Fragmentation of international climate policy: doom or boon for carbon markets?

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Abstract

After Copenhagen and Cancun, fragmentation of carbon markets is in full swing, with the EU and Japan actively dismantling the role of the CDM as "gold standard" currency of the global carbon market. While some political scientists argue that fragmentation could be advantageous for the climate negotiations, economists see it negatively, as it drives mitigation costs upwards and leads to a hodgepodge of rules with high transaction costs. The voluntary market as a laboratory for fragmentation has shown that high-quality credits are restricted to a tiny share, prices vary by several orders of magnitude and registries as well as verification standards have proliferated. Thus fragmentation should be resisted as far as possible.

The rise and fall of centralized international climate policy

Anthropogenic global climate change is one of the biggest challenges for mankind entering the 21st century due to its particularly "nasty" policy characteristics. Mitigation of greenhouse gases has the character of a global public good whose benefits accrue to everybody while costs have to be borne by the entity financing the mitigation activity. In contrast to other public goods such as public security, benefits from climate change mitigation do not accrue immediately, but only in the future, and the level of benefits is contested. For some actors, e.g. people living in high latitudes where climate change increases agricultural productivity (see Yang et al. 2007), mitigation of climate change might actually not be desirable. Moreover, given the uncertainty surrounding climate change impacts, people might prefer to "wait and see", and eventually call for government help if impacts actually occur.

After two decades of increasing visibility and salience, international climate policy is at a crossroads. Hitherto, climate policy had followed a path of increasing centralization and coordination, climbing up a ladder of increasingly detailed international agreements. Climate negotiators had the general impression to follow in the footsteps of ozone diplomacy, where a generic framework treaty was strengthened over time by specific treaties, ratcheting up emissions commitments as well as resource transfers from industrialized to developing countries to fund emissions mitigation. With the UN Framework Convention of Climate Change agreed in 1992, the Kyoto Protocol negotiated in 1997 and the Bali Plan of Action agreed in 2007 on the principles of a post-2012 climate regime, the Montreal Protocol precedent seemed to be a perfect fit.

Of course, game theorists (Barrett 1998) and political science realists (Victor 2001) had long stated that the free riding induced by the global public good characteristics of climate policy would lead to a failure of a centralized international approach. They had seemed to triumph already in 2001 when US president Bush repudiated the Kyoto Protocol. But then the rest of the world rallied to defend the Kyoto approach, and the Protocol entered into force in 2005. 2007 brought the consecration of climate policy as an issue of highest global importance with the award of the Nobel Peace Prize to the Intergovernmental Panel on Climate Change and Al Gore. Everything seemed on track to culminate in a glorious event that would lead international climate policy in its third decade and set up a really global climate regime – the Copenhagen climate summit of late 2009.

But fate intervened by unravelling the real estate bubble in the US. By mid-2009 policymakers in countries previously proud of their role as climate policy pioneers were struggling to keep their economies afloat. Hopes of the US playing the role of a climate policy frontrunner evaporated after Congress failed to pass a comprehensive emissions trading bill. Those advanced developing countries that had weathered the storm well were not really eager to take up the role of greenhouse gas mitigation pioneers. Instead, they discovered climate policy as a field where they could assert their newly won economic power and defy industrialized countries through a new negotiation group called BASIC.

This explosive cocktail derailed the Copenhagen negotiations, with things made worse by the host country's inept handling of the summit. What was hoped to be the herald of a new era of global cooperation on climate change mitigation dissolved into a glimpse into the abyss of a fragmented climate policy with each country just doing what it felt to be appropriate, without any comparability or transparency of mitigation efforts. While through last minute attempts the abyss was papered over by the "Copenhagen Accord", it became quickly visible that Copenhagen heralded a sea change in climate policy. Ever since then, international climate policy faces the inconvenient truth of fragmentation, even if hidden behind many smokescreens of UNFCCC language and "successes" in negotiations such as Cancun in 2010.

Why fragmentation of climate policy is a bad idea

Biermann et al. (2007, p. 8ff) discuss pros and cons of fragmentation from a political science view. In their view, fragmentation could lead to faster agreements among frontrunners and avoid watering down of commitments. Moreover, it would allow side payments and allow to involve non-state actors as well as solutions tailored to specific circumstances. Competition between different approaches could lead to innovation. Ostrom (2010) argues that bottom-up "polycentric efforts" could lead to a situation that is better than an ineffective centralized regime. However, many

of the arguments do not fully fit to the current regime, as it allows for differentiation of commitments, side payments through climate finance and voluntary non-state action. According to Biermann et al. (2007) the disadvantages of a fragmented approach include less potential for package deals, lack of fairness, incentives to engage in a race to the bottom and lack of transparency.

From an economist's viewpoint, the disadvantages dominate. Due to the characteristics of greenhouse gas mitigation as a global public good, it is economically ideal to agree on emissions targets globally and to harness the cheapest mitigation options through market mechanisms. While simple marginal abatement cost curves as reported by Mc Kinsey need to be treated with caution (see Ekins et al. (2011), and the dynamic effects of mitigation policies need to be considered when comparing measures, experience from the Clean Development Mechanism has shown that it was able to mobilize a significant volume of low-cost reductions, but also higher cost ones (Castro 2011). The effect of fragmentation will be that overall emissions mitigation effort will be lower than required by the 2°C target acknowledged both in the Copenhagen and Cancun agreements (Kartha and Erickson 2011 summarize all relevant studies and conclude that the temperature rise would be in the interval 2.5°C to 5°C) . This is even acknowledged by realists, Carraro and Massetti (2010) propose wryly to use 50 billion $ to buy mitigation in developing countries in order to close the effort gap. They do not realize that under a fragmented approach, there is no incentive for any country to spend huge sums on mitigation abroad.

A comparison of modelling studies show that any fragmentation of mitigation action will unequivocally lead to mitigation cost increases (Hof et al., 2009). This is the case in any configuration of marginal costs. In a fragmented world, carbon prices will differ and even if there is "linking" of different jurisdictions (Flachsland et al. 2009), transaction costs will occur. Further negative effects are carbon leakage, i.e. the increase of emissions outside a group of countries that mitigates emissions due to the reduction of fossil fuel prices caused by the mitigation action (Sinn 2008). Fragmentation of market mechanisms will deter financial institutions which need a minimum turnover and stability to enter a market. In a fragmented market, sellers of credits will be at the mercy of each single, unique buyer for specific types of credit while currently, international competition protects sellers against overly greedy buyers. While some buyers would look for high-quality credits, as done by the EU today, there would probably be a "race to the bottom" in order to minimize costs of complying with the pledge.

Fragmentation of mitigation action will unequivocally lead to mitigation cost increases.

How does a fragmented climate policy world look like?

The key characteristics of the centralized world of the Kyoto Protocol regime and their counterparts under a fragmented regime are shown in Box 1.

Often, a fragmented system is seen as equal to a "pledge and review" system, which was first proposed by Japan in the early 1990s and has resurfaced from time to time. However, the review element still needs to be based on some common ground, which would lack in a fully fragmented system.

A full fragmentation would mean that all countries define their climate policy unilaterally. While even in the bleakest scenario, the UNFCCC would persist, it would uniquely provide rules for reporting of national greenhouse gas inventories. So some degree

of ex post evaluation of actual climate policy successes would be possible, at least for the Annex I countries. However, for developing countries, this evaluation would become difficult as the frequency of reports is not specified in the UNFCCC.

The actual post-2012 future may settle on a "middle ground" between a centralized and a fully fragmented system (Prag et al. 2011, p. 8). While it retains some features of centralization that are commonly seen as useful – Prag et al. (2011) would include common accounting rules, tracking of international transactions and common principles for new market mechanisms - other elements are fragmented. This would entail the risk that in a fragmented system one mitigation activity could be counted in several systems. A reduction might be acknowledged as an offset and at the same time credited towards a national pledge. This would become particularly relevant if some mechanisms credit policies whereas in the same jurisdiction project-based mechanisms continue to exist. It is clear that transaction costs of checking for double counting might be substantial.

Even with the UNFCCC negotiations formally still aiming at a relatively centralized system, de facto fragmentation is in full swing. The EU, which has hitherto formed the backbone of the global carbon market with its domestic emission trading scheme (EU ETS) accepting credits from the project-based Kyoto Mechanisms without serious constraints, is no longer willing to play this role. Already in the legislation agreed in 2009, the import limits for Kyoto credits have been reduced massively for the third EU ETS phase 2013-2020. Moreover, in the absence of an international agreement, Certified Emission Reductions (CERs) from Clean Development Mechanism (CDM) projects can only be imported if they come from projects located in Least Developed Countries or from projects that have already been registered before 2013. The latest restriction, announced in November 2010, was the prohibition of CER imports from CDM projects reducing the industrial gases HFC-23, and N_2O from production of adipic acid, which will enter into force in April 2013. CERs from such projects currently make up the lion's share of all CDM credits. The EU has made it very clear that it sees the Kyoto Mechanisms as

Box 1: *Key differences between a centralized and a fragmented climate policy regime*

Centralized world	**Fragmented world**
- legally binding commitments (absolute)	- unilateral pledges (absolute or intensity-based, partially qualitative)
- common emissions units (same global warming potentials)	- unilaterally defined emissions units (different global warming potentials)
- common inventory guidelines (based on IPCC Good Practice)	- unilateral inventory guidelines (national approach)
- a UNFCCC-administered registry linking national registries	- national registries
- centrally defined market mechanisms	- bilateral mechanisms
- central regulatory oversight	- unilateral rules
- transparency	- opaqueness

a bargaining tool in the climate negotiations. It has been actively pushing for sectoral mechanisms to replace the CDM. Moreover, the EU's import regulations for the EU ETS allow multi-country agreements negotiated as per the EU's interests.

The US, which did not ratify the Kyoto Protocol and thus have been the vanguard of fragmentation proactively undermined the idea of a global carbon market. While the bills that failed to pass Congress in 2009 embraced the principle of international offsets, it remained always clear that these offsets would have to obey domestically defined regulations. This was due to a deep mistrust of the CDM (see e.g. US Government Accountability Office 2008) fostered by an awkward coalition of supporters of environmental integrity and opponents of any monetary transfers abroad generated by climate policy. Offset mechanisms are also seen as a way to subsidize competitors of US industry in advanced developing countries; thus avoided deforestation initiatives were preferred compared to industrial projects.

Even within the US, fragmentation is rampant, with two regional emission trading schemes (the Regional Greenhouse Gas Initiative, RGGI, in the Northeast and the Western Climate Initiative essentially triggered by the Californian emissions trading proposal under the bill "AB 32"). Each of these schemes has different rules for project-based offsets. California has set an offset limit of 8%; offsets may only come from projects in the US, Canada and Mexico under rules approved by the Air Resources Board. So far, only a limited number of project types has been accepted. Moreover, sectoral credits might be allowed.

In 2010, Japan introduced the idea of a bilateral mechanism and quickly embarked in filling it with life. A budget of 77.5 million $ was allocated to promote the concept in 2010 and 2011. Both the Ministry of Economy, Trade and Industry and the Ministry of Environment are lavishly funding feasibility studies for pilot projects, of which 59 have been started to date. Most of the studies are done in South East Asia and relate to technologies either not eligible under the CDM (e.g. a nuclear power plant in Vietnam) or suffering from additionality problems. Japanese industry strongly supports the bilateral approach as it was put off by the high regulatory intensity of the CDM process and now hopes for easily accessible export subsidies for Japanese technologies. Access to feasibility study subsidies is limited to Japanese firms. Agreements with several governments to award and recognize bilateral credits are under negotiation. The credits are to be counted towards the Japanese Copenhagen pledge. To date, no baseline, monitoring and verification methodologies have been published. The pilot projects shall however assess such methodologies.

Even with the UNFCCC negotiations formally still aiming at a relatively centralized system, de facto fragmentation is in full swing.

The current status of fragmentation of carbon markets for the time after 2012 is shown in Figure 1 below, showing the wide range of emissions trading systems and project-based offset mechanisms.

Below, I discuss which parameters of project-based mechanisms and emissions trading systems can be influenced by fragmentation.

Differentiation of project-based mechanisms

The different parameters of project-based market mechanisms that can be influenced by fragmentation are as follows:

a) Baseline and additionality determination
b) Project types and sector coverage

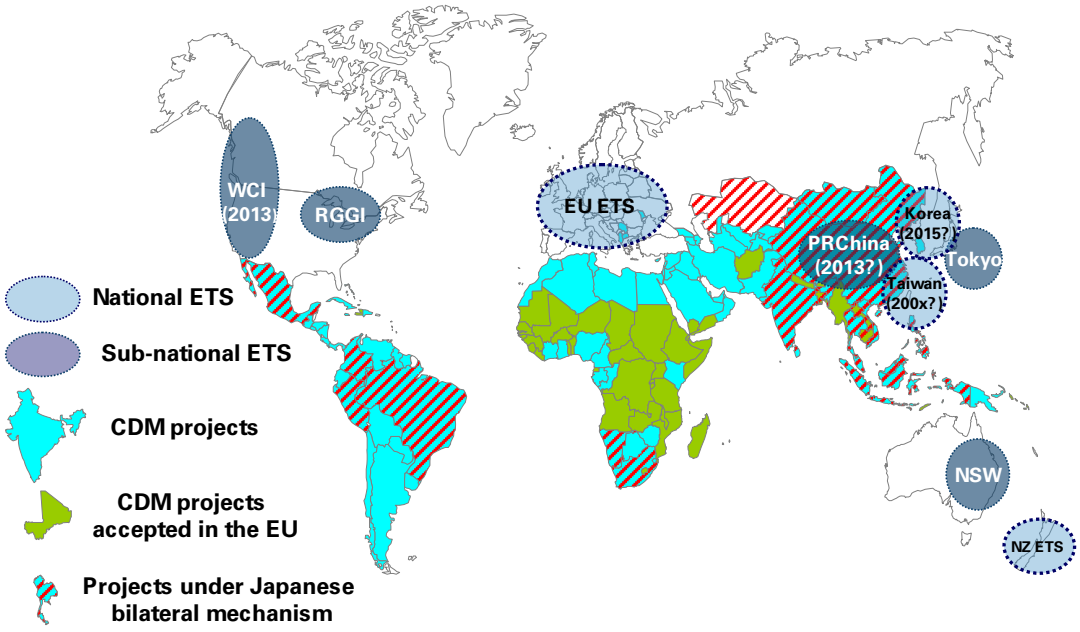


Figure 1: Ongoing carbon market fragmentation – current status for post-2012

c) Duration of crediting period
d) Validation process, monitoring, reporting and verification
e) Sustainability criteria

Positions of different countries and regional groups influencing their acceptance of offset credits in a fragmented world will be discussed below.

Baseline and additionality

Both baseline and additionality determination of mitigation projects are crucial elements of any offset mechanism and thus have been severely contested between business and environmental lobby groups. Normally, rules to set baselines are not identical with additionality determination rules but for many project types they are based on similar principles. The definition of the baseline is usually done by applying methodologies which have been accepted by the regulatory authorities.

Additionality is seen as important by key players in international negotiations. For example the EU has consistently emphasized strict additionality determination based on investment tests or tough technology benchmarks. Due to the strong domestic opposition against offset mechanisms mentioned above the US is arguing on the one hand for a robust additionality test to avoid the impression that US money flows abroad for the purchase of hot air. On the other hand US industry has always been interested in simple access to cheap credits and thus is not really interested in a limitation due to a strict additionality rule. In developing countries, views diverge. On the one hand Least Developed Countries and the AOSIS group which do not have a large potential of non-additional emission reductions due to the absence of industry are in favour of strong additionality to achieve real mitigation of greenhouse gases. On the other hand heavily industrialized CDM players like China and India see additionality as an obstacle to maximize emission credit generation and exports and thus support a lenient interpretation of additionality.

Regarding baseline determination similar challenges appear. A stringent baseline enhances envi-

ronmental integrity by leading to higher emission reductions while lowering the profitability of projects and increasing the costs of the investor country to reach its pledges. Thus the investor country might try to keep the baseline as loose and flexible as possible in a fragmented world.

Countries interested in environmental integrity will ask for accurate and complete datasets for baseline determination, while host countries and less quality-oriented buyers will go for simple default parameters. The pressure to reduce costs of baseline setting will be high; eventually the supporters of environmental integrity might settle for highly conservative default factors.

Project type and sector coverage

Investor countries will define eligible technologies in such a way that interests of its industries are satisfied. Thus technologies that are applied by competitors located in developing countries will not be eligible (see the US position discussed above), whereas technology exports not leading to direct competition will be favoured (see the Japanese approach to the bilateral mechanism).

Duration of crediting periods

In terms of environmental integrity, overall global emission reductions and project profitability, the characteristics of the crediting period within an offset system are a decisive factor as they directly affect the number of credits which can be generated under the scheme. The start of the crediting period can be determined in very different ways. While the CDM is very conservative inasmuch the registration date determines the start date, other mechanisms may apply the starting date of the project or the date of third party validation, both of which would lead to an earlier inflow of credits.

The duration of the crediting period has major impacts on the overall delivery volume of offsets. The CDM allows a maximum of 21 years for credit generation, split up in three periods of 7 years, whereas forestry projects can receive credits for 60 years. If one imagines that the whole lifetime of large power generation units like nuclear power plants or ultra-super critical coal power plants would be eligible for crediting, the overall amount of offsets would be increased tremendously compared to the CDM. Longer crediting periods also increase the unwillingness to change policy regime characteristics and thus tend to "fossilize" policies. The Japanese bilateral mechanism, which has not defined any crediting period, might be the first step into this direction.

Rules for updates and renewals of crediting periods can have important repercussions on credit volumes. Stringent approaches require recalculation of the baseline and re-validation of additionality whereas lenient ones would just require continued existence of the project.

The pressure to reduce costs of baseline setting will be high; eventually the supporters of environmental integrity might settle for highly conservative default factors.

While the EU has shown a tendency to prevent renewal of crediting periods of project types that generate exceedingly high profits such as HFC-23, internationally lenient approaches to crediting period duration and renewal have not really spread to date.

Validation process, monitoring, reporting and verification

A validation process requires an independent auditor. A project could be admitted to a market mechanism by simple production of a validation report of a certification company accredited under domestic law. The CDM goes beyond that inasmuch regulators scrutinize validation reports and frequently ask for revisions. Moreover, regulators accredit vali-

dators on the basis of a careful process of checking organizational competence. Significant cost savings could be achieved by doing away with validation and just rubber-stamping project documentation.

Furthermore it has to be defined whether it is compulsory to publish project documentation ex ante. The CDM even requires to collect the opinion of the potentially affected local population, e.g. by conducting a stakeholder meeting. Publication of documents and stakeholder consultation is costly, but usually seen as critical for credibility of projects. The same applies to monitoring, reporting and verification. Reporting frequencies, contents of monitoring reports, verification requirements and responsibilities need to be clarified. Should the verification body be independent or is verification done by the mechanism administrator?

In a fragmented climate policy world, the incentive to set legally binding targets will be lower than in the Kyoto world.

International acceptance of a "light" approach is not guaranteed, but experience is mixed. Some parties do not require independent validation for domestic offset systems (e.g. Canada). Advanced developing countries have been extremely reluctant to allow independent verification. On the other hand transparency of reporting monitoring results is generally supported, especially by the US.

Sustainability criteria

In the CDM the host country's DNA has the exclusive right to define a set of sustainability criteria that projects have to fulfil. In case of a negative outcome of the sustainability assessment projects can be rejected. This possibility reflects states' sovereignty, but is applied rarely. Under fragmented markets, both countries involved in a transaction would have first to see a need for assessing sustainability benefits and then agree who defines and evaluates the criteria. Either it will be the responsibility of the host country as in the current CDM, or the investor claims that right for itself. A third approach would be the joint definition of criteria and a joint evaluation body.

Differentiation of emissions trading systems

For emissions trading systems, the key parameters are

a) Characteristics of targets
b) Coverage
c) Allocation processes
d) Openness

Characteristics of targets

Under the Kyoto Protocol, targets are legally binding and thus generate demand for trading units. Targets can be set on different jurisdictional levels and "cascade" downwards from the international to the national and subnational level – the Kyoto target triggered the introduction of the EU ETS. In a fragmented climate policy world, the incentive to set legally binding targets will be lower than in the Kyoto world. Types of targets would also be differentiated. The currently prevalent absolute targets would most likely be substituted by much less "biting" intensity targets, especially in advanced developing countries.

Coverage

The degree of coverage is akin to project type eligibility for project-based mechanisms. An upstream system where allowances are surrendered by fossil fuel producers and importers can cover the entire economy. In a downstream system, coverage is usually limited to large sources in order to keep transaction cost at a manageable level. In a fragmented world, the latter system is more likely as it allows to exempt critical sectors. For example, in Australia and New Zealand key sectors prevented coverage

in proposed emission trading systems arguing that their competitors were not covered by any climate policy instrument. Likewise, industries in the EU were able to prevent a replacement of free allocation by auctioning in the phase 2013-2020 by arguing that a critical loss of competitiveness would ensue. Fragmentation will also lead to attempts to reduce transaction costs of the systems.

Allocation processes

Allocation can range from pure grandfathering to full auctioning of allowances. Fragmentation will make a grandfathering approach attractive as auctioning is seen to provide a competitive disadvantage. The EU implementation of the rules to prevent competitive distortions would certainly have led to less exemptions if Copenhagen had brought a centralized regime for post-2012.

Openness

In a centralized climate policy world, openness is favourable as it allows access to UNFCCC regulated credits and thus cost reduction with only a limited reduction in credibility. The fragmented world will reward exclusive relations between symbiotic partners and discount openness. Openness reduces the degree of control over prices and quantities. Price caps and floors are a huge obstacle to openness as they might lead to "contamination" of other trading schemes in case the caps are reached.

The voluntary carbon market – laboratory of fragmentation

We already have a fragmented world in an important segment of the carbon markets – the voluntary market. In the decade of its existence, several key lessons have been learned. None of these is particularly encouraging.

Lack of transparency

The voluntary market is highly non-transparent. Only specialists have a good overview of the details of rule differences. While some institutions provide an evaluation of the market segments (the best is the annual report on the state of voluntary markets, for the most recent edition see Peters-Stanley et al. 2011), there is no institution providing real-time information. This is a massive contrast to the mandatory market systems where high liquidity and standardized contracts lead to real-time publication of prices free of charge.

Wild swings in demand

Right from its inception, the voluntary market has been a buyer's market. Turnover of the voluntary market is dependent on the whims of the demand side and credit suppliers have to discover "what turns the markets on or off" (Peters-Stanley et al. 2011, p. iii). Whole market segments are turned off if the political appetite for greenhouse gas reductions slackens as seen in the US in 2009-10. This shows that a large share of the demand for voluntary credits was actually due to the hope to acquire an offset that could eventually be used for compliance purposes at rock-bottom prices. Many players in the voluntary markets have also tried to market those segments that were ineligible in the compliance market, such as forest protection. Generally, marketing plays a much larger role than in the compliance market, leading to waste of resources and a tendency to focus on simple messages. Despite a decade of efforts, overall, annual turnover of the entire voluntary market has remained below ¾ billion $, i.e. less than 1% of the compliance markets. Even if one only counts primary transactions of offsets from the Kyoto Mechanisms, the voluntary market never reached more than a quarter of the volume of the compliance market.

Proliferation of institutions with similar tasks

Registry and verification systems compete with each other, increasing transaction costs. 15 registries are competing, most of which are located in the US. Divergence of standards is likely as

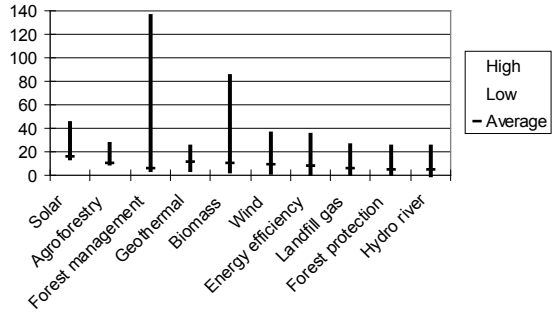
standard providers try to find stable niches. For example, the Gold Standard with a highly elaborate stakeholder consultation procedure caters for the buyers who value development benefits highly, whereas the Verified Carbon Standard (VCS) caters for those who want to get a "no-frills" credit. Peters-Stanley et al. (2011, p. vi) list 21 verification standards, twelve of which have a market share of 1% or less. Some offset providers combine several standards, particularly in the forestry sector.

As the voluntary market shows, there might be a small share of very high quality mechanisms, whereas bulk transactions would be done in a "no frills" way.

Wide divergence of credit prices reduces efficiency

Prices per emissions credit have a range of several orders of magnitude depending on the appeal of the credit. The difference is large both between project types as well as between different projects of the same type. This clearly does not lead to an efficient mitigation outcome, as should be achieved by a market mechanism. With the exception of forest protection, there is an inverse relationship between the typical size of a project and its chance to achieve a high price.

Figure 2: Price lottery on the voluntary market ($)



Data source: Peters-Stanley et al. (2011: 20).

Doubtful environmental integrity

Environmental integrity of voluntary offsets is very variable. While there is a distinct "high end" of the market catered for by the Gold Standard, many voluntary projects have a distinctively lax approach to additionality. Unsurprisingly, frequently projects rejected under the CDM are accessing the voluntary market.

Possible futures of market mechanisms in a fragmented climate policy world

An apt analogy of the current situation in global climate policy is the eve of the great depression in the 1930s. Then, the gold standard currency system was still working, albeit with challenges created by protectionist tendencies of countries in the post-war period. Nobody did envisage how the currency world would look like just five years later – impoverished and fragmented, with countries indulging in "beggar my neighbour " policies. If we do not engage in a last minute attempt to save a global climate policy approach, we will similarly look back in a nostalgic fashion to the "good old days" of an integrated carbon market with a single currency, the CER.

Fragmented carbon market mechanisms will lead to a coexistence of project-based mechanisms, sectoral crediting and crediting of policies. Within the universe of project-based mechanisms, there will be different eligible project types, different baseline methodologies, different monitoring procedures and different degrees of verification, all leading to different degrees of environmental integrity. We will se a patchwork of partially overlapping approaches. Buyers will try to minimize costs of credits whose environmental integrity is sufficiently high to dispel doubts in the general population, as well as in the eyes of the international community whereas sellers will want to maximize revenues. Given that the demand will be rather weak, a buyer's market can be expected.

One key criterion that is consistent among buyers and sellers is low transaction cost. The availability of cheap credits from hitherto ineligible project types is also supported by both sellers and buyers, unless the environmental integrity of those credits is perceived to be low. Furthermore, both sellers and buyers are interested in diffusion of advanced technology, unless transfer of this technology leads to an increase of competitive pressure on industries from the investor country. As the voluntary market shows, there might be a small share of very high quality mechanisms, whereas bulk transactions would be done in a "no frills" way.

Of course, fragmentation of carbon markets will generate some winners – politicians unwilling to underwrite expenses for serious national mitigation strategies, industry lobbyists, sovereignty enthusiasts, contract lawyers, highly specialized consultants like my firm Perspectives, speculators and arbitrageurs. The great loser will be the global climate.

Axel Michaelowa

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