



# Carbon market mechanisms in future international cooperation on climate change

28 March 2015

Niklas Höhne, Carsten Warnecke, Thomas Day,  
Frauke Röser

Project 15002



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety

This work was carried out by NewClimate Institute with support from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). The contents of the report are the opinions of the authors and do not necessarily reflect the opinions of the BMUB.

## Summary

*Global carbon markets were first introduced as flexibility mechanism under the Kyoto Protocol. Such mechanisms remain an attractive option due to their potential to exploit cost-effective mitigation potential and activate the private sector.*

### ***The achievements of the Kyoto flexibility mechanisms are considerable***

The first commitment period of the Kyoto Protocol shows that private entities can be mobilised and the positive effects of markets can be achieved when stable demand exists.

- The Kyoto Protocol flexibility mechanisms have activated markets and exploited cost-effective mitigation potential. EU ETS installations are estimated to have saved EUR 550 million in 2011 by using CERs for compliance, Japanese firms with voluntary commitments used CERs to save approximately EUR 92 million between 2008 and 2011.
- Market based approaches have encouraged an enhanced level of engagement and buy-in from the private sector that may not be possible through traditional modes of regulation. The emergence of international initiatives and alliances demonstrates the success that market mechanisms have had in mobilising the private sector.
- The CDM has driven technology transfer and revolutionised industries in host countries; the evolution of the maturity of domestic technologies in the ten years since the onset of the CDM is profound.
- The CDM and JI stimulated large domestic and foreign investments in climate change mitigation activities. Total investments by 2012 are forecast to be in the order of USD 100 billion to USD 200 billion and investment leverage factors are large.
- The Kyoto Protocol flexibility mechanisms have diffused price signals for carbon and carbon pricing approaches around the world. 110 developing and 42 developed countries have been directly engaged in the buying and selling of carbon credits, and many regional, national and subnational carbon pricing instruments rely upon capacities built under the Kyoto Protocol flexibility mechanisms.

### ***The potential position of market mechanisms in a future international climate change agreement remains unclear***

Stable market conditions require a diversity of market participants for both supply and demand. After a period of relative stability between 2009 and 2011, the international market price of CERs has fallen quite dramatically. Large numbers of project activities are returning to pre-CDM conditions, and institutions, infrastructure and monitoring expertise for climate change mitigation projects are at risk of being demobilised and lost.

The progress of mainstream discussions on future potential international market based mechanisms, particularly the New Market Mechanism (NMM) and the Framework for Various Approaches (FVA), has been slow in recent years. Consequently, the potential position of market mechanisms in a future international climate change agreement remains unclear. However, the diffusion of regional, national and subnational initiatives has gained considerable momentum. By 2014, 40 countries and over 20 subnational jurisdictions, covering approximately 12% of global greenhouse gas emissions, had implemented instruments that put a price on carbon. Furthermore, the past year has seen the introduction of several innovative approaches to mechanism design, such as instruments that improve

flexibility to adjust to unforeseen economic circumstances (EU), and blended carbon pricing approaches where a carbon tax is combined with a credit offset mechanism (Mexico).

### ***Market mechanisms can form part of future international cooperation on climate change***

Three fundamental options exist for carbon market mechanisms in a future international cooperation on climate change:

#### **1. International markets as a mechanism for achieving contributions/commitments in a 2015 international climate agreement**

Countries that wish to use international carbon market mechanisms could opt to do so and use these mechanisms to achieve their proposed targets under a 2015 international climate agreement. The proportion of the target that is to be achieved domestically could be split from the proportion that is to be reached through market mechanisms. Additional emission reductions could be achieved if a designated proportion of transferable credits are retired or discounted. Several conditions are important for the functional integration of market mechanisms as a component under a 2015 international climate change agreement: trust in carbon market mechanisms must be built and restored, mechanisms must be coordinated with internationally negotiated and agreed rules and provisions must be applied to ensure high ambition of countries' individual contributions. A feasible approach could be based upon multilaterally agreed moving benchmarks, similar in format to proposed bilateral sectoral approaches.

#### **2. Carbon market mechanisms as implementation instrument for climate finance**

Developed countries agreed to mobilise USD 100 billion by 2020 for climate change mitigation and adaptation in developing countries. Such climate finance could include market design elements through the use of credit purchase programmes or results-based financing. Such approaches would ensure rigorous monitoring and accounting of emission reductions, and activate the private sector to leverage additional investments.

#### **3. Carbon pricing as a domestic implementation instrument of a national contribution with international cooperation**

Domestic markets or other carbon pricing mechanisms may be used to implement internationally proposed targets. Many examples of such instruments already exist. Such domestic instruments could feasibly be linked to domestic instruments in other countries independent of an international framework.

### ***Market mechanisms can narrow the emissions gap pre-2020***

A 2015 international climate change agreement is scheduled to enter into force after 2020. Furthermore, market mechanisms can be used as a tool to narrow the emissions gap before 2020.

The mitigation impact of existing market mechanism activities should be harnessed and its pre-2020 continuation can be supported through the increased short-term demand for emission reduction credits, and the provision of national or international support that increases the alternative revenues or cost savings of project activities.

Short-term demand improvement could be achieved if a larger group of countries join, replicate, build upon, and scale up the purchase facility model. A broader base of demand-side market participants is required to increase demand, ensure stability and regain trust. In this regard the announcement of

ambitious INDCs and the option to use carbon markets in the new agreement is crucial for investor confidence.

### ***G7 countries should assume a leading and unified role***

The following recommendations for immediate action may develop the feasibility of options for integrating carbon market instruments in a 2015 climate change agreement, and maximise the potential for carbon market mechanisms to narrow the emissions gap before 2020.

**1. Commit to advance the development of a new generation of market mechanisms in the UNFCCC**

G7 countries could commit to form a working group to accelerate the development of processes and proposed regulations before the Paris COP in December 2015

**2. Review and learn from the positive outcomes of the first crediting period of the Kyoto Protocol**

Such successes are often overlooked in the wake of recent market difficulties, but a thorough understanding of the lessons learned from these mechanisms should inform the design of all future policy for carbon pricing approaches.

**3. Form a broad coalition of actors to safeguard knowledge and infrastructure on carbon pricing**

Specifically, this may include the replication and upscaling of credit purchase facility approaches and a platform for regular exchanges on carbon pricing approaches. This coalition could assume responsibility to coordinate the development of best practice guidelines for regional instruments and common international accounting rules, and could take the initiative to pilot promising approaches internationally.

## Table of contents

Summary .....	i
Table of contents .....	iv
1. Introduction.....	1
2. Development of carbon market mechanisms worldwide.....	2
2.1 Achievements of the Kyoto Protocol flexibility mechanisms .....	2
2.2 Current state of global carbon markets .....	5
2.3 Mainstream discussions for future potential market mechanisms.....	6
3. New regional and national examples of carbon pricing .....	8
3.1 New and emerging instruments and approaches.....	8
3.2 Emissions trading schemes and crediting approaches .....	9
3.3 Carbon taxation and blended approaches .....	11
4. Carbon market mechanisms in future international cooperation on climate change .....	12
4.1 Option 1: International markets as a mechanism for achieving contributions/commitments in a 2015 international climate agreement .....	13
4.2 Option 2: Carbon market mechanisms as implementation instrument for climate finance .....	15
4.3 Option 3: Carbon pricing as a domestic implementation instrument of a national contribution with international cooperation.....	16
5. Narrowing the emissions gap before 2020 using market mechanisms .....	17
6. Recommendations for the G7 .....	21
7. References .....	23
Annex.....	25

## 1. Introduction

Carbon market mechanisms were a fundamental component of the Kyoto Protocol, the major international agreement on climate change. Markets were introduced to allow more flexibility on where greenhouse gas emissions are to be reduced and to offer countries the ability to invest in more cost-effective mitigation options outside of their boundaries and thus lead to cost savings on the global level, which might in turn facilitated increased ambition for climate change mitigation.

Countries have embarked to negotiate a new international climate agreement to be adopted in Paris in December 2015. The potential role of carbon market mechanisms in the context of international commitments today is more complex, since developing as well as developed countries are expected to take on mitigation commitments in the new agreement. Therefore, a major component of the agreement will be “nationally determined contributions” and they are likely to take various forms. Decisions on the options for future international market mechanisms, namely the New Market Mechanism (NMM) and Framework for Various Approaches (FVA), still need to be taken. The potential position of market mechanisms in a future international climate change agreement remains unclear, largely because the structure the potential agreement itself remains to be clarified.

This discussion paper first provides an overview of the development of the international carbon market mechanisms (section 2) and emerging domestic carbon pricing systems (section 3). It then lays out three distinct but potentially complementary options for market mechanisms in a future climate change agreement (section 4). Also options for narrowing the emissions gap before 2020 using market mechanisms are explored (section 5). Finally the paper provides recommendations for short term action for the G7 countries (section 6).

## 2. Development of carbon market mechanisms worldwide

*Since their creation in 1997 with the Kyoto Protocol, international carbon market mechanisms have accomplished major achievements: they have activated markets and exploited cost-effective mitigation potential and have catalysed effective involvement of the private sector in climate change mitigation. The Clean Development Mechanism (CDM) and Joint Implementation (JI) stimulated large domestic and foreign investments in climate change mitigation activities. They have diffused price signals for carbon, and carbon pricing approaches, around the world. The success of the first crediting period of the Kyoto Protocol shows that private entities can be mobilised, and the positive effects of markets can be achieved when stable demand exists.*

International carbon market mechanisms were first implemented on a large scale as part of the flexibility mechanisms under the Kyoto Protocol. The use of international carbon market mechanisms was, and remains, an attractive option due to the potential to achieve emission reductions most cost effectively by exploiting the cheapest mitigation potential within a given trading system, and moreover due to the potential to partially re-internalise the social cost of greenhouse gas emissions. The flexibility mechanisms under the Kyoto Protocol include international emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation (JI).

By allowing developed countries (Annex I parties) to count their investments in GHG emission reduction projects in developing nations towards their own targets, the CDM was designed to provide more cost-effective opportunities for Annex-I parties to engage in climate change mitigation, and drive sustainable development in developing nations. Amongst other potential benefits, the CDM was intended to stimulate the technology transfer that would assist developing countries to embark on trajectories of sustained, low-carbon growth (Seres et al. 2009). Similarly, JI provided a flexibility mechanism for Annex I parties to invest in emission reduction projects in other Annex I countries, and to count these emission reductions towards their own targets.

### 2.1 Achievements of the Kyoto Protocol flexibility mechanisms

By the end of the first commitment period of the Kyoto Protocol on 31st December 2012, the CDM had driven the development of 7,338 emissions reduction projects in developing countries around the world<sup>1</sup>, whilst 622 projects had been registered under JI. This unprecedented global boom of carbon market activities under the Kyoto flexibility mechanisms has made a considerable contribution to existing efforts and capacities for climate change mitigation, in all regions around the world. Moreover, the CDM as an offset standard has gone through its own growing pains, and achieved a status whereby it is used as a blueprint for other domestic standards. Still, the CDM is the only internationally agreed standard, which allows for rigorous and transparent tracking of emission reductions.

#### *Market activation and cost-effective mitigation action*

**The Kyoto Protocol flexibility mechanisms have activated markets and exploited cost-effective mitigation potential.** A major attraction of market mechanisms is that they increase the cost effectiveness of climate change mitigation action, by encouraging efforts to be focused in regions and activities where the abatement potential carries the lowest costs. UNFCCC (2012) indicates that the average mitigation cost of CDM projects with renewable crediting periods up to 21 years is 0.40 USD / tCO<sub>2e</sub>, whilst the cost is below 10 USD / tCO<sub>2e</sub> for the majority of these projects. **EU ETS** installations are

---

<sup>1</sup> This includes 204 Programmes of Activities (PoA). Based on projects with a registration date in 2012 according to the UNEP DTU pipeline (UNEP DTU 2013).



estimated to have saved EUR 550 million in 2011 by using CERs for compliance, **Japanese firms** with voluntary commitments used CERs to save approximately EUR 92 million between 2008 and 2011 (UNFCCC 2012; Spalding-Fecher et al. 2012).

A common argument against international market mechanisms is that they capture the majority of the “low-hanging fruit” in host countries, and in doing so, make it more expensive for host countries to implement their own actions in future domestic mitigation targets. However, Castro and Michaelowa (2011) estimate that **the CDM exploited only a very low proportion of host countries’ low-cost abatement potential**. Furthermore, the **transfer and maturation of technologies through the CDM** is likely to have significantly increased the absolute volume of low cost abatement potential in these countries.

Empirical data indicates that not only are projects being implemented in the most cost-effective places, but also that **the market conditions under which CDM projects are developed are encouraging their development under the most cost-effective conditions**. For example, a comparison of CDM projects with similar non-CDM projects in Annex I countries shows that CDM projects are generally larger and less capital intensive. Overall, investments in additional capacity per MWe in CDM projects up until 2011 required approximately half of the capital investment required in non-CDM projects in Annex I countries (UNFCCC 2012).

#### *Private sector engagement*

**The Kyoto Protocol flexibility mechanisms have catalysed effective involvement of the private sector in climate change mitigation.** An important aspect in considering the achievements and carbon market mechanisms is the role of the private sector for the achievement of the global climate goal. Possibilities for mobilising private investors and approaches for the diversion of investment flows towards CO<sub>2</sub>-neutral alternatives are being increasingly discussed in the context of debates on international climate financing. The inherent alignment of market-based approaches in the private sector can provide an important impetus and practical experience.

Importantly, market based approaches have encouraged an enhanced level of engagement and *buy-in* from the private sector that may not be possible through traditional modes of regulation. The majority (87%) of Emission Reduction Credit Purchase Agreements (ERPAs) signed under the CDM were signed with private sector entities or a combination of private and public sector entities. New and existing large multinational firms made large investments in the development of CDM projects overseas whilst local entrepreneurs were mobilised on a large scale and supported by international investors.

Furthermore, the **diffusion of carbon pricing around global markets** required or encouraged detailed emissions accounting and the development of voluntary carbon inventories. This has been a key impetus for the gradual development of corporate environmental accounting practices.

**The emergence of international initiatives and alliances demonstrates the success that market mechanisms have had in mobilising the private sector**, and also demonstrates the support which such mechanisms have from businesses and investors. For example, under a World Bank’s Carbon Pricing Leadership Coalition initiative, 74 countries and 23 states, provinces and cities joined over 1,000 businesses and investors in signalling their support for carbon pricing. This initiative will provide an example of how businesses and investors can take a leading role in the design and implementation of carbon pricing and climate policy.

#### *Technology transfer*

**The CDM has driven technology transfer and revolutionised industries.** Approximately 39% of CDM projects (representing 59% of annual CDM emission reductions) report that the project included a

technology transfer component. This varies considerably by host country, as technology transfer benefits are indicated in the project documentation of fewer than 23% of projects in India and China, approximately half of projects in Brazil, and above 90% of projects in all other host countries combined (representing approximately 97% of annual CDM emission reductions in these host countries) (UNFCCC 2012). Notably, a high proportion of hydro and cement projects (two of the largest CDM project categories) reported no technology transfer benefit in their project. This is due to the relatively mature state of these technology types, and the high proportion of these project types that exist in China, where major investments are being made in the development of these technologies for domestic use and export.

According to the project documentation of projects registered up until 2012, **Germany was the largest source of technology transfer under the CDM**, counted as the primary source for approximately 19% of projects where technology transfer took place, particularly projects for household energy efficiency, wind, N<sub>2</sub>O destruction, cement, and hydrofluorocarbons (HFCs) (UNFCCC 2012).

**The evolution of the maturity of domestic technologies in the ten years since the onset of the CDM is profound**; roughly 90% of project documentation from projects registered in China in 2005 indicated that the project involved technology transfer from foreign countries, compared to approximately just 7% of projects registered in China in 2011 (UNFCCC 2012). This highlights a very positive success story for technology transfer to China. However, the effect is not so visible for other countries. The extraordinary success of China to adopt and mature their domestic technologies is actually a partial explanation for this; technology transfer in other countries is now largely accounted for by imports of Chinese technologies, which are produced in such cost-effective conditions that the incentives for the development of domestic technology industries in these importing countries are limited due to the inability to compete. 75% of wind CDM projects registered in 2009 or 2010 used equipment manufactured in China (although individual technical components were often sourced from other countries)(UNFCCC 2012).

### *Investments in GHG mitigation*

**The CDM and JI stimulated large domestic and foreign investments in climate change mitigation activities.** The total estimated investments in CDM projects is difficult to assess precisely; UNFCCC (2012) indicates that the total investments indicated for all registered projects by June 2012 was USD 215.4 billion, including USD 92.6 billion for projects that are known to be in operation. This makes up a considerable portion of total climate finance flows worldwide, which were estimated at USD 359 billion in 2012 (Climate Policy Initiative 2014).

The considerable effect of finance leveraging is apparent when one considers that the investments in CDM project activities are far larger than the CER revenues that were anticipated. It has been estimated by the World Bank that the leverage factor on CER revenues is 1:4.6 to 1:9 while Sterk et al. (2013) assume that an even higher factor is likely. In addition, data from Spalding-Fecher et al. (2012) shows for renewable energy projects that while the majority of CERs were purchased by entities in developed countries, the majority of the overall investments were made by private sector entities in developing countries.

### *Diffusion of carbon pricing*

**The Kyoto Protocol flexibility mechanisms have diffused price signals for carbon, and carbon pricing approaches, around the world**; 110 non-Annex I and 42 Annex I countries have been directly engaged in the buying and selling of carbon credits (UNEP DTU 2013). In doing so, these mechanisms diffused the carbon pricing concepts to every region of the world, and have been the fundamental building blocks upon which many regional, national and subnational carbon pricing approaches have been developed.

**Many regional, national and subnational carbon pricing instruments rely upon capacities built under the Kyoto Protocol flexibility mechanisms.** For example, a number of crediting programmes use adapted CDM processes and methodologies for monitoring, reporting, verification and issuance. In many cases, national institutions built under the CDM such as Designated National Authorities (DNAs) have been adapted or expanded to fulfil the institutional requirements for other carbon pricing approaches, and the structure of the CDM's central Executive Board has been taken as a blueprint for the central administration of some regional programmes, such as the Japanese Joint Crediting Mechanism.

## 2.2 Current state of global carbon markets

**The success of first commitment period of the Kyoto Protocol shows that private entities can be mobilised, and the positive effects of markets can be achieved when stable demand exists.** The success of the CDM thus relies on a stable demand for the supplied carbon credits and prices that are sufficient to incentivise investments in CDM projects.

**Stable market conditions require a diversity of market participants for both supply and demand.** Financial crisis and economic stagnation in the EU had a major impact on the demand for international CERs, due to the lack of a diversified pool of credit buyers; the EU ETS accounts for the vast majority of all CER credit purchases. Due to unforeseen developments, such as the economic crisis, emissions in various countries and EU ETS installations dropped to unexpected low levels, significantly hampering demand for CERs. **The participation of more countries as major credit buyers would provide longer term stability to international carbon markets, and significantly reduce the risks to investment.**

After a period of relative stability between 2009 and 2011, the rate of decline in the international market price of CERs is dramatic. At USD 0.17, the average credit price in 2014 was less than 1% the value of the average credit price in 2008 (EEX 2015).

**Large numbers of project activities are returning to pre-CDM conditions, and institutions, infrastructure and MRV-expertise for climate change mitigation projects are at risk of being demobilised and lost.** The effects of the collapse of the international market price are manifold. Revenues from the sale of CERs are sufficient for between just 2% and 3% of CDM projects, and this has driven a large number of CDM projects to cease their mitigation activities and return to their pre-CDM conditions. Between 21% and 36% of projects do not continue regular operations of the mitigation activity (NewClimate Institute n.d.). For some regions and activity types, such as methane avoidance activities in Latin America, entire chains of companies and infrastructure have been irreversibly shut down and abandoned. In 2013, Camco announced that they would cease all of their CDM activities, JP Morgan sold EcoSecurities and ceased carbon trading, and Deutsche Bank and Mabanafit also announced the closure of their carbon trading operations (World Bank 2014). **There is a great risk that institutions and expertise built by the CDM in countries around the world will be lost, although the feasibility of future potential market mechanisms is likely to rely heavily on such institutions and expertise.** The demobilisation of CDM infrastructure that is visible today could have substantial damaging effects on the institutional capacity that was built under the instrument, and could delay market recovery even when positive policy signals are restored (World Bank 2014). **It is not too late to avoid the irreversible loss of institutions, infrastructure and expertise.** Whilst the mechanisms have demonstrated their potential to deliver positive results, urgent action is needed to form a broad coalition of countries to rebuild stable demand, and trust, in the markets. **Thus, a strong signal for carbon pricing and markets should be sent in time for COP21 in Paris which helps to safeguard the knowledge and institutional capacity in host countries.**

**The CDM is providing a blueprint for many emerging market mechanisms.** Many CDM projects are expected to continue their mitigation activities yet seek opportunities to continue operations outside of the CDM (NewClimate Institute n.d.). Whilst the emergence of a multitude of regional, national and subnational carbon pricing approaches presents a risk for fragmentation, experiences from the CDM have provided a toolbox for the bottom-up design of emerging instruments, which could prevent the negative effects of potential fragmentation through the adoption of consistent approaches. The adoption of existing CDM processes, structures and experiences, combined with extensive international consultation, is likely to result in a range of regional programmes that are highly appropriate to local circumstances whilst still possibly linked to larger international market mechanisms in the future.

**There is an urgent need to rebuild trust in carbon markets.** Insights from interviews conducted with a range of market participants and stakeholders indicate that the loss of trust in international market mechanisms from both potential project developers and investors is a major risk to the potential achievements of market mechanisms for investment and private sector leverage, as demonstrated in section 2.1 (NewClimate Institute n.d.). Investors and project developers will require price signals with long term reliability provided by a broader coalition of market demand participants if they are to engage with future carbon market mechanisms.

## 2.3 Mainstream discussions for future potential market mechanisms

Discussions in recent years surrounding future potential international market mechanisms have focused largely on two approaches: the **New Market Mechanism (NMM)** and the **Framework for Various Approaches (FVA)**. While the negotiations are far from a general consensus on what **NMM** will entail, such a mechanism is widely understood as a potential approach to scale up marketable mitigation beyond project and programme level activities to a scale that target broad sectors of the economy, for instance through sectoral and cross-sectoral measures. Compared to flexibility mechanisms under the Kyoto Protocol, **NMM** should provide Parties with more responsibility and flexibility to define and design their mitigation activities, under the rules of a common international framework (IGES 2014). **FVA** is a loose term, broadly understood as a framework that allows maximum flexibility for Parties to create individual crediting systems that could be counted towards internationally agreed targets.

**The Subsidiary Body for Scientific and Technological Design (SBSTB) was tasked at the 2012 Conference of Parties in Doha to further explore the potential details of NMM and FVA approaches**, but progress in this regard has been slow in recent years, as some countries question the relevance of discussions on market mechanisms without increased statements of political ambition, and the potential position of market mechanisms in a future international climate change agreement remains unclear, largely because the structure the potential agreement itself remains to be clarified.

**Results-based financing (RBF) approaches are also receiving increasing attention in the climate finance context.** RBF characterises any programme where payments are released upon the achievement of certain results according to pre-defined performance parameters (Pearson 2011). Although often considered as a new and separate concept, **RBF** is already inherent in many existing climate finance mechanisms, including the **CDM**, and is now being discussed in the context of **Nationally Appropriate Mitigation Actions (NAMAs)** and the **Green Climate Fund (GCF)**. RBF application in the context of current and future carbon and climate finance initiatives is particularly interesting due to its potential benefits for catalysing effective climate action and supporting carbon pricing approaches alongside the pursuance of development objectives.

Lastly, the **voluntary carbon market** offers offsetting for the private sector in cases where demand is not driven by regulatory compliance. The voluntary market demonstrated relative stability during the time in which other formal mechanisms began to face difficulties, but the volume of trading as well as the

average trading price both fell considerably in 2013 (World Bank 2014). Voluntary carbon markets have become particularly popular in Japan, where several voluntary markets operate. The voluntary market is particularly interesting for companies with Corporate Social Responsibility (CSR) objectives, since voluntary crediting instruments are often linked with criteria that favour social and economic development as well as climate change mitigation.

### 3. New regional and national examples of carbon pricing

*The worldwide diffusion of national and regional carbon pricing has gained considerable momentum, now covering 12% of global greenhouse gas emissions. Innovative approaches are developed that combine market mechanisms with carbon taxes and direct international financial support.*

#### 3.1 New and emerging instruments and approaches

**The worldwide diffusion of carbon pricing has gained considerable momentum.** Following on from the success of the flexibility mechanisms of the Kyoto Protocol to diffuse carbon pricing to all regions of the world during the Protocol's first commitment period, the development of new carbon pricing instruments at regional, national and sub-national levels has been rapid in recent years, and market based instruments continue to gain momentum. Figure 1 gives an overview of the emergence of carbon pricing instruments worldwide.

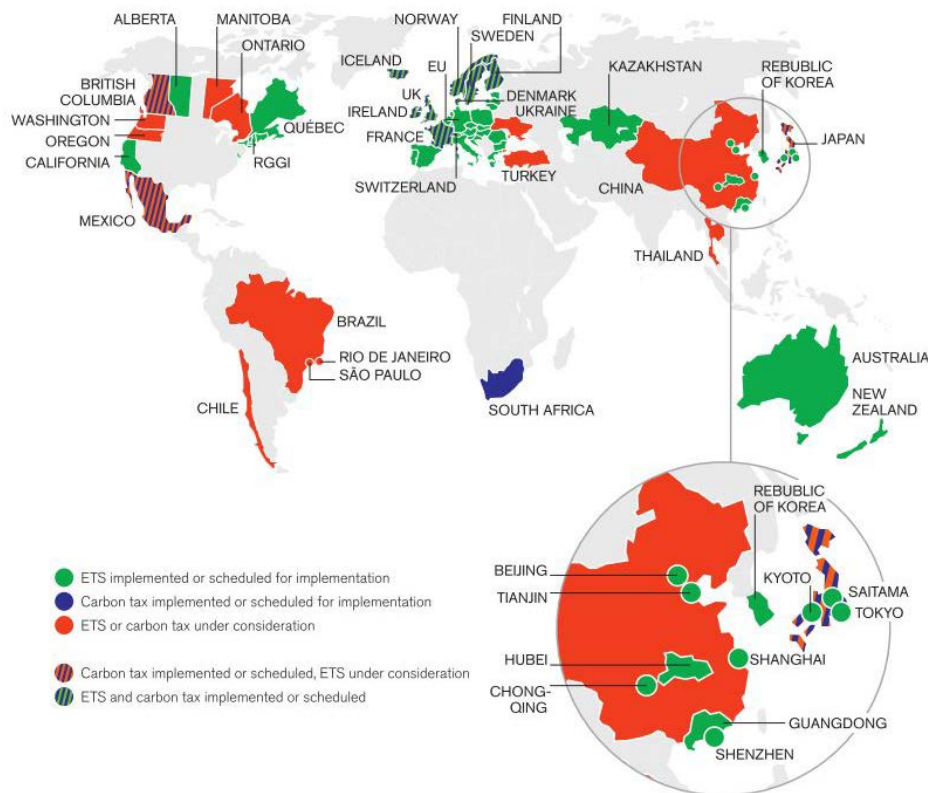


Figure 1. Carbon pricing instruments implemented, scheduled, and under consideration in 2014

Source: State and Trends of Carbon Pricing 2014 (World Bank 2014)

By 2014, 40 countries and over 20 subnational jurisdictions, covering approximately 12% of global greenhouse gas emissions, had implemented instruments that put a price on carbon (World Bank 2014). Such instruments include carbon taxes, crediting mechanisms, and emissions trading schemes. Notably, carbon pricing instruments have now been implemented in sub-national jurisdictions of both **China** and the **U.S.**, the two greatest emitters of greenhouse gases. The potential for national approaches is

currently under discussion in both of these countries, and the announcement of a climate agreement between the **U.S.** and **China** in November 2014 raises hopes for the potential for continued international cooperation in the future; pricing instruments might occupy a prominent position in such future cooperation. Furthermore, a Presidential decree that shows positive steps to the development of a national ETS in the future was signed in **Russia** in 2014. In total, regional, national and subnational emissions trading schemes were worth approximately USD 30 billion in 2014 (World Bank 2014).

**The structure, scope and boundaries of various regional and national carbon pricing instruments vary considerably**, and this is reflected most clearly in the broad range of prices under these schemes. Whilst prices in most emissions trading schemes in 2014 tended to cluster around USD 12 / tCO<sub>2</sub>e, prices were much lower under instruments that incorporate extensive exemptions for industry (USD 1 – 2 / tCO<sub>2</sub>e in the **New Zealand ETS** and **Japanese carbon tax**), and much higher in more ambitious schemes (USD 168 / tCO<sub>2</sub>e in the **Swedish carbon tax**) (World Bank 2014).

**The past year has seen the introduction of several innovative approaches** to the design of new instruments, and the modification of existing schemes in the face of non-envisaged scenarios (World Bank 2014):

- In the sub-national **Regional Greenhouse Gas Initiative (RGGI)** in the U.S., participating states triggered a doubling in the price of carbon credits by increasing the cap stringency by 45% compared to the original scaling plans.
- The **Danish** government strengthened the effectiveness of its **carbon tax** by using revenues from the tax for targeted subsidies that reinforced the price signal.
- In the face of carbon market depression in the **EU ETS**, the European Commission has designed a plan which improves the flexibility of the scheme to adjust to unforeseen economic circumstances, through a **market stability reserve** and a '**backloading**' mechanism. Under the backloading mechanism, the planned auctioning of emission allowances was pushed back to later years in order to partially mitigate the current saturation of the market.
- **Blended carbon pricing approaches** are emerging, such as in **Mexico** (see section 3.3.1, below) where the carbon tax is combined with a credit offsetting mechanism.
- **Market based approaches are under consideration for a number of International Cooperative Initiatives (ICIs)**, such as the International Civil Aviation Authority. Similarly, some larger companies are beginning to establish **internal corporate carbon pricing instruments** and trading schemes (World Bank 2014).
- The **emissions trading schemes of Quebec and California** were linked in 2014, providing a blueprint for the integration of fragmented market mechanisms.

### 3.2 Emissions trading schemes and crediting approaches

**Emissions trading schemes (ETS)** allocate caps on the emissions of greenhouse gas emissions in affected sectors. Within the cap, limited emissions permits are distributed to regulated polluters, and permits are traded between market participants to achieve compliance.

**Emissions trading schemes have developed at pace in terms of both coverage and maturity in recent years.** By 2014, 18 ETS programmes were implemented in 18 national and subnational jurisdictions. Implementation was scheduled for one more country, and under consideration in 11 more national and subnational jurisdictions (World Bank 2014). Together, planned and implemented emissions trading schemes have reached all regions except for Africa. In 2015, emissions trading schemes will cover nearly 9% of global greenhouse gas emissions. Furthermore, the World Bank (2014) finds that the majority of implemented ETS programmes have made notable developments over the past year in terms of their scope and linkages and the development of approaches.

**Such carbon pricing approaches in developing countries offer opportunities to support countries in implementing climate policies based on result-based financing or market demand, and thus promote low carbon developments in these countries.**

The **EU ETS** remains the largest ETS by far, covering approximately 2 GtCO<sub>2</sub>e of emissions, but there are high hopes for the potential coverage of a **national ETS in China**, which is currently under design and consideration.

### 3.2.1 Emerging case study: Voluntary Emissions Trading Scheme with an offset program in Thailand

In cooperation with the Partnership for Market Readiness (PMR) Thailand has developed a voluntary carbon market framework composed of the following complementary programmes:

- Voluntary Emission Reduction Program (T-VER)
- Thailand Carbon Offsetting Program (T-COP)
- Energy Performance Certificate Scheme (EPC)
- Voluntary Emissions Trading Scheme (Thailand V-ETS) (under development)
- Low Carbon City Program (LCC)

The framework provides a means for firms to voluntarily pursue cost-effective greenhouse gas emission reduction activities through engagement with a voluntary trading scheme with an offsetting mechanism.

The T-VER is a domestic GHG crediting mechanism that can be used by companies and individuals to offset their carbon footprint voluntarily. The T-VER issues Voluntary Emissions Reduction credits to qualifying projects using CDM methodologies. The T-COP is a voluntary carbon offsetting program launched in March 2013, which provides a platform for participants to offset their own carbon footprint by contributing money to retire certified T-VER carbon credits (PMR 2014; ICAP 2015).

To build upon these voluntary platforms, Thailand has received 3 million USD from PMR to support the development of its proposed Voluntary Emissions Trading Scheme (V-ETS). V-ETS will help the private sector build MRV capacity and integrate carbon in their business models. The V-ETS will be a cap-and-trade system for energy related CO<sub>2</sub> emissions that targets no sectors specifically but is open for the voluntary participation of all firms. Emission allowances are allocated through a grandfathering approach, and participants can achieve compliance through offsets from the T-VER programme.

Another notable part of this policy framework is the Low Carbon City Program (LCC), a crediting mechanism for local municipalities and communities which will be integrated into the T-VER (ICAP 2015). In order to support the implementation of the LCC program and its local mitigation activities, an LCC Fund will be established with the aim to deliver carbon finance and technical support to local municipalities and communities, and to become a one-stop-shop for buyers and sellers of LCC-TVERs.

In addition, Thailand is developing a voluntary target-and-trade scheme for energy efficiency certificates for the industrial and building sectors, known as the Energy Performance Certificate Scheme (EPC). The EPC is currently in a preparation phase and a pilot launch is planned for 2017-2019 (Government of Thailand 2014).



### 3.3 Carbon taxation and blended approaches

**Carbon taxes** are defined by the World Bank (2014) as taxes explicitly stating a price on carbon or using a metric directly based on carbon.

**Countries have demonstrated through various approaches the flexibility of carbon taxes to fit with national circumstances.** By 2014, carbon taxes were implemented in 14 countries. Various approaches have been taken by countries in light of their national circumstances, in order to facilitate the use of carbon taxes alongside other carbon pricing instruments, and in light of considerations for industry competitiveness. For this reason, the coverage of national emissions under each tax programme ranges considerably; South Africa's carbon tax, to be launched in January 2016, has the broadest coverage of national emissions with 80% (World Bank 2014).

Several innovative design approaches for carbon taxes have emerged:

- In **Denmark**, partial tax exemption is awarded to businesses that make a voluntary agreement to investing in energy efficiency improvements.
- Likewise, in **Switzerland**, partial tax exemptions are awarded to businesses that adopt voluntary emission reduction targets.
- **Mexico's implemented carbon tax** (see section 3.3.1, below) and **South Africa's proposed carbon tax** use a blended approach under which offsets can be used to reduce liability to carbon tax.

#### 3.3.1 Emerging case study: Mexico's carbon tax with offsetting

In 2014, Mexico included in its tax reform a carbon tax on fossil fuel sales and import by manufacturers, producers and importers. The tax, which covers 40% of greenhouse gas emissions, does not cover the entire carbon content of fossil fuels but rather the additional emissions compared to natural gas, which is therefore exempt from the tax. This use of the natural gas carbon content benchmark is design feature that is compatible with Mexico's current wider strategy for economic development, and may be adjusted in the future. The price has been set conservatively to facilitate private sector buy-in and reduce the negative burden on international competitiveness, but incremental price increases are envisaged in the design (Balderas Torres 2014).

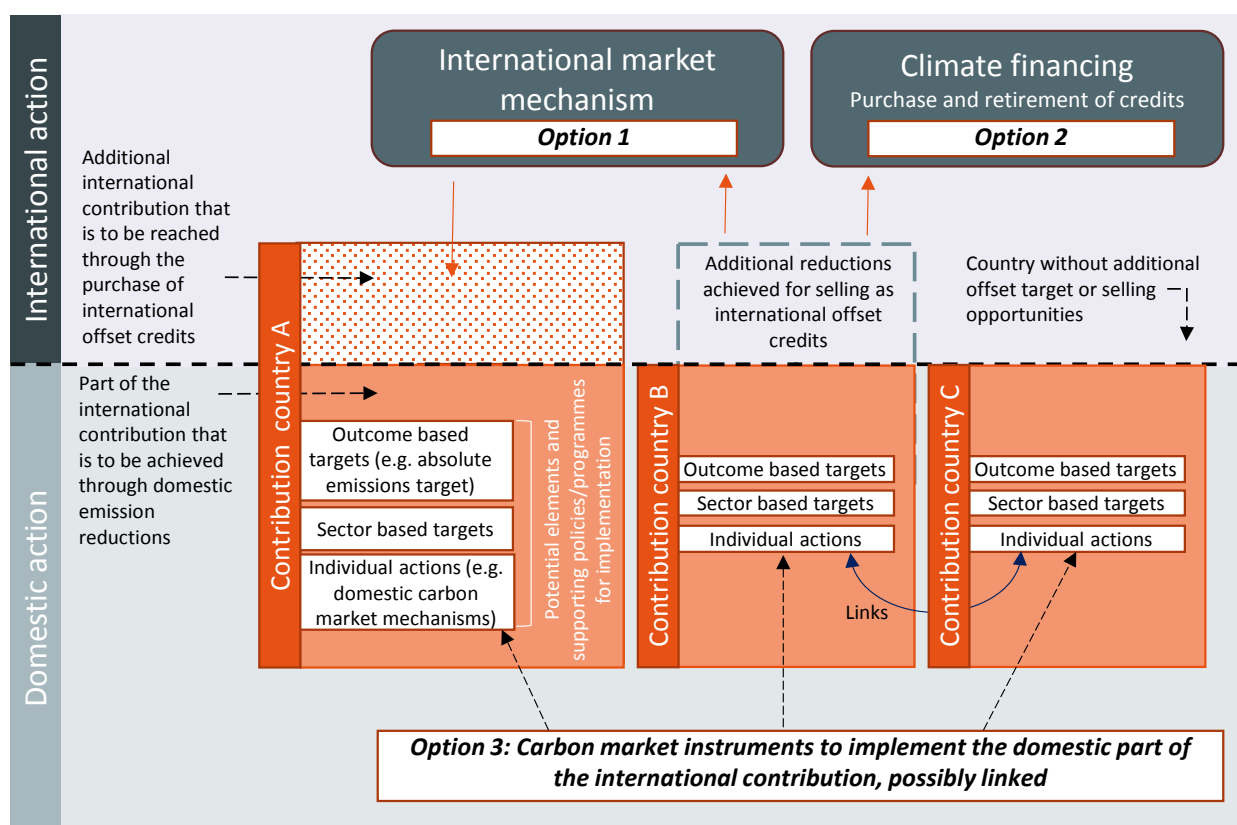
In addition to the tax's effect on reducing fossil fuel consumption and associated greenhouse gas emissions, the tax will raise governmental funds that will be used, in turn, to develop and promote climate change mitigation actions.

A notable feature of the Mexican carbon tax is that it offers participants the option to reduce their tax liability by purchasing offset credits through the *MexiCO2* platform, launched by the Mexican Stock Exchange in November 2013 for the sale of carbon credits from the Gold Standard, Voluntary Carbon Standard, Climate Action Reserve and CDM projects developed in Mexico.

## 4. Carbon market mechanisms in future international cooperation on climate change

Three fundamental options exist for carbon market mechanisms in a future international cooperation on climate change. First, such mechanisms could be a component of the nationally determined contributions of the countries under the international agreement, allowing more ambition through increased flexibility. A second option is to use (elements of) market mechanisms for international climate finance, independent of the national contributions. A third option is that domestic carbon market mechanisms and other carbon pricing policies are used to domestically implement the international offers.

In the following sections we present three options on how carbon market mechanisms can be used for international cooperation on climate change (Figure 2). The options are complementary to each other and could be linked and implemented at the same time. The first option is to use an international carbon mechanism as for the achievement of contributions/commitments expressed as emissions targets (Option 1 in Figure 2 further described in section 4.1). The next option is to use (elements of) market mechanisms for international climate finance, independent of the national contributions (Option 2 in Figure 2 further described in section 4.2). Finally, carbon pricing can be used as a domestic implementation instrument of the international offers (Option 3 in Figure 2 further described in section 4.3).



Note: The figure refers only to climate financing in the context of crediting mechanisms and results based financing (RBF). Climate finance flows must not always be linked to RBF. For example, any of these illustrative countries, including country C which has no participation in crediting mechanisms, may still be able to access climate finance through other channels.

Figure 2. Options for carbon markets in international cooperation

## 4.1 Option 1: International markets as a mechanism for achieving contributions/commitments in a 2015 international climate agreement

Carbon market mechanisms were included as a fundamental component of the commitments under the Kyoto Protocol to allow more flexibility on where greenhouse gas emissions are to be reduced. It offered the countries the ability to invest in more cost-effective mitigation options outside of their boundaries and thus lead to cost savings on the global level. The intention was to increase the willingness of countries to raise their ambition level beyond what would have been possible without the market mechanisms.

The role of carbon market mechanisms in the context of international commitments today is more complex. Since the agreement on the Durban Platform, developing as well as developed countries are expected to take on mitigation commitments in the new agreement, albeit following the overall principle of common but differentiated responsibilities and respective capabilities. These commitments are “nationally determined” and may take various forms (see Box 1).

### **Box 1: Background on proposals for intended nationally determined contributions (INDCs)**

Countries have embarked to negotiate a new international climate agreement to be adopted in Paris in December 2015. A major component of the agreement will be “nationally determined contributions”.

Countries are free to choose the type of these offers when they bring them forward. It is likely that the offers will vary significantly in type and stringency. Already, the few public draft proposals available are of various types. China proposed to peak CO<sub>2</sub> emissions by 2030, EU proposed to reduce its emissions by at least 40% below 1990 level in 2030, USA proposed to reduce emissions by 26 to 28% below 2005 levels by 2025, Chile proposed tentatively to reduce its emissions intensity by 30% to 35% below 2007 levels by 2025, and by 40% to 45% by 2030. It is also likely that some countries propose to implement particular energy targets or individual policies and not commit to reach a particular greenhouse gas emission level. Ambition of developing countries will also depend on prospects of financial support and/or other incentives.

The international climate agreement could include regular cycles of countries proposing contributions, an international review of the proposals, countries possibly strengthening their proposals and finally anchoring them as commitments in a final agreement.

The initial focus of the process is for countries to propose as much as they can realistically do at home, to reduce domestic emissions. In a second step, countries could consider how much more would be possible through cooperation, for example through market mechanisms.

Carbon market mechanisms could be directly included in the climate agreement to be agreed in Paris in December 2015. Countries that wish to use international carbon market mechanisms could opt to do so and use these mechanisms to achieve their proposed targets (as under the Kyoto Protocol). At the first instance this would provide flexibility; the reduction obligation is essentially transferred from one country to another. Additional reductions could be achieved if less than all reductions are transferred from one country to another, i.e. a proportion is retired or discounted. This way not only flexibility is introduced but also additional emission reductions are achieved.

The proportion of the target that is to be achieved domestically could also be split from the proportion that is to be reached through market mechanisms. This could be based on the following principles:

- All countries interested to participate in international offsetting mechanisms towards formal achievement of their contributions under a 2015 climate change agreement should first have an emissions reduction target that is to be achieved through domestic reductions only.
- Countries seeking to finance emission reductions elsewhere, could add a second, additional target to be achieved through purchase of international offset credits or international trading. The additional target would need to be fulfilled with high quality credits according to rules that need to be developed under the UNFCCC, or possibly by a smaller group of countries that plan to implement their commitments jointly.
- Countries seeking international finance in order to increase their level of ambition may propose additional target(s) subject to the availability of finance, for example through international market mechanisms. Such an additional action could be envisaged as proposed activities under a new sectoral mechanism with or without an own contribution – essentially a joint commitment to fulfil a certain reduction.

In order to use market mechanisms as a component of contributions under a 2015 international climate change agreement to successfully raise ambition, several conditions have to be met:

*Trust in carbon market mechanisms.* Markets rely on expectations, which can only be built with trust in the main market participants. Several developing countries have been sceptical of the introduction of new international carbon market mechanisms, as they are disappointed from the current lack of demand for credits given their investments in and experiences with the CDM.

*Agreement on international negotiations on rules for coordinated carbon market mechanisms.* International UNFCCC negotiations have embarked on two strands. The strand on “New Market Mechanisms” intends to develop rules for a new, coordinated mechanism, in the view of some aggregated as a sectoral mechanism. The second strand develops a “Framework on Various Approaches” where several different systems could be combined. These negotiations need to be accelerated to be finalised by the end of 2015.

*Application of provisions to allow high ambition.* Situations need to be avoided that a country seeking international finance through selling allowances has the incentive to lower its domestic ambition to be able to sell more allowances. Otherwise the markets would allow buyers to raise ambition, while sellers lower their ambition.

For countries that aim to purchase allowances, a split between the domestic target and the part to be achieved through mechanisms would allow that the domestic portion is increased independent of the demand from credits.

One option to ensure ambition is to allow only international emission reduction credits to be used for compliance from countries and/or sectors that would not be covered by emission limitations otherwise, e.g. countries with low capabilities and obligations, e.g. least developed countries or sectors that are not covered by other obligations and thus do not contribute to the achievement of nationally determined contributions. This approach is partly already taken by the EU emission trading system, which allows only CDM credits from least developed countries.

Another approach is through communal setting of benchmarks in selling countries by sellers and buyers alike. A feasible approach could be based upon multilaterally agreed moving benchmarks; countries could set sector or economy wide benchmarks for their own domestic action, and sell credits on all achieved emission reductions beyond this baseline. Such a setup would be similar to proposed bilateral sectoral approaches, except that a multilateral group of all market participants would have to agree to the target

level of the initial benchmarks, rather than this being determined between just two countries bilaterally, in order for such efforts to feasibly be accounted under a 2015 international agreement.

Such sector or economy-wide benchmarks should be moving, and formally reviewed and accepted by the international community on a regular basis. This means that a mechanism for proposing, reviewing and approving benchmarks on a regular basis is necessary. The process for reviewing and acceptance of the moving benchmarks on a regular basis should be based as much as possible on technical criteria<sup>2</sup>.

In summary, option 1 can offer the benefits of market mechanisms to parties of the 2015 climate change agreement, and may therefore play a role to reduce the cost of embarking on a faster and more ambitious climate change mitigation course, through increased short term technical flexibility. Such a solution would require a suite of carefully designed complementary processes and regulations in order to avoid having an adversary effect.

## 4.2 Option 2: Carbon market mechanisms as implementation instrument for climate finance

International carbon market mechanisms can also be used as a channel for international climate finance. Developed countries need to mobilise 100bln US\$ by 2020 for mitigation and adaptation in developing countries. The Green Climate Fund is one vehicle to provide this finance. The financial flows are additional to those incentivised through national emission reduction targets (option 1).

Climate finance could include market or market design elements in various ways:

- **Credit purchase programmes:** Funds could purchase high quality emission reduction credits, e.g. through reverse auctioning, which then are retired (not accounted towards any buyers reduction targets). This would use the full advantages of markets, where the private sector searches for high quality, low cost emission reduction opportunities.
- **Results-based financing:** The funds could finance activities based on their results, e.g. only after a certain emission reduction has been verified. This would use elements of CDM and other market mechanisms to monitor the reductions and make payments accordingly.

Such elements of climate finance would use the main advantages of markets:

- Involvement of the private sector with knowledge on mitigation options to search for high quality and low cost mitigation options
- Involvement of the private sector to leverage additional investments
- Rigorous monitoring and accounting of the reductions

In climate financing, developed countries finance is counted against climate finance targets only and not against their emission reduction target. For developing countries some overlap with national targets is possible in case they have been proposed conditional to international support.

---

<sup>2</sup> An introduction to a benchmarking approach based upon technical criteria can be found in (Warnecke & Fekete 2013)

### 4.3 Option 3: Carbon pricing as a domestic implementation instrument of a national contribution with international cooperation

Another option would be to use a domestic carbon market mechanism and/or other carbon pricing mechanisms to domestically implement the internationally proposed targets. These domestic markets could be linked to other domestic markets, independent of an international agreement on climate change.

Several examples are already existing:

- The EU, for example, has implemented its domestic emissions trading system to help fulfil its Kyoto targets. This system covers the 28 EU countries and operates in Iceland, Liechtenstein and Norway. Furthermore, links to other domestic systems are in consideration and planning.
- Mexico employ carbon pricing as a domestic implementation instrument through its carbon tax for fossil fuel sales with a complementary scheme for offsetting, as well as an ETS for the energy sector which is in planning.
- Alberta implements its target to reduce emissions intensity through the Greenhouse Gas Reduction Program and Offset Credit System. This offers a menu of carbon pricing compliance options to heavily emitting industries, including an offset credit mechanism where only credits generated in Alberta are eligible for compliance (World Bank 2014).
- China implements subnational Emissions Trading Schemes, which offer the option of partial compliance through offsetting with domestically generated Chinese Certified Emissions Reductions (CCERs).

For this option 3, each country may develop its own market rules, although international coordination on such rules is certainly preferable. The domestic or subnational market instruments could also be linked if all involved parties agree, for example in the case of China's regional ETS programmes, where a limited amount of offsetting credits can be traded between the individual provincial programmes.

To propose the *implementation* of a domestic carbon pricing system could also be a component of the international contribution in itself. For example, in addition to an emissions target, a country could propose to implement the carbon market mechanism or another carbon pricing policy as part of their international contribution. Such a component might a) demonstrate commitment to increasing national mitigative capacity, b) increase the certainty that the other proposed targets are really implemented and c) increase *buy-in* amongst potentially sceptical industries.

## 5. Narrowing the emissions gap before 2020 using market mechanisms

*Carbon market mechanisms can be a tool to narrow the emissions gap in 2020 between what countries currently collectively propose to do and what would be necessary to limit global temperature increase to 2°C. It would be beneficial to develop robust and predictable rules in emerging regional, national and subnational carbon pricing instruments to create certainty and ensure stability. The continuation of existing market activities can be supported by increasing the demand for international emission reduction credits, through a diversification of market buyers, and the replication and up-scaling of purchase facility approaches. Interested countries could begin to pilot bilateral or multilateral sectoral mechanisms in order to achieve more pre-2020 emission reductions and improve the feasibility of such sectoral approaches as part of a potential international mechanism for post-2020 climate change agreements.*

The anticipated emissions trajectory of countries' current and pledged policies and activities up to 2020 leaves a considerable gap to a pathway that would be necessary to achieve the agreed goal to limit temperature increase to 2°C. Additional reductions of 8 to 10 GtCO<sub>2</sub>e per year by 2020 (16% to 20% of global emissions in 2010) would be required for lowest global costs towards the 2°C limit (UNEP 2014). If the reductions are delayed, global costs would increase to meet the same goal and significantly steeper reductions would be necessary in the middle of the century. Hence additional action before 2020 is urgently necessary to keep the option open to stabilise global temperature increase at 2°C.

**Market mechanisms can be an important tool to narrow the 2020 emissions gap**, by catalysing the commencement of new mitigation activities, as well as supporting the continuation of activities started under existing and previous market mechanisms, and maintaining the institutional capacities developed under such mechanisms.

The following elements briefly describe the most important issues to be considered, in order to maximise the role that market mechanisms can play to support the continuation of existing mitigation activities, and the commencement of new action pre-2020.

### *Create certainty with new international rules*

**A functioning market requires robust and predictable rules.** Rules for the Clean Development Mechanism are currently under revision, and the probable framework and rules of future schemes including the mooted New Market-based Mechanism remain unclear at their most fundamental level. Prompt action is needed to create a degree of certainty on the mid-term outlook for carbon market mechanisms and the rules that they will follow, in order to attract and win back the trust of both public and private sector stakeholders.

**A tonne is a tonne. This basic principle must be ensured.** International coordination on these frameworks should lead to an undisputable application of the principle of guaranteeing that the emissions value traded in any global trading scheme is equal to (at least) the same emissions reduction value at the point of credit generation. This principle, commonly referred to as "a tonne is a tonne" recognises that efforts in crediting schemes in some host countries to reduce the burdens of MRV should not be made at the cost of guaranteeing the integrity of full abatement value of credits traded outside of the system. The most fundamental requirement of the fulfilment of this principle is the **international review and acceptance** of the MRV and credit issuance regulations adopted in each individual regional, national or subnational trading system. The ability to internationally integrate accounting rules in a cost effective way that results in a satisfactory outcome for all parties (including credit buyers and sellers, and all the private and public stakeholders in between), is only realistically possible if such a review and acceptance process

is conducted from a very early stage in the planning phase of each individual programme. In this regard, **the development of international guidelines for a) the development of MRV and credit issuance processes, and b) formal international review processes, is overdue**, and the absence of such guidelines is already causing increased fragmentation of accounting regulations. A formal international platform for such review and acceptance may double as a platform for knowledge sharing between countries and regions eager to implement similar policies.

Furthermore, international acceptance of MRV processes is a natural precondition for the acceptance of emission reductions achieved, and thus a precondition for investment certainty. Undertaking such a process is therefore highly likely to reduce investment risks significantly and, in turn, to trigger private sector investment in the system.

*Support the continuation of existing market mechanism activities:*

The collective envisaged greenhouse gas emission reductions of the CDM by the end of the first crediting period, according to the initial project design documents of all projects registered by December 31<sup>st</sup> 2012, was approximately 950 MtCO<sub>2</sub>e per year (UNEP DTU 2013). Realistically, NewClimate Institute research (forthcoming), combined with data from project design documents indicates the actual current annual mitigation impact to be in the range of 627 to 760 MtCO<sub>2</sub>e per year. Furthermore, the research forecasts that this impact will decrease in 2015, and will continue to decrease over the near term future as a result of the discontinuation of CDM project activities; many CDM projects are expected to return to pre-CDM conditions in the near future as a result of the poor market conditions, procedural difficulties, and the lack of continued support available for projects that are coming to the end of their crediting periods.

A revitalised international market mechanism framework may reverse the trend – early indications from the Chinese CCERs indicate that new mechanisms can build upon the existing strengths and methodologies of the CDM to allow project conversion and re-commencement with minimal transaction costs – although it is highly likely that a significant proportion of the loss of CDM initiated mitigation action (an estimated 57 to 261 MtCO<sub>2</sub>e/a) is irreversible, due to the closure of implementing firms or the permanent dismantling of facilities that contained mitigation project activities. Timely action should ensure that no more mitigation action is irreversibly lost.

There are two major modes of support for the continuation of existing market mechanism activities in the period before the new climate agreement enters into force. These are, (a) to **increase short-term demand for emission reduction credits**, and (b) the **provision of national or international support that increases the alternative revenues or cost savings of project activities**.

a) Increase demand

**A broader base of demand-side market participants is required to increase demand, ensure stability and regain trust. In this regard the announcement of ambitious INDCs and the option to use carbon markets in the new agreement is crucial for investor confidence.** A major surplus of certified emission reduction credits exists on the international market due to the reduced demand caused in part by the global economic crisis faced at time in the past decade, and in part by the failure of most developed countries to sustain and increase demand through the sufficient implementation of more stringent domestic climate change policies. The surplus, in turn, has caused the market price of CERs to plummet, reaching a low of EUR 0.23 in June 2014, and averaging approximately EUR 0.40 across the year 2014 (EEX 2015). Several programmes have emerged with the aim to artificially increase demand of CERs to support project continuation in the short term. These programmes include the purchase facilities of the **Swedish Energy Agency** and the **Nordic Environment Finance Corporation**, the **Pilot Auction Facility** and **Carbon Initiative for Development** of the **World Bank**, national programmes such as **Germany's Foundation "Future of the Carbon Market"**, and a number of private and public



foundations. The two major purchase facilities have confirmed agreements to buy up a total of approximately 42 million CERs between 2014 and 2020 (Swedish Energy Agency 2012; NEFCO 2014), or on average 6-7 million per year, potentially enough to support the continuation of approximately 1% of total CDM mitigation action. Whilst these are truly commendable initiatives, their replication and considerable upscaling is a key step to maintaining and increasing a significant amount of market driven mitigation activities pre-2020. Purchase programmes use specific criteria to ensure that they support only the projects that are at a high risk of discontinuance without support. Moreover, the purchase of credits from such activities is also of key importance to the restoration of the trust amongst some disillusioned project owner and developers, a large majority of whom report that they would not consider to register a similar project under the CDM again (NewClimate Institute n.d.).

**Join, replicate, build upon, and scale up the purchase facility model.** The commendable development of such efforts have catalysed the possibility of a larger opportunity for a potential broader coalition of credit buyers to restore trust amongst broader market participants, especially local entrepreneurs and private sector investors. This potential coalition of credit buying countries should seize this opportunity through piloting more innovative credit purchase designs in new programmes, and scaling up successful initiatives on a mass level. The World Bank is demonstrating leadership in the piloting of innovative approaches through the reverse auction design of the Pilot Auction Facility for methane avoidance projects. **An opportunity exists before the Paris Conference of Parties in December 2015**, for a group of countries to join, replicate, build upon and scale up such activities, in order to positively influence the perceived feasibility of market mechanisms in a future climate agreements amongst negotiators, and moreover to exploit and highlight the potential that remains for market mechanisms to increase pre-2020 ambition.

b) Increase alternative revenues

In the second mode of support, domestic or international policy intervention that increase the alternative revenues or cost savings of project activities, reduce the reliance of projects on CER revenues, and are therefore shown to have a major effect on the ability of such projects to continue to operate their mitigation equipment and to conduct regular monitoring, reporting and verification. Such modes of support include:

- Implementation of policies that provide other financial incentives (tax credits, subsidies or feed in tariffs)
- Increased stringency of regulations against unclean industries that are project competitors
- Proactive domestic institution and capacity building to reduce transaction costs of MRV and credit issuance
- Reform and streamlining of national bureaucratic processes.

In many cases, support providers may find its provision to be a cost effective means of fulfilling national development goals, especially in the energy sector where the use of feed in tariffs or competitive procurement for distributed renewable energies may be a cheaper and more appropriate means of broadening national electrification or meeting increasing national energy demand than through the use of traditional fossil fuel technology options. The provision of such support reduces the reliance on CER revenues to facilitate continuation of some project activities within market mechanisms in the short term. The sustained and reliable provision of such support in the medium-term may allow for the eventual continuation of some project activities outside of market mechanisms and without alternative support in the long term.

### *Implement pilot bilateral sectoral crediting programmes*

Developed countries could include in their contribution under a 2015 climate agreement to achieve a certain amount of reduction through international offsets after 2020. In this context, countries could already begin before 2020 to undertake pilot initiatives to bilaterally or multilaterally test the sectoral mechanisms approach based upon communally-agreed benchmarks, as discussed in section 4.1.

**Piloting activities for bilateral crediting systems can counteract the emerging fragmentation of the global carbon market** by further enabling countries to finance and initiate mitigation activities, by involving regional trading schemes and by mostly building on existing CDM or ETS compatible methodological structures. Warnecke and Fekete (2013) provide an overview of how pilot sectoral mechanisms might be developed and implemented.

Bilateral agreements for piloting activities may regulate the processes and responsibilities and allow for learning-by-doing, as long as the further development of mechanisms under the UNFCCC process is still pending. Experiences from the past have shown that early activities positively affect the development of market-based mechanisms and have the potential to set standards.

**The near-term implementation of pilot bilateral sectoral crediting programmes** between interested countries **may considerably increase mitigation action** in such countries pre-2020, and lead to the development and testing of processes that might be tweaked and adopted by a potential international or multilateral sectoral mechanism for post-2020 climate change agreements.

## 6. Recommendations for the G7

The G7 group of countries could consider the following immediate actions in order to develop the feasibility of options for integrating carbon market instruments in a 2015 climate change agreement, and maximise the potential for carbon market mechanisms to narrow the emissions gap before 2020.

### *1. Commit to advance the development of a new generation of market mechanisms in the UNFCCC before the Paris COP in December 2015*

Considering the option to use international carbon markets as a component of contributions under a 2015 climate change agreement, **G7 countries** could commit to **form a working group to accelerate the development of processes and proposed regulations**, in order to increase the feasibility of such approaches. Major attention should be paid to ensure that proposed approaches mitigate the risks of the potential economic disincentives for regular ambition raising, and avoid double counting of reductions through coordinated international accounting that is fundamentally compatible with the existing or envisaged reporting processes of all countries.

### *2. Review and learn from the positive outcomes of the first crediting period of the Kyoto Protocol*

During the first crediting period, the Kyoto Protocol's flexibility mechanisms (the CDM and JI) demonstrated an ability to activate markets and **cost-effective mitigation** action, **engage foreign and domestic private sector entities** in climate change mitigation and achieve considerable **financial leverage**, drive **technology transfer** and revolutionise host country industries, generate enormous **volumes of investment** in climate change mitigation, and **diffuse the principles of carbon pricing** and climate change mitigation to all corners of the world. Such successes are often overlooked in the wake of recent market difficulties, but a thorough understanding of the lessons learned from these mechanisms should inform the design of all future policy for carbon pricing approaches.

### *3. Form a broad coalition of actors to safeguard knowledge and infrastructure on carbon pricing*

It is not too late to avoid the irreversible loss of institutions, infrastructure and expertise built up under the CDM. The immediate diversification of demand side market participants will **increase the demand** of high quality emission reduction credits, improve the **stability of market prices**, regain **market trust** amongst project developers and potential investors, reduce the **risk to investments**, and attract a larger **volume of private finance**.

#### *➤ Join, replicate, build upon and upscale credit purchase facility approaches*

**G7 countries** could lead a broad coalition of actors who studies, replicates and significantly upscales the **CER purchase programmes that seek to increase the short-term demand** in international markets. These efforts should pay particular attention to targeting project types and countries where there are especially high risks of project discontinuation and/or especially low degrees of trust in the markets. Rebuilding confidence in the continuity of the markets is urgently needed.

#### *➤ Use the coalition as a platform for regular exchanges on carbon pricing approaches*

A **broad coalition of actors** could be used as a **platform for regular meetings and exchanges** on carbon pricing approaches including market mechanisms. This may be an ideal forum for discussions on standards and rules in the period after COP21 in Paris. Such a platform may also be used as a forum for the discussion and analysis of **options for using carbon pricing approaches to raise ambition**. This should build upon and complement successful existing platforms such as the International Carbon Action Partnership (ICAP) and

the World Bank's Partnership for Market Readiness (PMR), which is already providing support to a limited number of countries.

- ***Take the initiative to begin to pilot bilateral or multilateral sectoral crediting mechanisms***

**G7 countries** or the **broader coalition of actors** could commit to engage in the **immediate implementation of pilot bilateral or multilateral sectoral market mechanisms**, so as to test and further develop such approaches before 2020, and also to increase the level of mitigation action in targeted sectors before 2020.

- ***Create best practice guidelines to ensure that regional and domestic pricing instruments are designed with robust rules and develop a voluntary process for international review***

Although freedom to choose carbon pricing instruments is key to convince as many countries as possible to make use of the principles of carbon pricing, ultimately **global carbon pricing needs comparable efforts and reporting**. Multilaterally organised companies might find it easier to anticipate carbon pricing strategies on a company level if similar conditions apply to their worldwide operations. **Rules of similar strength** would also improve competitive conditions between companies. The **platform of actors** could **start processes that ensure converging conditions** in their individual carbon pricing policies. **Rules and methods of similar strengths can become a blueprint** for further regional initiatives and would have a positive global effect towards credible accounting and high reputational initiatives. This could include best practice guidelines to ensure that regional and domestic pricing instruments are designed with robust rules and potentially the development a voluntary process for international review.

## 7. References

- Balderas Torres, A., 2014. El carbon tax y el mercado de carbono en México. Available at: [http://www.milenio.com/firmas/arturo\\_balderas\\_torres/carbon-tax-mercado-carbono-Mexico\\_18\\_231756900.html](http://www.milenio.com/firmas/arturo_balderas_torres/carbon-tax-mercado-carbono-Mexico_18_231756900.html) [Accessed March 5, 2015].
- Castro, P. & Michaelowa, A., 2011. Would preferential access measures be sufficient to overcome current barriers to CDM projects in least developed countries? *Climate and Development*, 3(2), pp.123–142. Available at: <http://www.tandfonline.com/doi/abs/10.1080/17565529.2011.582275?journalCode=tclD20>.
- Climate Policy Initiative, 2014. *The Global Landscape of Climate Finance 2014*, Available at: <http://climatepolicyinitiative.org/wp-content/uploads/2014/11/The-Global-Landscape-of-Climate-Finance-2014.pdf>.
- EEX, 2015. Certified Emission Reduction Futures | Global Environmental Exchange. Available at: <https://www.eex.com/en/market-data/emission-allowances/derivatives-market/certified-emission-reductions-futures> [Accessed February 11, 2015].
- Government of Thailand, 2014. *Draft Market Readiness Proposal: Thailand*, Available at: <https://www.thepmr.org/system/files/documents/Thailand Draft MRP presentation %28PA7%29.pdf>.
- ICAP, 2015. ETS detailed information: Thailand. Available at: [https://icapcarbonaction.com/index.php?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=81](https://icapcarbonaction.com/index.php?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=81) [Accessed March 5, 2015].
- IGES, 2014. *New Market Mechanisms in CHARTS*, Available at: [http://pub.iges.or.jp/modules/envirolib/upload/3352/attach/new\\_mech\\_charts.pdf](http://pub.iges.or.jp/modules/envirolib/upload/3352/attach/new_mech_charts.pdf).
- NEFCO, 2014. NEFCO to close first Call for Proposals for NorCaP. Available at: [http://www.nefco.org/news/nefco\\_to\\_close\\_first\\_call\\_for\\_proposals\\_for\\_norcap](http://www.nefco.org/news/nefco_to_close_first_call_for_proposals_for_norcap) [Accessed February 11, 2015].
- NewClimate Institute, *Concepts and country specific strategies for the carbon market post 2012 (publication in preparation)*,
- Pearson, M., 2011. *Results based aid and results based financing : What are they? Have they delivered results?*, London.
- PMR, 2014. Partnership for Market Readiness: Thailand. Available at: <https://www.thepmr.org/country/thailand-0> [Accessed March 5, 2015].
- Seres, S., Haites, E. & Murphy, K., 2009. Analysis of technology transfer in CDM projects: An update. *Energy Policy*, 37(11), pp.4919–4926.
- Spalding-Fecher, R. et al., 2012. *Assessing the Impact of the Clean Development Mechanism: Report commissioned by the high-level panel on the CDM Policy Dialogue*, Available at: [http://www.cdmpolicydialogue.org/research/1030\\_impact.pdf](http://www.cdmpolicydialogue.org/research/1030_impact.pdf).
- Sterk, W., Mersmann, F. & Warnecke, C., *Climate Finance Requirements and the Current Status of International Climate Finance and Carbon Markets (unpublished)*,
- Swedish Energy Agency, 2012. *The Swedish CDM and JI Programme: Contributing to global climate change mitigation*, Available at: <http://www.energimyndigheten.se/en/Cooperation/For-a-better->

climate/Flexible-mechanisms-for-monitoring-green-house-gas-emissions/Swedish-CDM-and-JI-climate-programmes-/.

UNEP, 2014. The emissions gap report 2014 - A UNEP synthesis report. Available at: [http://www.unep.org/publications/ebooks/emissionsgapreport2014/portals/50268/pdf/EGR2014\\_LOWRES.pdf](http://www.unep.org/publications/ebooks/emissionsgapreport2014/portals/50268/pdf/EGR2014_LOWRES.pdf) [Accessed February 3, 2015].

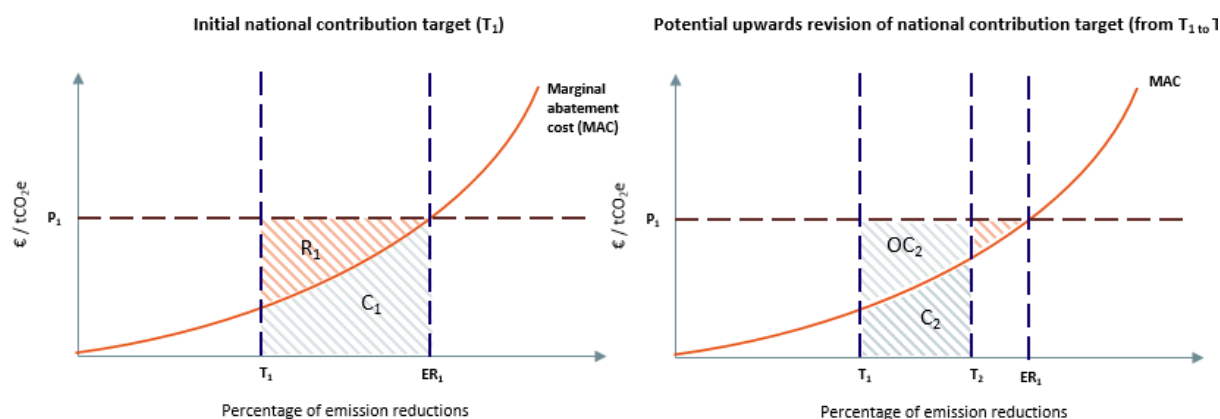
UNEP DTU, 2013. UNEP Risoe CDM/JI Pipeline Analysis and Database: September 2013. Available at: <http://cdmpipeline.org/> [Accessed September 9, 2013].

UNFCCC, 2012. *Benefits of the Clean Development Mechanism 2012* G. A. Kirkman et al., eds., Available at: [http://cdm.unfccc.int/about/dev\\_ben/ABC\\_2012.pdf](http://cdm.unfccc.int/about/dev_ben/ABC_2012.pdf).

Warnecke, C. & Fekete, H., 2013. *Carbon markets in transition*, Berlin. Available at: [http://www.dehst.de/SharedDocs/Downloads/EN/JI-CDM/Carbon-markets-in-transition.pdf?\\_\\_blob=publicationFile](http://www.dehst.de/SharedDocs/Downloads/EN/JI-CDM/Carbon-markets-in-transition.pdf?__blob=publicationFile).

World Bank, 2014. *State and Trends of Carbon Pricing*, Washington D.C. Available at: <http://documents.worldbank.org/curated/en/2014/05/19572833/state-trends-carbon-pricing-2014>.

## Annex

**Box 2: Reconciling carbon market mechanisms with the concept of gradual commitment increases**

The diagrams above indicate the potential barrier to increasing ambition once an initial commitment level is fixed, when international market offsetting is an available option. The left hand diagram portrays the scenario where a country commits to reduce emissions up to the target T<sub>1</sub>. Since, at the level T<sub>1</sub> the marginal cost of mitigation action (MAC) is still lower than the international price of international carbon allowances (P<sub>1</sub>), the rational course of action would be for the country to increase its emission reductions to the point at which the marginal cost of mitigation is equal to the price of carbon allowances (ER<sub>1</sub>), and to sell allowances for the emission reductions achieved between target T<sub>1</sub> and ER<sub>1</sub>. To reach this point, the country will incur costs equal to the area C<sub>1</sub>, but will receive revenue equal to the area of the whole shaded area, and the area R<sub>1</sub> represents a positive return. The right hand diagram portrays the scenario where the country considers to upscale its national contribution target from T<sub>1</sub> to T<sub>2</sub>. In the absence of market mechanisms the cost of increasing ambition in this way would be equal to the area C<sub>2</sub>. However, in the case that an offsetting mechanism exists, the upscaling of ambition would *also* entail the opportunity cost equal to the area OC<sub>2</sub>, which would otherwise have been profit from the international sale of allowances. The total cost of increasing ambition of the fixed target therefore significantly exceeds the actual cost of implementing the mitigation action, since the marginal cost of all action up to this level essentially becomes the international price of carbon, even for mitigation actions where the actual mitigation costs are below this price. Importantly, it should be clear from the right hand diagram that an increase in the international price of carbon (which is a logical outcome of increased collective domestic ambition raising) would further increase the opportunity cost incurred by a shift from target T<sub>1</sub> to target T<sub>2</sub>.

The implication of this is that a country will face economic disincentives to raise its ambition level. A further implication is that countries may actually *reduce* the ambition of their initial contribution in anticipation of this scenario.