

## Advances in the Modelling of Innovation and Finance in Macroeconomic Models

### AGENDA

#### **DAY 1 – Thursday 13<sup>th</sup> October 2016, 16.00-18.00**

Venue: MINES ParisTech, Luxembourg

*Conceptual frameworks on innovation*

<b>Time</b>	<b>Title</b>	<b>Person</b>
16.00 -16.10	Introductions	Paul Ekins
16.10 – 16.40	DG Energy study	JF Mercure
16.40 – 17:00	Three Domains and IMPC	Michael Grubb
17:0 – 17:20	Resource efficiency	Raimund Bleischwitz
17.20 – 17.40	Microeconomic concepts	Antoine Mandel
17.40 - 18.00	Open discussion	ALL

#### **DAY 2 – Friday 14<sup>th</sup> October 2016, 09.00-13.00**

Venue: **Salle 19** Maison des sciences économiques, 106-112 Boulevard de l'hôpital, 75013 Paris .  
Metro line 5, campo-formio

*Modelling Experience and empirical evidence*

<b>Time</b>	<b>Title</b>	<b>Person</b>
09.00 – 09.20	Hands-on modelling experiences from Green-WIN	Leonidas Parroussos
09.20 - 09.40	Perspectives on how to approach modelling innovation and finance	A Calzadilla, Matthew Winning
09.40 – 10.00	Macro-Econometrics on innovation	JF Mercure
10.00 – 10.20	CIRED approaches to innovation	Jean-Charles Hourcade
<i>BREAK</i>		
10.50 – 11.05	Empirics on Innovation	TBC
11.05 – 11.20	Empirics on Finance	Nadia Ameli
11.20 – 12.45	Open discussion	ALL

12.45 – 13.00	Implications for future projects	Paul Ekins
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## OUTLINE

Innovation and technological change are essential components in solving many of the major environmental problems which need to be addressed over the next years and decades. An issue of debate has been how this technological innovation occurs and what drives it within certain sectors and economies, and how eco-innovations can be conceptualized. From the literature there is a general consensus that technological innovation occurs through two main factors: by increased knowledge from Research and Development and also through practical experience i.e. learning by doing (Weyant and Olavson, 1999); cost reductions also occur through related channels such as scale economies. There is good evidence for process innovations in different industries leading to enhanced resource efficiency over time (also known as ‘decoupling’), some evidence on a ‘saturation effect’ occurring when economies become less material intensive when moving through development stages. There are also knowledge transfers and productivity spillover effects although these are harder again to measure in practice.

The inclusion of technological change in economic models is crucial for analysis of long-run problems which require innovation and system transformation (like climate change/circular economy). There have been several studies and attempts to lay out the main issues and problems involved in the modelling (Grubb et al, 2002; IMCP, 2006) but widespread use remains sporadic (eg. IPCC 2014) and particularly challenging to include in General Equilibrium and other optimising modelling frameworks.

Another critical component in solving environmental issues such as climate change and achieving eco-innovation is the availability of finance, in terms of structure and constraints, which can differ across nations. However, the inclusion of plausible financial processes within models is less developed and most models which do not incorporate monetary and finance sectors explicitly. Therefore, we will also take time at the end of the meeting to have some discussion on finance and how finance is included in energy and environmental modelling of the economy which has been considered in Green-WIN and how it might be considered in modelling a circular economy.

The meeting on 13<sup>th</sup> and 14<sup>th</sup> of October 2016 in Paris is an informal meeting targeted at understanding the current state of the art of incorporating endogenous technological change into top-down macroeconomic modelling tools, including equilibrium-based models such as GEM-E3 and econometric/disequilibrium models, as well as understanding and sharing the practical experiences and difficulties involved in implementing such innovation modelling. With several projects focussed on issues related to the area (GREEN-WIN, SINCERE, INNOPATHS, RIPPLES, CIRCLE) this meeting is a chance to learn from each other’s practical experiences in an open environment, and thereby inform a number of model-based projects developing over the coming year(s).