



# Towards climate friendly development patterns: the role of early action on infrastructure

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How can  
climate policy models shape real decisions ?

March 24<sup>th</sup>, 2009

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# IPCC: challenging physics but good economic news?

Category	Radiative forcing (W/m <sup>2</sup> )	CO <sub>2</sub> concentration <sup>c)</sup> (ppm)	CO <sub>2</sub> -eq concentration <sup>c)</sup> (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity <sup>b), c)</sup> (°C)	Peaking year for CO <sub>2</sub> emissions <sup>d)</sup>	Change in global CO <sub>2</sub> emissions in 2050 (% of 2000 emissions) <sup>d)</sup>	No. of assessed scenarios
I	2.5-3.0	350-400	445-490	2.0-2.4	2000-2015	-85 to -50	6
II	3.0-3.5	400-440	490-535	2.4-2.8	2000-2020	-60 to -30	18
III	3.5-4.0	440-485	535-590	2.8-3.2	2010-2030	-30 to +5	21
IV	4.0-5.0	485-570	590-710	3.2-4.0	2020-2060	+10 to +60	118
V	5.0-6.0	570-660	710-855	4.0-4.9	2050-2080	+25 to +85	9
VI	6.0-7.5	660-790	855-1130	4.9-6.1	2060-2090	+90 to +140	5
Total							177

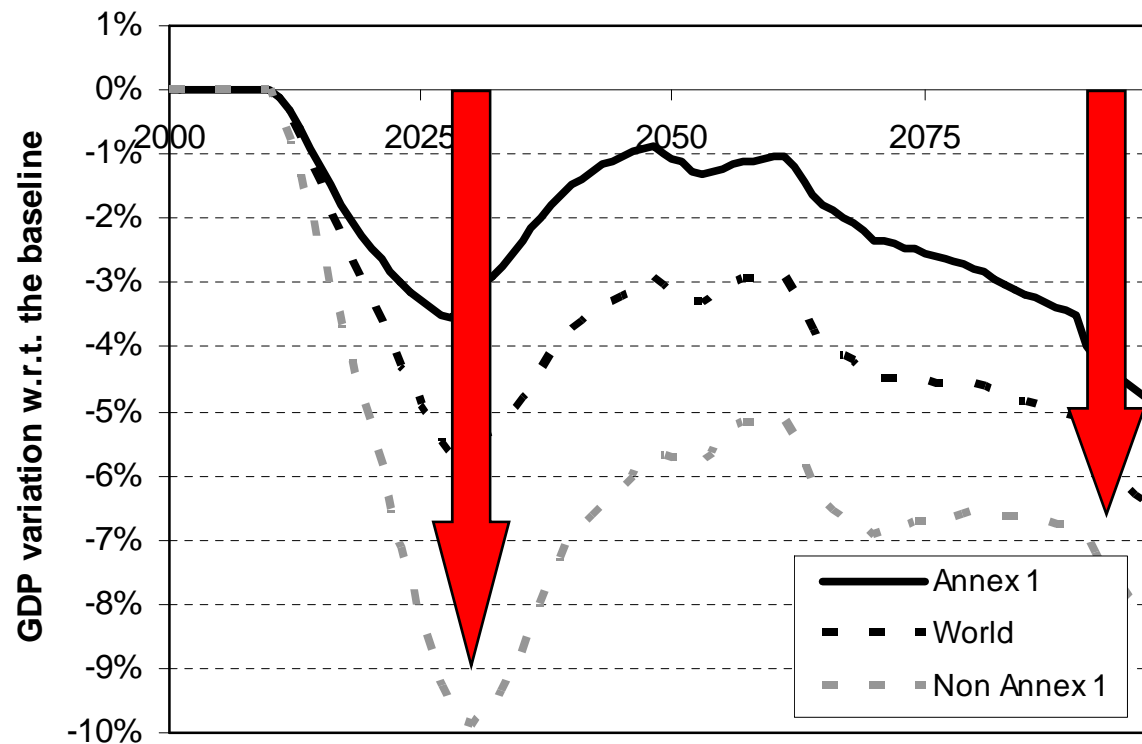
Stabilization levels (ppm CO <sub>2</sub> -eq)	Median GDP reduction <sup>d)</sup> (%)	Range of GDP reduction <sup>d), e)</sup> (%)	Reduction of average annual GDP growth rates <sup>d), f)</sup> (percentage points)
590-710	0.2	-0.6-1.2	<0.06
535-590	0.6	0.2-2.5	<0.1
445-535 <sup>g)</sup>	not available	<3	<0.12

## Re-exploring these results with a new tool

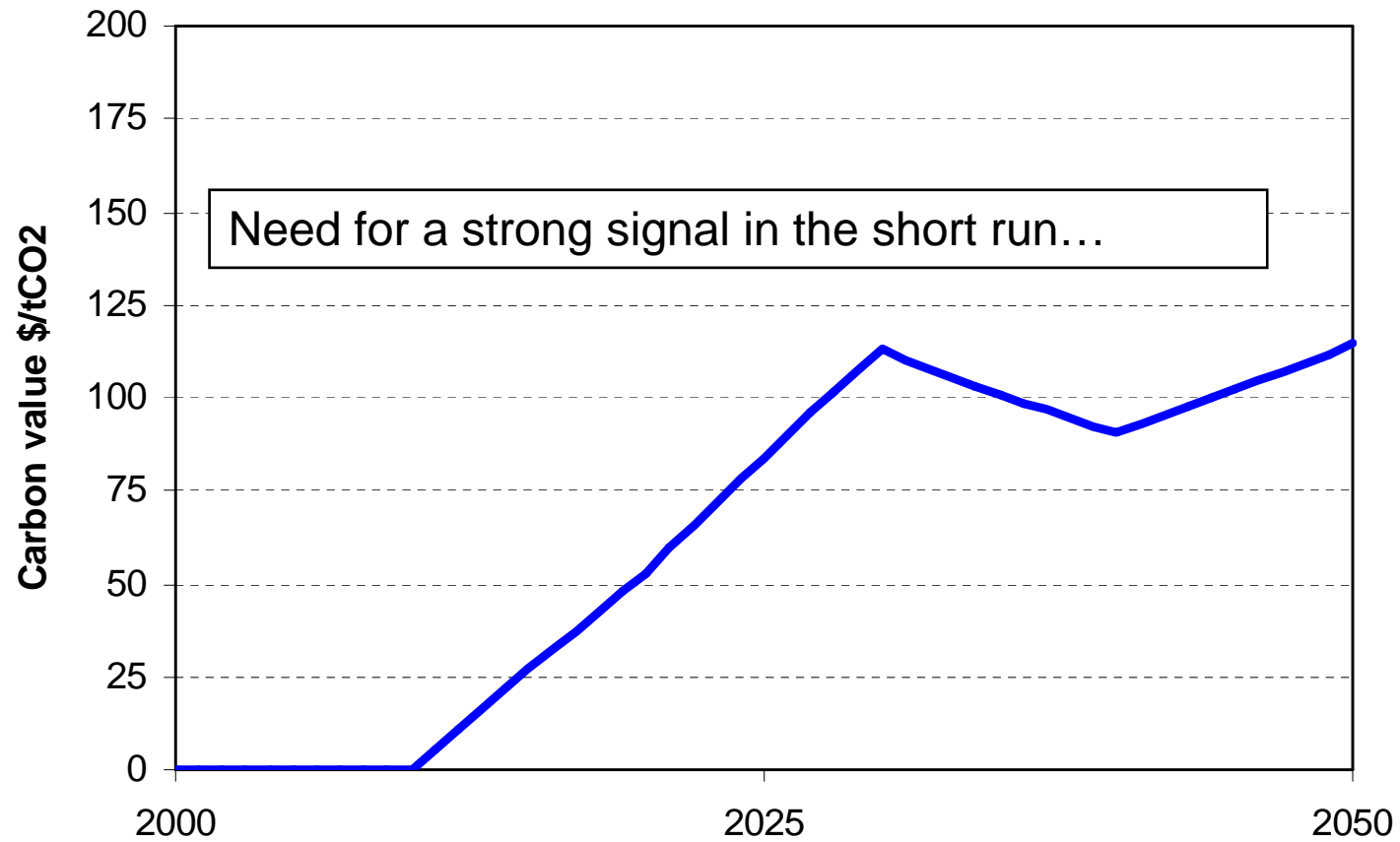
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- Numerical experiments with IMACLIM-R: an **hybrid** model with a growth engine with **ETC** and **disequilibrium**
- Explicit description of the **inertia** of capital stocks, including infrastructures and end-use equipments
- Explicit description of technical **asymptotes** (expert judgments)
- Realistic description of **transportation** demand specificities
- « **Semi-perfect foresight** » for the energy sector, « **semi-myopic** » for the others
- Carbon price only policies -> shout to attract attention of the short-sighted

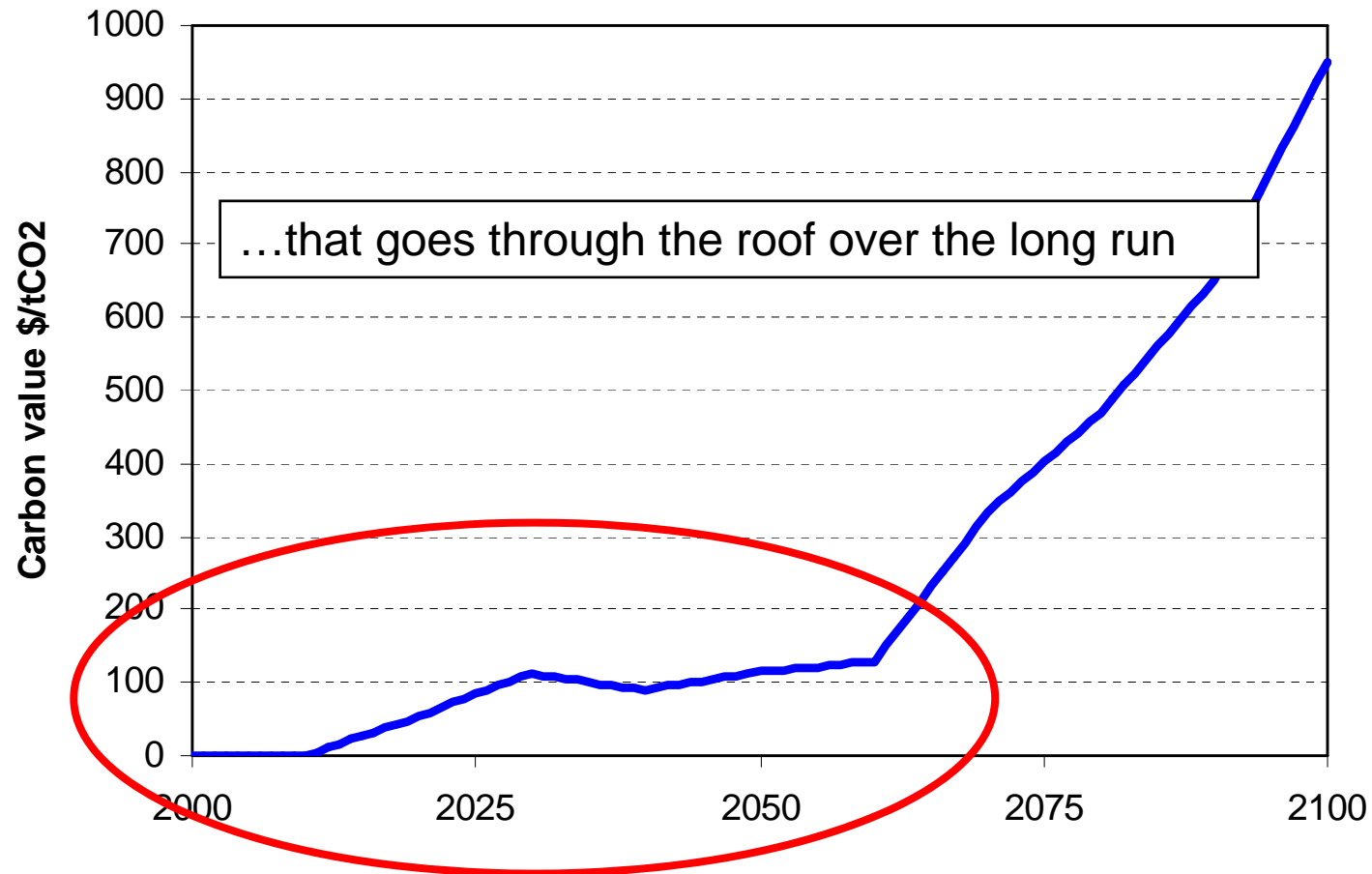
# GDP losses: Mind the transition and the end point ! (450ppm CO<sub>2</sub>)



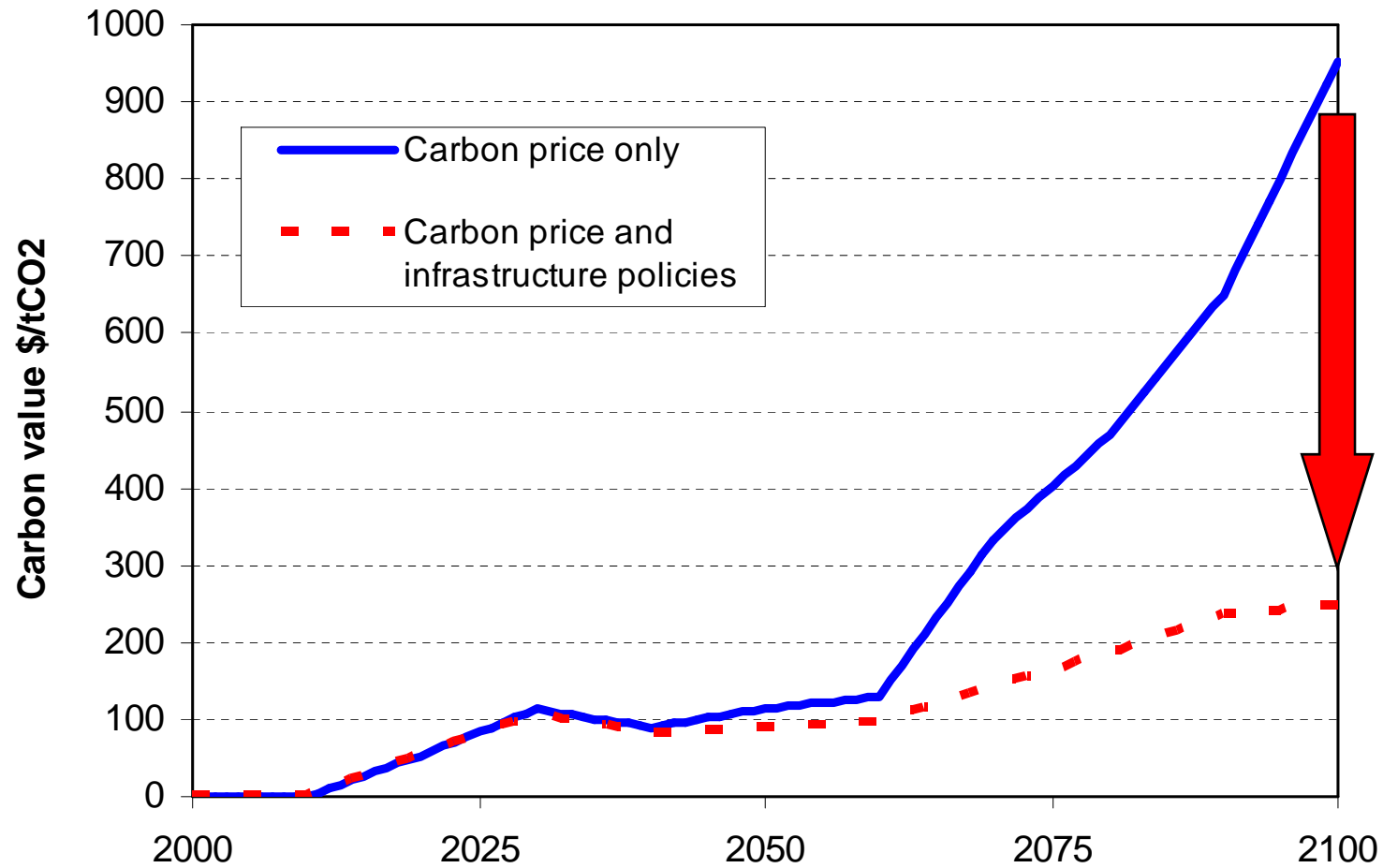
# Time profile of the price signal at first period



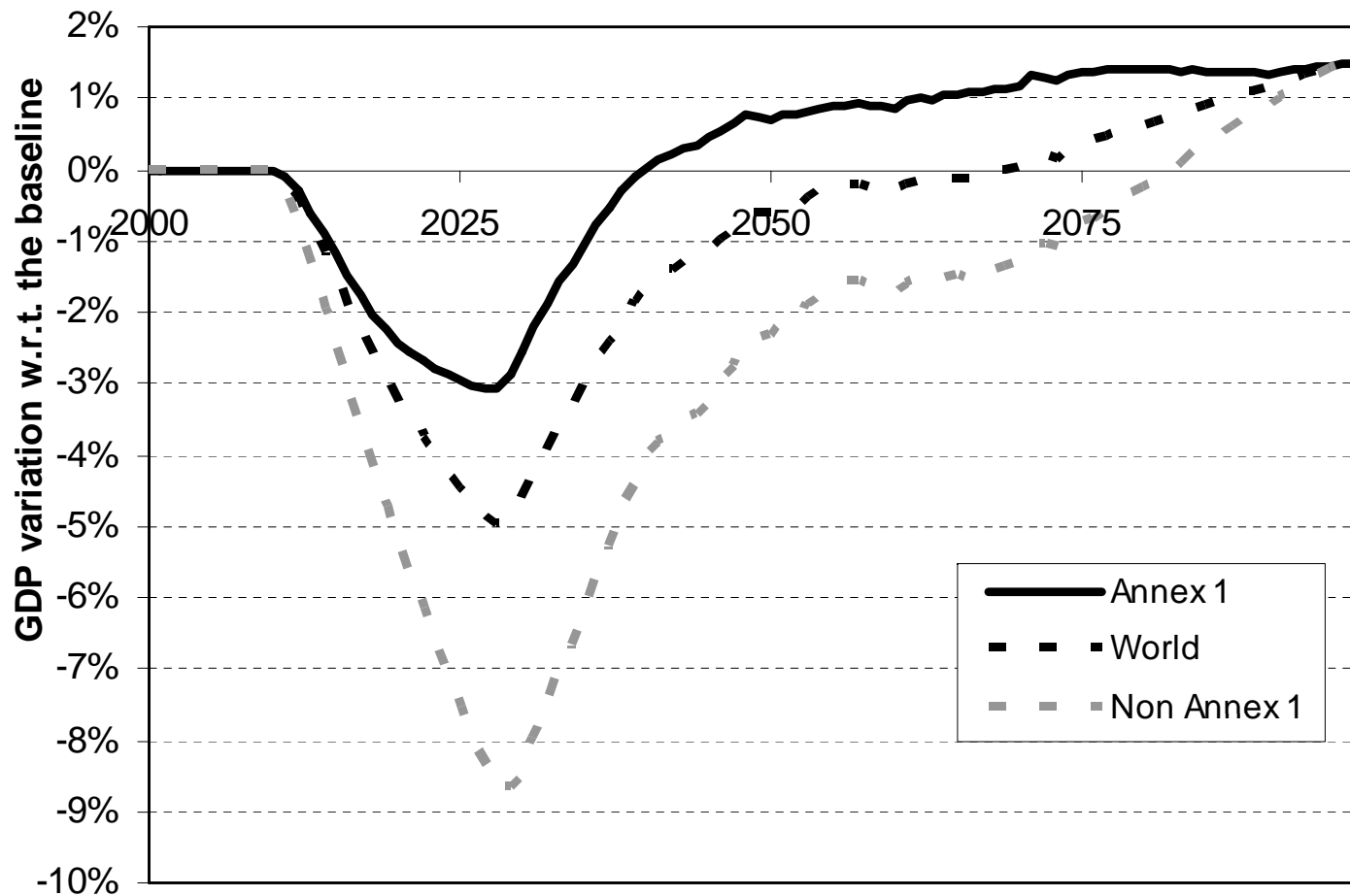
# Time profile of the carbon price at second period: really bad news?



# The same 450ppm with early action infrastructure and diversification of policy signals



# Reassuring end-points but still transition problems





## Lessons: re-framing the conventional wisdom

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- Climate policies may be **beneficial** over the **long run**
- The **squeeze** of uniform carbon prices (only) policies:
  - **Hurt emerging economies** over the short run (when the carbon prices are low relatively low!!!)
  - Without preventing **risks of lock-in** in carbon intensive development pathways
- Non negotiable « **equity** » of the burden sharing and compensations
- Need of **early action** to shift infrastructure investments

# Policy and research agenda

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- One intellectual pre-condition: **beyond carbon prices** ...
  - what governs infrastructure policies? prices, standards, urban policies and .... local political bargaining
  - what domestic and international policies to compensate for short term adverse distributional impacts?
  
- A well designed overlapping of **short and long term** measures
  - Laying the foundations of a “climate friendly” fiscal system
  
  - Fostering early penetration of efficient end-use equipments for emerging middle classes (electric vehicle, efficient air-conditioning)
  
  - Developing support to low income classes
  
  - Early action in infrastructure policies
  
  - Domestic differentiation of carbon and energy prices and climate policies



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