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# LIMITS

LOW  
CLIMATE  
**I**MPACT  
SCENARIOS  
AND THE  
**I**MPPLICATIONS  
OF REQUIRED  
**T**IGHT  
EMISSION  
CONTROL  
**S**TRATEGIES

## LIMITS special issue on Durban Platform scenarios

The Durban platform for enhanced action provides the most important opportunity for a post 2020 international climate agreement. It contains several innovative elements, most notably a focus on the major economies which goes beyond the traditional divide between developed and developing countries. The LIMITS project has **completed the most comprehensive and up to date model inter-comparison** on the relation between the short term policy outcome **of the Durban negotiation process and the long term climate objective of 2°C**.

A suite of seven leading integrated assessment models has assessed 12 scenarios which span combinations of **short term action, long term climate objective, degree of cooperation and of effort sharing**. The special issue – forthcoming in the journal *Climate Change Economics* – is composed of 12 original papers (see the table of contents) which covers a broad range of topics related to model evaluation of Durban scenarios.

Here we briefly report on the main insights of the study. All papers are accessible from the LIMITS website [www.feem-project.net/limits](http://www.feem-project.net/limits). All the data underlying the scenarios will be available for download and for web visualization at the time of publishing of publication the special issue, expected for early 2014.

## The relevance of the Durban platform negotiation outcome

The LIMITS study finds robust evidence that the outcome of the **Durban Platform negotiations plays a crucial role in keeping the option to limit global mean warming to 2°C open**. Weak action in 2020 or fragmentation to 2030 raises the rates of decarbonization and policy costs significantly, making subsequent policy implementation less likely. This is supported by a **strong correlation between the short term gap in emissions and the increase in the rate of emission reductions and economic costs** at the time of the adoption of the climate treaty.

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Making it more likely than not to maintain global mean temperature below 2°C would require **a peak in global emissions between 2020 and 2030, a carbon budget to mid-century of 1400 to 1700 GtCO<sub>2</sub>-eq**, and eventually a complete phase out of global emissions. Emissions intensity would need to **decline by 4 to 5% per year, three times** greater than the long term global average rate, and above the decarbonization rates of leading countries like Sweden.

## Investing and financing the transformation

Achieving these rates of emissions reduction will require a **major restructuring of the energy system**. The power sector will need to undergo the largest transformation over the next decades, with **capacity additions for key low carbon technologies** such as wind, solar, fossil fuels with CCS **exceeding 50GW/yr**, above the massive capacity growth of conventional coal power of recent years. Bioenergy is shown to be a key contributor to the decarbonisation strategy, due to its versatility and the potential for generating negative emissions.

This would require a significant **upscaling of investments** into low-carbon energy and energy efficiency, reaching approximately \$1.1 trillion annually. It represents a **“clean-energy investment gap” of \$800 billion/yr**– in the same order of magnitude **as present-day subsidies for fossil** energy and electricity worldwide. A **clean-energy R&D** gap has been also quantified to about **\$50 billion/yr**. These rates of investments could be **fully covered by the fiscal revenues of carbon pricing**.

## Implementing Durban policies in the major economies

The special issue has also quantified the implication of Durban policy architectures for the major economies, highlighting **significant regional heterogeneity**. Achieving **2°C with likely chances** will require **emissions** to be **always below today's values for OECD regions**, and to **return to today's levels by 2040 in China and India**. Absent financial transfers- the costs of mitigation will be distributed differently across regions, with **lower costs for advanced economies, higher for fast-growing economies and significantly higher for energy-exporters**. The asymmetric distribution of costs could be alleviated by **endowing** regions with **emission permits** and allowing free **trade** of such entitlements, but it would require establishing a global **carbon market of several GtCO<sub>2</sub> and up to \$100 Billion in 2030**.

Climate policies are likely to lead to significantly **lower global energy trade** and reduce **energy imports** of major economies, **decrease** the rate of **resource depletion**, and **increase the diversity** of energy options, particularly in the transportation sector. **China, India and the E.U.** will derive particularly **strong benefits** from climate policies, whereas the **U.S. may forego some opportunities** to export fossil fuels in the second half of the century.



## Meetings and Events

### **4th Project Meeting**

26-27 September 2013

Austria

### **COP 19 - Side Event EU Pavillon - Durban Action Global Scenarios for 2C: feasibility, implications and impacts**

11 November 2013

Poland

### **5th Project Meeting, Stakeholder Meeting, and hosted event at the International Energy Workshop (IEW)**

June 2014

China

## Table of Contents of the special issue

Title	Lead Authors
What does the 2°C target imply for a global climate agreement in 2020? The LIMITS study on Durban Platform action scenarios	Kriegler et. al
The distribution of the major economies' effort in the Durban platform scenarios	Tavoni et. al
Energy investments under climate policy: a comparison of global models	McCollum et al.
Energy security of China, India, the EU and the US under long-term scenarios: Results from six IAMs	Jewell et. al
A multi-model analysis of post-2020 mitigation efforts of five major economies	van Sluisveld et. al.
A Cross-model Comparison of Global Long-term Technology Diffusion under a 2°C Climate Change Control Target	van der Zwaan et. al
A multi-model analysis of the regional and sectoral roles of bioenergy in near-term and long-term carbon mitigation	Calvin et al.
Regional Burden Sharing Regimes for reaching a global long-term 2°C Climate Change Control Target	Kober et. al.
On the regional distribution of climate mitigation costs: the impact of delayed cooperative action	Aboumahboub et. al.
The clean energy R&D gap to 2C	Marangoni and Tavoni
Climate Policy in Practice: A Typology of Obstacles and Implications for Integrated Assessment Modeling	I. Staub-Kaminski et. al
A macroeconomic perspective on climate change mitigation: Meeting the financing challenge	Bowen et. Al.



## LIMITS Consortium

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Indian Institute of Management (IIM), India

[www.iimahd.ernet.in](http://www.iimahd.ernet.in)

### Associated Research Organisations

Pacific Northwest National Laboratory, Joint Global Change Research Institute at the University of Maryland (PNNL), USA

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National Institute for Environmental Studies (NIES), Japan

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