# Climate Strategies Research Prospectus 2007:

# Economic, policy and political drivers in carbon control

## Prospectus Update

## April 2007

## Contents


Contents ..... 1
1. Executive Summary ..... 4
2. Strategic Development of the CS Work Plan ..... 5
3. The EU Emissions Trading Scheme (EU ETS) ..... 6
3.1 Phase II National Allocation Plans ..... 6
a. Overview ..... 6
b. Deliverables ..... 6
c. Conclusions ..... 8
3.2 Differentiation and dynamics of competitiveness under the EU ETS ..... 8
a. Prospectus entry ..... 8
b. Research activities conducted this quarter ..... 9
c. Deliverables due next quarter with expected dates ..... 9
3.3 Auctioning ..... 10
a. Current Situation ..... 10
b. Workplan April to June 2007 ..... 11
3.4 International Linkages between Emission Trading Schemes ..... 11
a. Background ..... 11
b. Research Questions ..... 12
c. Research Methodologies ..... 13
d. Deliverables ..... 14
e. Work Packages ..... 14
4. The EU ETS Post-2012 ..... 16
4.1. Investment security ..... 16
4.2. Instruments to address competitiveness concerns ..... 16
a. Sectoral agreements to address competitiveness ..... 17
b. Border tax adjustment ..... 17
c. Output based allocations (OBAs) ..... 18
4.3. Compatibility with future international agreements ..... 18
4.4 Time line and Deliverables: ..... 19
5. The Clean Development Mechanism ..... 19
a. Current Situation ..... 19
b. Workplan April to June 2007 ..... 20
c. Final project deliverables ..... 20
6. East-West Investment: ..... 20
6.1. Joint Implementation in the CIS: Market, Projects and Barriers ..... 20

a. Current Situation ..... 20
b. Workplan April to June 2007 ..... 21
c. Final project deliverables ..... 21
6.2. Conclusions from OCP/CS JI in Russia Workshop; ..... 21
6.3. The Role of Russia in post-2012 Climate Regimes: Scenarios and Debates ..... 22
a. Research questions ..... 22
b. Research methods ..... 22
c. Timeline, research and target group ..... 23
6.4. Green Investment Schemes ..... 23
a. Current Situation ..... 23
b. Workplan April to June 2007 ..... 23
Appendix I: Organisational structure ..... 25
Appendix II: Future directions - new pillars of research activity ..... 26

## 1. Executive Summary

Climate Strategies was founded in 2006 as a network organisation focused upon delivering research to meet the needs of international policymaking. Its initial work on the EU ETS, including Phase II allocations had a major impact. During 2007 we are pursuing a wider-ranging research effort, with corresponding organisational and funding development.

This Prospectus Update outlines our overall research programme, provides an overview of work delivered in the first quarter 2007, and sets out plans and opportunities for the remainder of 2007. Our current and proposed projects cover implementation of the EU Emissions Trading Scheme (EU ETS) and its international linkages, the Clean Development Mechanism (CDM) of the Kyoto Protocol, and East-West investment. A second phase of work will focus on how these instruments may extend post-2012.

During the next quarter, a fast-track focus on reviewing options for the EU ETS post-2012 will include:

- Three "Research Roundtables" during May on topics of sectoral agreements and intensity targets, implications of price uncertainty for investment, and on relationships to other workstreams including competitiveness;
- A culminating workshop in Berlin on options for EU ETS post 2012, including options to address competitiveness concerns, at which key stakeholders will be invited to debate the initial findings of the research roundtables and discuss implications of additional options.

The conclusions from the work detailed in this Prospectus will help to lay foundations for an expanded work programme in 2008 on International Architecture. Subject to the outcome of the Bali COP/MOP in December 2007, a major component of this research activity will be targeted at understanding and supporting that negotiation process.

Climate Strategies is an evolving organisation. An additional pillar of activity under active consideration would bring together modelling of technology responses and economic impacts of response measures, building directly upon the Innovation Modelling Comparison Project used in the IPCC Fourth Assessment (Mitigation) and the Stern Review on the Economics of Climate Change. Other work under consideration includes analysis of trends and lessons in national mitigation policies, and adaptation strategies in the international context.

## 2. Strategic Development of the CS Work Plan

Climate Strategies' goal, 'to assist governments in tackling the collective action problem of climate change', will necessarily involve work on the design of post-2012 commitments. Unlike much of the current research effort, however, Climate Strategies has adopted an evolutionary, 3-phase approach to these issues.

The first phase, as mapped out in our *Prospectus*, is a portfolio of projects that focus upon the implementation of present instruments and commitments. These span several detailed aspects of the EU Emissions Trading Scheme (EU ETS), the Clean Development Mechanism (CDM) of the Kyoto Protocol and East-West investment.

The second phase is to develop an understanding of how these components may, in themselves, extend beyond 2012, and of the underlying forces and options through which existing structures may carry forward. Again, the main focus is on the EU ETS, with a project on post 2012 extension that will feed directly into the European Commission review of the EU ETS. Other components will include, for example, understanding how progress on JI and Green Investment Schemes may influence the Russian approach to post 2012 commitments.

These two phases, which focus broadly upon international implementation, will span this calendar year, 2007. The conclusions will help to underpin analysis for a work programme on International Architecture next year. If the Bali COP/MOP in December 2007 is successful in securing a mandate for global negotiations, then a major part of this stream of CS work would be targeted at understanding and contributing to that negotiation process.

In addition, as a rapidly developing organisation and based upon feedback from stakeholders, Climate Strategies is considering proposals for additional pillars of analysis. A major additional pillar under discussion would focus upon modelling technology responses and economic impacts. Subject to successful completion of discussions with a lead sponsor, this would be directed by Ottmar Edenhofer and build directly upon the Innovation Modelling Comparison Project, a major international collaboration whose results were used extensively in both the IPCC Fourth Assessment (Mitigation) and the Stern Review on the Economics of Climate Change.

Additional pillars of activity may be considered over time, depending upon sponsorship and the availability of credible project leaders and implementation plans. Possibilities under tentative consideration include analysis of trends and lessons in national mitigation policies, and adaptation strategies in the international context.

Our organisational structure and research programme is illustrated in Appendix I. Possible additional pillars of research activity are shown in Appendix II.

This Prospectus Update sets out in depth our progress and plans on the "Pillar 1" international implementation activities for 2007. Enquiries concerning developments on the other possible pillars of activity should be directed in the first instance to Michael Grubb (michael.grubb@imperial.ac.uk.).

## 3. The EU Emissions Trading Scheme (EU ETS)

### 3.1 Phase II National Allocation Plans

This project was an early-start project to analyse the proposed Phase II National Allocation Plans. The main research work was carried out intensively in the period from September to December 2006 and contributed directly to the EU Commission decisions of 29 November 2006 that rejected nine out of the ten submitted allocation plans as inadequate. The work was subsequently extended, written up and published as papers in a Special Issue of the *Climate Policy Journal* (6:4), presented and launched at the Carbon Market Insights conference in Copenhagen, 13 March 2007. The Carbon Trust analysis of the final allocation outcome is published on 11 May 2007..

**a. Overview**

The EU ETS Phase II project was a direct follow-on from the 2006 project *Allocation and Competitiveness under the EU ETS* the results of which were also published as papers in a Special Issue of *Climate Policy* (6:1), which is widely cited in the IPCC Fourth Assessment. The early start of this follow-on project was made possible by carrying forward the existing budget and by a £100k commitment by the Carbon Trust.

The focus of the project was to apply the insights of the 2006 research to criteria for evaluating National Allocation Plans actually proposed by Member States. The prime research was led by Dr Karsten Neuhoff at the University of Cambridge Faculty of Economics, with support from Misato Sato, and Federico Ferrario, who also collaborated with an international team led by Regina Betz (UNSW) and Joachim Schleich (Fraunhofer ISI). The emerging conclusions were presented to EU Commissioner Dimas and colleagues on 11 November, and published as a press release associated with a public presentation of results in Brussels.

Strongly positive feedback indicates that the work assisted the Commission in reaching the decisions of 29 November. The principal outputs and findings of the commissioned research were written up for the CP Journal Special Issue published 13 March 2007. In addition to updating the analysis, additional work for this included a brief study of historical and other evidence on emission forecasting errors.

**b. Deliverables**

The papers contributed to *Climate Policy* (6:1) constitute the final report of this project. Their abstracts are as follows:

**i. Emission projections 2008–2012 versus national allocation plans II**

**Karsten Neuhoff, Federico Ferrario, Michael Grubb, Etienne Gabel, Kim Keats**

We compare the national allocation plans (NAPs), as proposed and submitted by EU Member States as of October 2006, with our estimations for $CO_2$ emissions by the installations covered by these NAPs. The collective allocations proposed under phase II NAPs exceed the historic trend of emissions extrapolated forward. Using our projections we find, depending on uncertainty in fuel prices, economic growth rates, performance of the non-power sector and CDM/JI availability, a 15% chance of a 'dead market' with emissions below cap even at zero prices. With an expected inflow of committed CDM/JI credits of 100 $MtCO_2$/year, allowance supply will exceed demand in 50% of cases without any carbon price, and in 80% of our €20/$tCO_2$ scenarios. Banking of allowances

towards post- 2012 conditions could create additional demand, but this is difficult to anticipate and conditional on policy evolution. The proposed phase II NAPs would result in low prices and only small volumes of CDM/JI would enter the EU ETS. CDM/JI would almost exclusively be public-sector funded, placing the cost of Kyoto compliance entirely upon governments.

**ii. Implications of announced phase II national allocation plans for the EU ETS**

**Karsten Neuhoff, Markus Åhman, Regina Betz, Johanna Cludius, Federico Ferrario, Kristina Holmgren, Gabriella Pal, Michael Grubb, Felix Matthes, Karoline Rogge, Misato Sato, Joachim Schleich, Jos Sijm, Andreas Tuerk, Claudia Kettner, Neil Walker**

We quantified the volume of free allowances that different national allocation plans proposed to allocate to existing and new installations, with specific reference to the power sector. Most countries continue to allocate based on historic emissions, contrary to hopes for improved allocation methods, with allocations to installations frequently based on 2005 emission data; this may strengthen the belief in the private sector that emissions in the coming years will influence their subsequent allowance allocation. Allocations to new installations provide high and frequently fuel-differentiated subsidies, risking significant distortions to investment choices. Thus, in addition to supplying a long market in aggregate, proposed allocation plans reveal continuing diverse problems, including perverse incentives. To ensure the effectiveness of the EU ETS in the future, the private sector will need to be shown credible evidence that free allowance allocation will be drastically reduced post-2012, or that these problems will be addressed in some other way.

**iii. EU emissions trading: an early analysis of national allocation plans for 2008–2012**

**Regina Betz, Karoline Rogge, Joachim Schleich**

Based on 18 national allocation plans (NAPs) for phase 2 (2008–2012) of the EU Emission Trading Scheme (EU ETS), we find that, on average, the ET budgets in phase 2 are only about 3% lower than the budgets in phase 1 (2005–2007), historical emissions in 2005 and projected emissions in 2010. While the EU-15 Member States (MS) intend to reduce emissions by about 8–11%, the implied excess allocation in the new Member States lies between 21% and 31%. Compared with a cost-efficient split of the required emission reductions, the ET budgets in the EU-15 MS are generally too large. Thus, in total, the burden for the non-trading sectors (households, tertiary and transport) is too high. Furthermore, the high shares of governments' intended and companies' possible use of Kyoto mechanisms challenge the supplementarity principle. Our detailed analyses of the allocation methods of these NAPs (across countries and phases) suggest that MS should adhere to the concepts and methodologies developed in phase 1. This implies that only a little progress has been made towards achieving more efficient and more harmonized allocation rules across MS. Untapped potentials to improve environmental effectiveness and economic efficiency crucially hinge on the outcome of the Commission's review process. Keywords: Climate policy; Emissions trading; Economic efficiency; Environmental effectiveness; National allocation plan

**iv. False confidences: forecasting errors and emission caps in $CO_2$ trading systems**

**Michael Grubb and Federico Ferrario**

This Commentary sets out four lines of evidence to argue that emission forecasts are intrinsically both *uncertain*, and that there is clear evidence of *projection inflation* in the forecasts of sector emissions used to underpin the setting of sector caps in emission trading systems. From a limited

evidence base, we conclude that uncertainty is at least ±2%/yr, overlaying an upward bias (projection inflation) on the order of 1%/yr, cumulative. The Commentary concludes that this has important implications both for allocation approaches, and for some other design elements in the EU ETS. Forecasting uncertainty is not an inconvenience best ignored, but a fundamental fact that must be accommodated in the future design of the EU ETS and other $CO_2$ emission trading schemes.

**c. Conclusions**

The over-arching conclusion is that the EU ETS – while having succeeded in establishing a well functioning market – remains plagued by problems associated with the allocation process (including closure and new entrant rules). Learning from Phase I was slow and inadequate, leading to inflated allocation plans and an unavoidable need for extensive intervention by the European Commission. The intervention was well-judged, but has nevertheless been able to resolve the problems only partially. The EU ETS in Phase II will remain a highly imperfect instrument, with potentially volatile prices and a number of perverse incentives that will reduce its efficiency and effectiveness. Despite the important successes, a number of important issues will need to be considered afresh when designing Phase III.

From the perspective of Climate Strategies, the project built very successfully upon the parent project on allocation and competitiveness, and underlined the value of a European-level research vehicle to address such fundamentally European-level issues of instrument design and implementation.

### 3.2 Differentiation and dynamics of competitiveness under the EU ETS

*Project Leader: Jean-Charles Hourcade*

The first phase of this work has been conducted throughout February and March of 2007. The full interim report for the work stream compiling the scoping findings from this phase, and the detailed work plan for the next phase is available as an Annex to this general update.

**a. Prospectus entry**

The six Phase 1 research objectives for this work stream were detailed in the *Prospectus* as follows:

1. Set the scene by assessing and summarising where we stand today in the competitiveness debate and understanding in the issue;
2. Develop indicators to help judge the level of exposure of sectors and sub-sectors to competitiveness impacts of the EU ETS;
3. Using existing sector models for the cement and steel sectors, quantitatively assess the impacts of EU ETS for various $CO_2$ prices. Conduct a sensitivity analysis to identify crucial parameters;
4. Discuss and clarify the notion of “tipping points” with respect to quantitative data obtained in (3);
5. Examine and establish the extent to which deeper analyses of competitiveness must take account of differences between countries, sectors, products and production processes;
6. Based on qualitative and quantitative insights gained, set out a second phase programme of work that would be required to provide more robust insights into these competitiveness concerns.

**b. Research activities conducted this quarter**

The Cambridge University Group (Misato Sato, Karsten Neuhoff and Michael Grubb) and the CIRED Group (Damien Demailly, Philippe Quirion, Jean-Charles Hourcade) have simultaneously conducted research according to the outlined programme. The set research objectives have been addressed the following way:

- A short literature review sets the context of the debate on industrial competitiveness impacts of the EU ETS. In addition, estimated impacts of the EU ETS on various sectors thus far reported in the literature have been summarised.
- Using net value at stake (NVAS) and trade intensity as indicators of cost and trade exposure, respectively, potential ranges of impacts have been quantified for a number of sectors using UK data for intra-EU and non-EU trade. The sectors covered were iron & steel; cement; pulp & paper; refining; food & tobacco; chemicals & plastic; metal manufactures; glass & ceramics.
- Cement and steel sector models have been used to quantify impacts on market shares and trade, and to investigate the level of free permit allocation ('grandfathering') required to compensate these sectors. Sensitivity analyses concerning parameters like PT, trade sensitivity were carried out.
- The quantitative analysis estimating potential impacts for sub-sectors (4 digit level SIC) provided insights into the differentiation of impacts within sectors. In addition, an examination of production processes and country differentials were conducted for cement, iron & steel and paper & pulp industries.
- The full interim report (see Annex) sets out the phase two programme of work.

The results obtained in the first phase have been discussed at a stakeholders' meeting conducted at the Confederation of British Industry in London, 29th March with industrial representatives from the sectors examined in this study (France and the UK), sector experts and government representatives. The full interim report contains the key points from the discussions in the stakeholder meeting.

Misato Sato and Damien Demailly represented the project at the COMETR conference (Competitiveness Effects of Environmental Tax Reforms – a Specific Targeted Research Project (STREP) financially supported by the EU's Sixth Framework Programme for Research (FP6), 21st March in Brussels.

In addition, Misato Sato attended the SQW stakeholder meeting (27th March, 2007) on a project commissioned by Defra in October to consider how and in what way the design and delivery of environmental regulation can affect competitiveness.

**c. Deliverables due next quarter with expected dates**

Final deliverables for the project, as stated in the work programme, are expected in Autumn 2007. Draft findings will be presented to Climate Strategies sponsors in Paris in June 2007. However, in line with policy debates and specifically the EU ETS Review process, interim results from the ongoing research over the period will be made available to funders. The work stream will also generate independent input into the EU ETS Review. A Final Report will be delivered in Autumn 2007.

### 3.3 Auctioning

*Project leader: Karsten Neuhoff*

**a. Current Situation**

The current phase of this work stream has largely been completed during the past quarter. The main task was to assess the economic and technical issues relating to auctions for $CO_2$ allowances in the European Union Emissions Trading Scheme (EU ETS).

*Update on Q1 project activities*. A workshop was organised at Cambridge in January. The programme comprised nine invited presentations with discussion of the specific topics covered, concluding with an overall discussion session.

Participants from academia, industry and policy makers from Europe and North America were invited to present and discuss (i) experience from auctions in other markets (ii) experience from the first $CO_2$ allowance auctions, (iii) price impacts and transaction costs and (iv) revenue recycling.

The following presentations were given during the workshop[1]:

- **US power market auctions**, Mary Sharpe-Hayes, New England ISO
- **T-Bond auctions**, Andreas Pick, University of Cambridge
- **Hungarian allowance sales in Phase 1** , Peter Kaderjak, University of Budapest
- **The US RGGI program**, Dallas Burtraw, Resources For the Future, Washington
- **The UK ETS auction,** Stephen Smith, University College London
- **Irish auctions for $CO_2$ allowances: learning from Phase 1,** Ken Macken, Environmental Protection Agency, Ireland
- **Cash flow implications**, Jonathan Mirrlees-Black, Exane BNP Paribas
- **Options for institutional set up,** Stefan Teis, European Energy Exchange AG
- **Trading aspects,** Rupert Edwards, Climate Change Capital
- **Options for revenue recycling**, Martina Priebe, IETA
- **Constraints on revenue recycling**, Angus Johnston, University of Cambridge

The workshop benefited from input by auction experts (Paul Klemperer) and those closely involved in national implementation (Felix Matthes) or the EU review (Johannes Enzmann).

A draft report was produced considering a “straw man” auctioning system that built on the discussion of the workshop and added additional quantitative analyses relating to better understanding of the trade offs associated with the auction frequency. While not representing a consensus document reflecting the views of all participants or capturing all the arguments and perspectives presented during the workshop, the report has already been subject to intensive consultation and has so far benefited from feedback from Andreas Pick, Jonathan Mirrlees-Black, Angus Johnston, Rupert Edwards, Kate Hampton, Cameron Hepburn, Hubert Kieken, Misato Sato,

[1] Presentations are available at http://www.electricitypolicy.org.uk/TSEC/2/euetsworkshop/

Stefan Teiss, Maximilien Tse and David Newbery. The current version of the report is now publicly available – and is still evolving with the ongoing discussion.

The workshop identified the following objectives that should be considered during the auction design, and are reflected in the choice of the auction "straw man":

The success of an emission trading scheme hinges on a credible, transparent, stringent and non-distorting market design. This report assumes that auctions are one component of the overall design – and does not discuss whether to auction or not. Instead it focuses on the technical details of the implementation of an auction.

The workshop identified several objectives that could guide an optimal auction design and institutional set-up. One of the primary objectives would be to maximise revenue for governments auctioning public assets while minimising transaction costs for government and market participants. Stability and predictability of revenue could be a further objective as it facilitates government budgeting not only if revenues are hypothecated. For political acceptability, and also to encourage participation, an auction should be careful not to impose unnecessary participation restrictions, and should not create management, information or set up costs that indirectly result in their exclusions. The design, frequency and timing of auctions should serve to minimise cash flow problems for market participants. As in other auctions, the design of EU ETS auctions should avoid opportunities for market participants to exercise market power – and should also address concerns about the exercise of market power in secondary markets following, such as short squeezings of the auction. Finally, one could consider whether an auction might contribute to market stabilisation e.g. by setting a reserve price in the auctions that serves as a price floor for the overall allowance market.

**b. Workplan April to June 2007**

Planned work for this quarter includes finalising the report for the workshop and submitting as a journal paper. Additional work on auction implementation is also being considered, subject to funding.

### 3.4 International Linkages between Emission Trading Schemes

*Project Leader*: *Bernhard Schlamadinger (Joanneum Research, Austria)*

The project will be carried out in 18 months, from April 2007 to October 2008, by a consortium coordinated by Joanneum Research (Austria), the Wuppertal Institute (Germany), the University of Greifswald (Germany), Union of Concerned Scientists (UCS), and an Australian and New Zealand partner (t.b.c.).

**a. Background**

A growing number of countries are integrating cap-and-trade schemes into their national climate policies. The European Union Emissions Trading Scheme (EU ETS), operational since 2005, is one of the frontrunners in this development, but an increasing number of similar systems are emerging around the world. In the United States, in particular, dynamic initiatives have been launched at the State level, and several legislative proposals for a federal system are currently under discussion in the US Congress. In Australia, a State-level ETS is already in place in New South Wales, and a proposal for a state-initiated country-wide scheme is under discussion. In other countries, such as New Zealand or South Korea, such schemes are also being discussed. Most of these schemes

explicitly emphasize the aim of linking up to other schemes. The linkage of the EU-ETS with other comparable schemes is also a strategic goal of EU climate policy.

A link between different ETSs can be established in a number of different ways, such as:

- A direct linkage, by making the allowances from the different schemes fully fungible and valid for compliance in each of them;
- An indirect linkage by governments acting as mediators which receive allowances from market actors wishing to make a transfer, convert them into Assigned Amount Units (AAUs), and transfer them to another government, which then converts them into their respective system's allowances;
- An Indirect Linkage by accepting common project mechanisms, such as the Clean Development Mechanism.

Given the state of international negotiations, linking may be the most realistic way of achieving a truly global carbon market. This may be of great importance for the development of the future international climate regime. Additionally, linking may be a driver for a greater standardization of different emissions trading schemes and greenhouse gas offset projects. Analyzing options for direct and indirect linking of existing and emerging trading schemes is thus of urgent policy relevance.

**b. Research Questions**

The work stream will principally address the following research questions:

**i. What are the barriers and obstacles to direct linkages of ETSs?**

Potential barriers to such direct linkages include a number different design issues, such allocation methodology, stringency of targets, definition and recognition of trading units, absolute versus relative targets etc. Identifying barriers to linking is of great importance, as many ETS worldwide currently are in the design phase, and the EU ETS is under review. Recommendations to reduce barriers to linking may influence the final design of the emerging system and the future of the EU ETS. However, depending on which legal option is chosen, the importance of different design features may differ.

**ii. What are the options for indirect linkages by way of common offsets?**

Within the work stream, there will also be a focus on the issue of including carbon offsets in trading schemes and the implications for linkages. There are different options for how ETSs may link in the future via offsets. Domestic trading schemes could for example accept existing project mechanisms, such as the CDM. This is the case with the EU-ETS, and is also foreseen for the US Bingaman cap-and-trade bill.[2] They could also link by establishing a common framework for project-based reductions with exchangeability of credits (as proposed in the new US Lieberman-McCain bill). Within a common framework, specific project features could vary while maintaining a common set of methodologies and certification procedures.

[2] Draft Bill by US Senator Jeff Bingaman entitled 'Climate and Economic Insurance Act of 2005' (never formally introduce to US Congress).

**iii. What are the legal options, institutional preconditions and regulatory requirements for linkages between schemes?**

The project aims to address the legal options and institutional requirements for direct and indirect linkages. There are several legal options by which direct linkages could be established:

- by binding international treaties, as envisaged by Article 25(1) of the EU ETS directive,
- by a political commitment to adopt domestic legislation that provides for linking,
- by contractual arrangements between private market actors based on private law.

The advantages and disadvantages of the different options are to be assessed in the project work stream. Furthermore, it will analyze whether the different approaches to link schemes (direct, indirect) require a common regulator, and if so, to what extent and with which institutional mandate? At the international level, this role of a common regulator is implicitly held by the Kyoto Protocol's Joint Implementation Supervisory Committee (JISC) and the and the Clean Development Mechanism Executive Board (CDM EB), operating within the framework established by the Kyoto Protocol governing body, the COP/MOP.

Another issue is the degree of the regulatory effort which strongly depends on the linking framework. Indirect linkage by way of mere acceptance of existing project mechanisms, for instance, does not require much regulatory effort. Establishing a common framework for project based reductions, however, would require substantial effort on the part of regulators.

**iv. What is the role of linking ETSs for post-Kyoto international climate policy?**

This activity of the project work stream will include an assessment of the role of linking schemes in the future development of international climate policy. It involves the question of whether the linkage of schemes will be a major building block for a future climate treaty, or, on the contrary, might actually undermine efforts for a post-2012 international agreement. It will also address the question of how emerging cap-and-trade systems in countries that have not ratified Kyoto can be (re-)integrated into the global context. It will furthermore include an exploration of possible links to new emerging market mechanisms.

**c. Research Methodologies**

The work will involve different methodologies, among them:

- literature survey and analysis of design elements of existing and emerging ETSs,
- legal analysis of the regulatory framework for a linking scheme,
- in depth interviews with national stakeholders in Annex I countries (to be selected),
- moderated workshops/focus groups with national stakeholders,
- Inquiries about interests and expected benefits/risks among companies and policymakers concerned.

**d. Deliverables**

- Compilation of the *status quo* of emerging ETSs worldwide, including the eligibility of offset projects, both domestic and international, and elaboration of solutions to specific barriers of direct linkage.
- Analysis of options for indirect linkage by way of common offsets,
- Selection of a "sample ETS" with further analysis of possible linkage options with the EU ETS. This could, for instance, be the RGGI in the United States. For this concrete case study, options for various degrees of linking will be elaborated and a straw man agreement drafted.
- Recommendations for the short, medium and long-term concerning the further development of the EU ETS. Short-term recommendations would also be issued with a view to decisions made in the next 1-2 years on the design of ETS systems other than the EU ETS, in order to maximize compatibility.
- Special edition on linking in the "Climate Policy" journal
- Side Event at COP13 in December 2007 presenting first results

**e. Work Packages**

**i. Legal options, institutional conditions and regulatory requirements for different forms of linking**

*Project leader: University of Greifswald.*

This work package aims at addressing the legal options and institutional/regulatory requirements for direct and indirect linking. This primarily involves a comprehensive legal assessment of:

- the institutional mandates and the constitutional distribution of powers in participating jurisdictions;
- the procedural requirements of a linking arrangement; and
- the regulatory obstacles and requirements in different areas of international, regional and domestic law (such as the free trade disciplines under WTO law).

Moreover, this work package will include an analysis of the advantages and disadvantages of different identified linking options, and whether and to what extent such options require a common regulator. Drawing on this description of the legal and regulatory framework of linking, the subsequent work packages can assess how the remaining scope of government action can be used to the greatest advantage, or indeed whether legislative amendments are necessary before a linking scheme can be designed effectively.

**ii. Barriers of and solutions to direct linking of ETSs**

*Project leader: Wuppertal Institute*

*Compilation of the status quo of ETSs*. All currently existing or proposed ETS schemes will be examined and the barriers for linking identified. Policy recommendations will be formulated with respect to the modification of existing and the design of future trading schemes in order to reduce barriers for the linking of schemes. This involves an analysis of issues such as the allocation

methodology, the stringency of targets, the definition and recognition of Trading Units, etc. The project will also examine to which extent the importance of a barrier depends on which legal option for linking is chosen.

*Elaborating solutions to specific barriers.* Specific mechanisms that could be required to overcome differences between trading schemes, such as gateways between different schemes, will be set out in detail and assessed regarding what the associated transactions costs might be.

*The role of offsets when linking*. A special focus will also be placed on how offsets, in particular land-based offsets, are included in ETSs and the implications for linkage. Furthermore, options for a standardization of the modalities of including offsets in ETSs will be elaborated.

**iii. Options for indirect linking via common offsets**

*Project leader: Joanneum Research*

As part of this work package, different options for how ETSs may indirectly link in the future via offsets will be analyzed:

*Options for indirect linking via common offsets.* Current ETS schemes and proposals will be analyzed with a view to their offset provisions in order to draw conclusions on the options for indirect linking.

*Standardization of offsets*. An analysis will be carried out to what extent a standardization of offsets is required to address regulatory hurdles of indirect linking.

**iv. Case study**

*Project leader: Wuppertal Institute*

In this work package, a "Sample ETS" will be chosen, followed by detailed analysis of possible linkage options with the EU-ETS. Given its expected market size and impact, a good sample ETS could be the scheme currently under development in the Northeast United States (RGGI). For this concrete case study, barriers will be analyzed in detail, and options for various degrees of linking will be elaborated. Furthermore, an international "straw man" agreement will be drafted, providing for the possibility of linking, at least at the level of offset projects.

*Barrier analysis*. In a first step the barriers to linking will be analyzed in detail, including offsets provisions.

*Addressing the barriers.* In a second step, options will be addressed to overcome the identified barriers.

*Drafting of an international "straw-man" agreement*. Finally an international "strawman" agreement will be drafted that would govern the "basics" of different ETSs in different regions, but would provide for the possibility of linking, at least at the level of offset projects.

**v. Role of linking for post-Kyoto**

*Project leader: Joanneum Research*

This work package will include an assessment of the role of linking schemes for the future development of international climate policy. Different options of linking will be analyzed from a political view. This work package involves the question whether the linkage of schemes will be a

major building block for a future climate treaty, or might even undermine efforts for a post-2012 international agreement. It will also address the question on how emerging cap-and-trade systems in countries that have not ratified Kyoto could be (re-)integrated into the global context. Furthermore possible links to new emerging market mechanisms will be explored.

**vi. Dissemination of results and recommendations for policy makers**

*Project leaders: Joanneum Research and Wuppertal Institute*

This work package aims at making concrete recommendations for the short, medium and long term concerning the development of the EU ETS and the design of emerging cap and trade schemes in order to maximize compatibility. This will be made by various publications and a side event at COP13.

## 4. The EU ETS Post-2012

*Project leader: Karsten Neuhoff*

To follow-up the work on the EU ETS, Climate Strategies proposes a package of three work streams – investment security, competitiveness instruments, and post-2012 international compatibility – to run from April to December 2007.

### 4.1. Investment security

Most emission reductions are expected to result from changes in investment choices and investment in new technologies. The work stream will analyse the extent to which uncertainty about (i) target levels and/or $CO_2$ prices and (ii) allocation methods will affect investment decisions.

The work will involve surveying industry participants and representing their investment decisions under uncertainty using stylised models with realistic parameterisation. These will be used to analyse the possible implications of uncertainties on choices by market participants.

The work stream will use the analytic part to assess the extent to which different design options of the EU ETS would be able to address uncertainty and how this would impact on investment decisions. The work will, in particular, look at (i) longer commitment periods, (ii) commitments not to targets but to allocation methods, (iii) commitments to target price bands – e.g. if governments issue option contracts for $CO_2$ allowances, (iv) direct contracts for outputs or inputs with authorised institutions – e.g. single buyer model, and (v) other instruments of the financial markets

### 4.2. Instruments to address competitiveness concerns

Domestic and international climate policies are still evolving, and thus expectations vary widely as to when the level of stringency of climate policies will converge between countries. However, to provide more investment certainty we need to commit now to a longer-term perspective for the European Union Emission Trading Scheme. However, it is difficult to commit to such a longer-term perspective if this carries the risk of significant competitive disadvantages or relocations rather then promoting a reduction of emissions.

This work stream will build on the separate competitiveness work stream, which identifies sectors that could be exposed to significant competitiveness concerns if $CO_2$ constraints are implemented

unilaterally. We will explore in detail the feasibility of three options to address the competitiveness concerns for these sectors.

**a. Sectoral agreements to address competitiveness**

In the absence of a global agreement covering all emissions of all sectors, one could envisage agreements that cover only individual sectors. The work will build on studies that describe such agreements (industry sources, OECD) and assess their feasibility. The work will identify and analyse the features of sectoral agreements that address competitiveness concerns. This is likely to involve questions relating to the role of governments and institutional arrangements to bring together companies and, if required, governments, to pursue such agreements. Incentives could possibly be given for additional countries to join countries that form a sectoral agreement if the agreement is combined with some form of border tax adjustment – particularly if the agreement starts out with a wide coverage of countries.

**b. Border tax adjustment**

The economic principle behind the conventional idea of Border Tax Adjustment (BTA) is simple. Exports from areas covered by emission limitations are partially compensated for the extra mitigation costs during production, most likely at the level that would have been incurred by the best available technology. Likewise, imports are charged a levy corresponding to that cost. The combination of both instruments is taken to preserve a level playing field between producers covered by emission constraints and those who are not. If $CO_2$ allowances are auctioned and if a BTA is implemented together with the emission trading scheme that includes auctioning of allowances then it is likely to be WTO compatible. In practice we think further research is required to understand the feasibility of border tax adjustment.

The work will model the question whether covering the specific commodity by border tax adjustments would suffice to address competitiveness concerns, or whether the coverage would need to be extended to, say, products containing the commodity in question. For this purpose we will implement border tax adjustments at different coverage levels in a general equilibrium model. To improve the understanding of the implications and the robustness of the results we will compare them to sectoral results from a bottom up model.

Electricity prices in most European markets have been increasing with $CO_2$ costs. We will further investigate whether and how border tax adjustment could be formulated such as to also allow for adjustment for higher electricity costs

The main concern regarding BTAs is likely to relate to its political acceptability more than legal considerations relating to the WTO. While the objective is to create a level playing field, some countries might perceive or depict BTA as being applied ‘against’ them. This might undermine efforts to engage a wider set of countries to pursue stringent climate policy. The project will investigate pathways and institutional arrangements that could address such concerns.

Finally, the project will explore unconventional variations of BTA – such as the imposition of export taxes on carbon intensive goods from countries without carbon constraints explored in Müller and Sharma (2005)[3] – in order to address these political concerns.

**c. Output based allocations (OBAs)**

Under carbon constraints, emission costs are reflected in product and intermediate product prices. This is, of course, in principle one of the intended outcomes of emission trading: it ensures that product prices reflect full costs and thus allows for appropriate substitution effects. However, it is also the main cause for competitiveness concerns. They could therefore be addressed by allocating allowances proportional to the output of a producer, as this would compensate for the costs of allowances the producer required during the production process. Output based allocation requires *ex-post* adjustment of allowances allocations, and is as such not permitted under the EU ETS Directive.

The work stream will investigate whether such allocations should be considered as a possible tool to address competitiveness concerns of specific sectors or sub-sectors. Industry experts will be asked to identify the feasibility of such output based allocation in specific sectors. For example, in the cement sector, OBA based on the final cement production creates strong incentives to relocate the $CO_2$ intensive production of one input factor – clinker – outside of the area covered by emission trading. If however output based allocation is directly targeted at clinker, then incentives for innovation in the production process are severely reduced. Instead of allocating to industrial emitters the allowances could directly be allocated, say to large industrial electricity consumers. Again this would require a change of the directive and can induce various unintended consequences which we are interested in further exploring.

### 4.3. Compatibility with future international agreements

The review process of the EU Emissions Trading Scheme envisages a commitment to a post 2012 design for the scheme, possibly by the end of 2007. This raises the question how much flexibility should be build into this scheme to ensure compatibility with possible outcomes of future international negotiations on climate policy. We envisage the following challenges:

- The EU currently proposes a 2020 emission reduction target of 20% below 1990 levels but is prepared to participate in tightening this to reflect a reduction by 30% of OECD countries with a wider participation. How could the EU scheme reflect the necessary flexibility.
- If international arrangements aim to achieve comparable levels of ambitions across countries/regions, then the question is how they should be defined and operationalised.
- How should linking and international mechanisms be defined in the absence of an international agreement for post 2012? The analysis will be linked to Climate Strategies work on the Clean Development Mechanism, on the Joint Implementation mechanism and on linking with other schemes and deforestation.
- Which emission trading design elements will enhance or impede the linking of different schemes without violating their integrity?

[3] • Benito Müller and Anju Sharma, 'Trade tactic could unlock climate negotiations', 17 June 2005, SciDev.Net

The overarching theme of this analysis is whether we can avoid or will have to face trade offs between flexibility for compatibility with future regimes and commitment to support private sector investment in low Carbon technologies.

**4.4 Time line and Deliverables:**

Workshops and initial work to provide preliminary first insights for the EU review will be scheduled by end of June. The work will firm up over the summer with final policy papers and presentations ready at the end of summer. Writing up for academic-level publication will then follow to finish the entire work by December 2007. The deliverables will comprise:

- International workshops with academics, policy makers and key stakeholders.
- Presentations and short policy briefings of preliminary results by end of June.
- Reports in the format and rigour of academic papers by December.

## 5. The Clean Development Mechanism

*Project Leader*: *Axel Michaelowa*

**a. Current Situation**

Axel Michaelowa is leading the work on this project, supervising Daisuke Hayashi, and Pallav Purohit as core researchers. Additional collaboration is being sought from a number of institutions including Stockholm Environment Institute, Joanneum Research of Austria, COPPE of Brazil and the Chinese Academy of Social Sciences.

The project aims to assess whether the CDM projects currently developed will really produce CER volumes as projected to fill EU governments' Kyoto gaps and provide sufficient volume for companies to fulfil the requirements under the EU ETS. Specifically, it seeks to understand the criteria that drive project success, including factors such as the project type, the type of project developer, the type of CER sales contract, project size, host country and the degree of stakeholder participation. The work stream is divided into five tasks:

- Analysis of the ratio between CERs generated and forecast in PDDs;
- Analysis of variance in project success by project developers and host countries;
- Evaluattion of the extent of project additionality;
- Assessment of project lead times;
- Forecast of estimated quantity of CERs in the EU market in 2008-2012.

*Update on Q1 project activities*. The focus of the first quarter activities has been on finalising the team and project definition. Data have been collected that allow project-type specific assessment of the ratio between issued CERs, CERs projected at the time of registration and CERs projected at the time the projects were submitted for validation. These data show that landfill gas projects and projects capturing methane from pig waste have a very low ratio of about 10-15%. Surprisingly, also projects reducing HFC-23 have seen issuance of only 75% of the CER volumes projected in the documents submitted for validation, whereas $N_2O$ reduction from adipic acid is the only category

that has seen an issuance higher than the projected volumes. The variability among projects of the same type is very large, showing the importance of a good project management.

Moreover, the time gap between first submission and registration of projects has been analyzed. It is found that a substantial share of projects submitted in 2004 and 2005 has still not been registered (38% of the 2004 and 34% of the 2005 projects). These projects come mainly from the renewable energy, fuel switch and energy efficiency sectors and it is questionable whether they will ever achieve registration.

Analysis of a sample of projects registered before May 2006 shows that a substantial share has problems with additionality determination. Analysis of several case studies also shows that the CDM Executive Board is not applying consistent criteria in rejecting projects due to lack of additionality.

**b. Workplan April to June 2007**

- Assessment of reasons for underperformance of the different project types;
- Assessment of the projects with a delay of more than one year between submission of the PDD for validation and registration;
- Expansion of the project list to be checked with regards to additionality.

**c. Final project deliverables**

- Ultimate deliverable is a report on estimated CER volumes in the EU market 2008-2012, due December 2007
- Interim reports are scheduled to be produced in June, August, September, October and November covering other project deliverables;

## 6. East-West Investment:

### 6.1. Joint Implementation in the CIS: Market, Projects and Barriers

*Project Leader*: *Arild Moe*

**a. Current Situation**

Anna Korppoo (Imperial College) – under the guidance of Arild Moe (Fridtjof Nansen Institute) as project leader – has begun work on this project in February 2007. The research tasks of the project are:

- Task 1 Analyse the development of the institutional framework for JI approval and Kyoto compliance;
- Task 2 Assess the potential of JI through an analysis of JI projects offered until now;
- Task 3 Evaluate the JI projects offered based on a set a criteria;
- Task 4 Assess the quality of project hosts and project providers; and
- Task 5 Explore the barriers to JI.

*Update on Q1 project activities*. Ms Korppoo has attended the UNFCCC JI technical expert workshop in Bonn 13-14 February for an update on the developments of JI. The project team has

helped to organise a workshop on JI in Russia together with *Oxford Climate Policy*. Reports on both activities will shortly be made available on the CS East-West Investment webpage.

As the Russian JI approval system has still not been adopted, the team has drafted a briefing paper on the compliance and the latest developments of Russian climate policy. This paper will be finalised after the Oxford meeting in the end of March.

Work to set up the evaluation criteria has started. The Russia projects submitted to JISC are used as a pipeline. Cooperation possibilities with the CDM project are being explored. Work on evaluation of additionality of submitted projects has started.

**b. Workplan April to June 2007**

Planned work during the second quarter of 2007 is divided under the relevant prospectus entries:

- Task 1 (a) Briefing paper on the compliance and the latest developments of Russian climate policy, expected date early April; (b) Special paper on the Russian JI procedures – date subject to the approval of Russian JI procedures which are expected during the next quarter;
- Task 2 (a) Establishing the project evaluation criteria; (b) Project evaluation (c) Briefing paper of Russian JI pipeline, May 2007;
- Task 3 JI pipeline briefing paper will cover some aspects relevant to this task.

**c. Final project deliverables**

- final report compiling and updating the papers we have produced during the project
- journal article
- Presentation of the results in a conference in Europe

**6.2. Conclusions from OCP/CS JI in Russia Workshop;**

This discussion intensive workshop brought together both Russian and Western climate policy experts to debate the opportunities and pitfalls of JI in Russia, also touching Emissions Trading, Green Investment Schemes, Russian compliance with the institutional requirements of the Kyoto Protocol, and prospects for Russian policies beyond the first Kyoto commitment period in 2008-2012.

Regardless of the long administrative process and the approaching first commitment period, the Russian administration is yet ready to adopt the domestic JI approval procedures crucial to project investment. The main reasons for these delays include administrative struggles between ministries and the lack of political priorities and economic importance of JI projects on the highest level of decision-making. The Russian government and the largest companies find themselves in a very good economic position due to the high price of oil. Therefore, JI investments to restructure existing energy production and consumption infrastructure are not seen to merit fast decision-making procedures. The relatively few private sector actors who take an interest in JI lack adequate negotiation power towards the government, and therefore, are unable to put up significant pressure to get the approval of JI procedures fast-tracked.

JI projects also suffer from the lack of well-defined property rights. It remains unclear who owns the Emission Reduction Units (ERUs) converted from the state-owned Assigned Amount Units (AAUs), and whether the government could simply decide to withdraw part of the ERUs generated as a tax. Also the lack of transparency of the general business environment including the potential corruption by officials adds to the list of problems. However, the fact that the Russian draft JI procedures are planning to run all Russian JI projects through the JI Supervisory Committee (JISC) as Track 2 projects may contribute to solving this problem.

However, a number of positive developments were also reported. The Russian compliance instruments including GHG inventory and reporting are now in place, the responsibilities of these tasks have been clearly divided between governmental bodies, and financial resources have been allocated. Equally the only missing institutional requirement, the GHG registry, is well under way and is expected to be launched during the first half of 2007.

Moreover the readiness of Russian project developers is positive; 23 – i.e. half of the Project Design Documents (PDDs) submitted to the JISC so far – are Russian. As a result the only missing piece of an operational JI regime is the domestic JI approval procedures which are being developed, and could be approved as early as April 2007.

### 6.3. The Role of Russia in post-2012 Climate Regimes: Scenarios and Debates

*Project leader: Arild Moe with Anna Korppo*

Russia's share of global greenhouse gas emissions is the third largest at 6.2%, after the US (24.4%) and China (12.1%). Russia used its powerful negotiating position to secure an advantageous deal under the Kyoto Protocol. Still, many Russian policy-makers do not see clear benefits in tackling climate change, and it is very likely that the Russian leadership will need to see such benefits for joining a future climate regime, as they did in the past. The influence of power coalitions on decision-making cannot be underestimated in this context. This study will contribute to the understanding of Russia's role and positions in the ongoing climate negotiations.

#### a. Research questions

With respect to the 'big picture' of the post 2012 international climate change regime –including the approaches and positions of the main players – the objectives of this research project are:

- to analyse potential Russian positions in post-2012 negotiations by exploring the background and dynamics of the Russian debate and power coalitions;
- to develop alternative policy scenarios for Russian positions under various post-2012 arrangement options; and
- to suggest ways in which Russia could be encouraged to join future climate change cooperation efforts.

#### b. Research methods

The project will follow and analyse the Russian policy debate and policy formulation, as reflected in Russian official documents and media. Information will also be collected through semi-structured interviews among Russian experts. The policy analysis will be used to create qualitative scenarios for Russian post-Kyoto futures.

**c. Timeline, research and target group**

The initial phase of the project will be carried out from May 2007 to February 2008. Funding permitting, the project will continue in 2008. The research team will consist of Arild Moe (Project Leader) and Anna Korppoo (Associate Research Fellow), Fridtjof Nansen Institute, Norway and a Russian partner (to be identified). The target groups for this study are European governments and the European Commission. The results will provide advice to policy-makers, and could facilitate discussion on the post-2012 position in Russia.

### 6.4. Green Investment Schemes

*Project leader: Olga Gassan-Zade (Ukraine and Russia) with Diana Urge-Vorsatz (New EU Member States)*

**a. Current Situation**

Compared to CDM, ETS and JI, the idea of Green Investment Schemes GIS is under-researched and under-discussed in the expert and policy-making communities, considering its potential global significance in emission reductions. Climate Strategies aims to fill in this research gap by delivering collaborative research on some of the key overarching and global questions related to GIS.

The lack of previous experience and background research poses the risk of GIS schemes not delivering the desired effects. To realise the full mitigation potential and to maximise country benefits, it is essential to analyse thoroughly the different GIS architectures and their impacts on economy and environment in order to design national or bilateral GIS schemes adequately. This is one of the key objectives of this project.

GIS proposals were initially considered in the context of the Russian and Ukrainian surplus, but in practice are developing much more rapidly in the new EU Member States that also have considerable surplus Assigned Amounts. These experiences are likely to have strong implications for the larger potentials in Ukraine and Russia. Subject to funding, this project would consider both dimensions. It would be coordinated overall by Olga Gassan-Zade, Director of the Pointcarbon Ukrainian office, but with analysis of the rapidly-developing situation in the New Member States led by Diana Urge-Vorsatz at Budapest University. The work would also link with Joanneum Research (Graz, Austria) on land-use dimensions of the GIS.

**b. Workplan**

The following questions have been identified as potentially being of interest:

- What is the overall GIS potential on the selling and buying side? What is the theoretical potential, given by compliance gaps and surplus AAUs? What are the likely figures for the real potential – i.e. the combination of these theoretical figures with the willingness of potential buyers to purchase AAUs and the likely estimates of CDM/JI activity by 2012?
- Who will be the key market players determining the greened AAU market? Is it likely that non-governmental agents will play a major role? Are there any schemes around the world outside the Kyoto Protocol where the purchase of (greened) Kyoto AAUs can be used for compliance (such as the Japanese voluntary corporate emission reduction scheme)? How big are these markets?

- Is there a likelihood that some buyers (mainly governments) purchase *non-greened* AAUs? Could this undermine the role of the entire GIS market/scheme?
- In general, what are the main expectations of potential buyers from GISs? What are the project types favoured by potential buyers?
- From a global climate change perspective, what are the most desired investments to be supported by AAUs? Is it true that GIS revenues will comprise a potentially major (limited-time) resource for a very flexible budget to achieve mitigation goals. Since in the EU there are major efforts and new policies in the pipeline targeting many areas of GHG mitigation, would it be advisable that GIG revenues in Central and Eastern Europe (CEE) are channelled towards GHG reduction needs that are important but are difficult to foster by business-as-usual policies or available/foreseeable other support schemes?
- If the previous hypothesis is right, which are such areas in the different CEE countries?
- Are the potential buyers willing to accept GIS schemes that focus on such areas, particularly in the land-use sector?
- What are the primary GIS architecture options that favour investments in such areas?
- In particular, what type of greening can be advised for these different investment areas to support such projects optimally, but still ensure their additionality and give an acceptably correct estimate of the emission reductions? Is it possible to develop "menus" of E&M schemes for each key investment area that can be recommended for national GIS schemes to be adopted. Examine also the potential for policy and programmatic approaches.

Project leaders have been identified as indicated, and a first step in the project will be a workshop on land-use proposals for Green Investment Schemes, organised by Joanneum Research in Graz and to be hosted in Budapest in May 2007. Contingent upon funding, the details and timescales of the subsequent workplan will be developed in consultation with both relevant funders and key government officials.

## Appendix I: Organisational structure

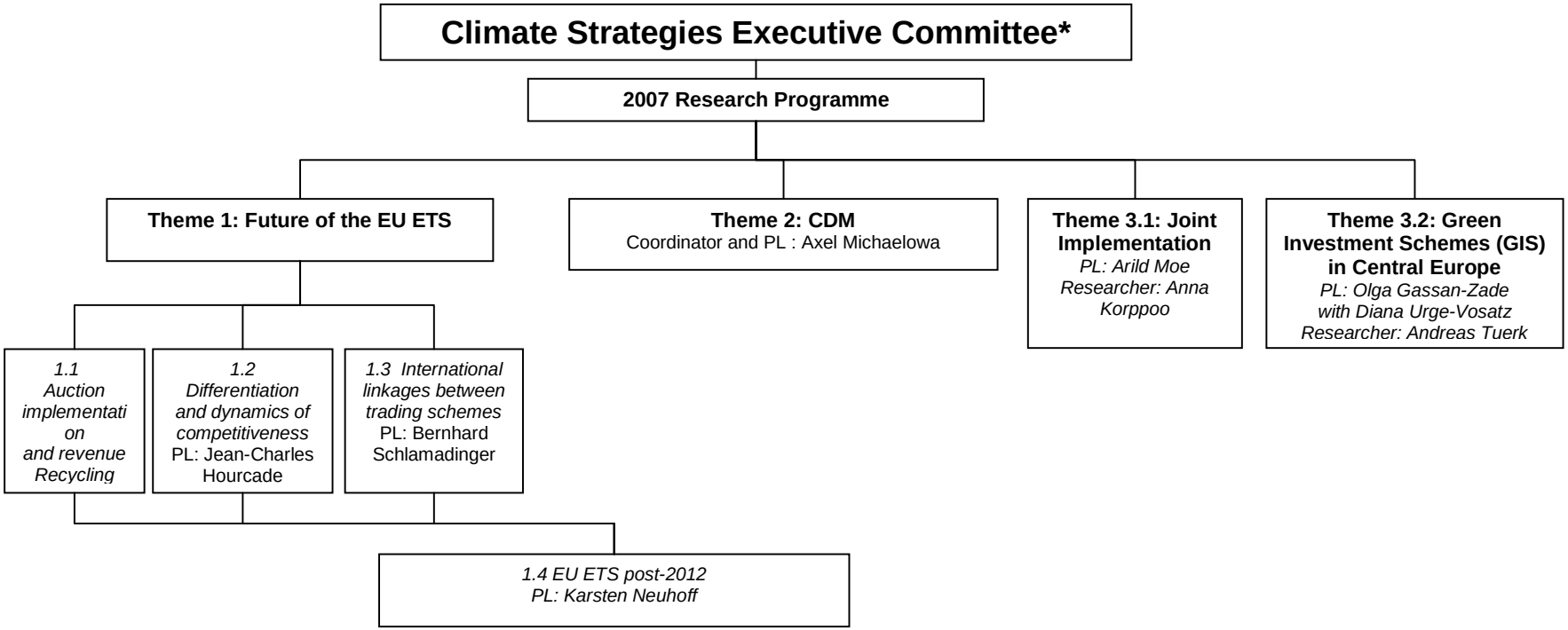


*Figure 1: Structure of Research Programme*

*Theme coordinators are also Members of the Steering Committee; see Annex III. Project Leaders (PL) carry specific responsibilities for delivery of research projects. For named researchers on the modules of the EUETS programme; see text.*

** Michael Grubb (Chair), Jean-Charles Hourcade, Bernhard Schlamadinger, Benito Mueller, Axel Michaelowa, Tom Downing; ** To be confirmed*

## Appendix II: Future directions - new pillars of research activity

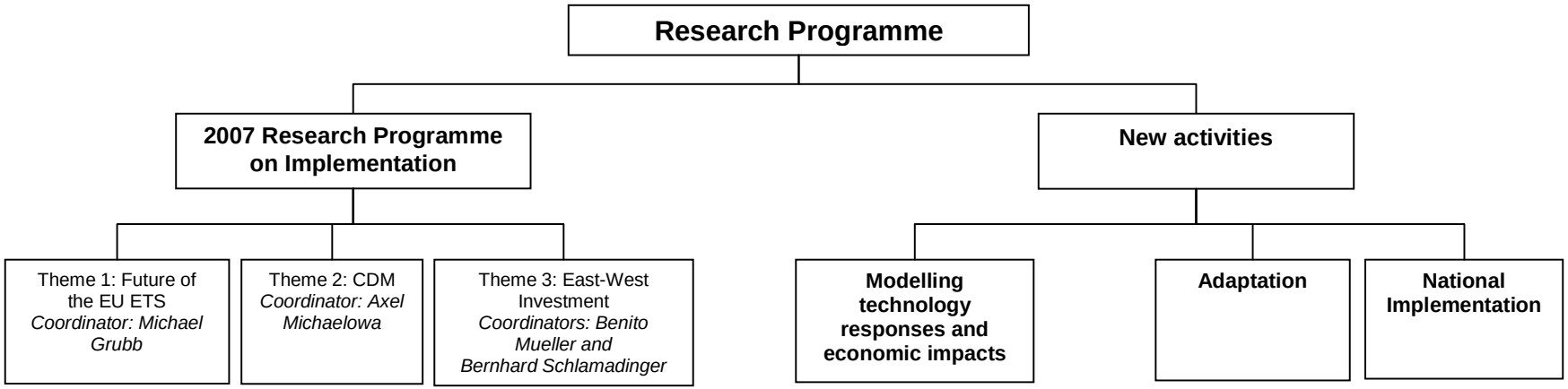


*Figure 2: Structure of Research Programme: new pillars of research activity*