

## Capacity Building for NDCs

Editor's note by Wytze van der Gaast

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The COP in Katowice by the end of this year will give an important indication of whether the world is on track towards realising the goals of the Paris Agreement. This indication will be based on the nationally determined contributions (NDC) that countries communicate for climate change mitigation and adaptation. While NDCs are a relatively new concept, introduced at the Warsaw COP of 2013 and included in the Paris Agreement of 2015, earlier experience exists under the Convention with identifying and planning options for mitigation and adaptation at the national level. Technology needs assessments (TNA), nationally appropriate mitigation actions (NAMA) and national adaptation plans (NAP) are examples of such processes.

An important lesson learned from these processes is the need for (institutional) capacity. This relates to the ability to assess (technology) options at a larger scale in the short, medium, and long term within a country context, and understand possible socio-economic impacts of that for the country. Part of that capacity thus includes mobilising stakeholder groups and engage them in co-designing NDCs.

It also relates to the planning of selected options for mitigation and adaptation and ability to attract investment funding. Capacity requirements for that are the ability to identify actions needed for accelerating selected options, assign (public and private sector) responsibilities for undertaking these, specify cost items with identified financial support, and formulate contingency measures in case the plan does not work well.

Preferably, part of the planning stage consists of identifying actions for strengthening institutions for successful implementation of an NDC. This relates to actions for improving, for example, a country's enforcement framework, legal framework, financial institutions, monitoring, reporting, and review institutions, as well as clearing barriers in the value chains of identified options for mitigation or adaptation in an NDC.

The Paris Committee on Capacity-building (PCCB) has been established under the Paris Agreement to support countries in enhancing their (institutional) capacity for NDC planning and implementation. At the recent Bonn Climate Session, Honduras presented its NDC Partnership Plan ('Hoja de Ruta') with prioritised climate actions, but also with institutional enablers such as a Presidential Office for Climate Change and a multi-stakeholder national commission on climate change. These are promising steps towards a situation in which NDCs not only pledge ambitious actions, but also lead to actual implementation of these.

# 'Locally Grown' CO<sub>2</sub> Certificate Trading in the Northern Netherlands: "Just Do it!"

By Gert-Jan Kok\*

Last year, the 'Green Deal: Pilot National Carbon Market' was launched in the Netherlands by public and private market players. With the Green Deal it is aimed to create a 'rulebook' for the accounting of greenhouse gas (GHG) emission reductions achieved through Dutch projects. Potential sellers on this voluntary market are developers of emission reduction projects in sectors not covered by the EU emissions trading scheme (ETS). Buyers are expected to be organisations or even citizens who wish to reduce their carbon footprint.

While the Green Deals sets the stage for producing climate certificates based on real and additional emission reductions, it does not actively pursue market matching. This is left to the market. In some cases, local stakeholders have established local or regional carbon funds or banks to match demand and supply of climate certificates. Examples are local climate funds in The Hague, Province of Zeeland, and the CO2Bank Utrecht.

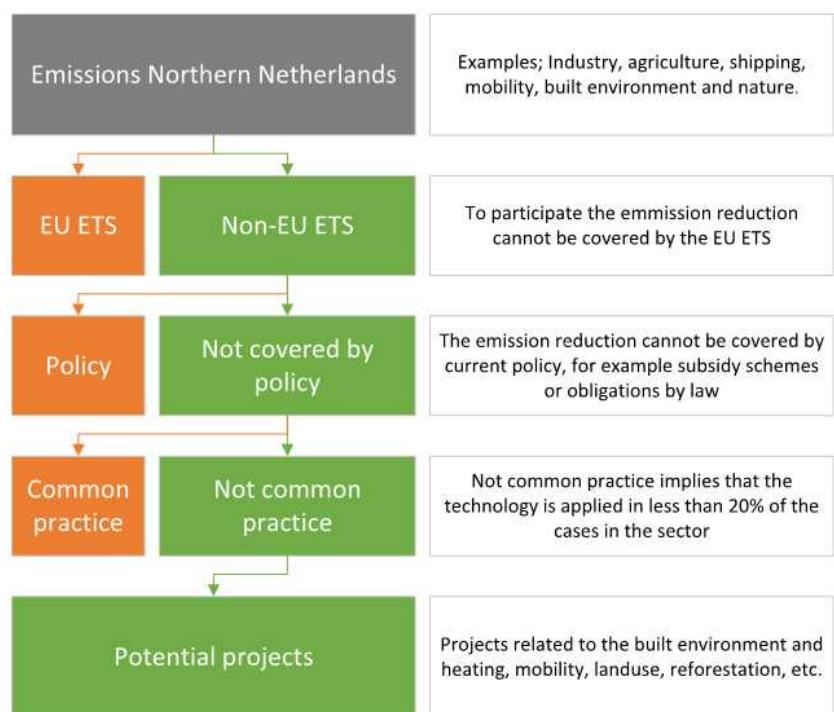
Recently, JIN Climate & Sustainability and E&E Advies conducted a feasibility study for a regional carbon market facility in the Northern region of the Netherlands. The study explores different organisation modalities ranging from a 'simple' online platform to a 'regional carbon bank.'

The feasibility of each organisation model depends on (expected) market size: how many emission reduction projects can the region generate, who are potential buyers, and with what quantities? A next question is to what extent a regional carbon facility can result in lower administrative and transaction costs, instead of leaving it to individual project owners.

## Carbon market demand

The region of the Northern Netherlands (provinces of Fryslân, Groningen and Drenthe) emits 21 Mton CO<sub>2</sub>-eq. per year. For a first indication of the demand for carbon certificates, interviews have been held with a group of public and private organisations that are actively pursuing sustainability and corporate social responsibility goals.

In general, interviewees, especially public sector entities, expressed interest in using carbon certificates via regional projects for reducing their own climate footprints. Interviewees gave examples of how they had invested in carbon saving measures, but were still left with CO<sub>2</sub> emissions that could not be removed, e.g., business travel. These interviewees expressed a basic interest in investing in regional projects and receiving climate certificates for that. On the other hand, interviewees also cautioned that the certificates



**Figure 1.** Decision tree for identifying eligible projects in the Green Deal

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Project type	Market size (€/y)	Market size (kton/y)	Avg. project size (ton/y)
<b>Thermal energy storage</b>	27,487	1.37	160
<b>Peat meadows</b>	25,043,478	1,252.17	15,904
<b>Reforestation</b>	808,150	40.41	1,122
<b>Olivine</b>	334	0.02	17
<b>Algue</b>	-	-	-
<b>LNG vs Diesel trucks</b>	419,866	20.99	7
<b>bio-CNG engines</b>	-	-	-
<b>LNG Shipping</b>	260,800	13.04	1,304
<b>Biodiesel fueled genset</b>	62,116	3.11	25

**Table 1.** Overall market size per year and average project size per year for the nine identified project types in the Northern Netherlands.

must be 'crystal clear' and should not give rise to accusations of 'greenwashing'.

### Market supply

Potentially, a wide variety of suitable projects are available in the Northern Netherlands. In general, all emission reductions are suitable for carbon certification if they are not already: covered by the EU ETS, required by policy, or part of common practice in the sector. For the remaining potential projects (see Figure 1), we assessed nine project types in three emission reduction categories (green projects, mobility, and built environment) in terms of:

- potential emission reductions per project type,
- financial contribution of certificates to projects.

Table 1 presents a summary of the assessment. We found that four project types, thermal energy storage, rewetting peat meadows, reforestation, and LNG shipping, could realise a scale (>100 tonnes of CO<sub>2</sub>/year) and revenue stream that are sufficiently large for a promising market potential.

It is noted that the revenues as shown in Table 1 will become higher with increasing CO<sub>2</sub> prices, which could lead to a larger supply of projects with certified emission reductions.

### Trade platform

A next step in the feasibility study was to explore possible forms of a regional carbon facility:

1. A virtual place where potential buyers of CO<sub>2</sub> certificates can search for projects.
2. Type 1 + an online overview of experts that can offer their expertise to project developers to help them with GHG accounting aspects.
3. Type 2 + a dedicated support by the Facility itself on GHG accounting aspects.
4. Type 3 + the function of a risk bearing climate fund (active trading of certificates).

In case of the first option, the costs are mainly related to maintaining the website and the revenues are generated by fees that are paid by the advertising project developers. The second option does not differ too much from that, except that it also includes fees from experts who offer their services through the facility's platform. Under the third option, the Facility becomes an active market player by providing (consultancy) services to market actors and generate revenues from these. In the fourth option, the facility would be a wholesaler which buys and sells certificates online and over the counter.

The third option, i.e. an active service provider, seems to be the most attractive. Although options 1 and 2 have low initial costs, their potential revenue stream is also low. Option 4 requires a liquid carbon certificates market in non-ETS sectors, which, in the current stage of the Green Deal as a pilot initiative for a carbon certificate market, does not yet exist. In light of that, option 3 can already be financially viable, even in an emerging carbon certificates market, starting with a small portfolio of promising project types. When the market evolves to a larger liquid market, option 4 can become an interesting follow-up.

### Streamlining certification

The main goal of the Green Deal Pilot National Carbon Market is to establish confidence among market actors that carbon certificates supplied in the voluntary carbon market are based on real and additional emission reductions. For that, robust methodologies are being developed, which become available via the Green Deal Rulebook.

A crucial element in the project cycle is certification: an external entity who checks whether the Green Deal methodology for GHG accounting has been correctly applied in a project. The study offers suggestions for streamlining certification processes and thus reducing certification costs:

- Support project parties in setting up a monitoring protocol for their project: in option 3, the Facility supports project developers in internally monitoring project progress including determination of emission reductions achieved. A well done monitoring can streamline certification.
- Certify projects that are similar and in the same region by assessing samples instead of certifying each project separately.
- Possibly organise a commission of experts for the region, who assess whether a project has carried out according to the GHG accounting methodology as in the Green Deal Rulebook. Possibly, trade in these certificates could be limited to the own region.

### Follow up

The feasibility study has indicated a basic interest among potential buyers in the Northern provinces of

the Netherlands in purchasing carbon certificates based on projects not covered by the ETS and not yet required by EU and national policy. The study has also identified a potential for starting with emission reduction projects in the region.

Potential buyers interviewed for the study prefer local or regional projects through which they can clearly demonstrate their contribution to or corporate responsibility for realising Dutch climate goals.

A challenge remains scaling up project activities and, related to that, reducing transaction costs. The facility studied in the feasibility report could provide the market for carbon certificates in the Northern Netherlands region with a kick start. "Just do it".

For more information on the regional carbon market study you may contact the author.

## National Carbon Markets Event in Nijmegen, April 2018

**On 13 April, the partners of the Green Deal Pilot National Carbon Market in the Netherlands hosted a side event at the Ports and the City conference in Nijmegen. The aim was to exchange experience with a group of international practitioners in the areas of climate change mitigation and carbon markets.**

Speakers at the event included Wytze van der Gaast, Jan van den Berg, and Jos Coizjnsen on behalf of the Dutch Green Deal; Dorian Frieden (JOANNEUM) on carbon market development in Austria; Fanny Guezennec (Eco-Act) on carbon market opportunities in France; and Jeff Swartz (South Pole) on the Swiss domestic credit system. Presentations are available via the Green Deal website [nationaleCO2markt.nl](http://nationaleCO2markt.nl).

For successful carbon markets it is important to not only focus on the supply side of projects, but also on motivations of potential buyers of certificates. One observation was that many schemes do not aim at creating 'rights to emit', but, instead, certificates showing that a buyer has invested in a clean, low-emission project and thus taken social responsibility.

Carbon certificate schemes struggle with the role of national governments, or governments struggle with defining their roles in the schemes: should it be an active role being on top of emission reductions that the government needs for complying with Paris goals,

or should it be a more passive role in terms of 'when it's good for the climate, we're fine'? In the Dutch Green Deal context, the government collaborates with private partners in a public-private partnership.

Practitioners in carbon certificate markets struggle with the concept of additionality, especially that of policy additionality. It is clear that when a measure is mandatory by law, it cannot generate emission reduction certificates. It is also clear that when no policy exists in an area, emission reduction action would be eligible for carbon certification. However, it is the grey area between 'hard' and no policy that is difficult to handle. For example, when the Dutch government agrees with the inland shipping sector on an emission reduction goal of 20% by 2030, does that mean that no longer carbon certificates can be generated in this sector, or is it precisely the other way round and could carbon markets actually provide welcome market instrument support to realising this goal. The event's discussion tended toward that latter.

Finally, prices of certificates were discussed, including setting price floors. It was felt that the certificate price does/should not only reflect the carbon benefits, but also other benefits such as regional development, social aspects, technology deployment support, etc. For example, practice shows that potential certificate buyers are willing to pay a higher price for certificates if the project takes place in their own region.

## The 3rd GEO Data Providers Workshop Drives Forward Global Technical Cooperation on Data for Development

The event was hosted at ESRIN, the ESA-establishment in Frascati, Italy, from 2-4 May 2018, and was co-organized by the GEO Secretariat, the European Space Agency (ESA), CNR-IIA, United States Geological Survey (USGS) and the University of Geneva.

The ambition of the event was to improve and increase the impact of the Global Earth Observation System of Systems (GEOSS). The 3rd annual installment of this important GEO community event brought together Earth Observation data providers and users to improve the way Earth Observation data is managed, communicated, disseminated and used through the [GEOSS Platform](#).

The packed workshop [agenda](#) reflected the substantial interest in the event, which was attended by nearly twice as many participants as last year. In just 3 days there were over 97 presentations, 26 scientific sessions, 11 training sessions, and a Hackathon. In attendance were 200 participants from more than 130 organizations, 33 countries, and 5 continents.

Presenters showcased the benefits, opportunities and challenges to discover, access and use the 400+ million data and information resources available on the GEOSS Platform. Sessions focused on wide range of several thematic and technical areas, including data



Incoming GEO Secretariat Director Gilberto Câmara of Brazil's INPE spoke on the challenges of turning data into action at the national level. Photo: Steven Ramage / GEO.

management and sharing best practices, making data analysis and application-ready, and optimising Earth observation data for decision making across specific international policy priorities such as the Sendai Framework for Disaster Risk Reduction, the UN Sustainable Development Goals, and the Paris Climate Agreement. Training sessions immersed participants in the latest GEOSS Platform developments, while a [Hackathon](#) challenged developers to create data discovery and access tools that solve global challenges.

Lively discussions at the workshop included exchanges on the potential of the GEOSS Platform to alleviate data preparation and processing burden for users, the role of regional GEOSS initiatives, private sector



Workshop participants shared technical knowledge and needs that will inform the future of the GEOSS Platform - aimed at ensuring decisions are informed by the best available information about our planet.

contributions, and the need for further reporting on users, data download and usage, performance and user satisfaction.

The workshop report, photos presentations and Hackathon submissions will be available shortly on the [event website](#). For more information about the event or the GEOSS platform, please contact: Paola De Salvo ([pdesalvo@geosec.org](mailto:pdesalvo@geosec.org)).

Note: EDGE, short for European Direction in GCI Enhancements, is contributing to the GEOSS Platform implementation. EDGE receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776136.



Dr Zandaryaa Sarantuyaa (UNESCO - IIWQ) spoke on the importance of EO in support of SDGs Decision Making.

## ZERO BRINE co-design workshop Industrial Saline Impaired Effluents (Brines) are an Environmental Challenge and an Economic Opportunity

By Dimitris Xevgenos\*

**On 12 March 2018, the first ZERO BRINE stakeholder consultation event took place in the faculty of Applied Sciences, at TU Delft. This consultation event is the first of, at least, three events that will be carried out within the EU-funded ZERO BRINE project. The events focus on the large-scale demonstration plant that is being implemented for the Evides water demineralisation plant, at the site of HUNTSMAN, in the Port of Rotterdam. Relevant stakeholders representing local industry, policy, and regulation participated in this event providing key inputs for re-designing the value and supply chain for water and minerals to get to a zero liquid discharge system (eliminating brine effluent).**

### Stakeholder consultation events

It is anticipated that new circular water solutions (like ZERO BRINE developments) will be challenging to

implement, since the project deviates from the current more linear business model of water and minerals supply and value chains. By mobilising the (tacit) knowledge and insights of stakeholders, mutual trust can be built. This provides stakeholders with the opportunity to become actively engaged in all aspects of project planning, which can be critical to ensure project success.

In our first stakeholder consultation event, the participants had the opportunity to hear technical and business information about the project by Dr. Dimitris Xevgenos (SEALEAU), as well as about the tool "sustainable business model canvas" developed by the IDE faculty of TU Delft, presented by Brian Baldassare (TU Delft). Very interesting presentations followed by Steven Lemain (RHDHV) for the "Take-Back-Chemicals" project, by Koen de Kruif and Hans Gerritsen (DCMR) for the regulatory aspects and Corrinne van Voorden (RVO) for the synergies that

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<sup>1</sup> The quotes comprise part of the interviews carried out by Revolve Media, Work Package leader for communication activities of ZERO BRINE project.



**Figure 2.** First Stakeholder Consultation event, Applied Sciences Faculty, TU Delft.

can be promoted with the new initiative of Holland Circular Economy Hotspot. During the breakout sessions, the participants worked in 3 groups (see also Figure 2), brainstorming for ideas, making also use of the "sustainable business model canvas" tool.

### Viewpoints from the stakeholders<sup>1</sup>

"For us, as Akzo Nobel, sustainability is very important. We want to reduce our dependence on fossil resources, that also applies to salts, where you want to reuse it for example to make chlorine, plastics again and basically close the circle. If you look at the global 70 million-ton chlor-alkali industry recycling of that salt, can potentially save a lot of money and resources." — **Dr. Thijs de Groot, Innovation Technologist at AkzoNobel**

"New business models are needed to overcome challenges. You see a lot of companies today that are locked in to their linear, sales per volume, models. New models – maybe circular models – can help rethink the model itself, re-think incentives and so become new opportunities for a different way of doing things." — **Steven Lemain, Royal Haskoning DHV**

"Evides produces demiwater for the Industry in the Netherlands and other European countries. Normally the brines are discharged directly into the surface water. Evides is, however, exploring the possibilities for Zero Liquid Discharge. The company's policy is to reduce waste streams, to strive for reuse of water and components and to contribute to a sustainable water cycle. Another reason to investigate Zero Liquid Discharge solutions is the expected permit limitations for brine discharge, especially in more arid European regions. The ZERO BRINE project is focusing on new

technological solutions for both salts and water recovery. The market will develop especially at locations where discharge of salty brines into fresh surface water will be limited or forbidden." — **Wilbert van den Broek, Senior Process Engineer, Evides Industriewater**

"Co-creation is important to deal with the complexity of these problems that the circular economy and industrial symbiosis bring to us. The greatest thing of co-creation is that everyone has a role in the activity of coming up with the solution; so people that are more sceptical, people that do not understand certain aspects of the problem, have the chance to ask those questions, get an answer and see how they can contribute to that. So, it's a great way to engage people in the process of coming with something new" — **Giulia Calabretta, Associate professor, TU Delft**

"Europiren sees ZERO BRINE project as a market opportunity, for having raw material coming with high purity than we have already from the natural product, brucite, with this maybe we can penetrate new kind of market, like pharmacy industry, where the purity is very important. At this moment our product is 93% or higher, but not more than 96% purity. So, from this project, maybe we can get 99 plus per cent purity. This way, we can go for different market" — **Dr. Cristinel Dereagatu, EUROPIREN B.V.**

### Coming events

ZERO BRINE will participate in the workshop that the European Salt Producers' Association (EUsalt) is organizing coming Autumn in Brussels. This workshop will provide a great opportunity for ZERO BRINE project, since more than 20 salt producers across Europe are expected to participate.

ZERO BRINE will also participate in the Annual EUsalt meeting in Rotterdam Port in May 2019. More information about these events and the outcomes will be made available at the project website.

Follow our project updates and new events via: [www.zerobrine.eu](http://www.zerobrine.eu)



Industrial  
Wastewater



Resource  
Recovery

Circular  
Economy

# How Symmetric is the EU Greening Process Really?

By Catrinus J. Jepma\*

So far, the EU has demonstrated a remarkable willingness to green its energy system:

- it committed firmly to the 20-20-20 targets and introduced fines for non-complying Member States;
- it introduced since 2005 an ambitious emissions trading scheme (the EU ETS) controlling about half of its CO<sub>2</sub> emissions from the larger installations;
- it firmly set a nearly-zero emissions target for 2050 and developed roadmaps to get there; and
- it introduced via its Member States since about 2000 a long list of mostly OPEX-based subsidies to enhance the introduction of renewables.

In addition, some Member States started to phase out or reduce the number of nuclear power plants as well as coal-based power production. On top of this, a sheer unlimited number of policies and measures at European, national, and subnational levels have been introduced, matched by an equally endless list of private initiatives to get the energy system greener.

So, the obvious question is: what did all these measures bring us in terms of greening the energy system? And more specifically: did all the subsidies across the EU Member States for energy efficiency and renewables – a crude estimate would suggest since 2000 cumulatively some € 1 trillion – have a serious impact on greening the energy we use?

The answer to that question is: it depends on which part of the energy system you are looking at.

In order to explain that answer, first a few generic observations will have to be made. Broadly speaking, energy is consumed by end users as either **electrons** or **molecules**. Of these two options, in terms of overall energy uptake, the role of molecules traditionally considerably surpasses the one of electrons, currently by a factor of about 4 both worldwide and in the EU (as well as most of its Member States). The question – which is at the heart of understanding the energy system – why molecules



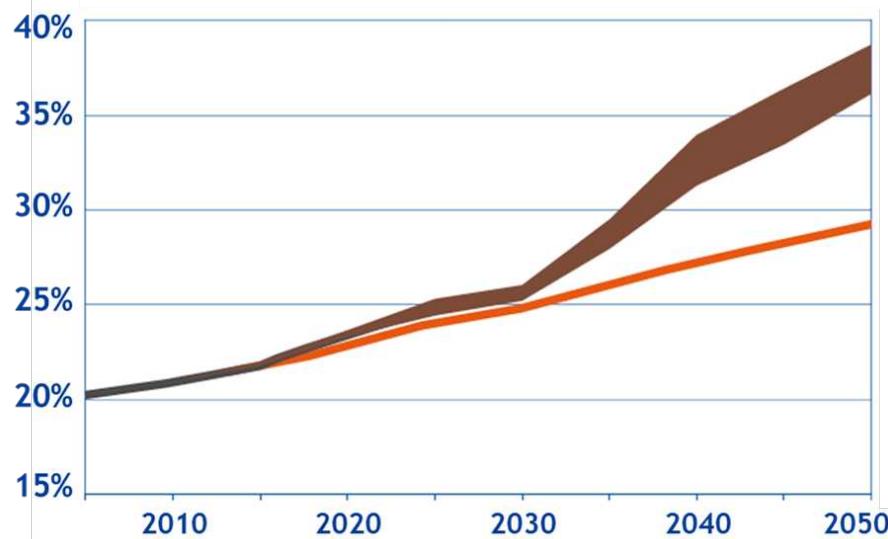
In the EU-funded **STORE&GO** project, 27 partner organisations and companies from all over Europe collaborate to integrate power-to-gas technology into the future European energy system. The project, coordinated by the German gas association DVGW, demonstrates three innovative power-to-gas storage concepts at locations in Germany, Switzerland, and Italy in order to overcome technical, economic, social, and legal barriers.

The University of Groningen works on several research topics within the **STORE&GO** project, including relevant licensing and regulatory regimes, environmental impact assessments, and an analysis of the business and economic aspects of the market uptake of power-to-gas energy storage.

as energy carrier by far beat electrons is remarkably little researched, but ultimately can probably be traced down to some fundamental physical and economic laws explaining why it is easier and cheaper to: produce, transport, store, and often even apply molecules rather than electrons.

Since the impact of such fundamental laws will not easily be overruled via new technologies or policies and measures, the obvious question is if the dominance of molecules in energy end use will remain, even if the whole energy system has become green. It is interesting to see what the EU itself assumes about this. The EU 2050 Roadmap projects that the importance of electrification will grow (especially in built environment and mobility) but the factor 4 (20/80%) is projected to eventually drop no more than to about 1.5 (40/60%). In other words, even in a completely green energy system, molecules as energy carriers are projected to still dominate (see Figure 3).

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**Figure 3.** Share of electricity in current (orange) and decarbonisation scenarios (brown) as a percentage of final energy demand. Source: EU Energy Roadmap 2050.

So let's get back to the original question: how far did we get in greening our EU energy system? Statistics on the 20% electrons' part are clear: according to the latest data, which relate to the 2016 situation, 27% of EU-wide power production was green, obviously with huge variation across Member States. But what about the molecules representing 80% of our energy system? Systematic data about greening liquid and solid energy molecules are not available, but it seems fair to assume – especially given information about the introduction of biofuels – that overall greening will be a few percentages only. The same in fact seems to apply to the world of gases where natural gas still is the prime carrier. Some studies have focussed on the greening of the gas system, but found that virtually all green gas is based on digestion of biomass and represents some 15-20 bcm, roughly 4% of total EU gas consumption (about 450 bcm). Because only some 11% of biogas enters the grid after having been upgraded to the green gas requirements, the share of green gas drops to about half a percent only if one would limit oneself to the grid-related gas system.

In other words, unlike the world of electrons that has become greener to a considerable extent (27% in 2016), the 80% share of molecules remained virtually as 'grey' as it has been before the energy transition started: green molecules are hard to find; the about € 1 trillion has greened the electrons, but missed the molecules.

This picture only gets a stronger profile when zooming in on the expected 2030 situation. The EU roadmap for that year tells us that by then the green share of electrons will have grown to a level of 56-65%, well on track towards the about 100% 2050 target. For the

molecules, however, the picture remains gloomy. Based on various projections, we tried – in the spirit of the H2020 STORE&GO methanation project – to estimate what the role of green gases by 2030 could be under four scenarios, the most positive of which representing positive policy as well as market conditions towards the introduction of green gases. We found that only under the most positive set of conditions the share of green gases in the total use (assumed to remain at the about 450 bcm level) would grow towards 13-14%. Most of the increase would be based on an extension of 'traditional' biogas (together some 10%); the remainder on the first contributions from biomass gasification and power-to-gas. So, the asymmetry in greening between electrons and molecules is most likely going to stay and even increase for the coming decade.

However, if molecules are to stay with us and become the backbone of a future green energy system, then we should pay more attention to green them too. The energy transition is not about green electrons only; the major challenge is to green the molecules. Substantial progress on this will probably have to come from serious investment in power-to-gas. Why is it then that so little policies and measures initiatives are taken to get this technology through its 'valley of death'?

### Read more

The STORE&GO project has published a report on 'Exploring the future for green gases' ([Jepma, Van Leeuwen and Hulshof, 2017 - pdf](#)). In the report, the various factors determining the greening of gas across the EU by 2030 have been inventoried, and summarised in four scenarios

## Carbon Credits Enable Sustainable Development Projects in Africa

The Carbon Initiative for Development (Ci-Dev) is an initiative by the World Bank's Carbon Finance Unit to show how performance-based payments in the form of certified carbon emission reduction purchases can help to realise viable business models for small-scale emission reduction projects in developing countries. The Ci-Dev Carbon Fund purchases certified emission reductions (CERs) under the UN's Clean Development Mechanism (CDM) from projects with high development benefits in developing countries. These include projects mainly on rural electrification, household energy access, and energy efficiency.

According to Ci-Dev's criteria for project selection, projects in International Development Assistance (IDA) countries in Africa as well as least developed countries (LDCs) in Asia are eligible. Until now, ten projects in Sub-Saharan Africa have been supported (see Figure 4). With these projects, Ci-Dev has entered into Emissions Reductions Purchase Agreements (ERPAs), an agreement that defines the terms of the transaction in which Ci-Dev pays the project developer for the CERs.

Apart from using these 'performance-based' payments to support projects, the initiative also helps to build capacity and develop methodologies for accessing carbon finance in the world's poorest countries. This capacity building is necessary, as LDCs are responsible for only 0.2% of issued CERs. There are additional challenges specifically for renewable energy access projects, as they are commonly of small size, have high start-up and transaction costs, and have to



compete with cheaper fossil fuel energy sources. In addition, project developers can only receive payments for CERs once the project is completed and operational, making direct carbon credits unsuitable for funding the required capital investments. The ERPAs of the Ci-Dev include advance payments and 'insurances' such as a carbon delivery guarantee to overcome these problems.

In early-2018, the first carbon credit issuance under the CDM took place in Burkina Faso. Through the National Biodigester Programme, biodigesters are installed to generate biogas for cooking. This directly reduces air pollution caused by cooking with charcoal or wood, helps to combat deforestation, and improves the livelihoods of farmers. The biodigesters save time, as collecting the manure (as feedstock for the digester) only takes 30 minutes per day, much less than collecting firewood. An average household biodigester produces 1.2-2 cubic metres of biogas per day, reducing the firewood use by 12 kg per household per day. A by-product of the digester, nutrient-rich slurry, is used as organic fertiliser and increases crop yields.

The Ci-Dev project purchases the CERs generated through the ERPA, creating a revenue stream to help the National Biodigester Programme to be financially sustainable.

The Ci-Dev programme in Burkina Faso shows how the funding generated through carbon credits enables the development of emission reduction projects in an LDC such as Burkina Faso, while simultaneously leading to economic, environmental, and health benefits.



**Figure 4.** Signed ERPAs by Ci-Dev. There are two clean cookstoves projects in Rwanda.

For more information about Ci-Dev, see [ci-dev.org](http://ci-dev.org).

# CARISMA Final Conference: Presentations and Video of the Highlights and Interviews

**On 6 February 2018, CARISMA organised its final project conference in Brussels. At the conference, titled "Realising the potential for climate change mitigation options – implementing the Paris Agreement in Europe and beyond", the CARISMA team presented the main findings from its work on:**

- The social, economic and environmental impacts of mitigation options in different country contexts when implemented on a scale required for realising climate and socio-economic goals;
- How effectiveness of national and European climate change policies can be influenced by developments in the policy and societal context;
- Positive or negative interactions with other climate or environmental policies, as well as innovation policies at the country or firm level;
- International cooperation in the field of technology and innovation, as well as on the 'transfer' of effective policies to other contexts.

At the conference, the outcomes of CARISMA were presented against the backdrop of an increasing need to scale up mitigation options for realising the goals of the Paris Agreement. In practice, scaling up of (technology) options is often hindered by aspects such as: sector- or economy-wide costs or welfare impacts, public resistance or insufficient consideration of local context factors. At the conference, these aspects, with recommendations from CARISMA on how to address these, were discussed with practitioners from the public and private sector.

Powerpoint presentations of various speakers are available on the CARISMA website (see an overview on the next page). For a quick impression of the final conference, CARISMA has also published a [video](#) with some highlights of the conference, as well as interviews with a few of the key speakers.

In her keynote address, Maria van der Hoeven, vice chair of the High-Level Panel of the European Decarbonisation Pathways Initiative, stressed that with regard to mitigation "doing nothing is no option, and postponing is no option." She added that "the socioeconomic transformation of society is as important as the technological transition will be." This was also highlighted by other speakers throughout the



day. As Adriaan Slob, coordinator of the EU-funded DEEDS project, put it: "In the end, it always goes back to the people!"

Another issue that was discussed is the complexity of innovation and policy. Michael Grubb of University College London: "Innovation is complex, and to understand and make use of a complex thing you've



Maria van der Hoeven:  
"Doing nothing is no option, and postponing is no option."

got to break it down and understand all the components." In that spirit, Emilie Alberola of CARISMA partner I4CE showed a graphic of the current framework of EU climate policy, highlighting its complexity and explaining the interrelationships. Annick de Vries, a policymaker at the Dutch Ministry of Economic Affairs and Climate, reiterated these points and indicated that the biggest challenges faced in climate innovation policymaking include institutional coordination, alignment with non-climate policies, and managing the constellation of stakeholders.

Two of the speakers representing business, Nick Campbell of Arkema and Corrado Topi of GreenEcoNet, emphasised the important role for businesses in innovation for mitigation. Mr. Topi argued that "one of the most important groups of stakeholders in Europe are the small and medium-sized enterprises," as they form a broad majority of the European economy. However, for many smaller-sized enterprises, it is very difficult to link overarching



Michael Grubb:  
"Understanding complexity means that you need to understand its individual components."

climate goals and possible consequences for their markets and value chains to their daily business practice.

Ulrich Hansen of the UNEP DTU Partnership presented the CARISMA results on international collaboration on innovation for climate change mitigation: "Increasingly, especially within the last 10-15 years, we are seeing that R&D is being undertaken at a much more globalised level." Several opportunities and challenges related to this development were discussed. For example, while R&D offshoring from the EU to emerging economies may support international knowledge build up on mitigation options and be beneficial for the business entities involved in the collaboration, transfer of R&D capacity may have negative impacts on the innovation power of the EU as a whole.

The CARISMA project will finalise by July 2018. The conference therefore ended by focusing on how the work of CARISMA can be continued. A key project in this regard is the DEEDS project, and for this reason CARISMA coordinator Heleen de Coninck also symbolically handed over the CARISMA results, including the ClimateChangeMitigation.eu portal, to DEEDS coordinator Adriaan Slob.



Heleen de Coninck (CARISMA) and Adriaan Slob (DEEDS). "CARISMA legacy remains in capable hands."

The video [CARISMA Final Conference 2018: highlights and interviews](#) is available via Youtube. See the box below for an overview of speakers at the conference, and links to their PowerPoint presentations.

## CARISMA Final Conference, 6 February 2018: Speakers and presentations

### Intro: European decarbonisation pathways

- Andrea Tilche (European Commission): DG Research and Innovation mitigation research [\[pdf\]](#)
- Maria van der Hoeven (High-level Panel of the European Decarbonisation Pathways Initiative)
- Heleen de Coninck (Radboud University): How CARISMA responded to mitigation challenges [\[pdf\]](#)

### Session 1: Realising climate change mitigation potential through research and innovation

- Milan Elkerbout (CEPS): Prioritising climate technologies [\[pdf\]](#)
- Diana Ürge-Vorsatz (Central European University): From technological to social innovation [\[pdf\]](#)
- Corrado Topi (GreenEcoNet): the role of SMEs in innovation for climate change mitigation
- James Davey (UK Department of Business, Energy and Industrial Strategy)
- Marieke Reijalt (European Hydrogen Association)
- Michael Grubb (University College London): Complexity of innovation systems [\[pdf\]](#)

### Session 2: Making context-sensitive climate policy for realising the mitigation potential

- Emilie Alberola (I4CE): The impact of contextual differences within the EU on INECPs [\[pdf\]](#)
- Noriko Fujiwara (CEPS): Embedding mitigation actions in national contexts [\[pdf\]](#)
- Henning Sittel (EFA NRW): Local context for climate decisions, German SME examples [\[pdf\]](#)
- Annick de Vries (Netherlands Ministry of Economic Affairs and Climate): Considering national and local contexts for climate decisions [\[pdf\]](#)

### Session 3: Maximise mitigation in EU and beyond

- Tom van Ierland (DG Clima, European Commission): Update on EU's energy and climate policies [\[pdf\]](#)
- Ulrich Hansen (UNEP DTU Partnership): R&D offshoring to emerging economies in climate technologies [\[pdf\]](#)
- Henry Derwent (Climate Strategies)
- Hartwig Kremer (UN Environment / CTCN): Realising the potential for mitigation options - the role of the CTCN [\[pdf\]](#)
- Nick Campbell (Arkema)

## Reports

 Open access /  
free of charge

 **England, M.I., Dougill, A.J., Stringer, L.C., Vincent, K.E., Pardoe, J., Kalaba, F.K., Mkwambisi, D.D., Namaganda, E. and Afionis, S., 2018, Climate change adaptation and cross-sectoral policy coherence in Southern Africa, Regional Environmental Change.**

To be effective, climate change adaptation needs to be mainstreamed across multiple sectors and greater policy coherence is essential. Using the cases of Malawi, Tanzania and Zambia, this paper investigates the extent of coherence in national policies across the water and agriculture sectors and to climate change adaptation goals outlined in national development plans. For more effective mainstreaming of climate change adaptation, governments need to actively embrace longer-term cross-sectoral planning through cross-Ministerial structures, such as initiated through Zambia's Interim Climate Change Secretariat, to foster greater policy coherence and integrated adaptation planning.

 **IRENA, 2018, Global Energy Transformation: A roadmap to 2050, International Renewable Energy Agency, Abu Dhabi, United Arab Emirates.**

Renewable energy needs to be scaled up at least six times faster for the world to meet the decarbonisation and climate mitigation goals set out in the Paris Agreement, according to this 2050 roadmap by IRENA. Keeping the global temperature rise below 2°C is technically feasible. It would also be more economically, socially and environmentally beneficial than the path resulting from current plans and policies. However, the global energy system must undergo a profound transformation, from one largely based on fossil fuels to one that enhances efficiency and is based on renewable energy. Such a global energy transformation can create a world that is more prosperous and inclusive.

 **Jordan, A., Huitema, D., Van Asselt, H. and Forster, J. (eds.), 2018, Governing Climate Change: Polycentricity in Action?, Cambridge University Press, Cambridge, United Kingdom.**

We know that the climate governance landscape is in a state of great flux. Practitioners are intuitively aware that it encompasses many more actors, modes and levels of governance than it did even a decade ago. The aim of this book is to explore what is to be gained by thinking about climate governance as an evolving polycentric system. It does so by bringing together

some of the world's leading experts on climate governance, who are very well placed to connect the relevant strands of conceptual and empirical work and view it through the prism of polycentric governance. It answers the questions: How polycentric is climate governance post-Paris? When, how, and why has climate governance become more polycentric? What are the implications of greater polycentricity? And what is the most salient purpose of the emerging framework on polycentric governance?

 **Karavai, M., Lutken, S.E. and Puig, D., 2018. Could baseline establishment be counterproductive for emission reduction? Insights from Vietnam's building sector, Climate Policy, vol. 18, no. 4, pp. 459-470.**

This article provides insights into the role of institutions involved in climate governance working towards a future low-carbon society at the national level, within the global climate change governance architecture. Specifically, it contributes to understanding the fragmented governance of energy efficiency policy in developing countries by focussing on Vietnam's building sector, identifying key institutions related to underlying discourses, national and international power relations, resource distribution and coalitions. The analysis reveals that, in addition to domestic efforts and challenges, the international agenda greatly influences the energy efficiency policy arena. The article presents lessons to be learnt about policy processes from the specific Vietnamese case, reflecting on the role of international actors and discourses in it. Finally, it argues for the abolition of baselines in favour of adequate monitoring and evaluation, from the perspective that requirement for deviation from fictitious baselines is unproductive and only serves an international techno-managerial discourse.

 **Olsen, K.H., Arens, C. and Mersmann, F., 2018. Learning from CDM SD tool experience for Article 6.4 of the Paris Agreement, Climate Policy, vol. 18, no. 4, pp. 383-395.**

This article analyses the usefulness of the CDM sustainable development (SD) tool for stakeholders and compares the SD tool's reporting requirements against other flexible mechanisms and multilateral standards to provide recommendations for improvement. A key conclusion is that the Paris Agreement's Sustainable Mitigation Mechanism has a stronger political mandate than the CDM to measure

that SD impacts are 'real, measurable and long-term'. Recommendations for an improved CDM SD tool are a relevant starting point to develop rules, modalities, and procedures for SD assessment in Article 6.4 of the Paris Agreement as well as for other cooperative mitigation approaches.

**Pauw, W.P. Klein, R.J.T., Mbева, K., Dzebo, A., Cassanmagnago, D. and Rudloff, A., 2018. Beyond headline mitigation numbers: we need more transparent and comparable NDCs to achieve the Paris Agreement on climate change, Climatic Change, vol. 147, pp. 23-29.**

The 'headline numbers' of the NDCs were quickly identified. However, beyond these headline mitigation numbers, NDCs are more difficult to analyse and compare. UN climate negotiations have so far provided limited guidance on NDC formulation, which has resulted in varying scopes and contents of NDCs, often lacking details concerning ambitions. If NDCs are to become the long-term instrument for international cooperation, negotiation, and ratcheting up of ambitions to address climate change, then they need to become more transparent and comparable, both with respect to mitigation goals, and to issues such as adaptation, finance, and the way in which NDCs are aligned with national policies.

**Pintos, P. and Linares, P., 2018. Assessing the EU ETS with a bottom-up, multi-sector model, Climate Policy, vol. 18, no. 4, pp. 413-424.**

The authors have built a bottom-up, multi-sector model, which represents the EU ETS in an integrated, cross-sectoral way, paying particular attention to the interactions among the most emissions intensive industries. The model addresses limitations of previous models by considering that agents who participate in the EU ETS may behave in a way that may lead to inefficient CO<sub>2</sub> prices, creating doubts about the static and dynamic efficiency of the system. The results show the benefits of this modelling approach and how it better reflects real market conditions.

**Potting, J., Hanemaaijer, A (eds.), Delahaye, R., Ganzevles, J., Hoekstra, R. and Lijzen, J., 2018, What we want to know and can measure. System and baseline assessment for monitoring the progress of the circular economy in the Netherlands, PBL Netherlands Environmental Assessment Agency, The Hague, Netherlands.**

A monitoring system is required to determine whether the transition to a circular economy is progressing as planned, a proposal for which is made in this report.

In the monitoring system, a distinction is made between the desired effects and the transition process that needs to take place to bring about these effects. The most important desired effect of the transition to a circular economy is a reduced consumption of natural resources. In the report, indicators for monitoring both the transition process and the effects achieved. are proposed.

**Rizzo, A. and Maro, P., 2018, Implementing Nationally Determined Contributions (NDCs) in the South-Mediterranean region: Perspectives on climate action from eight countries, ClimaSouth project Paper No. 4.**

The paper presents the results of a comparative analysis of the NDC process among eight countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia) with a focus on the six following topics: resources for NDC implementation; NDC process coordination; mainstreaming NDCs in national processes; alignment of NDC and SDG; using NAPs to deliver on NDC goals; and measurement, reporting and verification (MRV) of NDC implementation. The result is a compact assessment of where the eight countries currently stand with the NDC implementation process, followed by a summary and recommendations for the road ahead.

#### Box 4. Climate Change Mitigation portal.

##### Online portal highlighting EU-funded research on reducing emissions



The ClimateChangeMitigation.eu portal highlights information from different EU-funded research and coordination projects emission reduction. The portal covers a range of mitigation-related topics, including mitigation technologies and practices, scenarios and models, links to relevant data sources, case studies, policy information, and stakeholder engagement. 13 EU-funded projects have joined the portal, and additional projects are invited to become involved!

Linked to the online portal, updates on mitigation research are shared on Twitter using the #mitigationEU hashtag.

## JIQ Meeting Planner

### **11-13 June 2018, Helsinki, Finland**

3rd European Sustainable Phosphorus Conference  
[phosphorusplatform.eu/espcc3-2018](http://phosphorusplatform.eu/espcc3-2018)

### **18-21 June 2018, Cape Town, South Africa**

5th international climate change adaptation conference Adaptation Futures 2018: Dialogues for Solutions  
[adaptationfutures2018.capetown](http://adaptationfutures2018.capetown)

### **20-22 June 2018, Naples, Italy**

Environmental Impact 2018: 4th International Conference on Environmental and Economic Impact on Sustainable Development  
[witconferences.com/impact2018](http://witconferences.com/impact2018)

### **25-27 June 2018, Vienna, Austria**

International Energy Policy and Programme Evaluation Conference (IEPPEC)  
[ieppec.org/vienna-2018](http://ieppec.org/vienna-2018)

### **30-31 August 2018, Wrocław, Poland**

13th conference of the International Society for the Intercommunication of New Ideas (ISINI)  
[isini.info](http://isini.info)

### **24-27 September 2018, Helsinki, Finland**

2018 Global District Energy Days  
'Unite | Innovate | Experience'  
[2018dedays.org](http://2018dedays.org)

### **16-18 October 2018, London, United Kingdom**

Carbon Forward 2018 - Survive and thrive in the global carbon markets  
[carbon-forward.com](http://carbon-forward.com)



JIQ Magazine (Joint Implementation Quarterly) is an independent magazine with background information about the Kyoto mechanisms, emissions trading, and other climate policy and sustainability issues.

JIQ is of special interest to policy makers, representatives from business, science and non-governmental organisations, and staff of international organisations involved in climate policy negotiations and operationalisation of climate policy instruments.

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