Project No 282846

LIMITS

Low climate IMpact scenarios and the Implications of required Tight emission control Strategies

FP7-Cooperation-ENV
Collaborative project
Small or medium-scale focused research project

DELIVERABLE No 5.1
Report on the 1st Stakeholder Workshop on the definition of the project's policy scenarios

Due date of deliverable: 30/11/2011
Actual submission date: 29/11/2011

Start date of project: 01/10/2011 Duration: 36

Organisation name of lead contractor for this deliverable: FEEM

Revision: 1 (30/09/2013)

Project co-funded by the European Commission within the Seventh Framework Programme		
Dissemination level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Report on the 1st Stakeholder Workshop on the definition of the project's policy scenarios

Name of all participants to the redaction of the report [a]

[a] Fondazione Eni Enrico Mattei

Table of Contents

1. Introduction

The LIMITS project aims at assessing climate policies that offer an effective response to mitigate climate change, namely that of restricting global warming to 2 degrees Centigrade. It is recognised that the needed transformation of the major economies would require a fundamental restructuring of the way energy and land are managed, which would not be costless and would require unparalleled policy commitment and coordination. Specifically, the LIMITS project will highlight policies that are economically, technically and politically feasible, and what is needed to overcome major impediments.

The first LIMITS stakeholder meeting took place on October, the 11th 2011 at the Fondazione Eni Enrico Mattei in Milano (FEEM). The subject of the meeting was to help defining the project's policy scenarios and to help evaluate the strength and weakness of the overall research objectives. The rich and lively discussion which emerged allowed to match the goal of the LIMITS project with the views and opinions of the stakeholders.

FEEM Executive Director, Giuseppe Sammarco opened the meeting and welcomed the stakeholders of the LIMITS project. A brief presentation of Susana Calsamiglia-Mendlevitcz (European commission), the project officer, emphasised the need of a fruitful collaboration between the researchers team and the stakeholders. Massimo Tavoni (FEEM), project co-ordinator then described the structure of the workshop and the contents of the two panel sessions.

2. Achieving and financing green growth in major economies

The first session was dedicated on the requirements to actually achieve and finance green growth. The discussion was moderated by Alex Bowen (LSE). It began with two presentations on China (by Jiang Kejun, NDRC-ERI) and India (by Amit Garg, IIM) and the challenges posed by those two major economies.

2.1 Modelling for China's Low Carbon Society

The CO_2 emissions in China is clearly a problem deserving attention given the rapid growth of China. This motivated strong efforts in national climate-economics modelling and policy roadmap planning. The number of possible policies currently studied in China is quite substantial and it involves different sectors, level and agents. Achieving a stringent target would require both national targets, carbon tax, emission trading,

national level, sector policies, technologies based policies and regional policies. The recent studies by the Energy Research Institute showed the technical feasibility for China to significantly reduce its CO_2 emissions (cfr. Figure 1).

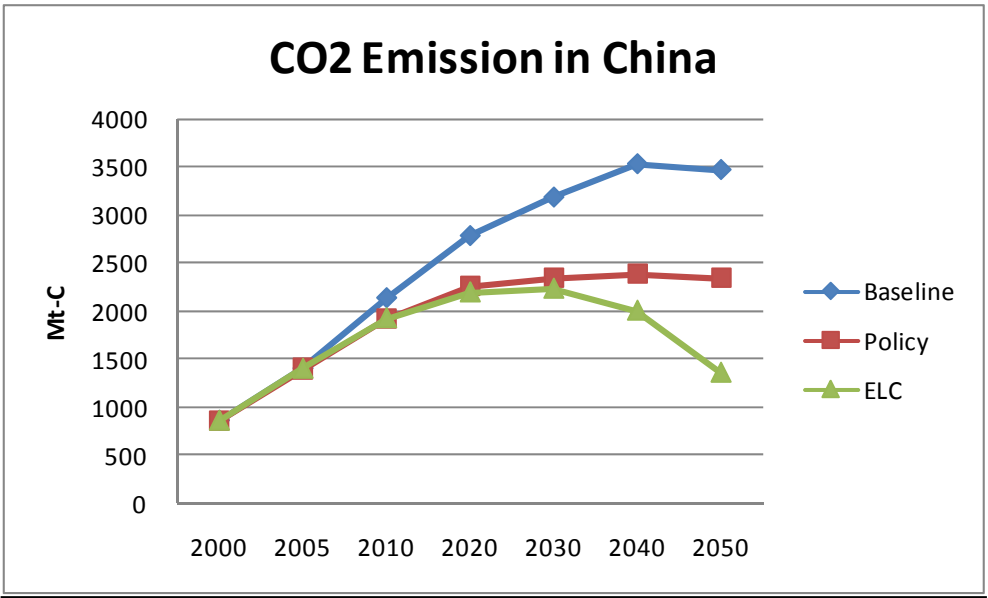

Figure 1: Carbon emission in China for different scenarios

The implication for the major sector of the economies were presented, with a particular concern for the industry, building and transport sectors which requires substantial additional investment (cfr. Figure 2).

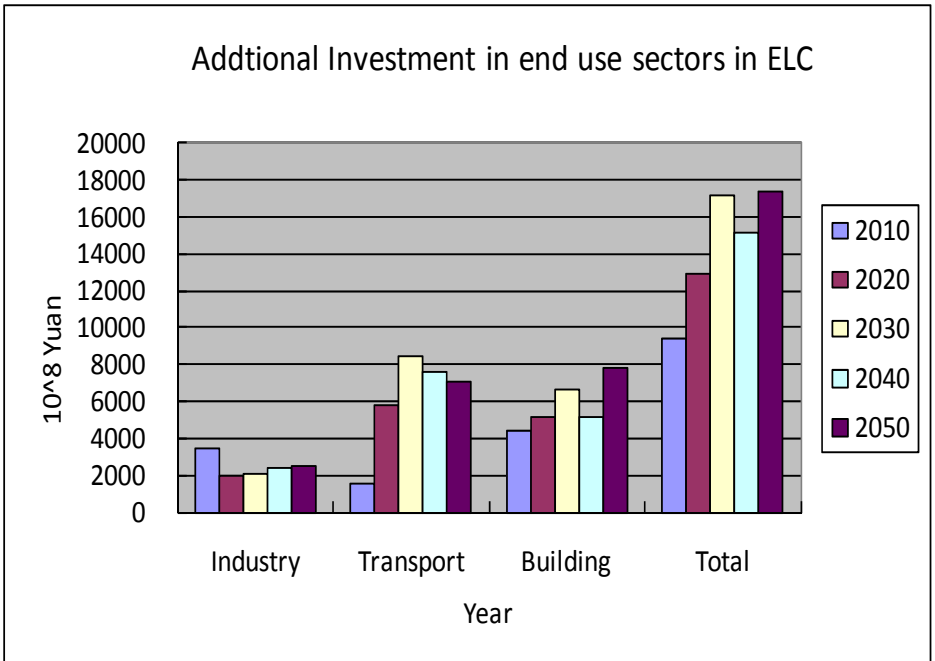

Figure 2: Investment in the different sector of China's economy

Jiang Kejun reviewed the current policy regime that are for the moment under consideration in China:

- Pilot phase low carbon cities and provinces: 8 cities and 5 provinces
- Carbon tax: under discussion
- Domestic Emission trading: 6 pilot provinces and cities
- Energy and CO2 targets in 12th Five Year Plan: national and provincial level
- Cap on energy demand: on the national and provincial level
- Low carbon technology priority list: under preparing

Finally, Jiang Kejun showed the changes in technology foreseen for the future and the policy roadmap for mitigating climate change, which considers burdens on "old technologies" and implementation of "new technologies" as key steps for reaching a sustainable growth regime.

2.2 Modeling Low Carbon Roadmaps in India

Amit Garg outlined the Indian policy and regulatory landscape in a climate changing context. The current policies in India are varied and aim at e.g. promoting solar energy (20 GW by 2022), enhancing energy efficiency (avoid 19 GW by 2014), improving the water sector, sustaining habitat and agriculture, achieving a forest cover of 33% by 2020.

He insisted that the future development of India is quite uncertain, even when not considering climate policies. The key drivers of the path are the population, the primary energy and the energy and carbon intensity. This complicates the exercise of assessing the effectiveness of a policy.

Then the presentation focused on the Indian investment perspective in the different energy sectors, touching critical points like rate of returns of new technologies, green certificates and incentives for renewable. Afterwards he reviewed some low carbon transitions already happening in India, in particular concerning transport, the electricity sector, the cement sector, steel industry, rural energy (biomass plants), dairy sector, energy farm, etc. Some important issues that should be solved for the transition were mentioned (e.g. on land issues of biomass, solar pricing and biomass) and some conclusive remarks were made on current modelling status and timing of planned commitments.

2.3 Discussion

After the two insightful presentation, the panellists gave their comment on the subject and the presentation

Barbara Buchner (CPI) looked at the status of the flows of money in climate finance, commenting on the difficulty of efficiently mobilizing public resources, and on the importance of a bottom-up inclusion of all the available knowledge in the modelling process.

Alex Chirmiciu (EBRD) reacted to the presentations, and brought to the audience attention the relationship between the State and the private markets. In the end he spoke about the challenges in the technological development needed for climate policies.

Tom van Ierland (European Commission) said that is very difficult to argue what is the amount of investments in renewable energy in India and China. With regards to China, the situation presented by ERI seems almost positive, but a change is necessary both at a local and a global scale. He also shared his positive impressions on the informative value of the issues addressed by LIMITS, and observed that the availability of results by 2015 combines well with the current schedule of the policy making process.

Dominique van der Mansbrugghe (FAO) recognized the relevance of several topics emerged in the discussion, like the Chinese energy consumption changes, the role of biomass in India, along with its implications in terms of food security, and the financing aspects presented by CPI. He concluded with a thought on the need to account for tensions and balances between the different regional economical settings.

Jorg Haas (ECF) underlined the clear gap between the current commitment and the 2°C. He acknowledged green growth as a necessity, and emphasized the importance of assessing the best practice in green growth planning. Climate finance and effective public resource management will play a big role too.

Robert Dellink (OECD) reflected on the difference between Europe and fast growing countries like India and China, and on the difficulty to compare how different countries are implementing their commitments. He also positively commented on the balanced approach of LIMITS on the subject, but also asked the researchers to include among outputs some clear policy messages inferred from the model results.

A discussion with all the participants followed. A set of key questions emerged in the discussion, and would accordingly specifically addressed in the LIMITS project. They are listed below.

- It is difficult to evaluate the political feasibility of the scenarios that the project can define. However it is important to give to policy makers results that can help them to choose. An effort should be take better translate models' results into concrete policies. The panellists insisted that any policy recommendation need to be quite detailed and at least surveyed the way of financing it. Also a great effort should be done to replace the current concept of growth used by economy minister into a concept of "green growth".

- The mix of bottom-up and top-down approaches is a delicate subject. In a bottom-up approach a model accounts for a multitude of inputs based on national realities, which give models an important feedback on what is really happening. However, a trade-off between computational tractability and realism must be always evaluated.

- How to model and account for biodiversity, which is intimately related with climate change.

3. Impact of climate policies on energy infrastructure and markets

The second section was devoted to the impact of the policies on the infrastructure and market architecture. Bob van der Swaan (ECN) was the moderator of the session. It stated with a presentation of Keywan Riahi (IIASA) on the implementation of Low Carbon policies, followed by a presentation of Jae Edmond (PNNL) on energy and land use transformations in regimes that limit the anthropogenic climate change.

3.1 Implementing Low Carbon Policies

Keywan Riahi showed to that sustaining energy developments needed to mitigate climate change would also have multiple co-benefits in term of air pollution and energy security. He started his presentation by showing the current picture of access to energy, air pollution and their impacts on human health. He then depicted the future investment path needed to limit global warming and presented some possible scenarios for the demand and supply of energy. Efficiency and flexibility on both sides were described as key factors for a low carbon transition. As an example he showed the total investment in the energy portfolio of China, and compared a scenario without any policies and one with adequate policies that prevent global warming (cfr. Figure 3).

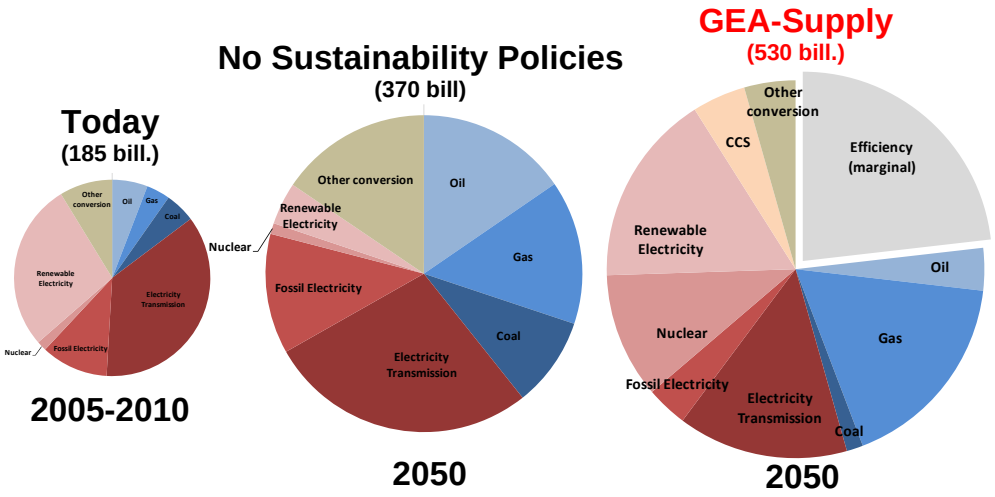

Figure 3: Future investment in China depending on the policies

He concluded remarking how total policy costs can be lowered when considering climate together with other potentially synergistic policy targets. This should help the political acceptability of the policies.

3.2 Energy and land use transformations regimes that limit anthropogenic climate change

Firstly, Jae Edmonds presented the GCAM model, an integrated assessment model used by the PNNL. He particularly focused on how it has been steadily growing to represent always more aspects of the complex dynamics of the natural ecosystems interacting with the core economic, energetic and climatic modules. Speaking of technologies, he underlined that both CCS and bioenergy will be extremely important for mitigation purposes.

CO2 removal technologies are very helpful especially in low radiative forcing scenarios, and geological studies seem to provide a very optimistic perspective on the availability of space for storage, at least for the next century and at least for most countries. Edmonds then showed some projections considering both energy and land use policies (FFCIT), and no land use policy (cfr. Figure 4)

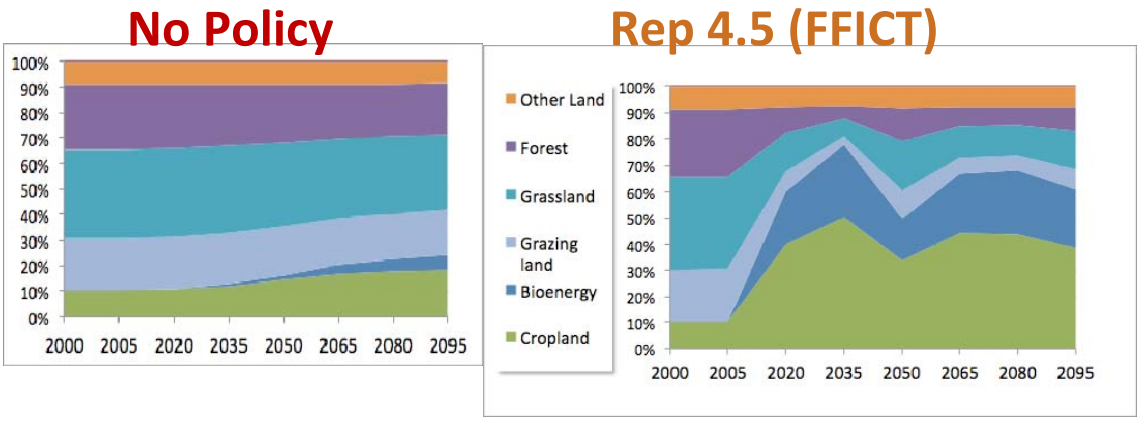

Figure 4: Land use prospectives

One clearly sees that the scenario without any land use policy lead to a significant modification of the land use, notably in term of forest cover and cropland. Jae Edmond then insisted that this would also lead to a quite different climate change as the feedbacks from land-use policy to global mean temperature can be very big.

3.3 Discussion

After the two presentation, the panellists gave their comment on the subject and the presentation

Valentina Bosetti (FEEM) underlined the necessity to consider in the models also the risk of unexpected bad consequences. In particular, this risk of "going wrong" may become more relevant when tackling multiple objectives concurrently.

Susana Calsamiglia-Mendlewicz (EU) emphasized the importance of considering innovation in energy technologies for the LIMITS project. She also suggested to take into account the top-down approach of the EU 2020 strategy for all the sectors (energy, transport, and so on).

Hans Holger Rogner (IAEA) reacted to Bosetti's perspective and proposed to focus also on the benefits of "going right". He then reflected on how transformation requires flexibility, and how energy efficiency improvements should be combined with the building of smart cities. He said finally that it is important consider the possibility that something could go wrong and that the resilience is the answer in this case.

Georg Zachman (Bruegel) commented on the need to scale up technologies quickly and to keep electricity prices to a minimum in order to make decarbonisation possible.

UWE Remme (IEA) added some remarks to the presentations, especially on the issues related to bioenergy, like the infrastructure required and the potential energy security risks involved.

The panellists agreed on the importance to pay attention to new technologies and infrastructures, but also to the demand side is important: how to change the people's behaviour? Surely people react to prices, and by internalizing the externalities of climate change prices should lead behaviour in the right direction. Nonetheless, the political feasibility of price changes and the potential market failures should also be considered.

4. Stakeholders contribution to the definition of the LIMITS study protocol

Several of the comments of the participants to the stakeholder meeting and of the conversation which ensued have contributed to the definition of the scenario protocol adopted in WP1. The most important ones are listed below:

- *Focus on 450 ppm CO2-eq scenarios*: there was widespread recognition that the 450 ppm CO2-eq climate objective is the one most consistent with 2C and discussed among policymakers. The target has to be interpreted as a concentration goal for 2100, which can be exceeded before than (though what is called overshooting) but cannot be exceeded after 2100. This point was particularly emphasized by Tom van Ierland.

- *Consider fragmented regimes based on Copenhagen pledges before cooperation*. Stakeholders, especially Tom van Ierland, underlined the importance of representing realistic interim policy goals which both reflect the pledges enunciated in Copenhagen but also include policies on specific technologies and sectors, such as policies aimed at supporting renewables, nuclear, CCS and energy efficiency.

- *Work out the finance implications*. The stakeholders noted that existing multi model studies exploring 2C did not investigate the financing needs which would be needed to make the transformation happen.

- *Beware of the land use impacts of stringent climate policies*: Dominique van der Mansbrugghe emphasized the need to scrutinize the results of integrated assessment models with respect to their implications for land use via bioenergy and afforestation programmes, and their ultimate impacts on food security and biodiversity.

All these comments were integrated in the discussion which followed the kick off and which over the course of the following 6 months led to the design of the WP1 study protocol. The protocol included all these issues (with the exception of the last one, which will be tackled in WP3 in the second half of the project) and tried to decline them in the best possible way, while accounting for the feasibility of the implementation and the match to the abilities of the suite of IAMs involved in the project.

5. List of participants

List of participants		
Participant	**Affiliation**	**Country**
Tino Aboumahboub	Potsdam Institute for Climate Impact Research (PIK)	Germany
Federico Antognazza	Italian Climate Network	Italy
Valentina Bosetti	Fondazione Eni Enrico Mattei (FEEM)	Italy
Alex Bowen	London School of Economics and Political Science (LSE)	United Kingdom
Barbara Buchner	Climate Policy Initiative (CPI)	Italy
Susana Calsamiglia-Mendlewicz	European Commission (EC)	Belgium
Katherine Calvin	Pacific Northwest National Laboratory (PNNL)	USA
Giovanni Caprara	Corriere della Sera	Italy
Mariaester Cassinelli	Fondazione Eni Enrico Mattei (FEEM)	Italy
Chen Chen	Fondazione Eni Enrico Mattei (FEEM)	Italy
Aleh Cherp	Central European University (CEU)	Hungary
Alex Chirmiciu	European Bank for Reconstruction and Development (EBRD)	United Kingdom
Enrica De Cian	Fondazione Eni Enrico Mattei (FEEM)	Italy
Gauthier de Maere d'Aertrycke	Fondazione Eni Enrico Mattei (FEEM)	Italy
Rob Dellink	Organisation for Economic Co-operation and Development (OECD)	France
James Edmonds	Pacific Northwest National Laboratory (PNNL)	USA
Christian Flachsland	Potsdam Institute for Climate Impact Research (PIK)	Germany

Sabine Fuss	International Institute for Applied Systems Analysis (IIASA)	Austria
Giulia Galluccio	Fondazione Eni Enrico Mattei	Italy
Amit Garg	Indian Institute of Management (IIM)	India
Alessandra Goria	Fondazione Eni Enrico Mattei (FEEM)	Italy
Jörg Haas	European Climate Foundation (ECF)	Germany
Maria Koon	University of Hamburg	Germany
Jessica Jewell	International Institute for Applied Systems Analysis/International Energy Agency (IIASA/IEA)	Austria
Mikiko Kainuma	National Institute for Environmental Studies (NIES)	Japan
Jiang Kejun	Energy Research Institute of the National Development and Reform Commission (NDRC-ERI)	China
Elmar Kriegler	Potsdam Institute for Climate Impact Research (PIK)	Germany
Thomas Longden	Fondazione Eni Enrico Mattei (FEEM)	Italy
Gunnar Luderer	Potsdam Institute for Climate Impact Research (PIK)	Germany
Giacomo Marangoni	Fondazione Eni Enrico Mattei (FEEM)	Italy
Martina Marian	Fondazione Eni Enrico Mattei (FEEM)	Italy
Robert Marschinski	Potsdam Institute for Climate Impact Research (PIK)	Germany
Carlo Orecchia	Fondazione Eni Enrico Mattei (FEEM)	Italy
David McCollum	International Institute for Applied Systems Analysis (IIASA)	Austria
Alexander Popp	Potsdam Institute for Climate Impact Research (PIK)	Germany
Shilpa Rao	International Institute for Applied Systems Analysis (IIASA)	Austria
Uwe Remme	International Energy Agency (IEA)	France
Keywan Riahi	International Institute for Applied Systems Analysis (IIASA)	Austria

Elena Ricci	Fondazione Eni Enrico Mattei	Italy
Holger Rogner	International Atomic Energy Agency (IAEA)	Austria
Hilke Rosler	Energy Research Centre of the Netherlands (ECN)	Netherlands
Giuseppe Sammarco	Fondazione Eni Enrico Mattei (FEEM)	Italy
Annalisa Savaresi	University of Copenhagen	Denmark
Fabio Sferra	Fondazione Eni Enrico Mattei (FEEM)	Italy
Patrick Sullivan	National Renewable Energy Laboratory (NREL)	USA
Massimo Tavoni	Fondazione Eni Enrico Mattei (FEEM)	Italy
Chiara Trabacchi	Climate Policy Initiative (CPI)	Italy
Dominique van der Mansbrugghe	Food and Agriculture Organization of the United Nations (FAO)	Italy
Bob Van der Zwaan	Energy Research Centre of the Netherlands (ECN)	Netherlands
Rita Van Dingenen	Joint Research Centre, Institute for Environment and Sustainability, European Commission (JRC-IES)	Italy
Tom van Ierland	European Commission (EC)	Belgium
Detlef van Vuuren	Utrecht University (UU)	Netherlands
Georg Zachmann	Bruegel Institute (Bruegel)	Belgium