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Carbon crediting far from over

In the run-up to the Kyoto Protocol in 1997, Joint Implementation (JI) was a heavily debated negotiation topic. In 1992, JI had been included in the UNFCCC as an option for developed countries to implement national policies and measures on climate change mitigation 'jointly with other Parties' (UNFCCC 1992, Art. 4.2a). Soon after that, JI was criticised by developing countries as an excuse for delaying developed countries' domestic climate investments. At the first COP in Berlin (1995), JI only survived as a pilot programme, called Activities Implemented Jointly (AIJ).

Quite surprisingly, in the Kyoto Protocol of 1997, JI was operationalised in full shape as a project-based cooperation among developed countries (dubbed 'JI') and between developed and developing countries (as the Clean Development Mechanism or CDM). Under the Kyoto Protocol, over 8,500 CDM and over 750 JI projects were initiated. Next to the reported GHG emission reductions (credits), these projects resulted in enhanced methodologies for calculating GHG emission reductions and trained professionals for project preparation and implementation and verification.

Since 2012, howver, after the first commitment period of the Kyoto Protocol, market perspectives for JI and CDM under the UNFCCC have worsened. Also prospects for JI and CDM credits within the EU emissions trading scheme (ETS) have become weak.

On top of it all, a study on JI by the Stockholm Environment Institute[1] concluded during the summer of this year that "about three-quarters of JI offsets are unlikely to represent additional emission reductions."

The study shows that this problem is mainly related to the so-called JI Track I projects. Under JI, developed countries with a good GHG book-keeping system could use the more flexible JI Track I. This practically meant that no external validation and verification under the UNFCCC was required. Should countries be easy on the baseline and additionality rules, then this would appear in the Kyoto Protocol book-keeping as a mistake to be corrected.

SEI concludes that mainly two JI host countries (Russia and Ukraine) enabled selling of non-additional emission reductions to foreign investors as carbon credits and that, apparently, the Kyoto Protocol book-keeping procedures could not prevent that. The good news is that most other JI host countries have performed reasonably well. The bad news is that many EU installations seem to have purchased carbon credits that were not backed up by real emission reduction.

This does not mean that the concept of JI (and CDM) has failed. However, without a strict carbon accounting regime and compliance procedures, JI (and CDM) project collaboration without external validation and verification is not wise.

Despite the bleak prospects for JI and CDM, carbon crediting through project cooperation is far from over. As reported elsewhere in this issue, several parties and their governments in EU Member States are considering domestic systems for additional emission reductions with carbon credit trading. These parties continue to appreciate the role of markets in adding value to projects with GHG emission reductions. Dutch local climate funds use offsetting projects to create awareness among citizens, who can recognise the carbon credits as 'Made in Holland'.

It is striking to see though that most of the Parties that intend (in their Intended Nationally Determined Contributions, INDCs) to use international carbon markets, are developing countries. Only a few developed countries consider using international carbon markets for meeting their targets. In twenty years time of climate negotiations, a lot has changed.

JIQ editors

[1] Has Joint Implementation reduced GHG emissions? Lessons learned for the design of carbon market mechanisms; Anja Kollmuss, Lambert Schneider and Vladyslav Zhezherin, Stockholm Environment Institute; anja.kollmuss@sei-international.org

In this issue

Carbon Emissions Trading in China: The Evolution from Pilots to a Nation-wide Scheme

By ZhongXiang Zhang*

Prof. ZhongXiang Zhang

In an earlier issue of JIQ (April 2015), I provided an overview of the seven pilot schemes in China for GHG emissions trading ("Crossing the River by Feeling the Stones: the Case of Carbon Trading in China"). This article draws on Zhang (2015), and discusses the evolution from pilot schemes into a nation-wide carbon trading scheme in China.

The seven carbon trading pilots in China taken together cover slightly over 2,000 entities, with the total amount of allowances capped at 1.2 billion tons of CO_2 emissions (DCCNDRC, 2015). As of 16 July 2015, the total accumulated volume of traded allowances in the pilots reached 38 Mt CO_2, corresponding to a value of CNY 1.1 billion (US$160 million) (Zhao, 2015). Two prevailing views exist on how a national carbon market can be developed along a regional pathway, . One view is to continue expanding the existing carbon pilots in terms of geographical coverage and sectoral scope. According to the second view, new pilots are to be authorized so that due to a growing number of pilots a larger region is covered by emissions trading.

As the National Development and Reform Commission (NDRC) has not approved any new carbon pilots since the approval of the seven pilots in October 2011, this could be interpreted as China possibly attempting to expand into a national carbon market based on the seven pilot carbon markets but not along a regional pathway. Indeed, both speeches by senior NDRC officials and the NDRC policy document indicate that a nationwide carbon market is to be established as early as 2016 (DCCNDRC, 2015; Lin, 2015), although the preparation work could well delay it to late 2017.

The issue then is how to establish a national carbon market. In December 2014, NDRC (2014a) released the interim measures for carbon emissions trading, which provide some legal basis for a national ETS. In my view, there are two ways to move in the direction of a national carbon market. One way is to establish a nationwide ETS by linking those existing pilot carbon trading schemes that meet all the qualification conditions into a nationally linked system. Another option is that China establishes a national ETS. Until a fully-fledged national ETS is established and operational, the regional schemes continue to function in parallel. Entities covered by the existing regional pilots will be unconditionally integrated into a nationwide ETS if they meet the threshold set by a nationwide regime, which is expected to be much higher than the ones set in most of the existing regional carbon trading pilots. Which option fits better in China's specific situation is a highly policy-relevant issue, and deserves further investigation.

Nation-wide emissions trading

NDRC has been preparing for launching a nation-wide ETS. In January 2014, entities emitting 13,000 tCO_2-eq. or consuming at least 5,000 tonne coal equivalent per year (2010 data) were required to report their carbon emissions annually (NDRC, 2014b). The reporting should be based on the accounting and reporting guidelines for the ten sectors identified by NDRC (GONDRC, 2013). In December 2014, NDRC issued guidelines for another four sectors covering oil and natural gas, petrochemical, coal, and coking (GONDRC, 2014), and released the interim measures for carbon emissions trading (NDRC, 2014a).

With all these preparations, it seems that China has opted for the second option of establishing a national ETS, and that the central government will determine the coverage of GHGs and scope of sectors included in the national system. A senior NDRC official announced in February 2015 that China initially plans to include six sectors in its national ETS: power generation, metallurgy, nonferrous metals, building materials, chemicals, and aviation. The threshold for an entity to be part of the national scheme will be set at 26,000 tons of CO_2-eq. per year (Lin, 2015), which is twice the level set for the above-mentioned threshold for required GHG emission reporting (NDRC, 2014b). It is expected that the national ETS will initially cover about 10,000 entities with an estimated market size of three to four billion tonnes of CO_2-eq. emissions (Lin, 2015). While the recent NDRC estimate has lowered the market size to two to three billion tonnes of CO_2-eq. emissions, this would still make China's ETS the world's largest emissions trading scheme. With a three-year

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pilot phase, such a nationwide carbon market will become fully functional after 2019 (DCCNDRC, 2015; Lin, 2015).

Challenges

There will be a number of challenges though, of which I highlight two below. First, in order to create reliable allowances that can be compared across sectors and regions, it is important to ensure that all emissions data are properly measured, reported and verified (MRV). For that, a national ETS legislation needs to be established to provides uniform guidelines and methodologies on design and operation of ETS and enforcement of MRV, including penalties for non-compliance. Such legislation would ascribe allowances as financial assets and environmentally-credible reductions.

The recently released interim measures for carbon emissions trading (NDRC, 2014a) are a move in this direction, but in my view this is not enough. In particular, the provisions which govern emissions trading across regions in the form of interim measures, need to be elevated to a level of greater legal strength, ideally to national law. Realising that such a process may take a great deal of time, their elevation to at least the level of State Council regulation is essential, because disputes could become more intensive and frequent as the carbon market expands beyond the institutional jurisdiction of administrative regions.

The management of the national ETS seems to take place at two levels. The central government should be in charge of setting national rules for, among others, coverage and scope of the ETS, uniform standards for MRV, the allocation of allowances, and the rules of compliance across provinces or equivalent. In the meantime, provincial governments should be assigned to take responsibility for implementation and enforcement of the rules.

This includes, but is not limited to, identifying the entities covered and determining their emissions, calculating the amount of free allowances to the entities covered and, once approved by the central government, distributing these allowances to the entities, and implementing compliance rules. Provincial governments should be allowed to set even stricter rules than the national rules. For example, they could increase the coverage of sectors and the scope of entities, and have even stricter allocation rules of allowances (NDRC, 2014a).

Price uncertainty

Price uncertainty and market stabilization are expected to become even bigger issues in a nation-wide ETS than they have been in the pilots. The pilots reserve some allowances for cost-containment purposes, but it has been difficult to determine the appropriate amount for that as triggering conditions have not yet been disclosed for most of the pilots. For instance, even though the Beijing pilot ETS has determined a 'trigger price' for releasing allowances from the market reserves (based on the average price of allowances over ten consecutive trading days), it remains unclear whether the amount of reserved allowances is sufficient at that trigger price.

If the trigger price is set too low, there is a risk that the reserve decreases quickly. For example, should one region get into trouble while other regions do not sell allowances for whatever reasons, the market price will rise. With a low trigger price, the market price then reaches the point of releasing allowances from the reserve into the market relatively quickly. Later on, should other regions face similar problems, there might be no or insufficient allowances left in the reserve. A too high trigger price,

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on the other hand, could make compliance with ETS commitments for installation rather costly.

In my view, in order to address price uncertainties, it would be easy and effective to introduce both a price ceiling and a price floor in the pilot trading scheme. A floor price will remove downside risks for investors while delivering their objective of cutting carbon emissions efficiently. Setting a price ceiling is very helpful to limit the potential market power of a given larger player in a small, fragmented market. The ceiling could be set in relation to the prevailing international prices, as suggested by the proposed Australian ETS (Jotzo, 2012), which is relatively straightforward.

However, setting a price floor is not that easy. Detailed sectoral, regional and countrywide studies on carbon abatement can provide some basis for a price floor. Given that the cost of abating GHG emissions differs widely among sectors, a price floor should be set to be higher than the lowest abatement cost projected for the trading sectors. This will encourage carbon abatement in some sectors for which meeting emissions targets through their own actions is relatively difficult and costly. The price floor should be no less than any carbon tax levels to be introduced. If the world community can agree upon common pricing, either in the form of a harmonized carbon tax (Nordhaus, 2006) or a minimum carbon price under a cap-and-trade regime, then it could be set as a floor price (Weitzman, 2014).

Domestic Carbon Market Initiatives in Europe - Experiences and Opportunities*

Workshop Report

An increasing number of companies, organizations and governments want to take action beyond the UNFCCC negotiations and instruments by way of voluntary compensation of greenhouse gas emissions (GHG). For that reason, several European initiatives are developing domestic offset systems that have the potential to achieve emission reductions that go beyond the EU ETS. Furthermore, domestic offset systems could foster innovation, deliver co-benefits for the region and bring forward voluntary methods as blueprints for compliance markets.

It is therefore vital to explore how to join efforts and scale up the impact of domestic carbon offsetting across Europe in order to contribute to ambitious climate action and to support the transformation towards low-carbon economies. For this reason, the Gold Standard Foundation and the German Federal Environment Agency (UBA) organised an expert workshop on domestic carbon initiatives in Europe on 19 June 2015 in Berlin, supported by adelphi.

The expert workshop facilitated the dialogue among representatives and/or practitioners from domestic offset initiatives in Austria, Belgium, France, Germany, the Netherlands, Switzerland, Spain and the United Kingdom. Representatives from each initiative shared their knowledge on domestic offset projects and altogether provided a clear picture on current carbon offset activities within Europe.

Domestic offsets - snapshots from across Europe

The French representative, **Jean-Claude Gazeau** (Ministry of Ecology, Sustainable Development and Energy of France), highlighted the difference between larger industrial projects, where domestic offsetting functioned as an "ante room" before being transferred to the EU ETS, and smaller projects, which were more innovative but generated fewer GHG reductions. These smaller projects were often characterised by slow investigation and instruction procedures, as well as high transaction cost relative to their size.

Overall, the role of domestic offset projects in France is primarily seen as an innovation tool among other existing tools, which are the CCE (contribution climat énergie, French carbon tax) and the EU ETS. In order to promote innovation, domestic offset projects need to be integrated into other mitigation tools. According to Mr. Gazaeu, the success of domestic offset projects can partially be attributed to the fact that, in contrast to EU ETS, measures with a volume of less than 1 Mt CO_2-eq. can be included.

The German representative, **Stephan Wolters** (adelphi), shared his findings on domestic offset initiatives that follow from a comprehensive market analysis on voluntary carbon offsets in Germany. The study showed that the volume of the voluntary market in Germany is increasing and that there is a high preference among consumers for domestic projects, which is a positive signal and an opportunity for domestic carbon offset projects. However, this is not yet reflected at the supply side due to an undersupply of projects in Germany.

* Based on workshop report *Domestic Carbon Initiatives in Europe: Experiences and Opportunities* by Daria Ivleva, Katharina Nett, Regina Treutwein and Stephan Wolters (forthcoming), Berlin: adelphi. Commissioned by Umweltbundesamt. Shortened version for JIQ edited by Lennard Duursema

While consumer preferences for national standards can be considered good news to domestic initiatives, the survey also revealed that the country of origin is not the key decision factor for consumers choosing their offset projects. More decisive factors are co-benefits, quality standards, and the price.

Overall, the German voluntary offset market is growing. However, the confusing and not transparent market is a key challenge for bringing across advantages of domestic offsets. Exchange and cooperation at European level can help to overcome this challenge by fostering mutual learning and creating a more transparent market.

In line with the German findings, the Austrian representative, **Dorian Frieden** (JOANNEUM Research Forschungsgesellschaft mbH, Graz) highlighted that the high demand for domestic projects offers opportunities for domestic initiatives. At the same time, customer diversity and their respective level of information have been an important challenge. While customers need to be aware of what they obtain, complex technical issues of the market, such as double-counting, are difficult to be transferred to the customer level. The complexity of these issues and the heterogeneity of the market bring about the risk of losing customer trust if the right level of information and transparency is not met.

Similarly, the Dutch voluntary market demonstrated interest in national projects. According to **Jos Cozijnsen** (Consulting Attorney on Emissions Trading), clear communication is very important in order to keep transparency in the domestic carbon market high. The particular benefit of local projects is that they enhance visibility, local ownership and awareness for carbon emission reduction. Still, progress needs to be achieved to increase transparency and credibility of local offsets and to work towards a 'lean and mean' system.

Arnaud Brohé from CO2logic, an offset provider based in Brussels, and **Luc Wittebolle** from SuMa Consulting in Antwerp, presented the framework for domestic carbon offsetting projects in Belgium, highlighting different approaches in Wallonia and Flanders. The situation in Belgium is specific, as each region, as well as the federal level, has its own Minister of the Environment and is responsible for designing its climate policy to achieve the national and EU targets for non-EU ETS sectors. Domestic offsetting mechanisms, which are perceived as a cost-effective way to decrease CO_2 emissions, are therefore discussed at the regional level.

The Swiss representative, **Aric Gliesche** (Federal Office for the Environment – FOEN / BAFU, Switzerland), noted that one of the key challenges of the Swiss offset scheme is the monopoly of information and of prices that fossil motor fuel importers have. Consequently, the price is fixed by one player, and it does not reflect supply and demand. Moreover, transaction costs are still comparably high and the long processing time of project approval, validation and verification is a major issue.

Another difficulty lies in the small scale of projects in Switzerland: Swiss projects have an average volume of 4,500 tCO_2-eq. only, which significantly increases relative transaction and administrative costs for project validation, verification and certification. Scaling up will be an important issue post 2020 in order to reduce costs and scale up the volume.

Participants at workshop on Domestic Carbon Market Initiatives in Europe, Berlin, 19 June 2015

Lastly, Dr **Vicky West** discussed the UK Woodland Carbon Code (WCC), a voluntary standard for national woodland creation projects introduced in 2011. For the WCC, as for other domestic initiatives, visibility of the projects is highly relevant for companies. The fact that visiting the plantations and forests in the region is possible adds to the credibility and acceptance of the standard. However, many companies are still reluctant to buy WCC credits as their status within the national GHG account is still unclear. In order to address this problem, WCC credits could be 'formally' integrated into the UK's carbon account and it should be made more explicit where carbon credits come from.

Discussions

Five working groups debated on challenges and opportunities for domestic offset initiatives:

1 Flexibility mechanism under Effort Sharing Decision post 2020.
2 What can Europe learn from existing carbon markets? Sharing experiences from California and Spain.
3 How to ensure additional beyond carbon co-benefits in domestic initiatives?
4 How to account for projects in the national inventory?
5 What kind of dialogue and cooperation on carbon offsets in Europe?

In order to understand a domestic offsets project's real impact beyond the benefits in terms of climate change mitigation, it is necessary to identify and measure sustainable development co-benefits of carbon offsetting. This would also help to convince investors, governments and other stakeholders, and to achieve a higher carbon price. A comprehensive assessment of co-benefits and adverse effects beyond CO_2 reduction should be enhanced, while their measurement should support the initiatives and integrate practical considerations.

With regard to accounting project credits, double counting occurs when the environmental benefit of one greenhouse gas reduction unit appears in several contexts, such as national inventories, national emission trading schemes and registries of independent standards for voluntary and compliance markets. There are several sub-categories double counting can refer to, but the most problematic case is double monetization. This occurs when the emission reduction benefit is made available for accounting or trade under multiple mechanisms, *e.g.*, under an international standard like Gold Standard and under a national scheme (typically an emission trading instrument or a carbon tax).

Overall, there is a compelling case for maximum simplicity and transparency in the communication to businesses and individuals. Increasing trust in domestic offsetting is a key task ahead which will require additional efforts to communicate clearly. Emphasizing the opportunities of voluntary carbon trading may offer a more fruitful approach than concentrating on its limitations, *i.e.*, there is a need for moving from a problem-focused double counting approach to an opportunity-focused transparent accounting approach. In any case, the lively debate showed that there is not yet a clear way forward and that there is a need for more in-depth discussions.

The way forward

The conference proved to fill an important gap by bringing together actors and experiences on domestic offsets from across Europe and therefore provided a vital, productive first step in an effort to institutionalize mutual learning and to establish a forum for coordination.

More specifically, the following key lessons and recommendations emerged from the conference:

- **Learn from domestic offset initiatives**: These incentivize additional efforts to protect the climate beyond mandatory measures. Furthermore, the voluntary carbon market fulfils an important 'sandbox' function that allows exploring useful innovative ideas for climate protection.
- **Institutionalizing deeper cooperation**: There would be great benefits in intensifying cooperation due to heterogeneity of domestic offset initiatives across Europe. Promising activities include the development of joint concepts and a joint approach to regulatory challenges, such as the double counting issue.
- **From double counting to transparent accounting**: There seems to be no easy solution on how to harmonize approaches and on how to overcome all inconsistencies and challenges with respect to double counting. However, a consensus is emerging that it will be more fruitful to focus on adopting a transparent approach, based on clear information on emissions and their respective reductions.
- **Continued need for a platform dialogue**: at the workshop there was consensus about the need for continued space for mutual learning and exchange.
- **Provide adequate finance**: All of these efforts require financing. The suggested activities can yield great benefits in particular to policy-makers. Environmental ministries and agencies should hence support such work, ideally in an internationally coordinated manner and possibly with EU involvement.

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Energy Efficiency Obligation Schemes Outside the EU What can the EU Learn?

By Nick Eyre[1], Tina Fawcett[1], Vlasios Oikonomou[2], Niki Artemis Spyridaki[3], Jose Vega Barbero[4], Chris Tourkolias[5]

Article 7 of the European Union's Energy Efficiency Directive (EED) and its technical requirements (for instance additionality of savings and calculation methods) have generated a series of debates and arguments among EU Member States. The EU-funded Intelligent Energy Europe project ENSPOL (Energy Saving Policies and Energy Efficiency Obligation Schemes in Europe) sheds some light in this process through a series of workshops, trainings and observatories, both at the level of the EU and the Member States.

Thus far, the Energy Efficiency Obligation (EEO)[6] schemes dominate in the intentions of policies of most EU Member States (MS) in order to comply with the Article 7. To this end, policy experience of EEOs in the EU is clearly the most directly applicable. However, the use of EEOs is not unique to the EU, as there is significant (and in some cases much longer) experience of this type of policy instrument worldwide.

The diversity in the various EEO schemes, mainly found in several forms in the USA (California and Massachusetts), Canada (Ontario), Australia (Victoria), India, Brazil, China and South Korea, refers to the various levels of energy saving obligations and their links to climate or renewable energy policy targets, to the market players as obliged parties and their position in the energy supply market chain, to the types of markets (often merged with carbon markets or 'white-certificate' markets) and the overall design characteristics.

USA

The Californian obligation scheme applies energy saving obligations to natural gas and electricity suppliers, as these are the energy sectors regulated by the California Public Utilities Commission, and there are considerations for expanding them into water supply. In essence, these activities cannot be considered as obligations per se, but a commercial response by investor-owned utilities to a regulatory framework in which they make larger profits by undertaking energy efficiency actions than by not doing so. Evaluation processes are clearly defined and sophisticated.

The Massachusetts energy efficiency and climate policies are embedded primarily in the Global Warming Solutions Act and the Green Communities Act. The later required a comprehensive piece of energy reform legislation promoting development of renewable energy, energy efficiency, "green communities," and implementation of the Regional Greenhouse Gas Initiative. Under this Act, electric and natural gas distribution companies have increased their investment in energy efficiency, consistent with the goal of achieving all energy efficiency that is cost effective or cheaper than supply.

Australia

The Victorian Energy Efficiency Target scheme imposes a legal obligation on energy retail companies to reduce their GHG emissions. For each three-year phase, specific state-wide targets for energy savings are placed which results in a number of energy efficient products, assets and services being made available to the domestic and business sector discounted.

Canada

The Energy Efficiency Obligation Scheme in Ontario establishes specific obligations and energy efficiency targets on electricity distributors. Each licensed electricity distributor had to implement Board-

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6 EEOs require energy companies to achieve yearly energy savings of 1.5% of annual sales to final consumers. In order to reach this target, companies have to carry out measures which help final consumers improve energy efficiency. This may include improving the heating system in consumers' homes, installing double-glazed windows, or better insulating roofs to reduce energy consumption.

Approved CDM programmes, Ontario Power Authority-Contracted Province-Wide CDM programmes or a combination of the two alternatives.

India

India published its National Action Plan on Climate Change in 2008, with a comprehensive policy framework to achieve national growth objectives (strengthen energy security, reduce energy deficit and enhance global competitiveness of Indian industries) with climate change mitigation and adaptation targets. This framework consists of four strategies, where in terms of energy efficiency the National Mission for Enhanced Energy Efficiency (NMEEE) is the most relevant one. The NMEEE consists of four main initiatives, the Market Transformation for Energy Efficiency, the Framework for Energy Efficient Economic Development, the Energy Efficiency Financing Platform, and the Perform Achieve and Trade Scheme.

Reduction of energy demand

In all these forms of EEOs, policy design is influenced by the specific economic and political context of the jurisdiction and the design is strongly affected by the governance of energy industry. However, there are some general conclusions that can be drawn for the EU MS that implement or plan to adopt an EEO scheme.

As a background, the policy objective of EEOs is invariably the reduction of energy demand, either absolutely or below the business as usual trend. There is a range of broader policy objectives that can underpin this objective, including economic, environmental, energy security, industrial policy and a combination of all of these. The metric of energy saving (final energy, primary energy, peak demand, carbon, *etc.*) provides some insight into the main driver. However, as it is also influenced by history and evaluation issues, it is not necessarily a reliable indicator of all policy goals. There is evidence that the breadth of benefits of energy efficiency allows policy stability even when the primary goal changes. In some cases in the USA, there is an explicit comparison between energy efficiency and supply, with the targets determined with respect to cost effectiveness of energy efficiency and the concept of energy efficiency as a 'preferred resource'.

The design of EEOs reflects both the stated policy goals and the institutional and market framework of the jurisdiction. In most cases outside the EU, EEOs address privately owned, regulated utilities, but with a variety of levels of competition and types of market. In the USA, there is partial (Massachusetts) or no (California) retail competition and a mixed system of energy utilities dominated by large privately owned utilities. Regulation incentivizes utilities to undertake energy efficiency programmes through design of price controls rather than quantitatively specified obligations. In Victoria, there is a fully competitive retail market with the EEOs placed on retail companies that are not price regulated. Ontario is in an intermediate position with a competitive retail market are EEOs on the distribution utilities. This is often the case in the EU MS, where existing and planned EEOs range from competitive to monopoly energy supply or distribution markets.

Cost-effectiveness

These jurisdictions design, deliver and evaluate EEOs through electricity and gas utilities (distribution, retail or bundled companies). EEOs are therefore limited to the regulated energy markets of gas and electricity rather than being more broadly based across a wider group of fuels. Design is intended to incentivise delivery that is cost-effective. In the case of the US states examined this includes explicit consideration of the cost-effectiveness of EEO programmes in comparison to new supply, with price regulation adjusted through 'decoupling' to ensure utility profits are consistent with this goal. In Ontario, the distribution companies have a performance incentive with a similar aim. In competitive retail markets in Victoria, where as in Europe fixed quantity EEOs are used, it is assumed that retail competition incentivizes efficient delivery. Only in Victoria is cost-effectiveness in doubt.

We conclude that EEOs are a viable policy instrument across a range of ownership and regulatory structures, including all those compliant with EU electricity and gas regulation. In these jurisdictions, EEOs are not restricted to specific sectors, while there is either no restriction on the range of technologies or a wide scope of prescribed technologies. However, the use of other policies and cost-effectiveness drivers tends to focus the use of EEOs on specific areas.

In practice, in all cases the main focus is on energy use in existing buildings (residential and non-residential), in particular fabric and heating system improvement for gas, as well as heating, ventilation, air conditioning (HVAC), lighting, appliance and standby power control for electricity. India has a very different approach with EEOs placed on industrial energy consumers, of which electricity generation companies form the largest, but far from only, sector. Smaller energy users are outside the system. This very different focus appears to relate to India's position as a newly industrializing country. Its relevance to the EU may therefore be limited, but it does show the feasibility of extending EEOs far beyond regulated network utilities.

In all cases examined, energy savings are significant, but there are several cases of less well-designed and less ambitious EEOs. The different metrics used across jurisdictions (gas and electricity, energy and carbon, annual and cumulative, annual and lifetime) roughly indicate that the scale of the obligations across the

regulated sectors is ~1% of demand reduction annually, *i.e.,* of the same order of magnitude of the requirements of Article 7 of the EU Directive. Overseas experience is therefore consistent with the view that EEOs can, as intended, play a significant or dominant role in the scale of energy efficiency improvement mandated by Article 7.

Equity issues

As with any policy instrument, EEOs raise equity issues among policy makers. In the jurisdictions where EEOs are placed on gas and electricity utilities, the energy efficiency measures benefit some end users and lead to increased retail costs for the utilities, which can be expected to fall on the broader group of utility customers. In other words, EEOs raise energy prices to some extent and redistribute resources from the wholesale customer base to programme beneficiaries. The extent to which these impacts are problematic depends on the social and political context, as well as specific design issues. In many cases, there are programmes focused on low income households, funded out of EEOs or otherwise, that address the most obvious potential inequalities. In India both the costs of investment and the savings benefits accrue to the individual obligated company.

Broader package

In practice, all jurisdictions use EEOs as part of a broader package of energy efficiency policies, recognizing that EEOs may not be the most efficient or effective way to deliver research and development (R&D), improved efficiency products or community engagement. The consensus of experts is that product and building standards play an important role in energy efficiency policy as a whole and cannot realistically be substituted by EEOs. Most EEOs are designed in such a way that savings are only credited from a baseline determined by the relevant product standard (or market average performance), so that standards and EEOs are generally additional. Moreover, there is a consensus that R&D and information programmes are complements to support for individual measures, but as these cannot be easily funded by EEOs, the savings are more difficult to evaluate.

Future challenges

There is also concern amongst experts about the usefulness of EEOs for future challenges, even those highly supportive of EEOs in jurisdictions where they are used successfully. Essentially, the concerns arise from two issues. The first is that, as low cost energy efficiency measures are used and energy efficiency programme costs rise, this will be reflected in energy prices and cross-subsidies, which may become politically problematic (even where still cost effective).

The second concern is that whilst some energy companies are well-placed to deliver energy efficiency, especially low cost and straightforward measures, they are not necessarily the best placed organizations to undertake major building refurbishment and therefore that implementing energy efficiency programmes in this way may restrict the innovation that will be needed.

Recommendations

Based on this overseas experience, the recommendations for policy makers in the EU using and considering EEOs are as follows:

- EEOs should set ambitious goals, at least after a learning phase, *i.e.*, at a level of the order of magnitude of 1% annually.
- EEOs can be used in a variety of market structures, but the details of design need to reflect this structure.
- Obligated utilities should be either required or incentivized effectively, *i.e.*, with penalties or incentives that make non-delivery less profitable than delivery.
- EEOs should be designed to focus on delivering benefits over and above those that will result from minimum standards.
- EEOs should not be used alone, but as part of policy packages that include minimum standards, support for innovation and consumer engagement.
- Policy makers should continue to investigate innovative approaches to delivery using actors other than energy companies.

http://enspol.eu

TRANSrisk – Transition Pathways and Risk Analysis for Climate Change Policies

In September of this year, under the EU Horizon 2020 programme, the project TRANSrisk started with the objective 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. TRANSrisk will be implemented between September 2015 and August 2018 and is coordinated by the University of Sussex (UK).

High degree of uncertainty

Fundamental transformations are required in order to move towards low emission, sustainable, and climate-resilient economies. An example of what such a transformation may look like is the EU Roadmap for moving to a low emission economy by 2050. It indicates how the main sectors responsible for Europe's GHG emissions (namely power generation, industry, transport, buildings, construction and agriculture) could make a transition to a low emission economy in a cost-effective manner and at the same time boost Europe's economy through innovation and investment in clean technologies.

TRANSrisk ("Transitions pathways and risk analysis for climate change mitigation strategies") acknowledges the importance of quantitative modelling exercises, such as carried out for the EU Roadmap. At the same time, it realises that models concerning the future climate evolution and its impacts, as well as models assessing the costs and benefits associated with different mitigation scenarios, face a high degree of uncertainty. Consequently, policymakers need robust estimates of the costs and risks associated with climate change, as well as of the costs, benefits and co-effects related to different mitigation scenarios and, even more, ways to devise policies that are robust against uncertainty.

At the same time, the issue of public acceptance (or lack thereof) of low emission (technology) options should be accounted for, leading to a necessary modification of the least-cost way of thinking. For instance, a lack of public acceptance could halt introduction of technically and economically feasible options. These risks and co-effects of mitigation pathways[1] related to technological innovation are often not sufficiently understood and quantified, and therefore are not appropriately included into the policy design. Stakeholder input is therefore essential for scenario development. For instance, stakeholders, as practitioners, can give a better indication of how a market, supply chain, *etc*., may respond to policies.

Novel assessment framework

With respect to these observations, TRANSrisk has two main objectives:

1. To create a **novel assessment framework for analysing costs and benefits of transition pathways**, where uncertainty is at the heart of policy design rather than accounted for through sensitivity analysis at the end of the analysis. An innovative framework will integrate well-established approaches to modelling the costs of resilient, low-emission pathways with a wider interdisciplinary approach including risk assessments.
2. **Designing a decision support tool for decision makers**, which should help policy makers to better understand uncertainties and risks and enable them to include risk assessments into more robust policy design.

Towards these objectives, the work of TRANSrisk is structured in the following workpackages:

[1] In this article, the distinction between a scenario and a pathway is that the first refers to a 'plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces...and relationships" (IPCC definition in Allwood et al., 2014). Pathways are treated in TRANSrisk as (possible) 'courses of action' whereby choices made can be based on insights from scenario analysis.

Box 1. TRANSrisk consortium

Partner		Country
1. Prof. G. MacKerron (coord.)	SPRU, Science Technology Policy Research, University of Sussex	UK
2. Prof. M. Gonzalez Eguino	BC3, Basque Centre for Climate Change	Spain
3. Dr. A. Anger-Kraavi	Cambridge Econometrics	UK
4. Dr. J.P.M. Sijm	ECN, Energy Research Centre of the Netherlands	The Netherlands
5. Prof. A. Patt	ETH Zurich, Swiss Federal Institute of Technology (funded by Swiss Government)	Switzerland
6. P. Lewandowski	IBS, Institute for Structural Research	Poland
7. Dr. W.P. van der Gaast	JIN Climate and Sustainability	The Netherlands
8. Prof. H. Doukas	NTUA, National Technical University of Athens	Greece
9. Dr. F. Johnson	SEI, Stockholm Environment Institute	Sweden, Kenya
10. Prof. K. Steininger	UniGraz, University of Graz	Austria
11. Prof. A. Flamos	UPRC, University of Piraeus Research Center	Greece
12. Prof. Rodrigo Cerda	CLAPESUC, Ponthificial catholic University of Chile	Chile

Stakeholder analysis

Stakeholders represent the link between quantitative and qualitative techniques used in TRANSrisk. Their insights and domain knowledge, as well as perceptions and motivations, can help to formulate assumptions and "what-if" conditions for the quantitative models to assess the extent of synergies, conflicts, and risks associated with different technological pathways. Stakeholders also represent the institutional and social-economic innovations essential for driving technological innovations, including public acceptance of low-emission options. An illustration of what stakeholder consultation and application of models for low emission scenario could look like in TRANSrisk is shown in Box 2.

Synergies, conflicts and participatory scenario development

Synergies and conflicts are explored between different energy system pathways and other societal objectives, including sustainable development, health, and green growth. The work will consider co-benefits of low-emission pathways, including those arising from proportional changes in the energy mix (*e.g.*, reduced local air pollution), as well as impacts of improved energy efficiency or other resource constraints. Addressing this question also requires an explicit consideration of the indirect impacts on sustainable development via the macro-economic effects of alternative climate policies for the EU, other regions and at the global level. Understanding the conflicts will also help to identify blocking mechanisms to desired technological pathways.

Innovation policies and transition pathways

Innovation for a low emission future often takes place along complex pathways with involvement of multiple actors and consideration of existing policies, cultures, habits, *etc*. With the help of stakeholders and the models, TRANSrisk will explore such system dynamics in the case study countries. For that, the project will consider how different approaches towards climate and energy policy, as well as related policies across multiple sectors, can affect the process of innovation. Such approaches include the most-commonly modelled one, the imposition of a carbon price, alongside others, including specific technology support policies, or policies to achieve other objectives (*e.g.*, air pollution targets) that are synergistic with climate mitigation.

Assessing uncertainties and risks

Given the large uncertainties of model-based results, there are blurred boundaries between quantitative and qualitative methods and thus additional examination is required for:

1. The issue of the risk that a particular policy approach may not succeed in reducing emissions, which is determined by making the conditions for success of the different approaches explicit.
2. The health, safety, food supply, and security risks associated with particular technologies and technological systems, and which partly determine their public acceptance.
3. The economic risks that particular policy approaches may incur or alleviate, determined by running the energy systems models under multiple scenarios with respect to many of the core assumptions.

Case studies

In order to illustrate the ways in which the TRANSrisk frameworks for quantitative-qualitative analysis with corresponding tools, work in practice in national contexts, 15 case studies will be conducted. A second objective of the case studies is to give some policy-relevant indications to policy-makers about the risks and benefits of a range of possible future pathways for tackling climate change. National cases remain important, given that EU member states (as well as

non-European countries) retain primary responsibility for relevant policy areas, especially energy.

In-depth country case studies will be conducted in four EU Member States (Austria, Poland, Spain, UK) by supplementing model results by at least one round of stakeholder engagement to discuss, test and refine results (such as through the process illustrated in Box 2). Four other case studies will be carried out in Greece, the Netherlands, Sweden and Switzerland, but here the interaction between modelling work and stakeholder consultation will be less frequent, and mainly focussed on stakeholders' help to identify risks and uncertainties of possible low emission pathways.

Beyond the EU, TRANSrisk plans to carry out case studies in Canada, Chile, China, India, Indonesia and Kenya, following the approach of combining modelling results with stakeholder consultations in the countries concerned. In addition, there will be a global and regional case study exploring global low-emission scenarios, as well as regional scenarios for Europe, Africa, Asia, South America and North America. Also, the latter possible futures will be discussed with selected stakeholders.

Box 2. Collaboration between modellers and stakeholders for low emission pathways

Figure 1 illustrates what an iteration between models and participatory qualitative techniques in TRANSrisk could look like. It shows how, for instance, stakeholders and modellers together formulate their assumptions and constraints for low-emission pathways in the case study country. Subsequently, stakeholders can prioritise, from a longer list of (technology) options, those options that meet domestic economic, social and environmental criteria. Based on the prioritised low-emission options, the model can construct a low-emission scenario for the country based on stakeholder preferences. In a next stage, stakeholders can assess the limitations and opportunities for implementing the scenario within the country (using participatory tools for describing the relevant system or market for the scenario).

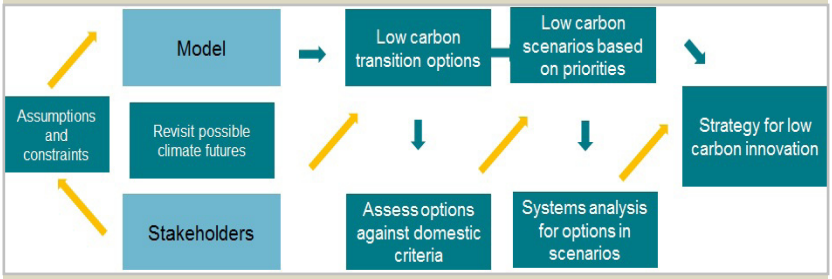

Figure 1. Illustration of possible iteration between model-based and participatory techniques for publically acceptable low emission scenarios.

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Figure 2. The TRANSrisk project team (Brussels, 24 September 2015)

Arens, C. (Editor-in-Chief), T. Forth, L. Hermwille, N. Kreibich, F. Mersmann, W. Obergassel, T. Wehnert, 2015. Looking Back into the Future: supporting projects at risk while paving the way for new schemes, Carbon Mechanisms Review, Issue 3, September-November 2015, Wuppertal Institute. http://wupperinst.org/
The magazine addresses the twofold challenge that international carbon markets presently face. Currently operating projects suffer from the market crisis and many actually run the risk of being discontinued. This issue of the Carbon Mechanism Review aims at taking up both challenges and reporting, for example, on a research activity that mapped the current status of CDM projects, analysing a sample of more than 70% of the registered CDM projects.

Moreover, the issue presents the results of the first auction under a new World Bank facility which supports methane CDM projects at risk. Regarding the future markets, the latest round of negotiations in Bonn is analysed.

Dransfeld, B., A. Kachi, D. Tänzler, S. Hoch, L. Ruthner and A. Michaelowa, 2015. Practicability of Transitioning from CDM to Future Climate Policy Instruments – synthesis report, Adelphi and Perspectives, Mülheim / Berlin, May 2015, http://www.perspectives.cc
Current trends in developing country approaches to climate policy show that market-based mechanisms will play an increasingly important role in the regulation of GHG. New mechanisms do not need to be invented "from scratch", but can build on existing elements and knowhow of established mechanisms such as the Clean Development Mechanism (CDM). The evolution of the CDM's regulatory framework and methodological toolkit shows that the CDM functions as a laboratory for upscaling of market mechanisms. This study explores options for future market-based mitigation frameworks in Non-Annex 1 countries, starting with the CDM and moving towards various possible forms of a multilateral new market mechanism (NMM) under the UNFCCC, domestic emissions trading schemes (ETS) or domestic non-ETS solutions implemented as Nationally Appropriate Mitigation Actions (NAMA).

Five potential transition options ("pathways") from the CDM to future mechanisms (such as the NMM or supported NAMAs) have been analytically developed. Each features a further step with the countries moving to implement independent domestic instruments, *e.g.*, under unilateral NAMAs. And each could serve as a potential progression of market-based climate policy instruments after the CDM.

European Environment Agency, 2015. Trends and projections in Europe 2015 - Tracking progress towards Europe's climate and energy targets.
http://www.eea.europa.eu/publications/trends-and-projections-in-europe-2015
The annual EEA 'Trends and projections' report provides an updated assessment of progress made by the EU and European countries towards their climate change mitigation and energy targets. It also presents some analysis of the progress made at the EU level in meeting longer-term policy objectives, where relevant data are available.

Kollmuss, A., L. Schneider and V. Zhezherin, 2015. Has Joint Implementation reduced GHG emissions? Lessons learned for the design of carbon market mechanisms, Stockholm Environment Institute, http://www.sei-international.org
This study systematically evaluates the environmental integrity of JI in the first commitment period of the Kyoto Protocol. The analysis indicates that about three-quarters of JI offsets are unlikely to represent additional emissions reductions. This suggests that the use of JI offsets may have enabled global GHG emissions to be about 600 million tonnes of carbon dioxide equivalent higher than they would have been if countries had met their emissions domestically. Of the six largest project types assessed in more detail, the study finds only one, N_2O abatement from nitric acid production, had overall high environmental integrity. The evaluation clearly shows that oversight of an international market mechanism by the host country alone is insufficient to ensure environmental integrity. The paper makes recommendations for the ongoing review of the JI Guidelines, for carbon markets generally, and for a new climate agreement.

Kossoy, A., G. Peszko, K. Oppermann, N. Prytz, N. Klein, K. Blok, L. Lam, L. Wong, B. Borkent. 2015. State and Trends of Carbon Pricing 2015 (September), by World Bank, Washington, DC.
Reflecting the growing momentum for carbon pricing worldwide, the 2015 edition of the State and Trends of Carbon Pricing report targets a wider audience of public and private stakeholders who are engaged in carbon pricing design and implementation. This report also provides critical input for the negotiations leading up to the COP in Paris. The report provides an up-to-date overview of existing and emerging carbon pricing instruments around the world, including national and subnational initiatives. Furthermore, it gives an overview of current corporate carbon pricing instruments.

To better reflect the plethora of topics being considered in the climate dialogue, the report also analyzes competitiveness and carbon leakage, and their impact on the development of carbon pricing instruments. The task team responsible for this report intends to select new relevant topics to be explored

in future editions. These topics could include, for example, the effectiveness of existing and emerging carbon pricing instruments, and how to measure it.

Finally, this year's report gives the audience a forward-looking assessment of the advantages of international cooperation in reaching stringent global mitigation targets. A review of existing modelling work provides a qualitative and quantitative assessment of cost-saving potentials and the magnitude of financial flows inherent to international cooperation aimed at reducing greenhouse gas emissions to a level consistent with the 2°C climate stabilization goal.

Marcu, A. and M. Elkerbout, 2015. The EU ETS Structural Reform for Phase 4: Views on European Commission Proposal, CEPS Carbon Market Forum. http://www.ceps-ech.eu

The 15 July 2015 European Commission proposal for EU emission trading scheme (EU ETS) structural reform is meant to provide the necessary changes, in the context of the of the 2030 framework for climate and energy policy and the EU, to ensure that the EU ETS can fulfil the role of central pillar of the EU climate change policy, which is how it is referred to in EU documents.

This paper looks at the overall result of the EU ETS structural reform, which includes back loading, the Market Stability Reserve and the current proposal, and asks the question: will the EU ETS, following the current package, be "fit for purpose" *i.e.,* the main driver towards a low GHG economy? While it is too early to answer in a definitive way, serious concerns seem justified regarding the performance of the final "EU ETS product".

The paper summarises the key changes proposed by the Commission, and reviews whether and how they take into account the guidance provided by the European Council. Additionally, it looks at how weaknesses and critique of Phase 3 (2020-2030) rules are addressed.

Obergassel, W., N. Sterk, 2015. Role of Market Mechanisms in Intended Nationally Determined Contributions, Wuppertal Institute for Climate, Environment and Energy, http://wupperinst.org/en/projects/details/wi/p/s/pd/429/

The market mechanisms CDM, JI and Art. 17 emission trading have been a central feature of the Kyoto Protocol. The shape of the new agreement for the period after 2020 is emerging only slowly, including the role market mechanisms will play. To gauge the potential scope of market mechanisms in the Paris agreement, this paper surveys the Intended Nationally Determined Contributions (INDCs) to the new agreement which countries have submitted. When the report was published (July 2015), twelve out of twenty-one Parties were considering to use international market mechanisms. The other Parties either do not discuss the issue or explicitly do not envisage use of international market mechanisms.

Of the twelve countries that may use international mechanisms, six discuss issues of environmental integrity and double counting: Canada, Ethiopia, New Zealand, Norway, South Korea and Switzerland. All six proclaim high standards. Seven Parties envisage use of domestic market instruments, including four that do not intend to use international mechanism: China, the EU, Gabon and Iceland. The other countries are Liechtenstein, Norway and South Korea.

The report concludes that the lack of emphasis on international markets in the EU's INDC is somewhat odd, given its strong engagement in the discussions on the reform of existing and the development of new mechanisms. According to the authors, the US silence on markets is similarly somewhat surprising, given that various US states and Canadian provinces are already engaging in cross-border emission trading.

Zhang, Z.X., 2015, Carbon emissions trading in China: the evolution from pilots to a nationwide scheme, Nota di Lavoro 38.2015, Fondazione Eni Enrico Mattei, Milan, Italy. Climate Policy, Vol. 15 (Supplement 1 on Climate Mitigation Policy in China Guest Edited by ZhongXiang Zhang)

The Chinese central government has approved seven pilot carbon trading schemes. These pilot regions are deliberately selected to be at varying stages of development and are given considerable leeway to design their own schemes. These schemes have features in common, but vary considerably in their approach to issues such as the coverage of sectors, allocation of allowances, price uncertainty and market stabilization, potential market power of dominated players, use of offsets, and enforcement and compliance.

The study finds that educating the covered entities, strictly enforcing compliance rules, ascribing allowances as financial assets and defining their valid duration, and including non-compliance in the credit record of non-complying entities are crucial to enabling active participation in carbon emissions trading. Moreover, the retrospective examination of the carbon trading pilots suggests that national emissions trading scheme (ETS) should at least be based on uniform standards for monitoring, reporting and verification, the allocation of allowances, and the rules of compliance. Until a nationwide carbon market will become fully functional after 2019, regional ETS continues to function in parallel but those entities covered in the existing regional ETS will be unconditionally integrated into a nationwide ETS if they meet the latter's threshold.

The **Joint Implementation Quarterly** is an independent magazine with background information about the Kyoto mechanisms, emissions trading, and other climate policy issues. *JIQ* is of special interest to policy makers, representatives from business, science and NGOs, and staff of international organisations involved in climate policy negotiations and operationalisation of climate policy instruments.

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Abbreviations

AAU	Assigned Amount Unit
ADP	Ad Hoc Working Group on the Durban Platform for Enhanced Action
Annex A	Kyoto Protocol Annex with GHGs and sector/source categories
Annex B	Annex to the Kyoto Protocol listing the quantified emission limitation or reduction commitment per Party
Annex I Parties	Industrialised countries listed in Annex I to the UNFCCC. Countries not included in Annex I are called Non-Annex I Parties
Annex II Parties	OECD countries (listed in Annex II to the UNFCCC)
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction (Article 12 Kyoto Protocol)
COP	Conference of the Parties to the UNFCCC
COP-MOP	COP serving as Meeting of the Kyoto Protocol Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
ERU	Emission Reduction Unit (Article 6 Kyoto Protocol)
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance (under the EU ETS)
GHG	Greenhouse Gas
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LCDS / LEDS	Low carbon (or emission) development strategy
LULUCF	Land Use, Land-Use Change and Forestry
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Programmes
PDD	Project Design Document
REDD	Reducing emissions from deforestation and forest degradation in developing countries
SBSTA	Subsidiary Body for Scientific and Technological Advice
SBI	Subsidiary Body for Implementation
TNA	Technology Needs Assessment
UNFCCC	UN Framework Convention on Climate Change

JIQ Meeting Planner

28-30 October 2015, Victoria Falls, Zimbabwe
5th Conference on Climate Change and Development in Africa (CCDA-V) - Climate Change and Sustainable Development: What is at Stake at Paris and Beyond?
Contact: http://www.climdev-africa.org/ccda5

9 November 2015, Berlin, Germany
Decarbonisation – 100% Renewable Energy and more – workshop hosted by German Federal Environment Agency (UBA)
Contact: uba_decarbonisation_workshop@ecologic-events.eu

23 – 27 November 2015, Paris, France
87th Meeting of the CDM Executive Board.
Contact: http://cdm.unfccc.int

8 - 10 November 2015, Paris, France
Pre-COP event hosted by the respective current and incoming COP presidents Peru and France

15-16 November 2015, Antalya, Turkey
G20 Leaders Summit, among others focussing on fossil fuel subsidie

30 November – 11 December 2015, Paris, France
COP21 and CMP11
Contact: http://unfccc.int/meetings/paris_nov_2015/meeting/8926.php