation**

Regenerative Froth Contactor design and the proven performance has shown promise for improving the productivity in capturing CO<sub>2</sub> while significantly reducing the footprint of the absorber and therefore reducing the capital expenditure and consequently the cost of CO<sub>2</sub> capture.

[www.icsolutions.work](http://www.icsolutions.work)

### **LEQUIA: e-ethanol**

The use of Microbial Electrochemical Technologies (METs) is a promising approach to achieve a selective bio-electroproduction of ethanol from CO<sub>2</sub>.

[www.lequia.udg.edu](http://www.lequia.udg.edu)

### **SeeO2 Energy Inc.: CO<sub>2</sub> electrolyser**

The SeeO2 Energy Inc. technology is an economically viable solution to CO<sub>2</sub> electrochemical conversion as it converts CO<sub>2</sub> into marketable and clean value-added fuels and chemicals.

[www.seeo2energy.com](http://www.seeo2energy.com)

### **Sotacarbo S.p.A.: Actinol, Active Methanol Catalyst**

This innovative, energy-efficient catalyst technology preparation (Actinol, Active Methanol Catalyst) allows CO<sub>2</sub> recovery by hydrogenation for methanol production.

[www.sotacarbo.it/en/](http://www.sotacarbo.it/en/)

### **The leaders of the CCU industry meet in Cologne**

The final programme of the "7<sup>th</sup> Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers" is available online ([www.co2-chemistry.eu/programme](http://www.co2-chemistry.eu/programme)). It features major topics such as Innovation & Strategy and Sustainability & Policy in the CCU area, hydrogen production, a dedicated carbon capture workshop, CO<sub>2</sub> for chemicals & materials as well as the use of CO<sub>2</sub> for fuel production. More than 200 participants are expected, only a few booths at the exhibition are left.

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

The nova-Institute would like to thank Covestro AG (Germany) for sponsoring the first innovation award "Best CO<sub>2</sub> Utilisation 2019". Phytonix Corporation (United States) supports the conference as a Gold Sponsor and Enviro Ambient (United States) is Silver Sponsor and EnergieAgentur.NRW (Germany) is a Premium Partner.

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nova-Institute is a private and independent research institute, founded in 1994; nova offers research and consultancy with a focus on bio-based and CO<sub>2</sub>-based economy in the fields of food and feedstock, techno-economic evaluation, markets, sustainability, dissemination, B2B communication and policy. Every year, nova organises several large conferences on these topics; nova-Institute has 30 employees and an annual turnover of more than 3 million €.

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