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Online Hub for EU-Funded Mitigation Research Editor's note

"Many climate information users are deluged by the huge number of reports, scenarios, datasets, toolkits and other publications that is produced each year, and consequently fail to find what they need." This quote from The Climate Knowledge Brokers Manifesto, published in 2015 by the [CKB Group](#), clearly describes the problem that many climate knowledge users face when they check their emails every day.



Figure 1. ClimateChangeMitigation.eu collects mitigation research outcomes.

The overload of information is closely linked to the phenomenon known as 'platform proliferation'. Innumerable online climate change knowledge platforms have been launched, including those that have resulted from a huge number by EU-funded research projects. While these platforms contain interesting and useful information, graphics, and tools, there is much duplication, and for finding the content on each platform we need to rely on Google. The CKB Group has aimed to treat this 'platform proliferation syndrome' in various ways, including the launch of the Manifesto, and the creation of online tools for interlinking platforms, such as linked-open-data techniques (LOD).

LOD is a great approach to overcome platform proliferation. The benefits of LOD have inspired a group of EU-funded projects to create an online hub through which users can customise their search for information about climate change mitigation: [ClimateChangeMitigation.eu](#). This hub does not use LOD software, but enables projects (as part of their outreach activities) to post summaries (highlights) of their work and categorise these under different headings, with links to the original documents on the project websites. For example, a policy maker who is interested in examples of engaging stakeholders for enhanced public acceptance of mitigation options can find an overview of case studies, reports, working documents, etc., prepared by the projects. The same type of information is found by a psychologist who is interested in reasons why people (dis)approve of climate-friendly solutions.

Should you like to receive monthly updates of highlights from the ClimateChangeMitigation.eu hub, please [subscribe to the mailing list](#).

Erwin Hofman and Wytze van der Gaast

Green Deal: Preparing for a National Carbon Market in the Netherlands

By Wytze van der Gaast*

On 26 October of this year, at a side event of the Dutch Climate Summit held in Rotterdam (see Box 1 on the next page), a group of market actors and environmental NGOs expressed their intention to enter in a so-called Green Deal for a national carbon market. A Green Deal is a collaboration between the Netherlands government and private actors to promote green economic growth, in the widest sense. This Green Deal will support crediting domestic carbon credits "Made in Holland".

As in other EU Member States, energy-intensive sectors in the Netherlands are covered by the EU ETS. In non-ETS sectors, greenhouse gas (GHG) emission reductions are partly addressed by governmental actions, and partly by actions of the private sector. Among the type of possible actions are projects that reduce emissions that are verified and then sold as carbon credits to actors (e.g. citizens, banks, or companies with a voluntary climate commitment), to compensate their carbon footprint. For example, a few local Dutch climate funds run regional emission reduction projects to offset the emissions related to heating and cooling of public buildings.¹

The idea for a Green Deal for a national carbon market in the Netherlands arose when several market actors and environmental NGOs expressed concern about the lack of transparency in terms of accounting for GHG emission reductions based on projects, and certifying and trading these as carbon credits. While some projects apply strict accounting rules, in other cases emissions reductions might be credited which may, for example, lead to double counting with EU ETS allowance trading. With enhanced transparency in the markets, market actors and NGOs hope that additional investments in GHG emission reduction projects in non-ETS sectors will be mobilised.



Figure 2. Declaration of intent for the Green Deal on a national carbon market (Rotterdam, 26 October 2016).

In a collaborative effort, the market actors and the government have been working on a Green Deal that aims at meeting three key conditions for a successful, transparent, and environmentally integer non-ETS carbon market in the Netherlands:

- 1 GHG accounting methods are available to calculate emission reductions realised via projects in non-ETS sectors. With these methods, it can be ensured that the calculated emission reductions are additional to those that are stimulated by incentives and policies already in place in non-ETS sectors. The methods also check for double counting with activities under the EU ETS;
- 2 Procedures exist for validation of project plans, including the use of GHG accounting methods, verification of the project results, and certification of these as carbon credits. These services are performed by qualified actors; and
- 3 A platform exists where project developers can make their generated carbon credits available for acquisition by potentially interested buyers.

In order to meet these conditions, the following steps are foreseen (see Figure 3). Market actors will

* Wytze van der Gaast (email: wytze@jin.ngo) is a senior researcher at JIN Climate and Sustainability, Groningen, Netherlands. He works as a facilitator of the preparation of the Green Deal for a national carbon market, together with Hans Warmenhoven and Jos Cozijnsen.

¹ See "Climate Fund Accelerate Regional Energy Transition" (2014), *JIQ Magazine*, vol. 20, no. 4, pp. 4-7.

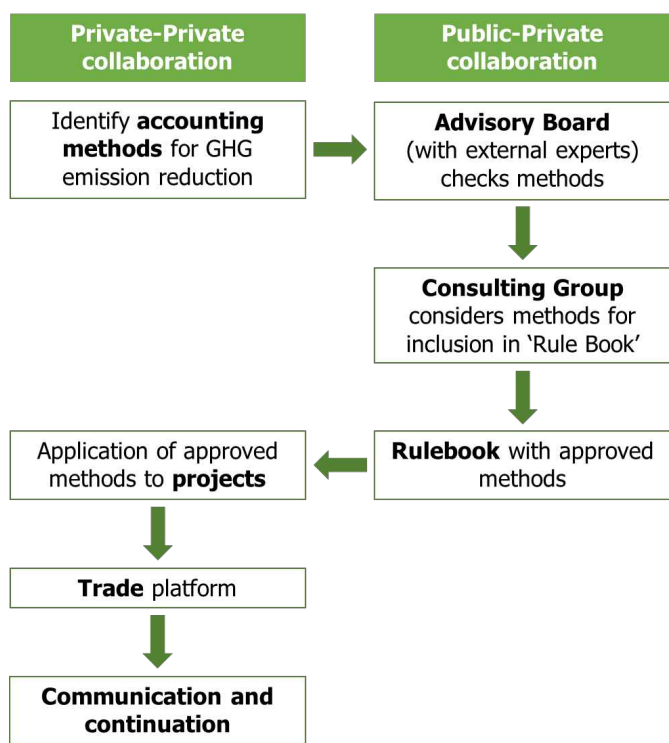


Figure 3. Organisation of collaboration on a Green Deal for a national non-ETS carbon market in the Netherlands.

identify, for projects in different non-ETS sector in the Netherlands, potential methods for calculating GHG emission reductions (including baseline scenarios and additionality of emission reductions). Such method can, for example, be derived from already existing methods under the Kyoto mechanisms JI and CDM, but they may be modified or even simplified for application within the Netherlands. These methods will be shared with an external Advisory Board, in which the Netherlands government will be represented, which will provide guidance on the (policy) integrity and applicability of the methods in the Dutch non-ETS context.

Based on the advice of the Advisory Board, a Consulting Group, in which market actors participate,

will consider methods for inclusion in a Rule Book for the accounting of GHG emission reductions. The Rule Book will be an important product of the Green Deal collaboration as it will contain guidance necessary for guaranteeing transparency in the system, leading to carbon credits based on real and additional GHG emission reduction. With the rulebook, market actors can work on fulfilling the second and third condition (validation, verification and crediting as well as a trading platform).

Market actors will subsequently apply the Rule Book to concrete projects in non-ETS sectors in the Netherlands, such as the built environment, transport, agriculture and land-use. Emission reductions based on these projects, and accounted for with help of the identified accounting rules, can be traded as carbon credits within the non-ETS sectors. Under the Green Deal, options for facilitating carbon credit supply and demand in a transparent way (e.g. including crowd funding options) will be explored.

Finally, while the planned Green Deal will exist for three years, parties will focus on the longer-term continuation of this market mechanisms so that future emission reduction projects in Dutch non-ETS sectors can continue to benefit from the financial value of carbon credits.

As is shown in Figure 3, the foreseen activities will partly be based on private-private and partly on public-private collaboration. In case of the latter, market actors work together with the Netherlands government, among others, to ensure policy consistency. Private-private collaboration supporting the Green Deal will be organised as working groups (accounting methods, projects, trade platform and communication and continuation), under the coordination of Energy Valley (a Dutch non-profit organisation focusing on realising market opportunities for clean and low-emission energy options in the northern provinces of the Netherlands).

Box 1. Dutch National Climate Summit (Rotterdam, 26 October 2016).

On 26 October, the Dutch government for the first time organised a **National Climate Summit**, with over 1,700 participants from government, business, and NGOs. The conference's motto, "Bring Paris home", signified the need for concrete actions based on the goals of the Paris Agreement. During the conference, many public-private agreements and 'Green Deals' were signed, and a group of 39

large Dutch businesses launched a 'transition coalition', requesting a Climate Act, a Climate Minister, a climate investment bank, and consistent long-term climate policy.

For the Green Deal on a national carbon market, a declaration of intent was signed. The formal ratification of this is expected in early-2017.

The Times They Are a-Changin'

Positive and Negative Impacts of Low-Emission Transitions in Livestock Farming, the Energy Sector, and Cities


By Jenny Lieu, Luis Gonzales-Carrasco, Timothy Suljada, Matthew Halstead, Eise Spijker, and Annela Anger-Kraavi*

The Paris Agreement of 2015 has thus far resulted in the submission of over 110 Nationally Determined Contributions (NDCs). NDCs stipulate a certain greenhouse gas (GHG) emissions reduction objective, and the way in which this can be met. For realising the NDCs, countries and sectors will have to make transitions in order to realise their sustainable development goals with low emissions. In order to improve our understanding of the impacts, risks, and uncertainties of such transitions, the TRANSrisk consortium hosted a side-event at the EU Pavilion at COP22 in Marrakesh, on 18 November.

Preliminary results of three TRANSrisk low-emission transition case studies were presented:

- Pathways for reducing emissions from livestock farming in the Netherlands;
- The role of renewable energy and biomass in Kenya's low-emission transition; and
- Linking reductions of GHG emissions and air pollution in Santiago de Chile.

A low-emission transition refers to technologies and/or practices applied in a certain region or country to reduce its impacts on climate change. Transitions do not refer to a single project or installation, but to large-scale (e.g. nation-wide or sectoral) roll-out of such technologies/ practices. A key goal of the TRANSrisk project is to identify risks related to low-emission pathways in different country contexts. For that, the case studies analyse whether and how a transition pathway will have negative external impacts (consequential risks), and how these can be offset or mitigated by positive impacts. The project also



The objective of the TRANSrisk project is to explore low-emission transition pathways and analyse the possible associated risks. A key feature of TRANSrisk is that it brings together quantitative techniques (such as models) and qualitative approaches (such as participatory consultations with stakeholders). This combined approach enables identification of possible low emission transition pathways which are technically and economically feasible, and acceptable from a social and environmental viewpoint.

explores risks of unsuccessful implementation of a pathway (implementation risks) by exploring barriers that slow down or block a transition.

A key lesson learned from the international debate on 'green growth and sustainable development' is that low-emission transitions should be in line with the broader socio-economic development ambitions of a country/region. Moreover, a transition should not result in an unjustifiable increase of other environmental impacts (e.g. pollution swapping). Instead, transition paths that generate most 'wins' and minimise the 'losses' are likely to be most viable, and more likely to be adopted by communities.

Aside from any (un)wanted positive or negative impacts of a transition pathway, there can be a range

* The authors are members of the TRANSrisk project team: Jenny Lieu (Science Policy Research Unit, University of Sussex, Brighton, UK; email: j.lieu@sussex.ac.uk), Luis Gonzales-Carrasco (Pontifical Catholic University of Chile, Santiago, Chile), Timothy Suljada (The Stockholm Environment Institute, Stockholm, Sweden), Matthew Halstead (ECN, Amsterdam, Netherlands), Eise Spijker (JIN Climate and Sustainability, Groningen, Netherlands), and Annela Anger-Kraavi (Cambridge Econometrics, Cambridge, UK).



Figure 4. From left to right Luis Gonzales-Carrasco, Jenny Lieu, Eise Spijker, Timothy Suljada, and Matthew Halstead.

of barriers preventing the uptake of a technology or practice. A systems analysis (considering policy mixes, stakeholder interactions, and contextual factors such as culture, habits, and religion) can show which conditions need to be met to successfully implement a transition pathway that is accepted by society. Several stakeholders attending the side-event acknowledged the importance of a better understanding of positive and negative impacts of low-emission transitions, and expressed a need to better incorporate this topic within the ongoing climate negotiations.

Low-emission transition in livestock farming in the Netherlands

For the Dutch case study, two low-emission transition pathways for the livestock sector were discussed. The Netherlands has one of the highest livestock densities in the EU, and is the world's second largest exporter of agricultural products (after the US). The production of animal protein (dairy and meat) forms a substantial part of these exports. The first pathway focuses on a substantial reduction of animal numbers in the livestock sector to reduce the environmental burden. The other pathway assumes that the current livestock will remain intact, but with an improved (integrated)

management of animal manure. These two pathways were selected as they are able to contribute to multiple environmental targets (lower emissions to soil/water, air, and atmosphere). Reducing the cattle livestock sector by 37.5% is considered to be sufficient to meet an indicative sectoral GHG emission reduction target by 2030, while integrated manure management will require major investments in (several thousands of) manure digestion and processing facilities. Hence, both pathways are likely to have considerable socio-economic impacts in the country, in terms of for example costs and job losses. Further case study work will be performed to better quantify the overall costs and benefits of low-emission transitions in the Dutch livestock sector.

Low-emission transitions in Kenya's energy sector: feasible, but challenges remain

For Kenya, a key question is how to meet its goal of becoming a middle-income country by 2030, while also pursuing the low-emission pathway set out in its Intended Nationally Determined Contribution (INDC). The TRANSrisk case study focuses on Kenya's rapidly expanding energy sector. Under business as usual, GHG emissions from energy are expected to increase more than six-fold between 2010 and 2030, dwarfing the increases in transportation, agriculture, and land use change. Results from the TIAM-ECN model show that Kenya's INDC targets can be achieved with rapid and timely deployment of renewable energy sources. However, this would require a shift away from current government plans to expand the role that domestic coal will play in Kenya's energy mix (see Figure 5).

Alongside rapid expansion of low-emission power sources, one of Kenya's biggest challenges is to meet household demand for wood and charcoal. This currently makes up about 68% of Kenya's final energy

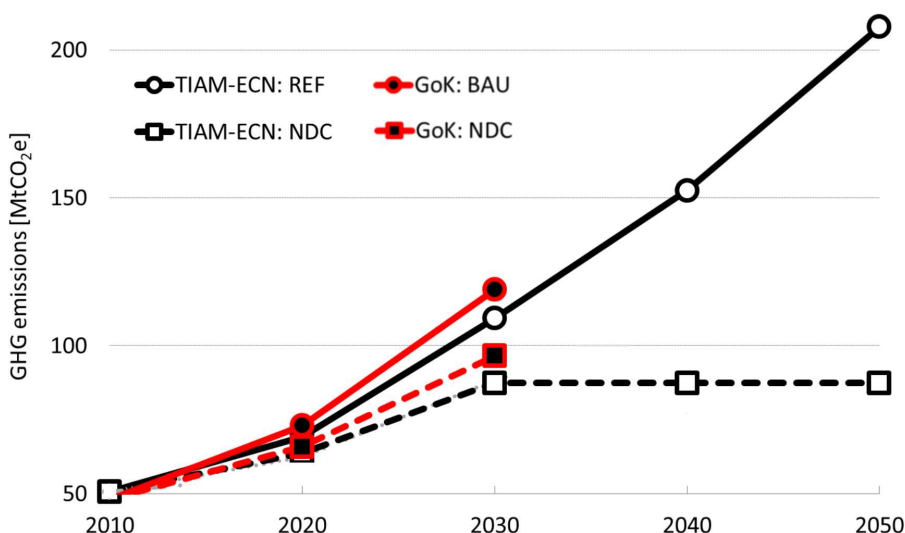


Figure 5. Scenarios from the global TIAM-ECN modelling work for Kenya, The red lines show the INDC emission projection by the government of Kenya (reference scenario and NDC scenario). The black lines show the TIAM-ECN scenarios (business-as-usual and NDC scenario).

consumption. Data on the 'sustainability deficit' for charcoal supply in Kenya was presented, illustrating that forest wood for charcoal production is harvested at a greater rate than it can be replenished, thus leading to rising net GHG emissions. To avoid these emissions, charcoal consumption needs to be reduced through greater efficiency and increased supply of sustainable sources of biomass. Understanding the factors that influence stakeholder behaviour in this complex value chain is a key focus of the case study research. Through a combination of scenario modelling and stakeholder engagement, the case study analysis could support Kenya in its challenge to establish a low-emission energy sector.

Low-emission transitions in Santiago de Chile: linking climate and local pollution

Chile faces increasing energy demand due to projected economic development and improved public welfare. Consequently, there is increasing pressure on the environment, both in terms of GHG emissions and local environmental pollution. The Chilean TRANSrisk case study aims to explore synergies between efforts to reduce emissions of GHGs and local pollutants, against the backdrop of a growing economy. The focus of the case study is on the capital, Santiago.

With over 40% of the country's population and many companies being located there, Santiago accounts for over 50% of Chile's total CO₂ emissions. Moreover, the city faces serious air quality problems. An important difference between climate change and local air pollution is that the latter is much more visible and has a more direct impact on the community. Since potential practices to reduce local air pollution often also contribute to GHG emission reduction, this provides a scope for linking local air quality actions with efforts to combat global climate change.

Therefore, the main objective of the continued work in this case study is to identify technologies, practices, and policies to develop synergetic solutions that mitigate both global GHG emissions and local environmental impacts.

Side-event presentations

The presentations delivered during the TRANSrisk side-event in Marrakesh can be downloaded from the TRANSrisk website's [event page](#). For the Dutch livestock case study also a more detailed handout is available (a JIQ Special issue; see Box 2 on more JIQ Special issues about other case studies).

Box 2. JIQ Special issues on TRANSrisk transition pathway case studies.

JIQ Specials: Biogas development in Indonesia; Solar PV expansion in the Netherlands

Three JIQ Special issues have been published, elaborating on individual TRANSrisk case studies. Apart from the Special on [livestock farming in the Netherlands](#) (as discussed in the article above), these are on biogas development in Indonesia, and solar PV expansion in the Netherlands.

The JIQ Special on [biogas development in Indonesia](#) focuses on mapping the costs and benefits of biogas technology implementation on a household scale in Indonesia, and this is compared with the current dominant form of cooking fuel, i.e. fuel wood. Both options focus on household-level application. Using biogas for cooking will positively impact health, mitigate climate change, and provides economic opportunities as households no longer need to purchase fuels and fertilisers. However, the initial costs of biogas installations may prove to be a challenge, as cooking on fuel wood is much cheaper. The JIQ Special discusses the emission reduction potential and side-effects of the two transition pathways.

The JIQ Special on [solar PV in the Netherlands](#) discusses two pathways for rapid expansion of solar power: wider application of rooftop solar panel use in the built environment; and increasing large-scale applications of solar panels on state-owned land (e.g. solar parks). The second option appears to be in a better position to contribute to the Dutch renewable energy targets, due to economies of scale in planning, financing, and construction. All potential impacts and challenges of both pathways are discussed in the document.



Engaging Hearts and Minds for Sustainability

By **Martin Ossewaarde***

The new Sustainable Development Goals (SDGs)¹ have quickly become a focus for public policies, and for professional development agencies. Yet, in order to turn a society onto a sustainable track, much more is needed than adopting a (national) development strategy. All sectors of society have to play their part, minimising impacts in their core activity and in the way they use resources for that purpose.

Developing together

The new SDGs represent two giant steps ahead, in the sense that they are written for all states (not only those deemed less developed) and that they cover the economic, social, and environmental dimensions of sustainability in a more balanced way than before. Also, the SDGs are timely intermediate goals on the long road to a sustainable future. For decades, efforts to reconcile the ideas of development and environment were hindered by false dilemmas around which of the two should take priority. It seemed that developing countries were choosing development, and industrialised countries prioritised environment. In reality, even after the landmark Earth Summit (Rio de Janeiro, 1992), most countries kept pursuing numerical GDP growth, especially in times of economic downturn.

However, in the last seven years or so, something has changed. Fast growing countries such as China and India so suffered the consequences of their own unsustainable development and those of climate change that their development narrative and strategies have changed. National goals now include targets for efficiency improvement, increasing the share of renewable power sources, and building capacity for competitive industries in green sectors.

Integrated policy change

Yet, in order to turn a society onto a sustainable track, much more is needed than adopting a national



Figure 6. The author, teaching at the American University of Central Asia in Bishkek, Kyrgyzstan.

development strategy. All sectors of society have to play their part, minimising impacts in their core activity and in the way they use resources for that purpose. In my recently completed academic textbook (see Box 3), I shortlist three areas that must be included in any strategy for sustainability:

- Campaigns addressing the environmental attitudes and **behaviour** of ordinary citizens and specific target groups;
- Plans to create new and reform existing **institutions** so that they contribute to sustainability goals or at least not hinder them;
- Adjust the framework conditions for **technology** development, so that it will have incentives to prioritise sustainability goals.

In my view, the above is the order of importance. Human values and attitudes shape the core of our daily choices (behaviour), and so do social norms and expectations. Moreover, they impact the way we order our society with rules, pricing systems, traditions, and organisations – the institutions. These are shaped by

* Martin Ossewaarde (email: martinosincasia@gmail.com) is a trainer at Komensky Consultancy in Pune, Maharashtra, India. He taught sustainable development and governance for a decade at the American University of Central Asia in Bishkek, Kyrgyzstan.

¹ Transforming our World: the 2030 Agenda for Sustainable Development (sustainabledevelopment.un.org).

relatively few people on behalf of society, but enable or hinder the rest of us in becoming responsible citizens, producers and consumers. Also, they shape the playing field within which market forces and academia develop new technologies that either support the transition to sustainability or create new challenges.

General practice

The world, however, usually treats the three policy areas in reverse order. Technology has played a key role in tackling environmental issues in the last half century. Indeed, it has the potential to enable sizeable reductions in environmental pressures, but these leak as people aspire to ever higher comfort levels. So, as a side-effect, environmental technology has enabled us to remove the strain that pollution caused in society, so that we could go on with business as usual.

The next to be tackled was the large and diverse area of institutions. The UN Commission on Environment and Development (1987)² put much emphasis on institutional change to give stakeholders the right incentives. Institutions also featured prominently in UNDP's 2003 Human Development Report (HDR)³. I follow the HDR's continuum pitching the institutions along the two dimensions from informal (values, traditions) to formal (regulations), and from easy to change (rules, companies) to hard to change (constitutions, charters). Essentially, they are inter-human arrangements that can only be changed by dialogue and structured decision-making that is written in a charter or constitution. It is therefore essential that sustainability students learn about the functioning of organisations.

Yet, even institutional change is enabled or restricted by human attitudes and behaviour. While agency and regulation reform may greatly support the efforts of all stakeholders, plans to that effect often get stuck because of weak political will and/or lack of public support. For instance, one reason that governments are still spending so much tax money on utility subsidies is that ordinary people have grown to consider cheap utilities as their natural right. Every decision to reduce or abolish such subsidies is met with fierce protest, even if the reason is that the subsidies have become unaffordable for the public

budget. It takes a lot of education (and time) to help change public perceptions as well as increased transparency and political leadership to navigate the complex change process.

Motivating people

The human factor has always been the hardest one to tackle. Perhaps this is why it has been left until now to deal with. Yet, if the world's population that is growing in numbers and wealth is to share global resources more equitably within ecological boundaries, change in attitudes and behaviour is essential. So how can people be motivated to make a change in behaviours that are learned and habitual? People that are already motivated to live sustainably only need to be told what the most helpful changes are. However, the vast majority need to be persuaded in one or more other ways.

I distinguish three ways in which leaders could motivate their followers to display the desired behaviour:

- **Rules and regulations:** works if followers are law-abiding and/or if enforcement is credible, so that the fear of punishment leads to compliance;
- **Material (dis)incentives:** works if the sustainable alternative is financially the most attractive; and
- **Values-based persuasion:** works if followers have a desire to do the right thing, which works if they have a supportive worldview or set of values in common.

Most people just want to get on with life ('normality'), whether they are merely surviving or are competing in the rat race for money and status. They are likely to see sustainability as a distraction. They may, however, comply with green legislation that is credibly enforced or respond to financial fees and charges that make desired behaviour cheaper than the undesirable alternative. However, the new behaviour may remain superficial and dependent on the incentives being in place. A deeper, long-lasting transformation takes place when people also change their attitudes to material and energy use. This may happen if they are confronted with unsustainable situations in a way that deeply impacts their soul. It may also come about as they (re)-discover the teachings on the proper human relation to nature from their spiritual or national

² UN Documents: Report of the World Commission on Environment and Development: Our Common Future (www.un-documents.net/wced-ocf.htm).

³ Human Development Report 2003, Millennium Development Goals: A Compact Among Nations to End Human Poverty (hdr.undp.org/en/content/human-development-report-2003).

heritage. Most communities of faith preach and practise moderation. Besides, there are also non-religious groups that have started sustainable towns and villages around the world. When people are convinced that environment-friendly attitudes and behaviour are the right thing to do, they will do so with consistency and vigour. Very likely, they will remain lifelong learners for sustainability, sharing their success stories with others.

Sustainability change makers

Central governments could be important drivers of change for sustainability in their countries, but the contributions of non-state actors have become more significant in recent years. For instance, numerous cities and regions have very active and effective policies on sustainability matters. Moreover, global business is pressed by environment-conscious clients, shareholders, and competitors to green up their act. Such non-state action may go on regardless of a possible lapse in interest at the state level. However, central government does have a unique capacity to coordinate stakeholder contributions and to adjust institutional systems to facilitate the transition to a

sustainable future. That capacity is ideally used to the full in the making and implementation of a green or circular economy strategy. Again, the awareness and attitudes of the general population and of the leaders and managers of society's institutions could make or break such a strategy. This is really what UNEP and OECD mean when they call environmental awareness an enabling condition.

So what are the signs that the big and growing economies of the world have understood this? Do they place priority on education for sustainable development? Only in schools or also in higher education where tomorrow's leaders are trained? Governments seem to move slowly, and universities are still overwhelmingly organised along disciplinary lines with little or no integration of sustainability thinking in their curriculum. Too many graduates still get their diplomas without any knowledge of sustainability. UNESCO's Global Action Plan for Sustainability Education offers facilities to change, but governments and university boards will have to seize them. Organisational change processes easily take five to ten years, so we have no time to lose.

Box 3. New textbook for sustainability change makers: coming soon.

Developing Our World – Equipping Sustainability Change Makers

In my textbook 'Developing Our World', I reduce the complexity of the sustainability field by using the same five section headings in every chapter: introduction, historical dimension, current state of the issue, and the theme's part in the overall transition. Last but not least, every chapter has a schools of thought section, which is based on the worldview categories that Clapp and Dauvergne describe in their 'Paths to a Green World' book.

The book's aim is not only to inform but also to engage and empower. The book includes material on change leadership, so that readers will not come away feeling overwhelmed by the complexity of the task. They will be equipped to keep learning lifelong and to start small changes.

The book does not contain lists of environmental and social issues and their solutions, because there are already enough books that do this. It really focuses on the kind of thinking that sustainability change makers need. Educators in different parts of the world who use the book are encouraged to supplement it with materials from their local

context to increase a sense of relevance. The book is structured as follows:

Part I: The case for sustainable development

- 1 A matter of urgency
- 2 Roots of unsustainability
- 3 Sustainability: new direction for development

Part II: Stakeholders and tools

- 4 Enabling and motivating people to take action
- 5 Changing behaviour, institutions and technology
- 6 Public sector roles: coordination/implementation
- 7 The private sector: business and civil society
- 8 From global concerns to local action

Part III: Key areas for the transition

- 9 Energy for sustainable development
- 10 Making cities more sustainable
- 11 Sustainable food and agriculture
- 12 Green economy

For further information about the book, please contact the author: Martin Ossewaarde. Email: martinoscincasia@gmail.com.

Advancing the Energy-Agriculture Nexus in Indonesia

By Ibnu Budiman and Ivan Bobashev*

Su-re.co, an environmental consulting company based in Bali, Indonesia, established a green business project named su-re.coffee. It works to implement sustainable, win-win solutions for coffee value chain stakeholders, by integrating biogas systems in Indonesia. Su-re.co believes that the biogas-coffee concept is a promising transition pathway for both climate change adaptation and mitigation.

Currently, Indonesia is promoting mitigation through clean energy such as biogas. Some people already use the biogas in limited capacity for domestic needs such as cooking. A biogas programme in Indonesia called BIRU, has 18,590 digesters in all over Indonesia from 2010-2015.¹ Compared to about five millions of cow and pig farmers in Indonesia, the BIRU digesters are still in very small number. A lack of demand for biogas is one of the key obstacles for further expansion. Thus, the initiative to roast coffee using biogas is considered to create demand. There is great potential for farmers to use biogas not only for coffee roasting, but also for expanding other small businesses. Through these and other initiatives, su-re.co is committed to advancing the energy-agriculture nexus in Indonesia.

Anaerobic digestion is a useful technology which harvests biogas (including methane) from agricultural waste, primarily manure. An abundant supply of agricultural waste in Indonesia makes biogas an excellent renewable energy source for rural areas. It includes residual waste from coffee production such as coffee cherry husk which can also be used for biogas in circular way. This practice has been done in Indonesia together with majority biogas from manure. There is a large supply of animal manure available for biogas production nearby coffee farms because farmers used to apply mixed crop-livestock farming. The coffee pulp can also be processed to be



Figure 7. Coffee roasting using biogas in Jembrana (Bali).

bioethanol.² The bioethanol then can support development of domestic sources for alternative transportation fuels for coffee distribution.

The biogas digester from anaerobic digestion will be used in this initiative with manure as main feedstock since the technology is already widely distributed. Bioslurry can also be produced as side product of the biogas, and it can be used as organic fertilisers in the coffee plantation. It will have an impact on the declining use of fossil fertilisers. Hence, biogas acts as a means of waste alleviation and management, preventing pollution, and enabling a healthy environment for farming communities. With the help of the coffee community, the project can make biogas more accessible and make a real, positive impact on the reduction of greenhouse gas emissions.

Coffee can support Indonesia's efforts to building resilience toward climate change. Coffee is the second biggest commodity in the world after oil, and Indonesia is one of the world's biggest coffee producers and exporters. Such an extensive demand for Indonesian coffee presents an opportunity for coffee to play a significant role in climate action and poverty alleviation.

* Ibnu Budiman is a researcher at PT Sustainability and Resilience (su-re.co), based in Bali, Indonesia (e-mail: budimanibnu26@gmail.com); Ivan Bobashev is an intern at the same organisation.

¹ Indonesia Domestic Biogas Programme BIRU (Program Biogas Rumah), see www.biru.or.id/en.

² Harsono, S.S., et al. (2015), "Second Generation Bioethanol from Arabic Coffee Waste Processing at Smallholder Plantation in Ijen Plateau Region of East Java", *Procedia Chemistry*, vol. 14, pp. 408-413.

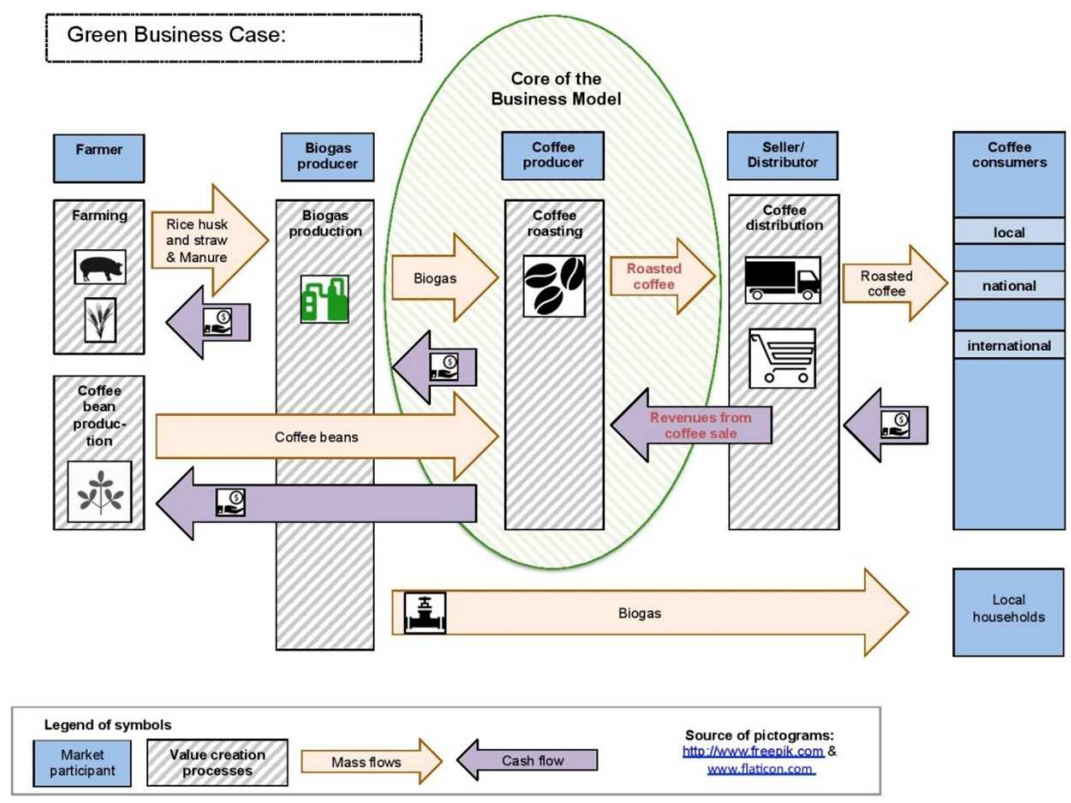


Figure 8. Diagram of su-re.coffee's green business model.

Indonesia, as an island nation, is projected to be severely impacted by climate change. Through a vulnerability assessment of potential agroforestry regions in Eastern Indonesia, su-re.co identified the regency of Jembrana (Bali) and the island of Flores as two of the most vulnerable areas.³ Acute symptoms of climate change are apparent now, and will only get worse in the future. Specifically, the two regions are experiencing severe drought. Based on the assessment, Bali and Flores are projected to experience temperature increases coupled with low precipitation. The su-re.coffee project aims to contribute to climate action and social welfare issues through market forces in the coffee trade.

In terms of adaptation, su-re.coffee has the potential to be a win-win solution by enabling opportunities for farmers to diversify livelihoods and support green growth. By combining the biogas element with a transition to a more resilient crop, it provides a solution for synergy of adaptation and mitigation.

The su-re.coffee model is based on an approach to add value throughout the coffee supply chain. To be considered for involvement in su-re.coffee, farmers must use climate-smart agriculture practices which lead to a reduction of greenhouse gas emissions,

agricultural waste production, and water consumption. For example, a sustainability technique the project aims to promote is opting for natural processing over full wash processing, saving a significant amount of water. The project assists sustainable processing, drying, and roasting of coffee. The farmers are expected to produce sustainable organic products and practice fair trade. Green business and eco-friendly products are in extremely high demand in modern society. Thus, coffee farmers produce high-value end products that ensure a steady income, even if the quantity of production is diminished.

Su-re.coffee advances the energy-agriculture nexus by driving biogas demand, and educating the coffee community on the potential uses of clean energy, climate change challenges, and sustainability concepts. The private sector initiative brings new perspectives to promote a more sustainable coffee business. Besides farmers, coffee shop owners are encouraged to buy from local farmers and participate in community development opportunities, instead of importing coffee. Su-re.coffee is an opportunity to enable farmers to provide a high quality, sustainable organic product for generations to come and make Indonesia a true powerhouse of the international coffee community generated by clean energy.

³ Takama, T. (2016), "Climate Change Adaptation in Coffee and Cocoa Supply Chains", UNDP.

Cost Recovery Mechanisms of Energy Efficiency Obligation Schemes in the EU and Beyond

Based on the requirements of the Article 7 of the EU Energy Efficiency Directive (EED), EU Member States are required to achieve energy savings using energy efficiency obligation (EEO) schemes or alternative measures, or a combination of both. Such policies can lead to additional costs for the obligated parties (energy suppliers or distributors). Therefore, one of the debated questions is which mechanism is used to recover these costs.

The Article 7 of the EED stipulates that EU Member States should set up an EEO scheme, or alternative policy measures that achieve yearly energy savings of 1.5% of annual sales to final consumers. More than half of the Member States have opted for the implementation of an EEO scheme, some of them in combination with alternative measures. In EEO schemes, the obligation to improve energy efficiency is placed on 'obligated parties', usually retailers and/or transmission and distribution system operators, road transport or heating fuel suppliers, and energy utilities. It varies how the costs incurred by these parties – ranging from energy efficiency investments to transaction and administrative costs – are recovered.

In the case of regulated markets, it is often the case that regulators provide mechanisms that enable energy providers to recover the costs of meeting their energy savings targets, as well as provide compensation for reduced energy sales as a result of the target fulfilment (through an energy tariff threshold). In the case of non-regulated markets (mainly when energy retailers are obligated parties), the two main cost recovery options are by (a) adapting their behaviour in the market and passing the costs on to the consumers through their energy bills, and (b) covering part of them through governmental funding schemes, either budgetary appropriations or price surcharges imposed on the market.

Cost recovery mechanisms in the EU

Almost half the Member States with an existing or planned EEO have left that cost recovery option open to the market, meaning that energy suppliers can decide on whether and how the costs are passed on



This article is a summary of the third policy brief published by the ENSPOL project. ENSPOL was an EU-funded project (March 2014 - August 2016) aimed at supporting EU Member States in the effective implementation of Article 7 of the Energy Efficiency Directive.

The policy brief 'Cost recovery mechanisms of EEO schemes', published in July 2016, was written by Vlasios Oikonomou (JIN).

to the consumers. This includes among others Austria, Ireland, Poland, Slovenia, Spain, and the United Kingdom. Six Member States have introduced or are planning a cost recovery mechanism regulation by setting energy tariffs. A few Member States that have substantial experience with their EEO schemes have each substantially different cost recovery mechanisms. These are briefly discussed below.

As the French energy market has been liberalised, a wide range of large and small electricity and gas suppliers have been included in the EEO scheme. The market experience shows that energy suppliers pass their costs directly to consumers. There is no public information on the costs, but a 2013 assessment estimates average costs at €0.004 per kWh of cumulative energy savings, with on average 75% of these costs for incentives for energy efficiency actions, and 25% administrative costs. Many new energy suppliers do not wish to increase their prices, as their business model is based on selling below the regulated price. For the incumbent suppliers, the costs are partly covered through a tax on energy bills. The cost recovery in the French scheme thus varies by market party, and by the degree of liberalisation of the market.

In the United Kingdom's scheme, the energy suppliers are obliged to report their costs to the regulator. Costs per company are confidential, and therefore only aggregate data are published. In an ex ante estimation, in the previous UK schemes, the consumer

contribution could amount to €0.625 per kWh. The average cost per residential consumer for both electricity and gas during 2008-2012 was €50, about 20% lower than expected. This is mainly due to the obligated parties targeting relatively low cost energy efficiency measures.

The obligated parties in the Danish scheme are energy distributors. According to the official evaluation, average investment costs by households were €1.20 per kWh. Due to these 'autonomous' investments, the distribution companies could keep costs low, which means that required cost recovery was limited. The surcharge on electricity prices was only €0.0023 per kWh on average between 2013 and 2015.

In the scheme of the Belgian region of Flanders, which is no longer in place, the obligated parties were also energy distributors. These distributors were mandated to submit an annual budget for compliance with their energy saving obligation, which must be approved by the federal regulator in charge of electricity tariffs. The cost recovery mechanism through tariff regulation was based upon approved annual action plans for compliance by the authority.

Lessons from outside the EU

EEO schemes have existed in various forms in several countries around the world. Also on the issue of cost recovery mechanisms therefore lessons can be learned from beyond the EU.

In the US state of Minnesota, minimum energy efficiency spending requirements are imposed on utilities (for example 1.5% of gross operating

revenues for electricity utilities). The costs for this are recovered through a recovery charge, determined as a part of the rate-setting.

In Korea, the Korea Electric Power Corporation collects a customer charge of 3.7% of the electricity charge, which funds the Electric Power Infrastructure Fund and investments in demand-side management. Similarly, in the state of South Australia, a per-customer amount is included in regulated price determination.

Issues to consider

There is a clear issue of transparency for the cost recovery mechanisms. For example, in Denmark and the UK, the obligated parties have to report their costs to the public authority. Nevertheless, this requirement is not fully clear, so the data reported by the obligated parties vary significantly in terms of scope, and the types of costs reported such as administration costs, marketing costs, incentives costs, etc.

Given the variety of cost recovery methods as shown inside and outside the EU, there is no blueprint that can be followed, but each country can adapt its own mechanism. The parameters that influence that decision (which has to be flexible and easy to adapt in case market standards change over time) are: obligated party (suppliers and/or distributors), obligation on all or selected energy carriers, openness of the market (expressed in number of companies) and expectations for newcomers, links of the EEO scheme to either funding mechanism (such as a certificate market) or other tools (such as subsidies, tenders and others), and availability of low cost energy saving options.



Box 4. The ENSPOL project's online platform.

Knowledge sharing platform on Article 7 of the EU's Energy Efficiency Directive

On the Article7EED.eu platform, the ENSPOL project has collected information on energy efficiency obligation schemes (EEOs) and alternative measures from across the EU, and beyond. The platform provides general Article 7 insights on policy design, additionality, double counting, savings calculation methods, monitoring, etc., as well as country-specific information on the National Energy Efficiency Action Plans of EU Member States, as well as the different energy efficiency policies implemented, in particular EEOs.

New Book on International Climate Negotiation Factors

The international climate conference held in Paris in December 2015 has clearly shown how big and important climate change has become as a topic of international collaboration. 'Paris' was by far the biggest United Nations (UN) climate summit since climate negotiations began in the late 1980s. Since then, UN-led negotiations have resulted in several milestones, such as the adoption of the UNFCCC in 1992, the Kyoto Protocol in 1997, and the Paris Agreement in 2015.

Initially, climate negotiations were mainly done and followed by climate specialists and climate change was generally not considered among core socio-economic issues. By the time of the UN Climate Conference in Kyoto, Japan, in 1997, climate change had drawn attention from more interest groups, such as groups expressing their concerns about scientific findings that people could actually influence climate systems, and business lobby groups.

Climate change had become a really big international political topic when negotiations moved to Copenhagen in 2009. Perhaps, 'Copenhagen' was too big to handle for negotiators at that time, but in Paris, six years later, negotiation tactics, processes and knowledge of what are effective climate policies had developed to a level that enabled reaching a global agreement on future climate policy making.

In the recently published book **International Climate Negotiation Factors: Design, Process, Tactics** the process of international climate negotiations since the late 1980s is looked at in more detail. It attempts to understand the complexity of finding a global solution for a global problem and identify a number of key factors that contribute to the success of negotiations. This is done by focusing on: the adoption of the UNFCCC in 1992, the agreement on and eventual ratification of the Kyoto Protocol in 1997 and 2005, and the 10-year process leading to the Paris Agreement of 2015.

The book analyses climate negotiations by considering the following three factors:

1. The **design** of the overall policy regime, thereby considering that:
 - a. International cooperation can lead to more effective outcomes than individual country



Figure 9. Van der Gaast, W. (2017). *International Climate Negotiations: Design, Process, Tactics*. Cham: Springer International Publishing.

- actions, as it, among others, helps to avoid free riding behaviour.
 - b. States are sovereign and their national self-interests need to be reflected by the policy agreement, which leads to a tension that proposed climate measures may have to become less strict or ambitious in order to keep all countries on board.
2. The **process of negotiations**, thereby considering that reaching a global climate deal takes times, that trying to accelerate negotiations may be counterproductive and that taking small steps at a time can be more productive. With flexible processes, the course of negotiations can change when necessary for achieving a broader support from countries for a climate policy package.
3. Changing the course of negotiations can be supported by **tactical and facilitating aspects**. For example, several climate negotiation sessions have benefitted from the personalities of COP Presidents, such as Estrada (at COP 3, Kyoto), Espinosa (at COP 16, Cancún) and Fabius (at COP 21, Paris). An important facilitating factor can be the input from science to negotiations, such as IPCC assessment reports or the UNEP Emissions Gap reports.

Purchase/download the book

For further information on the book, please visit the book page at JIN's website: jin.ngo/gaast2016book. The book can be ordered as hardcover or eBook, and also individual chapters can be purchased.

Collaboration on Mitigation Technology R&I Between Europe and Emerging Economies

Research and innovation (R&I) in mitigation technologies is increasingly taking place on a global scale. This globalization of innovation not only involves collaboration in R&I activities across OECD countries, but increasingly extends to partners from emerging economies, such as China, India and Brazil, in R&I projects and programmes undertaken in Europe.

Part of the CARISMA project focuses on mapping such cross-border, collaborative R&D initiatives, and on analysing how such developments impact the feasibility of mitigation options. The aim is to provide recommendations to relevant decision-makers and stakeholders to better serve mitigation targets.

A central element of the work on R&I collaboration involves consultation with the involved government and business actors, both in Europe and in emerging economies, in order to learn from their experiences in both process and outcome. On 20 February 2017, the CARISMA project organises a one-day workshop in



Figure 10. Amsterdam Central Library. Photo credit: Gkamiya/Wikimedia Commons.

Amsterdam's Central Library, aiming to obtain insights on the benefits and drawbacks of R&I collaboration, underlying strategic considerations, and key challenges and trade-offs (such as IPR issues and organisational aspects).

Attendance to the workshop is by invitation only. If you are involved in R&I collaboration, please contact Ulrich Elmer Hansen of the UNEP DTU Partnership for an invitation (uleh@dtu.dk).

Climate Change Mitigation Policy and Practice Roundtable

The climate change mitigation policy and practice roundtable is designed as a forum to bridge policy research and practice. It brings together policy researchers and practitioners to explore new insights on mitigation policies and strategies from recently concluded and ongoing EU-funded research projects.

On 27 March 2017, the CARISMA project will organise the roundtable workshop at the SEI Lounge in the



Figure 11. The Garnisonen city block in Stockholm. Photo credit: Arild Vågen/Wikimedia Commons.


Garnisonen city block in Stockholm. The workshop is aimed at disseminating key findings of policy-relevant EU-funded research projects; discussing the influence of research findings in light of practical experiences; and informing future research priorities for climate change mitigation policies.

Expected participants at the roundtable workshop include EU research project coordinators and task leaders on mitigation policy research, policy makers at the EU, national, and regional levels, business representatives, and civil society representatives. The workshop sessions will cover the following themes:

- Sectoral mitigation policies and strategies
- Innovation policies and entrepreneurship
- Cities and behavioural change


For more information, please contact Tim Suljada of SEI Stockholm (tim.suljada@sei-international.org) or Harro van Asselt of SEI Oxford (harro.vanasselt@sei-international.org). More information will be available at the CARISMA website shortly.

Reports

 Open access / free of charge

 **Bartlett, N., H. Cushing and S. Law, 2016. Embedding a carbon price into business strategy, CDP, London, United Kingdom.**

Companies increasingly disclose their practice of pricing carbon emissions. A number of companies take this approach further, by embedding a carbon price deeper within business strategies and operations. It is reported that such an internal price helps by providing an incentive to reallocate resources towards low-carbon activities. Nevertheless, many companies still do not (plan to) adopt carbon pricing, even though many of them are in countries that have implemented, or plan, carbon pricing. Investors may question the risk-preparedness of these companies.

 **Bee, S., S. Traerup and V. Hecl (Eds.), 2016. From Needs to Implementation: Stories from the Technology Needs Assessment, UNEP DTU Partnership, Copenhagen, Denmark, and UNFCCC Secretariat, Bonn, Germany.**

The publication provides examples of how countries have used their Technology Needs Assessments (TNAs), specifically Technology Action Plans (TAPs), to advance implementation of environmentally sound technologies for mitigation and adaptation. It provides country-based examples covering a range of sectors, making clear that TNAs have provided an effective foundation upon which countries can both scale-up and implement action on climate technologies.


 **EurActiv, 2016. Special Report: Sunlight at the end of the tunnel?, EurActiv.com EU News & Policy Debates, Brussels, Belgium.**

Europe is the most solarised region in the world, but deployment of technology needs to be stepped up for the EU to meet its climate commitments. Meanwhile, the EU and China have been locked in a long-running trade war over Chinese solar products, with the European Commission imposing punitive anti-dumping measures on Chinese imports. The report investigates whether the time is right to remove those duties.

 **IEA Bioenergy, 2016. Proteins for Food, Feed and Biobased Applications: Biorefining of protein containing biomass, IEA Bioenergy Task42, Wageningen, Netherlands.**

The report provides an overview of protein-containing crops, types of proteins/side-products and their applications, and market potentials for food, feed, and biobased applications. This information can enable the developing integral sustainable biomass valorisation

strategies. For the energy sector it is shown that upstream protein extraction prior to conversion of biomass into energy and/or co-valorisation of protein-rich agro or process residues will add economic value to the available biomass resources, thereby improving their overall commercial deployment potential.

 **Michaelowa, A., A. Bouzidi and V. Friedmann, 2016. Boosting climate action through innovative debt instruments: Combining debt for climate swaps and climate policy performance bonds, Perspectives, Freiburg, Germany.**

The development of new financial instruments is crucial to create investment incentives and trigger new financial flows to bring economies on low-emission and climate resilient development pathways. The note assesses two innovative instruments: 'Debt for Climate Swaps' and 'Climate Policy Performance Bonds'. Also 'Debt for Climate Policy Performance Swaps', an innovative combination of the two debt instruments, is introduced. The concepts can become an effective way to tackle debt burdens, while incentivising governments to promote mitigation.

Box 5. The UNFCCC home for technology.

TT:CLEAR: Updated UNFCCC platform on climate technology



The UNFCCC secretariat has launched a new TT:CLEAR website that showcases support to countries for technology action. The website contains comprehensive information on the mechanism's policy body (TEC) and implementation body (CTCN). TT:CLEAR will function as a key resource for countries to implement their nationally determined contributions (NDCs) to achieve the Paris Agreement objectives. It also contains information on technology needs assessments (TNAs) that developing countries undertake, and information about support for climate technology activities, including links to finance sources.

6 Rizos, V., A. Behrens, W. van der Gaast, E. Hofman, A. Ioannou, T. Kafyeke, A. Flamos, R. Rinaldi, S. Papadelis, M. Hirschnitz-Garbers and C. Topi, 2016. **Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers**, *Sustainability*, vol. 8, no. 12, 1212.

SMEs are increasingly aware of the circular economy. However, various barriers pose challenges to small businesses aiming for a transition to circular economy business models. The paper aims to increase the understanding on these barriers, as well as related enablers, based on a literature review and an analysis of a sample of SME case studies. The authors recommend that European and national policies strengthen their focus on greening consumer preferences, market value chains and company cultures, and support the recognition of SMEs' green business models.

6 Shishlov, I. and I. Cochran, 2016. **Six lessons on carbon accounting for Article 6 of the Paris Agreement**, *Climate Brief N°41, Institute for Climate Economics (I4CE), Paris, France*.

One of the key points to discuss on the implementation of the Paris Agreement is the rules for carbon accounting under Article 6, that provides for the possibility of international transfers of mitigation outcomes. However, given the currently insufficient ambition of the sum of countries' mitigation pledges and the resulting 'hot air' against the 2°C trajectory, the carbon accounting framework under Article 6 must take into account key lessons from past experience. Article 6 could greatly benefit from building upon the successes and failures of the CDM and JI at all stages of the monitoring, reporting and verification (MRV) process.

6 Van der Gaast, W., R. Sikkema and M. Vohrer, 2016. **The contribution of forest carbon credit projects to addressing the climate change challenge**, *Climate Policy*.

The article discusses how forestry projects, given the recently improved standards for the accounting of carbon sequestration, can benefit from existing and emerging carbon markets in the world. The scope of selling carbon credits from forestry projects exists both in compliance markets (although currently with strong limitations) and in voluntary markets for offsetting emissions with carbon credits. Improved carbon accounting methods for forestry investments can enhance the scope for forestry in the Nationally Determined Contributions (NDCs) that countries must prepare under the Paris Agreement.

6 Verles, M., O. Hewlett and S. Leugers, 2016. **From Kyoto to Paris and beyond: On the interconnections between Sustainable Development and Climate Policy**, *Carbon Mechanisms Review*, issue 4, pp. 26-32.

To rise to the ambition of the Paris Agreement and Agenda 2030, greater ambition for climate security and sustainable development is needed. The article outlines a vision for how the Global Goals can be a lever for more ambitious climate action, and provides guiding principles for the operationalisation of sustainable development provisions of Article 6 of the Paris Agreement.

6 Westermann, R., 2016. **Challenging Times: China is determined to launch its national ETS in 2017, but struggles with the complexity of setting up a well-designed carbon market**, *Carbon Mechanisms Review*, issue 4, pp. 32-39.

One of the cornerstones of China's climate policy for the next decades will be China's new national Emissions Trading System (ETS). It will go into operation in 2017 but, in spite of important progress achieved, it still faces some huge obstacles. The article focuses on the challenges, risks, and rewards of the difficult transition that China will need to go through from the seven existing ETS pilots to a fully operative national scheme.

6 World Bank, Ecofys and Vivid Economics, 2016. **States and Trends of Carbon Pricing 2016**, *The World Bank, Washington DC, United States*.

Already about 40 countries and over 20 cities, states, and regions are putting a price on carbon, in total covering about 13% of global GHG emissions. The report provides an overview of existing and emerging carbon pricing initiatives, an analysis of how to align carbon pricing with the broader policy landscape, and an assessment of the potential for an international carbon market after the Paris Agreement.

6 World Bioenergy Association, 2016. **FES 2030 - After COP 21 (Paris): Fossil Exit Strategy 2030 for Europe**, *World Bioenergy Association, Stockholm, Sweden*.

This position paper by the WBA was launched just before COP22 in Marrakesh. It promotes an energy transition away from fossil fuels and into renewable forms of energy, by introducing a global carbon tax, rapid deployment of solar, wind and biomass based electricity generation systems on feed in tariffs, better mobilization of biomass resources and no new investments in fossil fuel infrastructure.

JIQ Meeting Planner

16-19 January 2017, Abu Dhabi, UAE

10th World Future Energy Summit

Info: WorldFutureEnergySummit.com

27 Feb.-2 March 2017, Cape Town, South Africa

International Conference on Climate Services 5:

Innovation and Capacity Building

Info: climate-services.org/iccs/iccs5

2-5 April 2017, Sitges, Spain

1st International Conference on Energy Research and Social Science

Info: ERSSconference.com

21-22 April 2017, Cambridge, United Kingdom

9th International Conference on Climate Change:

Impacts & Responses

Info: on-climate.com/2017-conference

8-18 May 2017, Bonn, Germany

46th Sessions of the UNFCCC Subsidiary Bodies

info: UNFCCC.int/meetings/items/6240.php

18 May 2017, Netherlands (venue TBA)

Solarplaza: The Solar Future NL 17

Info: en.thesolarfuture.nl

22-26 May 2017, Barcelona, Spain

Innovate4Climate: Finance and Markets Week

Info: innovation4climate.com

5-9 June 2017, Glasgow, United Kingdom

3rd European Climate Change Adaption Conference:

Our Climate Ready Future

Info: ecca2017.eu



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.

Chief Editor:

Prof. Catrinus J. Jepma

- Chairman of JIN Climate and Sustainability
- Professor of Energy and Sustainability at University of Groningen, the Netherlands

Editors:

Anna van der Gaast-Witkowska

Wytze van der Gaast

Erwin Hofman

JIQ contact information:

JIN Climate and Sustainability

Laan Corpus den Hoorn 300

9728 JT Groningen

The Netherlands

phone: +31 50 5248430

e-mail: jin@jin.ngo

website: www.jin.ngo

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