

Know your LIMITS

Dr Massimo Tavoni discusses a new research project that aims at assessing the feasibility of international climate action and the implementation strategies in the major economies



Could you outline the main goals of the Low climate IMPact scenarios and the Implications of required Tight emission control Strategies (LIMITS) project? Can you explain more about the '2 °C' target and how your work feeds into this broader goal?

LIMITS is a research project that aims to advance understanding of how to implement climate policies that are consistent with keeping the average global temperature increase below 2 °C. This is a very pressing international question; the 2 °C target was reaffirmed at the United Nations Framework Convention on Climate Change COP17, in Durban last December. By 2015, the Durban Action Plan that emerged from the Conference is expected to generate an agreement to achieve this.

The project is expected to contribute in this respect by providing an assessment of the emission reduction strategies at the level of the major economies. It will do so by assessing strategy implementation in terms of defining emission reduction pathways; evaluating the investment needs and the associated finance mechanisms; quantifying the changes in the energy infrastructure and land use; and evaluating the synergies with national priorities such as energy security, air pollution and economic development.

Why do you believe action on climate mitigation and adaptation remains insufficient? How will LIMITS' activities help to combat this issue and how is your methodology unique?

Action on climate remains insufficient because climate change is an incredibly difficult problem to crack. It is global, long-term, uncertain, and it involves a lot of strategic thinking. One area where more progress is needed – and where this project can contribute to a great extent – is the joint assessment of both the stringency of climate objectives and the distributional implications of their implementation. Both are prerequisites to any successful deal on climate change. To help achieve this, we will be using a unique suite of the best available modelling tools which will help us quantify the various trade-offs that these policies will generate, helping decision makers in their ultimately political call.

One aspect of your work focuses on implementation in major economies. What changes are required in this area in order to help limit the rate of global warming?

We are talking about massive changes – changes that have rarely been seen in the past, at least in the energy sector. The way energy and land is managed and consumed will need to be radically restructured, employing more efficient technologies, transitioning and developing low carbon ones, and changing our attitudes and behaviour. Despite the difficulty of conveying the magnitude of change necessary, we must not be deterred. The question is how to manage the transition to a low carbon system over time gradually and efficiently, minimising any potential disruption (economic or technological). LIMITS is exactly about defining and quantifying these transformational pathways.

The project is in the first year of its three-year plan. What are the main activities required and what expectations do you have for the results?

We will consolidate our first results in a major study to be prepared in the fall of 2012. This first part of the project will specifically look into defining what it takes to get to 2 °C according to different probabilities of reaching the objective, different intermediate policy architectures, and different burden sharing rule. This analysis will also shed light on the climate finance needs, an essential element for the feasibility and the costs of achieving a low carbon energy system.

Are there any major up-and-coming events that LIMITS will be organising?

Our last meeting was held in June in Berlin, though it was an internal one. We will organise additional events and public workshops later in 2012 or early 2013 in Europe, and later on in China, a country where we see a lot of interest in this kind of analysis right now. We will follow closely the activities of the Durban Action Platform, since the timeline of the project fits in nicely with that of Durban, and the content is extremely relevant too.

A model approach

LIMITS, an EU funded project coordinated by the Fondazione Eni Enrico Mattei, is set to make inroads into climate policy, using multiple models to produce robust predictions about the impacts of climate legislation

CLIMATE CHANGE STRATEGIES continue to be a headline-making problem for the international community, and recent conferences such as COP17 in Durban have added to the ongoing discussion. The 'Low climate IMpact scenarios and the Implications of required Tight emission control Strategies' (LIMITS) project therefore seeks to focus both on details of quantification and upon practical solutions for the issues surrounding climate change. With climate change posing an increasingly pressing international problem, it is essential for research to be both policy focused, and as broad and flexible as is possible. This is precisely the aim of LIMITS. Its novel approach implements 10 integrated assessment models, run in an integrated fashion in order to produce the most robust results possible. These unprecedented levels of simultaneous modelling mean that, once the results are generated, the LIMITS consortium should be in a strong position to make effective recommendations on climate approaches regarding stringent climate policies such as those consistent with the 2 °C target.

THE MODELS

The 10 models have been developed across various institutions – from Italy to Japan. Each one addresses a particular element of climate change, bringing additional strengths to the portfolio available to LIMITS. These models examine an extremely broad range of associated factors in climate science. By accommodating models from a number of institutions, and designed for a range of purposes, LIMITS is meant to provide predictions of the appropriate breadth required to address such complex challenges.

The team is set to explore both the implications and the uncertainties of reaching

the 2 °C target set by the United Nation's Framework Convention on Climate Change (UNFCCC). The range of models means that different assumptions can be accounted for regarding, for example, the remaining margin for greenhouse gas emissions, the technology available, the relative participation of different regions in international climate policy and implementation obstacles. The data which these initial analyses produce will then fuel a second level of investigations – with the first set of results expected after the first year of research.

The high level of model integration means that the heterogeneity of regional and national responses to climate change can be assessed simultaneously. The interrelated environmental and social challenges, such as energy security, air pollution, economic development and ecosystem preservation will also be taken into account by LIMITS. The links between climate policy and these issues can then be explored, hopefully demonstrating both synergies and trade offs in the issues surrounding climate change itself. This is a truly original contribution of the project, since it will allow linking the transboundary problem of climate change closer to some key national priorities, which differ substantially across regions and are instrumental in providing support to climate change action. It is hoped that the breadth of LIMITS will help it to assess and demonstrate ways forward which are more successful and far-reaching than any previously attempted.

CLIMATE OF COMMUNICATION

Given the heights of LIMITS' ambitions and its focus on practical action, the dissemination of their findings is of pressing importance. The debate which has surrounded climate science recently is as much an opportunity as

a hindrance for the project. In fact, Dr Massimo Tavoni, who is leading LIMITS, has written critical reports on the feasibility of attaining stringent climate goals. However, the lack of outcome bias for the project as a whole means that the proof of the research will lie solely in the results; this is at the core of LIMITS' potential. By bringing together a formidable group of scientists who have contributed greatly to the model-based assessment of climate change policies, the project aims to provide coherent and authoritative research. Moreover, the plan to make all materials available and open source through the project website is critical to opening up climate economics research to wider scrutiny. Beyond this, the working group will contribute publications in scientific journals, and the main findings will be condensed and made easily available to the general public through brochures and newsletters.

NEW LIMITS

The three-year project began in October 2011, with the first results predicted for summer 2012. This has been aided by the fact that many of the individuals have collaborated on joint projects in the past, meaning that LIMITS has been quickly brought to operational level. Many members of the team are also involved in external commitments, notably in the ongoing Intergovernmental Panel on Climate Change 5th assessment report, which is also due around 2014. The importance of this research field at this time means that LIMITS will need to generate results which stand the scrutiny of science but which are also policy relevant. Work is now well underway with all the models busy running the first study protocol of the project. This first piece of analysis will look into the attainability of stringent climate policies under different assumptions about the severity of climate change, the level of commitment of the



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major economies in the medium term, and the distributional consequences of different burden sharing schemes. All of these are elements are of utmost importance for the new negotiation phase which has just begun with the Durban Platform for Enhanced Action.

INTERNATIONAL OUTLOOK

LIMITS – which is funded by the European Commission's Seventh Framework Programme (FP7) – is strengthened by its association with some of the major partners in the Assessment of climate change Mitigation Pathways and Evaluation of the Robustness of mitigation cost Estimates (AMPERE) project, coordinated by the Potsdam Institute for Climate Research.

The Fondazione Eni Enrico Mattei is also involved with AMPERE, in an overall consortium comprising 21 partner institutions from 12 countries. The LIMITS consortium has also been working together in many international fora for climate change modelling, most notably the Energy Modeling Forum and the Integrated Assessment Modeling Consortium. The involvement of partners in these projects will assure complementarity of the analysis and help to maximise synergies across projects. It is clear that in order to produce the strongest possible results and ideas, such inter-project involvement is essential, and it also helps to guarantee the careful use of EU financial resources. As these initiatives progress it is hoped that the policy focus of climate science will improve, with new and more ambitious action being undertaken in some of the major economies.

INTELLIGENCE

LIMITS

LOW CLIMATE IMPACT SCENARIOS AND THE IMPLICATIONS OF REQUIRED TIGHT EMISSION CONTROL STRATEGIES

OBJECTIVES

To carry out a rigorous assessment of what a stringent climate policy entails and what is needed to overcome major impediments. This information will allow policy makers to better assess the costs and benefits of aggressive climate targets, and on how to make them implementable.

PARTNERS

National Development and Reform Commission Energy Research Institute, China • Internationales Institut fuer Angewandte Systemanalyse, Austria • London School of Economics and Political Science, UK • Universiteit Utrecht, The Netherlands • Kozep-Europai Egyetem, Hungary • Potsdam Institut fuer Klimafolgenforschung, Germany • Stichting Energieonderzoek Centrum Nederland, The Netherlands • EC Joint Research Centre, EU • Indian Institute of Management, India

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