

Brochure speakers CO2 Smart Use Congress

Chairman for the day – Wim Raaijen

Wim Raaijen is a creative publisher with a journalistic and philosophic based view, working with leading subjects like sustainability, safety, energy efficiency, innovation, responsibility. He founded several magazines and congresses, including Industrielinqs, a modern publishing and networking platform for the industry. Wim is trying to re-invent the concept of publishing, based on platforms and partners, instead of separated media and advertisements. He is author of the Dutch book 'Proactieve Coalities' (Proactive Alliances), which is dealing with proactive cooperation within and between the Dutch and Flemish industries, governments and science.



Welcome – Alderman Arno Bonte

Since July 5, 2018, Arno Bonte has been an alderman in Rotterdam on behalf of GroenLinks. Within the B&W College, he is responsible for the realization of the energy transition. Bonte started his political career in 2005 as a municipal councillor for GroenLinks. In 2010 he became the party leader for his party and was the party chairman for four years. He was previously a spokesperson for the FNV and for Milieudefensie. He also worked for the Drechtsteden cooperation region. As a councillor, he provided more trees in the city and extra money for bicycle facilities, among other things.



Explanation program – Petrus Postma

Petrus Postma is a co-founder of BLOC, settled in Rotterdam. BLOC develops new value chains in the areas of urban development, raw material flows, mobility and clean energy. Petrus accelerates heat projects in the Amsterdam Metropolitan Area and coordinates the area development of sustainable greenhouse horticulture under the Horticulture and Climate Agreement. He is also the initiator and manager of the CO2 Smart Use program. Under this title, a broad coalition is working on the development of a Dutch ecosystem for CO2 as a raw material.



CCU from lab to pilot

Formic acid from CO₂ – Wim de Jong

Wim de Jong is working at Twence as Advisor Market & Strategy. As MSc in Applied Physics he is able to distinguish and interpret major developments in society. The complex interaction between technological innovation, the development of energy and commodity markets and environmental, energy and waste policies are his main focus of interest. The capture and usage of CO₂ produced by the energy production facilities of Twence are of highly strategic interest to the company. Twence expects Formic Acid to become one of the strategic commodities as a feedstock for the chemical industry in the circular economy.



Creating value from CO₂ – Frank Schreurs

Coval Energy is a clean tech company that has proprietary technology to convert CO₂ to valuable chemicals. Our first product is Formic Acid. It is the most competitive product that can be produced out of CO₂ and because our formic acid is renewable it opens opportunities in markets such as the supply of hydrogen and fuels. We are in the process of scaling up our technology and are looking for partners and strategic investors. For more information, please contact Frank Schreurs at +31611361442 or frank@covalenergy.com.



Reducing CO₂, producing chemicals: the potential of electrochemistry – Klaas Jan Schouten

Imagine a world in which CO₂ is no longer harmful to our future, but rather considered a useful feedstock for high value chemicals and materials! At Avantium we are unlocking this renewable carbon source by directly converting it using renewable electricity. The Volta technology from Avantium is the electrocatalytic platform developing CO₂ utilization solutions for a circular future. The current Volta platform has been developed by bolstering Avantium's existing electrocatalytic know-how with the acquisition of Liquid Light. Klaas Jan Schouten is Program Manager of the Volta program at Avantium and part time Assistant Professor at the University of Amsterdam.



Disruptive capture tech – Rob Littel

Since 2014, Dr.ir. Rob Littel leads the team of experts within Shell that is accountable for GHG Abatement technology development. Rob joined Shell in 1991 at the Royal Dutch Shell Laboratory Amsterdam (now Shell Technology Centre Amsterdam). He then moved to Shell's Downstream business where he worked in Manufacturing, Technical Consultancy, and Supply & Trading. Rob will present the Solid Sorbent CO₂ Capture Technology, an efficient temperature swing adsorption process. The technology promises to reduce the CO₂ abatement cost with up to 25% compared to state-of-the-art aqueous amine solvent technology.



Interview: CCU challenges from a national perspective – Ed Buddenbaum

Since 2013, Ed Buddenbaum is secretary at Topsector Energy, Ministry of Economic Affairs. Before that, he was a policy advisor at the same ministry. The Topsector Energy is the driving force behind innovations that are needed for the transition to an affordable, reliable and sustainable energy system. The missions for energy transition and sustainability determine the priorities of the Topsector Energy.



Dutch CCU innovation strategies – Rob Kreiter

Rob Kreiter is director of Topconsortium for Knowledge and Innovation (TKI) Energy & Industry, part of the Topsector Energy. He has a background in chemistry and has been working in energy innovation for nearly 15 years. Next to his activities for TKI Energy and Industry, he is involved in a scale-up for floating solar PV (Sunfloat) and board member of the Dutch technology platform for energy storage, Energy Storage NL. He will present the newly developed national innovation agenda for CCU, as part of the mission for a climate neutral and circular industry in 2050.



Phoenix, CCU Policy and the EU Innovation Fund – Damien Dallemagne

Damien Dallemagne holds an Engineering degree from the University of Liège, an MSc in Environmental Technology from the Imperial College in London and an MBA from the University of California in Berkeley. In recent years, Damien has been particularly involved in accompanying the development of multi-stakeholder innovation networks associating large industrial companies, SMES, research organizations, universities, and public institutions. For example, he played a key role in coaching the creation of the European Knowledge & Innovation Community (KIC) on Raw Materials. Damien coordinated the efforts that lead to the creation of CO₂ Value Europe, the European Association dedicated to CO₂ Utilization in November 2017, and has been Secretary General of the Association since then.



CCU from pilot to demo

Climeworks meets Antecy, accelerating CCU with DAC – Robert Rosa

Since 2010, ANTECY (recently merged with Climeworks) has developed scalable non-amine Direct Air Capture technology. CO₂ captured from ambient air can be directly used by various industries (e.g. food & beverage, greenhouses, industrial), but can also be converted into circular hydrocarbons to be used in existing infrastructures and systems (e.g. transportation, energy systems). Eventually, CO₂ needs to be long-term sequestered into e.g. materials, rock formation. Hence: “CO₂ where it matters”, not in excess in the atmosphere, but removed and materialised into value. Robert Rosa is actively involved in aligning ANTECY’s technology with market demands and will present various business cases.



BOF2UREA, say what? – Soledad van Eijk

Soledad van Eijk, business developer at TNO, has a long history at ECN and TNO starting after her Bachelor where she worked on material development for CCS applications. In 2010 she started her PhD in de CATO2 program on CO₂ adsorption mechanisms on hydrotalcites. Soledad is currently working as a Business Developer at TNO with a main focus on further developing several technologies for CCUS applications. One of the applications that is very promising is in the Iron and Steel Industry. With the pre-combustion capture technology SEWGS developed by TNO it is possible to convert syngas to Hydrogen and capture CO₂. She will present that when doing this with Basic Oxygen Furnace Gas (an off gas from the Steel Industry), the produced hydrogen and part of the CO₂ can be used for utilization for the production of UREA. And this is possible with achieving a Business Case for Carbon Capture.



The biologic route, very logical indeed – Veronique de Bruijn

Veronique has been an Investment director at ICOS Capital, previously she raised early-stage funding for 3 companies as an independent consultant and corporate finance role at PwC in the Netherlands. She is currently CEO of Photanol. Skilled in Venture Capital, Mergers & Acquisitions, Private Equity, Financial Modeling, and Financial Structuring, she is a strong business development professional with proven track record in closing Strategic Partnerships (Joint development Agreements) as well as raising capital for growth (totalling 30M+). Veronique graduated as MSc from Delft University of Technology and MBA from Rotterdam School of Management / Erasmus University.



Aircraft powered by CO₂ – Oskar Meijerink

Oskar Meijerink is Project Lead in the Future Fuels team and part of SkyNRG since 2016. He leads on various pre-commercial supply chain development projects in which we work together with (technology) partners from across the supply chain to take the next step in scaling future SAF technologies. Oskar leads SkyNRG's efforts on the synthetic fuels pathway, in which CO₂ is used as a feedstock for SAF production. Oskar studied Energy Science at Utrecht University and specialized in sustainable aviation fuels. More specifically, he studied investments in the SAF supply chain at Imperial College London.



CO₂ to CO by electrolysis – Tore Sylvester Jeppesen

Tore is responsible for commercialising new technologies, primarily in partnerships with strategic partners. Commercialisation and development of more sustainable technologies and processes necessitates building new value chains and for companies to collaborate across sectors. Currently the focus is on biobased chemicals and electrification of chemical production. CO₂ electrolysis enables utilisation of CO₂ and electricity to makes the CO value chain sustainable.



Reflecting on the potential game changers – Earl Goetheer

In this presentation, the focus is on separating the hype from the reality related to CO₂ capture and utilization.

Prof. Dr. ir. Earl Goetheer graduated for his MSc. (specialization organic chemistry and process engineering) at the Wageningen University and has more than 15 years of experience in chemical engineering since. He obtained a PhD in chemical engineering from the TUE. Dr. Goetheer is now working as a principal scientist at TNO on the development of CO₂ capture and utilization processes. He has published more than 100 publications and more than 40 patents related to process engineering. He has been appointed as part time professor at the TU Delft on the field of large scale energy storage in 2018. His research focus is on electrochemical conversion of CO₂ to useful products.



CCU, it's commercial!

The biggest game changer, binding CO₂ to cement – Kaja Salovsky

Kaja is Vice President of Business Development at CarbonCure Technologies. CarbonCure's technology chemically repurposes waste carbon dioxide during the concrete manufacturing process to make greener and stronger concrete. CarbonCure's technology reduces greenhouse gas emissions, lowers material costs and improves concrete quality – truly a win-win-win solution. It's licensed technology is currently installed in nearly 100 concrete plants across North America to meet the sustainability objectives of hundreds of building projects. Kaja has had many years of experience in sales at a.o. Kryton International and DHL Express.



Upcycling with CO₂, introducing Carbon8 – Paula Carey

Paula Carey is the managing director of Carbon8 Systems (C8S), a company that has commercialised Accelerated Carbonation of industrial waste streams and the manufacture of aggregate for the construction industry. In 2010, the company licensed the technology in the UK for the treatment of Air Pollution Control residues from Waste to Energy plants, using pure CO₂ transported to centralised plants. More recently, C8S has successfully demonstrated a containerised plant that has the capacity suited to the amount of residue produced at an individual plant and capturing CO₂ directly from the flue stack of the plant.



The most feasible cases, where does Linde invest in? – Fred Hage

Fred Hage has been a Manager Business Development at Linde Gas Benelux B.V. for 22 years now. Before that, he worked both as a sales engineer for Technip and a research engineer for Shell. He graduated with a MSc in Chemistry at Utrecht University. Fred is specialized in competitive analysis, mergers and acquisitions, project development and renewable energy consulting.



Omega Green, the potential of algae – Monique Schoondorp

Monique Schoondorp has served as managing partner of Algaecom and Omega Green B.V. since 2008 where she is also co-owner and -founder together with Bert Knol. Omega Green B.V. is focusing on large scale algae culturing as a CCU technology. Before entering the algae business, she had her own consultancy for innovation. She started in the scientific world as managing director of the GBB and Biomade and between 2011-2015 she was professor new business at the Hanze University of Applied Sciences. Monique received her PhD from the University of Groningen working with the molecules of professor Feringa who was awarded the Nobel prize in 2016.



Greenhouse industry, a 2.5 megaton market – Jacob Limbeek & Dennis Medema

During his study Applied Physics, Jacob Limbeek became interested in reusing heat and CO₂ to save emissions. This took shape in the concept of capturing industrial CO₂ and supplying it to horticultural greenhouses so that less gas needs to be fired there. After several years of preparations, he found construction company VolkerWessels and Linde Gas prepared to invest in this idea. This marked the start of OCAP. OCAP now supplies more than 0.5 Megaton CO₂ from, among others, Shell and Alco to greenhouse horticulture. There are now concrete plans to ultimately capture 2 megatons of CO₂ from various waste energy companies and thereby support the saving of up to 6 megatons of horticulture emissions.



Dennis Medema

Dennis Medema studied agricultural engineering at Wageningen University. He has more than 10 years of experience in coordinating energy innovations in greenhouse horticulture within the Greenhouse as Energy Source program. This is the innovation and action program of the Ministry of Agriculture, Nature and Food Quality to achieve the agreed CO₂ targets for the greenhouse horticulture sector. Work is being done here on innovations such as energy saving, geothermal energy, residual heat. A condition for this is sufficient CO₂ supply for better plant growth. Glastuinbouw Nederland is working on influencing policy and innovation programs within the entrepreneurial network on the themes of Labour, Energy, Plant Health and Water & Environment. Together it represents 70% of the total greenhouse area.



Lessons learned and reflection – Nico van Dooren

Nico van Dooren has a background in strategic planning and consultancy. Between 2001 and 2009, he worked at Royal Haskoning as head of an environmental technology advisory group. He then joined the Port of Rotterdam Authority where he focused on strategy development and area planning for the Maasvlakte 2 project. As Director of Energy & Industry, he is currently responsible for the development and implementation of the energy transition program. This program runs on 7 tracks: the infrastructure for energy, large-scale electrification, renewable energy, alternative fuels, biobased raw materials, alternative fuels and the circular economy. Van Dooren is also director of RAMLAB, a start-up field lab with 3D metal printers for the maritime industry.



CO2 Smart Use Congress 4 November 2019

CO2 as a valuable feedstock

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PROGRAM

9:30	Entry		
	Chairman for the day	Petrochem	Wim Raaijen
10:00	Welcome	Rotterdam	Alderman Bonte
10:10	Explanation program	&Flux	Petrus Postma
	<i>CCU from lab to pilot</i>		
10:20	Formic acid from CO2	Twence	Wim de Jong
	Creating value from CO2	Coval Energy	Frank Schreurs
	Reducing CO2, producing chemicals: the potential of electrochemistry	Avantium	Klaas Jan Schouten
	Disruptive capture tech	Shell	Rob Littel
	Reflecting on new technologies		Wim Raaijen
11:30	Interview: CCU challenges from a national perspective	MinEZK	Ed Buddebaum
	Dutch CCU innovation strategies	TKI	Rob Kreiter
	Phoenix, CCU Policy and the EU Innovation Fund	CO2 Value	Damien Dallemagne
	Discussion		Wim Raaijen
	Lunch and networking		
	<i>CCU from pilot to demo</i>		
13:40	Climeworks meets Antecy, accelerating CCU with DAC	Antecy & Climeworks	Robert Rosa
	BOF2UREA, say what?	TNO	Soledad van Eijk
	The biologic route, very logical indeed	Photanol	Veronique de Bruin
	Aircraft powered by CO2	SkyNRG	Oskar Meijerink
	CO2 to CO by electrolysis	Haldor Topsoe	Tore Sylvester Jeppesen
	Reflecting on the potential game changers	TNO	Earl Goetheer
	Discussion		Wim Raaijen
15:10	It's not the technology, it's the value chain! Networking		
	<i>CCU, it's commercial!</i>		
16:20	The biggest game changer, binding CO2 to cement	Carbon Cure	Robert Niven
	Upcycling with CO2, introducing Carbon8	Carbon8 Systems	Paula Carey
	The most feasible cases, where does Linde invest in?	Linde	Fred Hage
	Algae; the green CO2 consumers	Omega Green	Monique Schoondorp
	Greenhouse industry, a 2,5 megaton market	OCAP	Jacob Limbeek
		Glastuinbouw Nederland	Dennis Medema
17:15	Lessons learned and reflection	PoR	Nico van Dooren
17:25	Drinks		
18:30	End of program		