



**MISTRA**  
THE SWEDISH FOUNDATION FOR STRATEGIC  
ENVIRONMENTAL RESEARCH

# CLIPORE

a Climate Policy Research Program funded by Mistra

## KEY RESEARCH FINDINGS 2004-2011

## **Clipore Key Findings 2004-2011**

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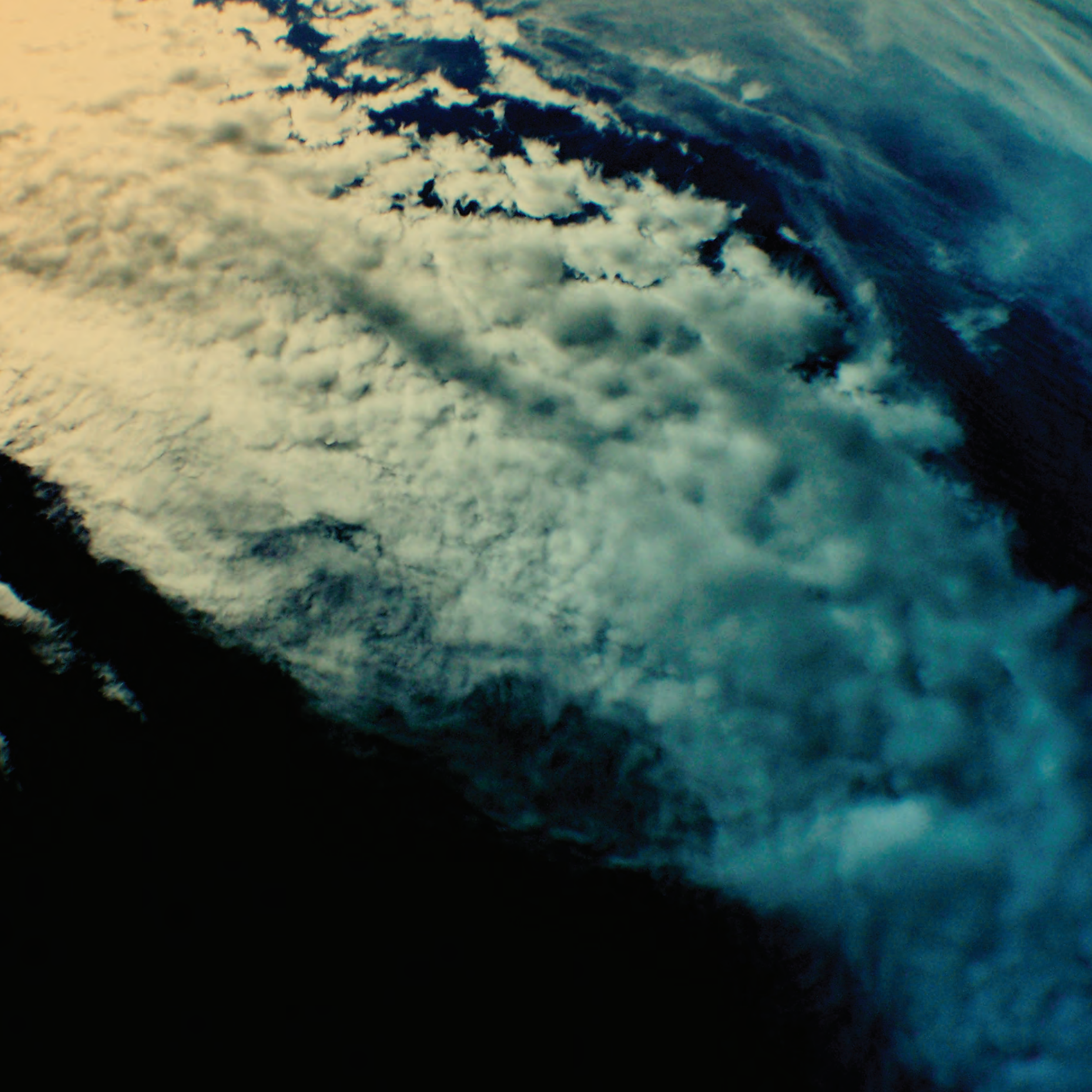
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# Clipore findings in short

1. Carbon pricing is the single most cost-effective instrument for reducing emissions. Targeted support for technologies like renewable energy can complement emissions pricing.
2. Without instruments for effort-sharing that doesn't threaten the development of the South, developing countries will conclude that they have more to lose than to gain from serious engagement in international climate agreements.
3. The EU Emissions Trading System (EU ETS) has resulted in a price on carbon emissions within a large part of the EU industry, but it has not yet led to any transformative investments in the economy.
4. Consumers pay more than 8 times as much as producers under an auction for emissions allowances. Most of the costs are passed through to consumers as changes in product prices.
5. Non-state participation is not only important for the legitimacy of the negotiations. Through side events it also contributes to enhanced capacity building, in particular for developing countries.
6. Nationally Appropriate Mitigation Actions (NAMAs) might spur agreement on open issues like finance, technology and capacity building. But what constitutes a NAMA is unclear. An international mechanism is required to operationalize NAMAs.
7. REDD (Reducing Emissions from Deforestation and Forest Degradation) has a great potential to generate co-benefits in biodiversity conservation. REDD activities targeted solely towards reducing CO<sub>2</sub> emissions generate noticeably less co-benefits than REDD activities designed to endorse multiple goals.
8. Even large nations are sensitive to mitigation actions by other nations through effects on incentives, thus affecting the willingness to contribute to co-ordinated international emission mitigation efforts.
9. Swedish carbon emissions can be reduced by 70% from 2007 to 2050 without using CCS, and by 80% if using CCS. This scenario requires an extensive use of forest residues and bi-products for energy.
10. In view of the obstacles in the UNFCCC climate negotiation process, there is a need for a broader approach on the international climate policy development. Such an approach may be bottom-up and include the industry, regardless of national origin.



# The role of science

**How do we put a price on CO<sub>2</sub>? What incentives makes industry mitigate carbon emissions? What are the drivers and barriers to stimulating climate policy action in developing countries? How do we best harmonize the plethora of carbon cutting instruments? And who takes the lead in international climate policy?**

These questions, and many others, have been the focus of the climate policy research program Clipore, funded by the Swedish Foundation for Strategic Environmental Research, Mistra. After seven years of creative research Clipore has now come to an end. Most certainly though, this field of research will stand for much longer.

The initial idea behind the program was that international climate change negotiations and agreements involve a large number of complicated issues related to social science, and that social science could support the system through interdisciplinary research. This idea has involved several crucial issues in relation to international climate policy:

- The use of financial instruments as tools for cost-effective emission control of greenhouse gases, with particular emphasis on the EU and the US.
- The development of a global political agenda with respect to the role of knowledge in international climate negotiations.
- Leadership and relations between domestic and international policies.
- Possibilities and constraints of instruments involving developing countries.

Being one of the largest international climate policy research initiatives in Europe, Clipore gathers eight research groups, distributed over three continents and four countries with a budget of more than 10 million €. With the strength of over 40 researchers the program has taken its starting point in the needs for coordinated and harmonized policy actions in order to achieve far reaching global reductions in greenhouse gas emissions.

As seen over the period since the program proposal was written in 2003, there have been dramatic changes in the international society's perception of climate policy and the needs for social science support. At that time, the United States were quite passive in the negotiations after the decision taken by George W. Bush in 2001 not to seek US ratification of the Kyoto Protocol. In 2009 though,

the Obama administration took an active line; and even if the situation in the US continues to be uncertain, American delegates now participate constructively.

Other parties too have come to play important roles in shaping the climate negotiations, including emerging economies like China and India. Climate negotiations are thus increasingly part of a broader geopolitical framework. Similarly, the deep economic and financial crisis has had a heavy impact on the climate negotiations, making financial support to developing countries much more difficult to realize, and more generally taking a heavy toll on world leaders' capacity to spend time and money on issues like climate change.

Climate policy is thus a moving target, and as the world changes so do policy priorities and processes. And not least must the research surrounding these processes adapt accordingly. Of course, research is by its very nature a long-term endeavour, and over a period of many years there are also many lessons to be learned.

As such, this report is an attempt to summarize our main findings on emission trading systems, design of policy technologies, global governance, adaptation strategies and climate policy in developing countries. All important areas where new problems still emerge and old gaps need to be filled. After many years of exploring this dynamic it is our firm belief that climate policy research is, and will continue to be, of critical importance on this bumpy road of international climate politics.



Peringe Grennfelt  
Program director, Clipore

# Economic instruments

**Of central importance in the Clipore program is the development of economic instruments. Clipore has produced a large number of scientific papers on the design of emissions trading systems, and results include in particular how efficiency, total costs and distributional outcomes are affected by allocation methodology.**

Setting a price on carbon dioxide is considered a key factor for a successful climate policy. A high, stable and to some extent predictable price on carbon dioxide is expected to drive investments towards low carbon economies, and especially to bring energy technologies into the market. Instruments such as taxes and cap and trade programs are considered being cost-effective ways to meet climate mitigation targets.

Emissions trading has therefore been seen as a main instrument for climate policy. The design of such systems is crucial and has been a central part of the Clipore research program. From its start in 2004, Clipore was strongly committed to study the European Union's Emissions Trading System (EU ETS), first launched in 2005, and being the main instrument for the EU from 2008. This policy instrument has been developed and implemented in both Europe and parts of the US.

Three crucial areas of the system have been of particular interest for Clipore; *allocation plans, cost uncertainty, and leakage of emissions to areas outside the trading system.*

For further use of emissions trading systems, a transition from free allocation to auction is the most efficient option. However, in the EU ETS Phase 3, starting 2013, the updated ETS directive will provide free allowances to carbon intensive export industries, such as steel and cement. This allocation is not adjusted ("updated") within the compliance period in response to changes in the level of production activity, meaning that corporations receive the same quantity of allowances even if they reduce their economic activity.

If free allocation were updated based on production activity, the allocation would promote economic activity among the regulated corporations and reduce leakage, while preserving an incentive for abatement. Properly implemented, "benchmarking" to industry or technology specific emissions rates can accomplish this. Auctioning allowances could make that value available to other purposes, such as investments in energy efficiency or reducing taxes, or giving the money directly back to households.

Including road transportation in the EU ETS (replacing present tax systems on

transportation), will most probably lead to an increased price on allowances and a larger pressure on emission reductions within the industrial sector due to an increase in the emissions within the transport sector. A hybrid solution where transports are included in the EU ETS, and where a transport carbon tax is sustained (and increased), will moderate the effects on ETS allowance price and emissions. Inclusion of road transport in EU ETS can, provide welfare benefits, given uncertain future oil prices. See also Fuel tax section.

Clipore concludes that the EU ETS program offers a successful model of trading under an emissions cap but it has not yet led to any long term transformative investments in the economy. Its ability to do so in a competitive international economy hinges on decisions of other nations regarding climate policy.

## Who bears the burden of the CO<sub>2</sub> cost?

Clipore has carefully studied the way that the effects of introducing a price on CO<sub>2</sub> find their way through the economy, affecting the prices of goods and services. The research shows that the opportunity costs of "free" permits are fully reflected in downstream prices, at least after a period of learning, and that auctions may eliminate some of the direct "windfall profits" that are observed in the EU following free, grandfathered permit allocations.

Changes in prices following increases in consumer prices are largely unaffected by allocation choices. This is therefore a strong reason to pay particular attention to the electricity sector in the design of emissions trading systems. The CO<sub>2</sub> pricing effect on consumer prices and windfall profits are largest in the electricity sector due to the large share of coal-fired power in the European electricity sector, leading to high CO<sub>2</sub> emissions and need for allowances.

In a detailed modelling and statistical analysis of the Nordic power market Clipore found that allowance cost is embedded in electricity prices, even when those allowances are given away for free. That means that electricity consumers see the value of emissions allowances, which is a positive outcome because it gives consumers an incentive to change their behavior. With free distribution though, firms are given something of value for free and are also able to charge their customers for that value.



## Challenges facing emissions trading

**For the foreseeable future, emissions trading systems and accompanying policies will yield low prices for emissions and for emission intensive goods and services (like electricity), posing challenges in terms of responses such as energy conservation and innovation.**

A transitional perspective on the dual challenge of how to enter a phase of polluter pays and how to see the sector change into sustainable modes through technological change, finds that present systems are weak on three accounts:

- 1) A transition from free allocation to auction is needed in order to preserve incentives and promote long term changes.
- 2) Free quotas and other 'accommodating instruments' seem persistent.
- 3) Technological change may be lagging for the intermediate to long term.

## Trading with emission permits among citizens

The idea of personal carbon allowances (PCAs) was presented by the UK Environment Secretary, David Miliband, in 2006. Although no nation state is seriously developing proposals for them, they have been discussed within academia, NGOs and policy-making circles.

Personal carbon allowances can be seen as a logical extension of emissions trading schemes, which has so far only applied at the firm level, to individuals.

While cost-efficiency is an important determinant for the prospects of implementing market based policy instruments, Clipore finds it is far from being the only important factor. Trust in politicians and fairness is important for the attitudes towards a permit scheme, while ideology seem to be of less importance.

## Trading with REDD

**Emissions from deforestation and land-use change activities comprise nearly one-quarter of global human-induced CO<sub>2</sub> emissions. Most of these emissions come from tropical deforestation. Although previous research indicates that the cost of reducing such emissions is relatively small, there is no mechanism within international agreements that incorporates the opportunity to meet emission obligations by reducing emissions associated with deforestation.**

Clipore has identified a few crucial questions that must be addressed to move forward with deforestation credits:

- The potential of REDD (United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries) to generate co-benefits in biodiversity conservation is promising. REDD activities targeted solely towards reducing carbon emissions generate noticeably less co-benefits than REDD activities designed to endorse multiple goals.
- Interviews of legislative staff in the US indicate no deep understanding, but widespread beliefs, about climate effects and policy. About international forest carbon issues, the widespread "conventional wisdom" is that policy tools may not yet be mature enough to produce real, verifiable reductions, and that developing countries lack the capacity to implement such programs.

## Fuel tax

**Fuel taxes, mainly in Europe and Japan, have reduced carbon emissions at such a scale that the carbon content of the atmosphere would have been several ppm higher in their absence. Had the US and other countries also had high fuel taxes, the effect would have been even greater.**

Fuel taxes appear to be determined by consumption. It is simply more difficult to raise fuel taxes in countries with large per capita consumption, due to lobbying from affected parties. This statistical connection does not imply, however, that the demand elasticities are any lower than normally estimated. The political resistance against fuel taxes often uses the argument that they are regressive. Clipore work calls this hypothesis into doubt – particularly in developing countries where fuel is mainly used by the privileged.



## Results in short

- Consumers pay more than 8 times as much as producers under an auction for emissions allowances. Most of the costs are passed through to consumers as changes in product prices. Full compensation for producers would require just 12 percent of allowance value in the US electricity sector.

- While most formulations of free allocation suggests allocation to emitters, in electricity and natural gas sectors a different formulation could give free allocation to local distribution companies. This would suppress the change in prices for consumers and help mitigate disparate price changes across regions of the US and the EU. Its efficiency would be better than free allocation to emitters, but not as good as an auction.

- When policy makers distribute allowances for free, polluters make efforts to signal a high need for quotas. This signalling activity is costly - much like the costs in models of rent seeking - and the costs include distortions in the market for quotas. In effect, high cost polluters use more quotas than they 'should', in order to signal their need for future periods. With a government that frequently distributes quotas and cannot commit to ignore needs of firms, the signalling costs will be so great that banning trade may be better.

- Innovative approaches to sector-specific cap and trade include "load-based compliance" in the electricity sector. This would assign compliance responsibility to downstream distribution companies rather than upstream power generators. However, this approach would introduce perverse behavioural incentives in the industry and interfere with market reform because firms would have an incentive to sort themselves. Dirty firms would opt into power pools while clean firms would seek bilateral contracts with distribution companies.

- U.S. households are affected much more significantly by the distribution of allowance value than by the stringency or pace of climate policy. This policy decision is also much more significant than regional differences in costs per household.

- Uncertainty in the implementation of climate policy through complicated provisions involving the assignment of allowance value compound household perceptions of the uncertainty of the climate problem, and may undermine support for policy.

- Ambiguity in the climate system and ambiguity aversion may contribute to conflicting national interests, while ambiguity in the economic systems facilitates cooperation. A climate agreement on mitigation may foster broader trust.

- The efficacy of carbon taxation in oil importing countries is strongly limited by the power of oil exporting countries to price discriminate between domestic and export market. Price discrimination will increase current carbon emissions. Oil importing countries concerned about climate damages may gain by negotiating with oil exporting countries.

- Compliance under the Clean Air Act in the US has momentum and can only be stopped by explicit congressional prohibition. Of many potential pathways under the Act, the New Source Performance Standards is the most likely. The program allows the US Environmental Protection Agency to regulate existing sources as well as new sources, and could achieve important emissions reductions at modest costs over the next decade, in the absence of comprehensive policy.

- Symmetric approaches to cost management would adjust programs for unanticipated increases or decreases in allowance price. A price collar (symmetric safety valve) can preserve expected emissions levels at less cost than in the absence of a collar.

## EU climate policy impact on US multinational corporations

Despite a growing interest among American corporations on climate change, they are generally considered to have a long way to go to catch up with European corporations on their climate strategies.

Clipore research finds that US corporations with experience from "institutional plurality" - both domestic and foreign climate policy - are less likely to develop emission reduction plans than corporations with sole experience from one of the two climate policy contexts. These results point to an important unintended conse-

quence of fragmented climate policy environments. Corporations seek consistency and predictability with respect to regulatory developments. When facing institutional plurality, they tend to opt for a passive wait-and-see-approach, which works against the purpose of the policy.

In the absence of a new international climate agreement post-2012, these type of consequences are important to be aware of as they may pose a threat to increased corporate climate action.



# Technology policy

**Substantial greenhouse gas emission reductions require not only an increasing price on emissions but also extensive government support for the development of climate-friendly technologies. Yet, government support for development of new technologies is a balancing act between exploiting learning effects, reducing risk, and national circumstances.**

A properly designed national policy for supporting emerging climate-friendly technologies can save public money, maximize the long-term effect on emissions of GHGs, reduce risks related to long-term technology investments, and be compatible with economic conditions, resource endowments, technical skills, and political concerns. International co-ordination and collaboration can further increase expected future benefits of investments in technology development.

Learning effects that reduce the cost of a technology as more investments are made is an argument for supporting only one or a few technologies, whereas intrinsic uncertainties in technology development and national and regional political conditions are arguments for supporting many technologies. These considerations are best balanced in government support for a focused portfolio of emerging technologies.

## **National circumstances important**

Government support for climate-friendly technologies are made in a setting of an existing energy system and scientific/technical/industrial capacity, remaining fossil fuel reserves, renewable energy endowments, regional economic concerns, the development potential of various energy options, political strengths of existing energy incumbents, international linkages, and public receptivity of different energy strategies and climate mitigation options.

These national circumstances and political considerations may, however, largely pull in the same direction for a country, with substantial roots in the existing industrial system. As an example, Carbon Capture and Storage seem very attractive for countries that have a large fossil fuel export sector (such as Canada and Norway). Therefore national circumstances may well pull in the direction of focusing support for one or a few emerging technologies.

## Sector agreements

**Clipore have studied how domestic and foreign climate policies influence industry, and how industry is expected to interact with such policies. Results from these studies show that sector agreements implemented in developing countries can reduce competitive distortions vis-à-vis industry in developed countries.**

Sector agreements have been discussed as a means to scale up the finance for mitigation actions in developing countries, increase the volume of low cost emissions reductions, engage development countries in mitigation and reduce competitive distortions in the global carbon market by including more sectors and countries in the carbon market. Clipore has investigated how sectorial agreements should be designed if the main aim is to reduce competitive distortions between Sweden and other countries.

This study concludes that if sector agreements are to reduce distortions on competition, it is important that the sector agreements are introduced in sectors where the corresponding Swedish industry has significant carbon related costs and where there is significant trade intensity between Sweden and regions outside the EU. Moreover, it's important that sectorial agreements leads to a real price on carbon, i.e. that carbon dioxide emissions are associated with a cost for the emitter.

## Carbon Capture and Storage

**Carbon dioxide capture and storage, CCS, is the process of collecting CO<sub>2</sub> emissions from power plants or large industrial sources, transporting the captured gas to a suitable location and injecting it underground in deep geological formations. Both scientists and policy makers are proposing use of this technology as one of the most promising alternatives for large scale reductions of greenhouse gases.**

One challenge for CCS to become a major climate technology is to establish a suitable regulation system at national and international level. Due to the

need for long-term storage of CO<sub>2</sub> in geological structures and related liability issues, regulation of storage is the more demanding to regulate than capture and transport. Clipore finds that a single, minimum international standard would be beneficial for CO<sub>2</sub> storage, e.g. containing minimum criteria for selecting suitable CCS storage sites, monitoring of sites, and transferring liability for stored CO<sub>2</sub> from operators to the national state.

Public acceptance in local communities has in some cases turned out to be an obstacle for CCS projects. Thus, when communicating CCS in general and establishing a basis for the public, regulators, and business decision makers to consider future investments in this technology, public perceptions of risks associated with CCS are important. The Clipore research on CCS improves the understanding of citizens' perceptions of risks associated with CCS, explains how these perceptions vary over countries and regions, and what factors may explain these differences.

Firms make regular media statements on CCS either to foster legitimacy or respond to criticism of CCS. Framing is not necessarily linked to technological success or failure; interpretations of the technology take different forms depending on whether the related activity occurs in domestic or foreign markets. Clipore also finds that media framings depend on the domestic energy situation and politics.

## Future scenarios

**The Swedish government has a vision that net greenhouse gas emissions in 2050 should be zero. Identifying potentials, barriers and implications on energy supply and in particular on renewables, Clipore has investigated how close to a zero carbon emission target it is possible to come with a sustained economic growth at 2.2% per year.**

The zero target is very likely all too demanding, but Clipore finds that Swedish carbon emissions can be reduced by 70% from 2007 to 2050, without using CCS and by 80% if using CCS.

The largest challenge is to reduce emissions in the transport sector. The study assumes that private cars are replaced by plug-in hybrids, using biofuels. Trucks, national aviation and national shipping are based on synthetic renewable fuels. The total biofuel demand in the transport sector is in the scenario estimated to 65 TWh. In the scenario, electricity demand increases by 6% and if nuclear power production is phased out, approximately 70 TWh of electricity needs must be replaced by wind, increased hydropower, solar, increased bioenergy and/or imports.

To meet the demands there is a need for an extensive use of forest residues and bi-products for energy. According to recent estimates from the Swedish Forest Agency, this can be achieved while allowing for an increased production of pulp- and paper timber and board. Due to the long investment cycles on energy supply systems, transportation infrastructure, industrial processes and housing the report concludes that long term investment decisions need to be taken soon.

## Results in short

- Carbon pricing is the single most cost-effective instrument for reducing emissions, even taking other market failures like knowledge spillovers into account. Targeted support for technologies like renewable energy can complement emissions pricing, but they are less effective as a substitute.
- To balance learning effects pulling in direction of supporting one or a few technologies, and uncertain payback from investing in one technology, governments should support a focused portfolio of emerging technologies.
- Even large nations are sensitive to mitigation actions by other nations through effects on incentives, thus affecting willingness to contribute to co-ordinated international emission mitigation efforts.
- Differentiated policy architecture at the national, as well as international level is necessary to build technological capabilities at national level, which will lead to a global transition to low-carbon economy.
- In the presence of tradable quota policies, additional policies in support of renewable energy can have counterintuitive effects. When emissions are capped, renewables will be promoted and the carbon price will be lowered. This will favour dirtier emitters. With renewable portfolio standards, additional incentives for renewables allow nonrenewable sources to expand.

## Travel and leisures

To achieve sustainable passenger transport, two related questions must be answered: *What policies are effective?* and *What is required to gain enough support for these policies?* The latter question has received too little emphasis in research. Popularity may be enhanced by letting people obtain personal experience with the impacts of the policies during a trial period, ear-marking tax revenues and using carefully designed information.

Clipore also finds that policies aimed at reducing energy consumption and CO<sub>2</sub> emissions for everyday travel may have the opposite effect on leisure travel. Developing more compact cities, fostering pro-environment attitudes and promoting the use of information and communication technologies may facilitate more use of public transport and reduce trip distances in everyday life, but they may also directly or indirectly stimulate leisure travel.

Reasons for this may be that money and time saved on everyday travel is spent on leisure travel. A moral budget where a good deed makes up for a bad deed, may also be part of the explanation.



# Governance and leadership

**Leadership is an essential ingredient for reaching international agreements and overcoming collective action problems associated with global environmental problems. Not least when confronting complex transnational problems in which the stakes are high and solutions can be blocked by collective action problems.**

Clipore has analyzed EU climate policies to examine the modes of international leadership, which EU has employed in pursuing its climate protection objectives. The study concludes that the EU's own performance has affected its aspirations to be a key norm-entrepreneur. While doing this study, the lack of data and research on potential followers became clear and provided the spark for filling these knowledge gaps by using survey data from the climate negotiations collected within Clipore since 2007.

The Clipore negotiations database now contains well over 1,000 responses from COP delegates, close to 3,000 responses to questionnaires from participants in 50 side events, and almost 200 responses from side-event organizers at the COP meetings from 2007 to 2010. Analyses of these conclude that the structural position and the aggregate power held by different actors are not the most important explanatory factors of who prospective followers perceive as leaders. For example, the US has the greatest combined power resources and its position as one of the two largest GHG emitters makes it a key player in the field of climate change. Nevertheless, at COP 14 the US was only recognized as leader by roughly a quarter of all respondents. However at the high

pressure negotiations in Copenhagen it rose to more than half. The survey also reveals that rather than looking for G-77 for leadership, developing country participants increasingly identify either the so-called large emerging economies within the BASIC group (Brazil, South Africa, India and China) or Small Island Developing States as leaders.

There is also some evidence of issue specific climate change leadership. China and the EU clearly emerge as leaders when it comes to mitigation and the issue of future agreements. However, among those respondents who report an interest in adaptation and equity issues, China is the strongest leadership candidate whereas the EU's position as a leader is substantially weaker. On energy and CCS, leadership is again shared between the EU and China, followed by the US.

Parallel to the negotiations venue, participants share ideas and debate at side events. These activities has grown in significantly in size over the last decade. Clipore conducted the first comprehensive analysis of this popular activity, which concluded that the main function of side events for the participants are information sharing; interconnecting people and policy areas; introducing potential negotiation items and most importantly capacity building, especially for developing countries. Other aspects in relation to the UNFCCC process that Clipore have studied include the primary formal platform for civil society engagement in the negotiations, how the principle of historical responsibility has been handled in the negotiations since Kyoto, and the politics of expertise in light of the Kyoto negotiations on land use change and forestry.

## The right to development in a climate constraint world - the Greenhouse Development Rights

If we are to earnestly attempt to keep global warming below 2°C, global CO<sub>2</sub> emissions must peak in 2013 and fall to 80 % below 1990 levels in 2050. The biggest portion of the global carbon budget is consumed by developed countries, and what remains to support the development in the South is alarmingly small.

This is what makes the climate challenge so daunting, the only proven route to development involve expanding access to energy. The only way forward is a climate regime that is explicitly structured to preserve a right to development. This is the objective of the Greenhouse Development Rights framework, an effort-sharing system designed to be as simple as possible while still capturing the intention behind the UNFCCC's foundational principles of "common but differentiated responsibilities and respective capabilities".

The premise of the Greenhouse Development Rights project, in a nutshell, is that the climate crisis can only be understood against the backdrop of an ongoing, bitter, debilitating development crisis, and that it is both unacceptable and unrealistic to expect those struggling against poverty to focus their limited resources on averting climate change. The GDRs work goes on from this premise to explore the necessary conclusions: those who are wealthier and have produced higher levels of emissions must take on the bulk of the costs of a global "emergency program" of mitigation and adaptation.

Clipore researchers have contributed to the communication and substantiation of the Greenhouse Development Rights, as well as to disaggregated analyses.



# Climate policy in developing countries

**Effectively adapting to a changing climate represents one of the greatest challenges facing the international community over the next century. The official goal of global average temperature increases of less than 2°C as stated by the UNFCCC is growing more and more difficult to achieve - predicted changes in natural systems are occurring on faster timescales than originally anticipated, and greenhouse gas emissions continue to increase at rates once labelled 'worst-case.'**

After nearly 20 years of international negotiations, the international community is still a great distance from agreeing to a comprehensive system for substantially reducing emissions. As a result of all these dynamics, adaptation has grown in prominence over the past few years and will continue to play a large role on the international stage.

The central issue of the consistency between a global climate regime and development objectives in developing countries is an issue that a future climate regime must address, if it is to be viable and effective. This issue has largely stayed at the level of preambular text in the UNFCCC and Kyoto Protocol, but it has implicitly affected international climate policy nonetheless, as it has underpinned every major decision taken by developing countries in the negotiations: regarding commitments, funding, adaptation, technology transfer, market mechanisms, and other central issues.

Clipore has studied concrete policy suggestions for developing country commitments under the UNFCCC. Under this umbrella, the connection between climate and development and the implementation of nationally appropriate mitigation actions (NAMAs) has been a particular area of research. The Global Adaptation Atlas is also a flag ship project, and much work on adaptation finance that now is globally sought after stems from Clipore research.

Having a close collaboration with the Indian research institute, TERI - The Energy and Resources Institute, has been a centrepiece in all Clipore research on climate policy in a developing country context. Extensive case studies on Indian and South African climate policy are important in mapping drivers and barriers to further the international processes.

## Drivers and barriers

**As the international climate negotiations show signs of adopting a "bottom-up" regime, it is becoming increasingly important to understand what factors drive or condition climate actions in different countries, in order to know what prospects there are for different countries to contribute to the international negotiations and for domestic action to respond to the climate challenge.**

India is an increasingly influential actor in global climate negotiations, as a growing economic power, part of the G77 and China group, and more recently in its cooperation within the BASIC group with Brazil, China and South Africa. This makes India an important case to study. India has among the world's lowest per capita greenhouse gas emissions, yet is the fifth largest source of GHG globally when accounted in total tonnes.

Being amongst the most vulnerable countries to climate impacts, India has a very real stake in a meaningful outcome being reached by climate negotiations and a growing awareness of the likely importance of India's participation to such an outcome. It, then, also presents a challenge to the Indian government in finding a balance between the priority of economic and social development for the poor and playing a proactive role in climate negotiations.

At the international level India has traditionally been cautious in climate negotiations, particularly towards any form of commitments to mitigation action. Recently however there are signs of India's representatives adopting a pro-active role. At the domestic level, the Indian government has already introduced a range of policy measures that are directly relevant to climate change objectives. This trend towards a 'multi-level governance' situation, with a more independent sub-national dimension suggests it is important to study driving forces of climate actions at each level. Clipore studies illuminate the various factors that Indian decision makers respond to when they approach climate policy at different levels, describing the various influences over India's engagement with international negotiations (climate diplomacy) and in the development of domestic policy measures.



## NAMAs

**NAMAs, Nationally Appropriate Mitigation Actions, is evolving as a mechanism to allow for discussion on emission reductions with the available support in developing countries. The Bali Action Plan calls for ‘nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner’.**

Since then negotiations have focused on detailing out ‘what entails NAMAs’. The proposals are still at a very conceptual level and often vary in terms of its interpretation.

**Clipore studies identify three policy implications:**

- NAMAs could be different for different groups of countries, especially for the least developed countries, depending on their respective capacities and specific national circumstances. Also, NAMAs should be dynamic in nature and evolve over time as their respective national circumstances and capabilities change.
- At present, criteria for sustainable development is not included in the core proposals. Sustainable development goals could for example have as baseline policies been contributing to the Millennium Development Goals.
- Clipore researchers propose an operational definition of NAMAs as voluntary mitigation actions by developing countries considered nationally appropriate by the respective country having sustainable development co-benefits and supported by enabling finance, technology, and capacity building. Given national circumstances developing countries may undertake mitigation action independent of the support without any international obligation. Clipore has suggested three types of NAMAs: domestic NAMAs, international NAMAs and allowance NAMAs.

# ADAPTATION ATLAS

## The Adaptation Atlas

**The challenges of adapting to climate change include not just responding properly to anticipating impacts and increasing the resilience of vulnerable communities, but also working to ensure that decision makers have the proper tools to make informed decisions.**

The Clipore funded Global Adaptation Atlas is such a tool, combining the best available climate impact data with timely maps of on the ground adaptation projects to highlight confluences of effects of climate change with actions taken to address those effects. Vulnerability, areas at risk, and adaptation actions and projects are all put together on a global scale using tools including Google Earth and Geographic Information Systems (GIS). Applying spatial analysis to overlay projected climate risks, including sea level rise, changes in disease vectors, and projected agriculture impacts among others, the Atlas identifies “hotspots”, or global target areas for adaptation.

Its ability to represent projected climate impacts will allow policy actors to move forward with a better understanding of existing responses and help illuminate scientific gaps in the expected challenges for adaptive responses. It is a powerful framework that will hopefully play an active role in assisting the world adapt effectively to climate change. This project is today taken further to full implementation through support from other financial sources.

## Adaptation finance - at the core of negotiations

One of the key issues within negotiations on a global climate agreement is financing of adaptation efforts in developing countries, where climate impacts are anticipated to hit hardest yet financial capacity to respond is lowest.

The UNFCCC process has thus far reached agreement that industrialised countries will provide substantial financial support to developing countries to assist adaptation. However, funding has been slow to accumulate and slow in delivery, reflecting challenges in how to raise funds, how to channel and spend them, as well as questions of governance. In order to generate sufficient funding for adaptation - or in the words of the Convention, to ensure ‘adequacy

and predictability’ and ‘appropriate burden sharing’ in funding adaptation - the climate discussion will have to evolve from general acknowledgement of ethical and legal principles to specific definitions of responsibility and their quantification.

Clipore studies concludes that national adaptation planning in developing countries needs to be further supported under the UNFCCC, and developed countries must provide follow-up support to implement adaptation activities identified in these national plans. Developed countries must also invest in building trust with the developing countries - lack of trust will hobble any future agreement on climate finance.



# Future climate policy

**Negotiations on climate change continue. Serious efforts have been made this year to progress on this issue so crucial for the future of mankind; however, parties are only making slow headway. At the same time action is indeed urgent. There is a striking discrepancy between the already overdue need for decisive, ambitious, global and concerted action on the one hand, and the actual negotiations taking place under the Climate Change Convention on the other.**

The UNFCCC negotiations have been struggling with fundamental problems from the very start. Parties have differing visions of how to shape international cooperation on climate change. Related issues of responsibility, financing and developing countries participation have not as yet found a solution. The Kyoto protocol and the legally binding system it represents are not anchored in the USA and some other Annex 1 countries - a fact that constitutes another fundamental difficulty. Moreover, present regulations and institutions that have been developed under the Convention and its Kyoto protocol are insufficient in their capacity to deliver the emission reductions necessary to avoid detrimental climate change.

These issues constitute the core of negotiations and have done so for a long time. They spill over into almost all discussions, even those considered to be mainly of technical, concrete and not political nature. There is no obvious and easy way out. Yet, when considering negotiations with a long term perspective they have after all delivered quite a lot within a rather short period of time. I would even be so bold as to claim that global emissions would have been significantly higher today had it not been for the Convention, its protocol and the seemingly never ending negotiations. The results are perhaps more due to the process as such, than the results it has yielded. The process and the issue of climate change have come to be in the centre of global politics. It has raised awareness and international pressure on politicians and business.

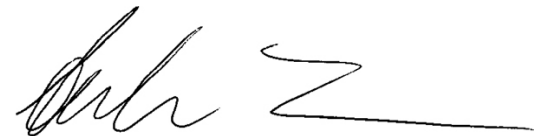
To my mind it is essential that the political process and the negotiations continue to be guided by science and the messages that are so carefully drafted by the IPCC. It is of utmost importance – and alas of increasing urgency – to craft an agreement that can actually produce reduced emissions to the extent necessary according to science. This will not be possible if the USA and the large and rapidly developing countries are not fully engaged in the effort to reduce emissions. In order to make this possible, all parties, in particular the USA, the EU and the large developing countries need to find a compromise between their different, seemingly incompatible perspectives and visions. Above all, it is necessary to reconcile development and emission reductions. Developing

countries must find a way to develop without unsustainable impact on the environment. Furthermore, developed countries need to assist them in this endeavour. Here lies the key to stopping growth of global emissions. It requires a major effort by developed countries to show how economic development can be combined with reduction of emissions. Furthermore, it is necessary to tackle the issue of adaptation as well as the issues of responsibility and solidarity connected with adaptation. Otherwise, inevitable climate change will result in humanitarian disasters, tension and conflict. This in turn will hamper efforts to finding global consensus and may result in an escalation of negative momentum.

I am convinced that climate change negotiations will gravitate around these issues in the coming years. Probably, a solution will emerge gradually. At this point, there is considerable frustration stemming from the very slow or even lack of progress in the negotiations under the Convention. Meetings are wasted on agenda fights and procedural conflicts. There is a temptation to shift focus from the process under the Convention and instead create a smaller and more manageable process which would include only a small number of countries – which as a group are responsible for a vast majority of emissions. The Major Economies Forum (MEF) initiated by former US president Bush goes in line with this idea, however, results so far are not convincing.

Perhaps this could change. In any case, it is my personal conviction that a 50 % reduction of global emissions within only four decades can only be accomplished with a regulatory framework within the Framework Convention on Climate Change. Moreover, one should not exclude the possibility that negotiations under the Convention could suddenly make a leap forward in the next coming years – perhaps as a result of dramatic developments stemming from climate change, or perhaps as a result of political changes.

Sometimes a window of opportunity opens even in the most difficult, conflict ridden and complex international negotiations. It has happened before and it can happen again.



**Anders Turesson**

Head of climate negotiations, Sweden 2001-2011  
Clipore board member 2004-2011

# We are Clipore

## Participating organisations

- IVL Swedish Environmental Research Institute
- The Centre for Climate Science and Policy Research, Linköping University
- Centre for International Climate and Environmental Research, CICERO
- The Energy and Resources Institute, TERI
- University of Gothenburg, Department of Economics
- Resources For the Future, RFF
- Stockholm Environment Institute, SEI
- Uppsala University, Department of Government
- Stockholm University, Department of Sociology

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# Acronyms

## **Annex I Parties**

The industrialized countries as of the original OECD members, plus Economies in transition (EIT) including the Russian Federation, the Baltic States, and several Central and Eastern European States.

## **Annex II Parties**

Countries which have a special obligation to provide financial resources and facilitate technology transfer to developing countries. Annex II Parties include the Annex 1 countries except the EIT.

## **AOSIS**

Alliance of Small Island States

## **BASIC-countries**

Brazil, South Africa, India and China

## **CCS**

Carbon Capture and Storage

## **CDM**

Clean Development Mechanism

## **COP**

Conference of the Parties

## **EPA**

Environmental Protection Agency (US)

## **EU ETS**

European Union Emissions Trading System

## **G77**

A large negotiating alliance of developing countries that seeks to harmonize the negotiating positions of its 131 member states.

## **GHG**

Greenhouse gases

## **GDR**

Greenhouse Development Rights

## **IPCC**

Intergovernmental Panel on Climate Change

## **MEF**

Major Economies Forum

## **NAMAs**

Nationally Appropriate Mitigation Actions

## **PCA**

Personal Carbon Allowances

## **REDD**

Reducing Emissions from Deforestation and Forest Degradation

## **UNFCCC**

United Nations Framework Convention on Climate Change



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climate policy research

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[www.adaptationatlas.org](http://www.adaptationatlas.org)

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