C.I.R.E.D.
CENTRE
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Transition towards LCS in a second-best world

Improving models and their use: an attempt in the French context

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The Policy Path to Low-Carbon Societies

A survey

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A normative value of carbon as a pillar to policy action

- Textbook rationale well established
  - Uniform pricing to equate marginal costs at any point in time + Hotelling rule for pricing dynamics
- Policy implication : not pricing but a normative assessment of the least-cost option
  - As a yardstick to explicit mitigation policies
  - As a signal to policymakers
  - To shape the anticipations of private agents

French and British reports on carbon valuation by CAS and DECC, 2009

- Comparable carbon values (2008 € per ton CO_2)
  - €36 *vs* €30 *and* €70 in 2010
  - A consensus on €100 in 2030
  - €200 *vs* €277 in 2050 (2008 euros)
- …mask widely diverging assumptions
  - 2010-2020: accounting for *vs* notwithstanding EU-ETS (double pricing!)
  - 2030: Europe alone (-60%) vs Global action
- …on oversimplified trajectory assumptions: Hotelling, linear (!)

Carbon pricing in a second best world

- Separate commitments for the ETS and non-ETS emissions + drasticaly limited trade = differentiated prices
- But efficiency loss not systematic in a second best world with
  - Pre-existing tax distortions
  - Exposure to international trade
- Possible trade-off between differentiated pricing and carefully crafted recycling policy

Grey literature: one thousand unassessed policy measures

- On energy supply (levelling the playing field and lifting institutional barriers, feed-in tariffs, legally binding targets, improvement of E transportation and storage)
- On energy demand (C&C policies targeting buildings, passenger cars and end-use equipments)
- Beyond energy markets
  - R&D support (directed)
  - Public awareness campaigns
  - Training programmes to adapt the labour force

Blatantly lacking micro & macro assessment

A blueprint for further research

- On a carbon value trajectory
  - Accounting for the core dynamics of demographics, fossil fuel markets, technical change, energy K stocks
- On the *terra incognita* beyond first best policy design
- On a microeconomic elicitation of incentive overlaps
- On an integrated framework of analysis

Together with progress on the modelling 'communication', to prevent strategic use on the policy field of cost figures with utterly different meanings

Issues behind the modelling of « 2nd best worlds »

Jean-Charles Hourcade

Head of CIRED

Directeur de recherche CNRS

Cheap 2° K? Too good to be true?

*"**The most ambitious pathways [350-450 ppm] are possible**"*
at the cost of a GDP impact between +0.5 and -3% in 2030
with technologies currently known
and a uniform carbon price between $5 and $80/tCO$_2$ in 2030

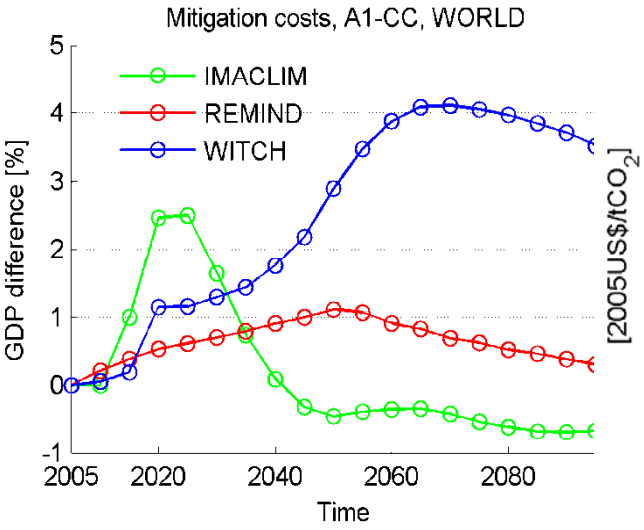
Good news!... conditional to a **'never read' caveat:**

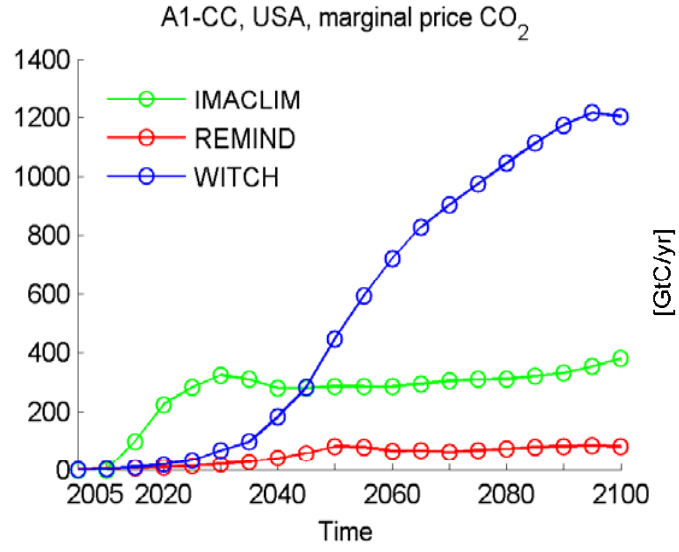
'Most models use a global least cost approach to mitigation portfolios and with universal emissions trading, assuming transparent markets, no transaction cost, and thus perfect implementation of mitigation measures throughout the 21st century.' (AR4 WGIII SPM Box 3)

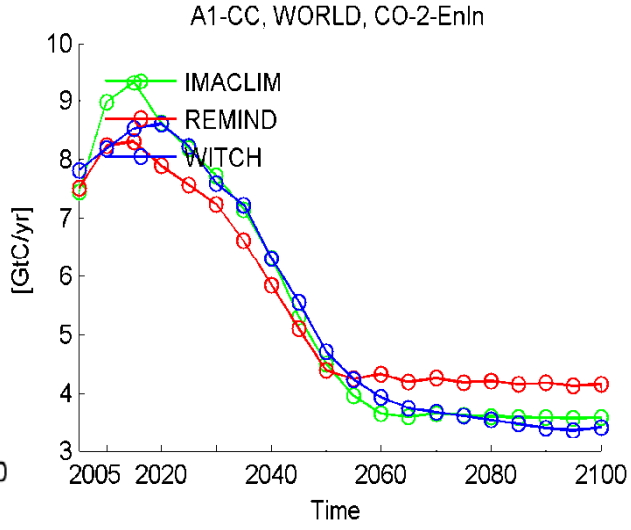
…to which one should add:

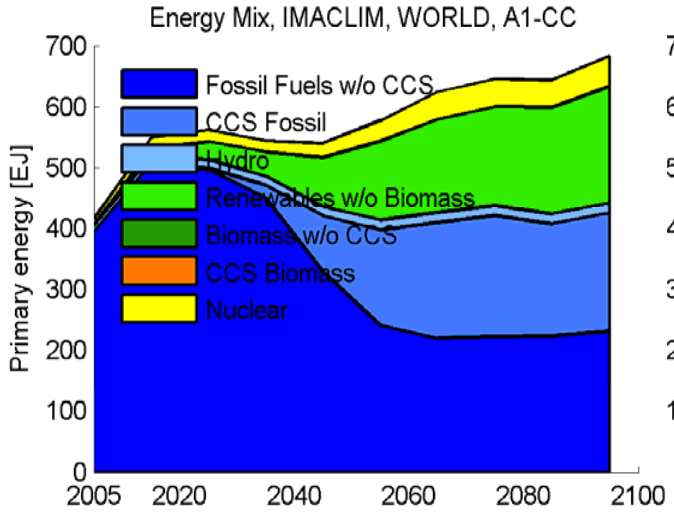
*And **widespread benevolence** to compensate the losers*

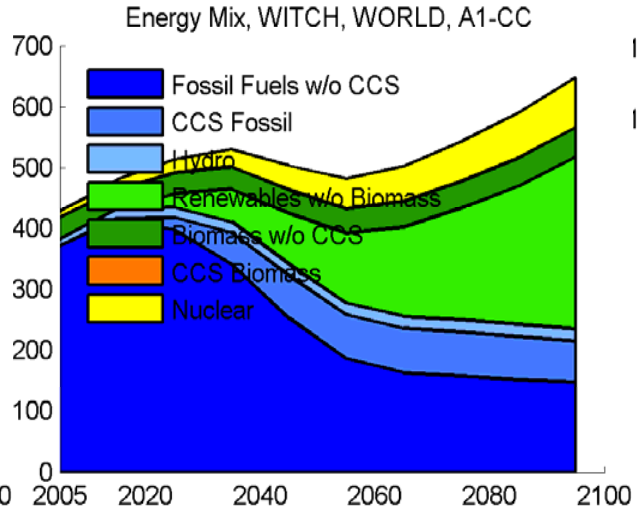
What dropping these conditions imply? Mind the transition!

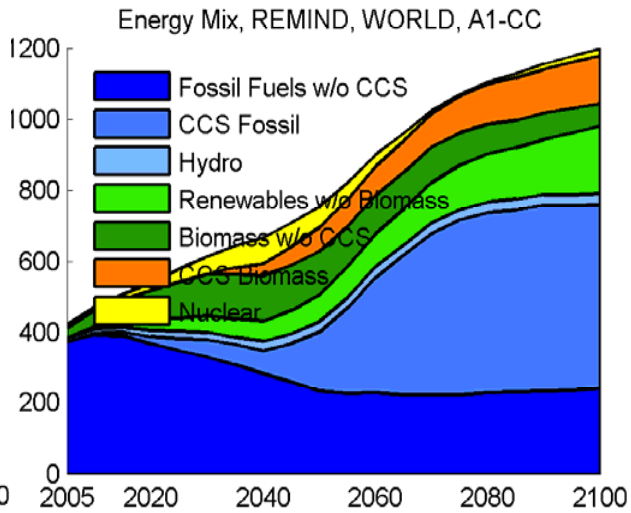












Main requirements to represent transitions

- Information needed about "what to do" in a 2nd best world with *missing/imperfect/distorted markets, constraints on lump sum transfers* postulated by the traditional welfare theory and 'noncompetitive behaviours'
- The debate on the *energy efficiency gap* masked *other pre-existing sub-optimalities* (labour markets, real estate markets, fiscal systems, risk markets, infrastructure policies, financial markets, informal economy)
- 1st best policy options may not be valid in a 2nd best world: *"If there is some constraint within the GE system that prevents attainment of at least one of the conditions of Pareto optimality, then the attainment of the other Pareto optimal conditions is no longer necessarily welfare improving"* (Lipsey and Lancaster, Review of Economic Studies, 1956)
- A core question: will considering a 2nd best world tend to
  - **exacerbate** policy costs?
  - reveal **co-dividends** from jointly correcting several market failures?
- If the second, urgent need to study "issue linkages"

Hybridizing models in two senses

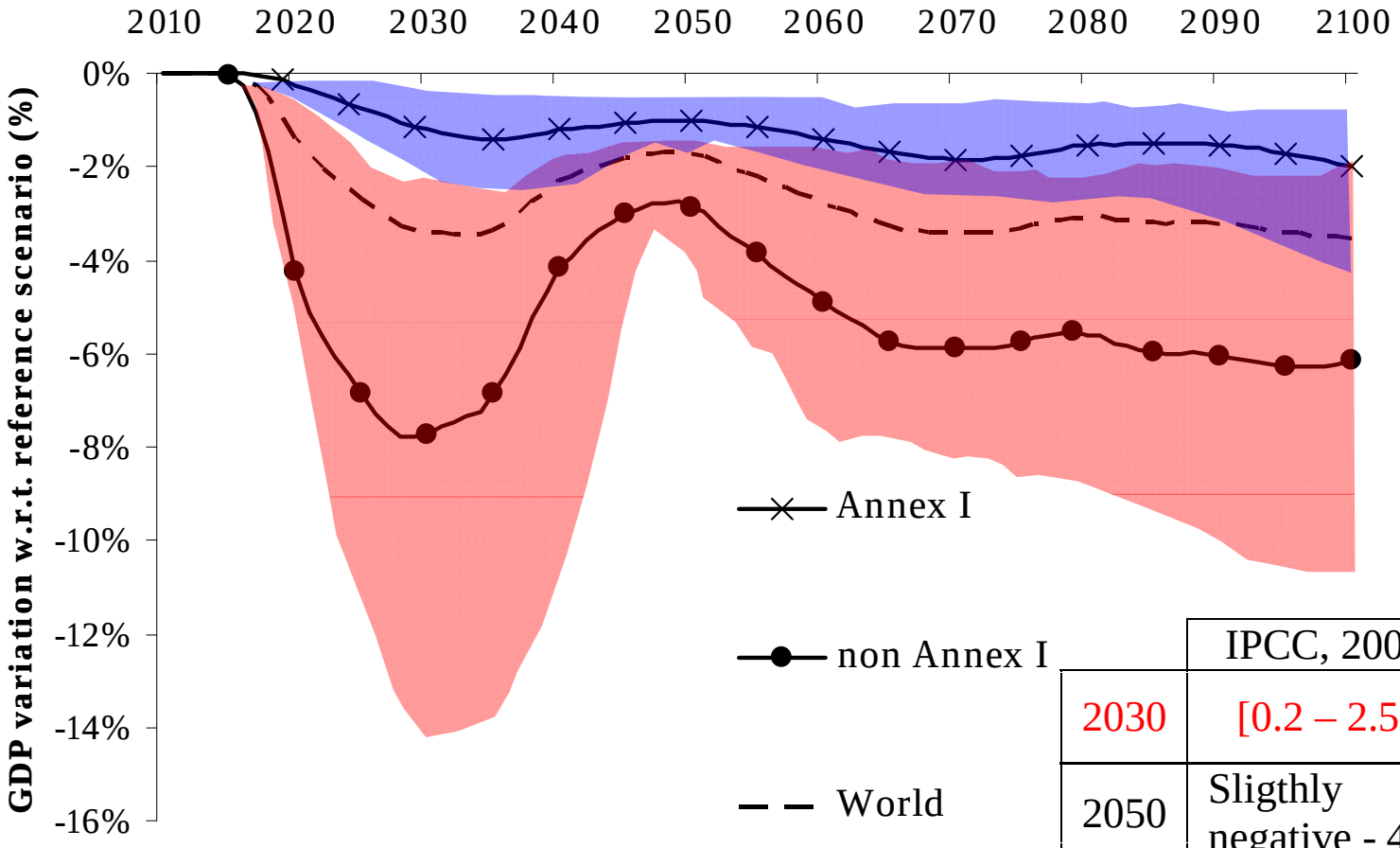
- Articulation between sector-based technology-rich expertise and general equilibrium analyses: towards hybrid Social Accounting Matrixes in values and explicit quantities
- Hybridizing long run (neo-classical colored) models with short run (Keynesian colored) model:

> "At short term scales, I think, something sort of 'Keynesian' is a good approximation, and surely better than anything straight 'neoclassical'. At very long time scales, the interesting questions are best studied in a neoclassical framework and attention to the Keynesian side of things would be a minor distraction; at a five to ten year time scale, we have to piece things together as best as we can, and look for a hybrid model that will do the job" Solow, 2000

- These two dimensions are deeply intertwined: joint representation of
  - adaptive behaviors and their sector/income classes/country specifics
  - the interplay between imperfect foresight, technical inertia and social routines

A carbon-price-only regime in a 2nd best setting: the economics of the Copenhagen failure

A time profile robust to uncertainty



	IPCC, 2007	Imaclim-R
2030	[0.2 – 2.5]	3.8 [1 – 9.5]
2050	Sligthly negative - 4	2.5 [0.5 – 4]

(550ppm CO2-eq stabilisation scenarios, +3° K)

At the roots of the “bad news”

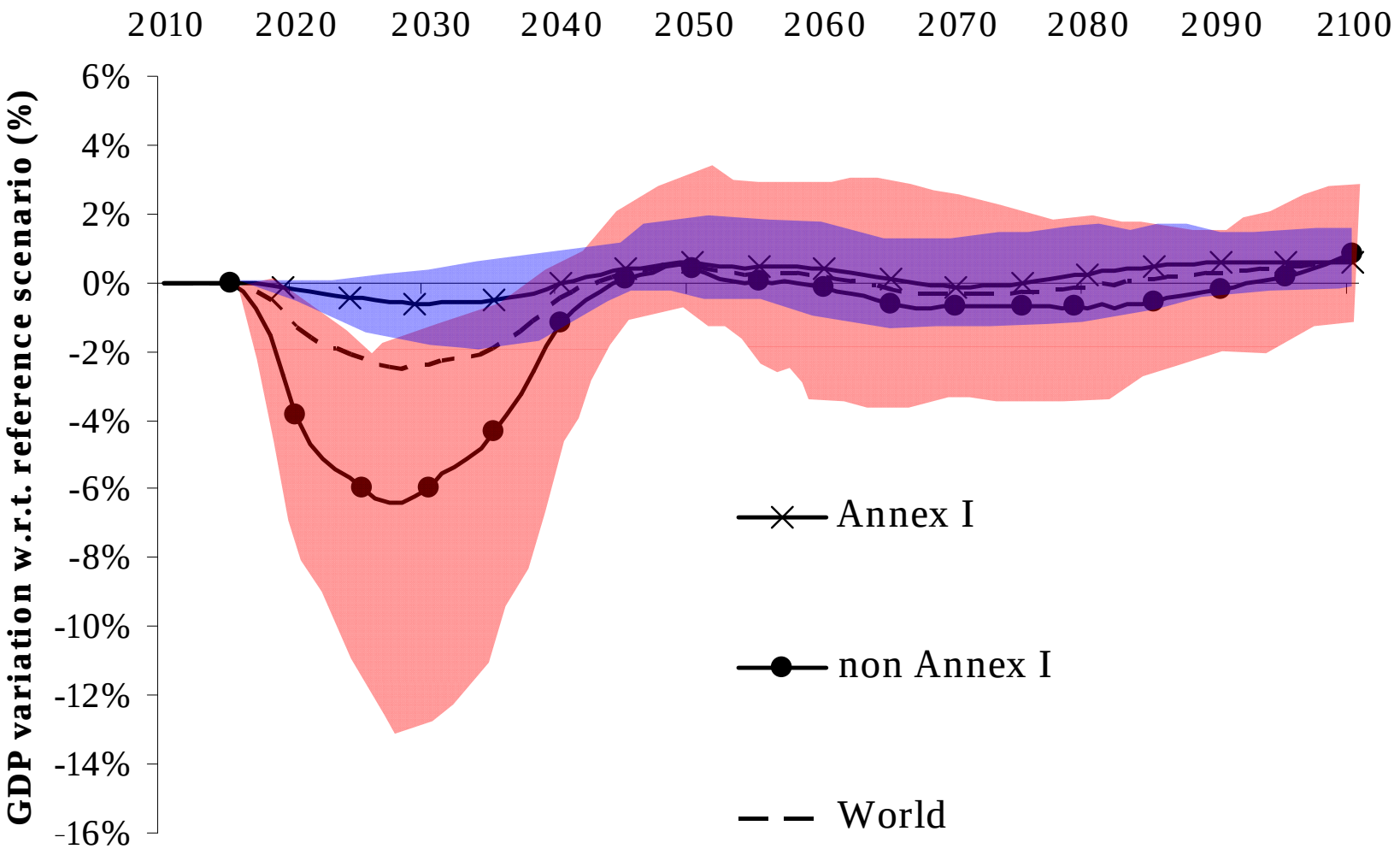
Significant short-term losses:

- Inertia in installed capital and imperfect foresight limit the pace of decarbonization, and require high carbon prices
- Increased production costs transmitted to consumers
- Inertia in changing households equipment reinforces the loss of purchasing power
- Macroeconomic feedbacks (unemployment, lower wages, lower consumption…)

Long-term losses:

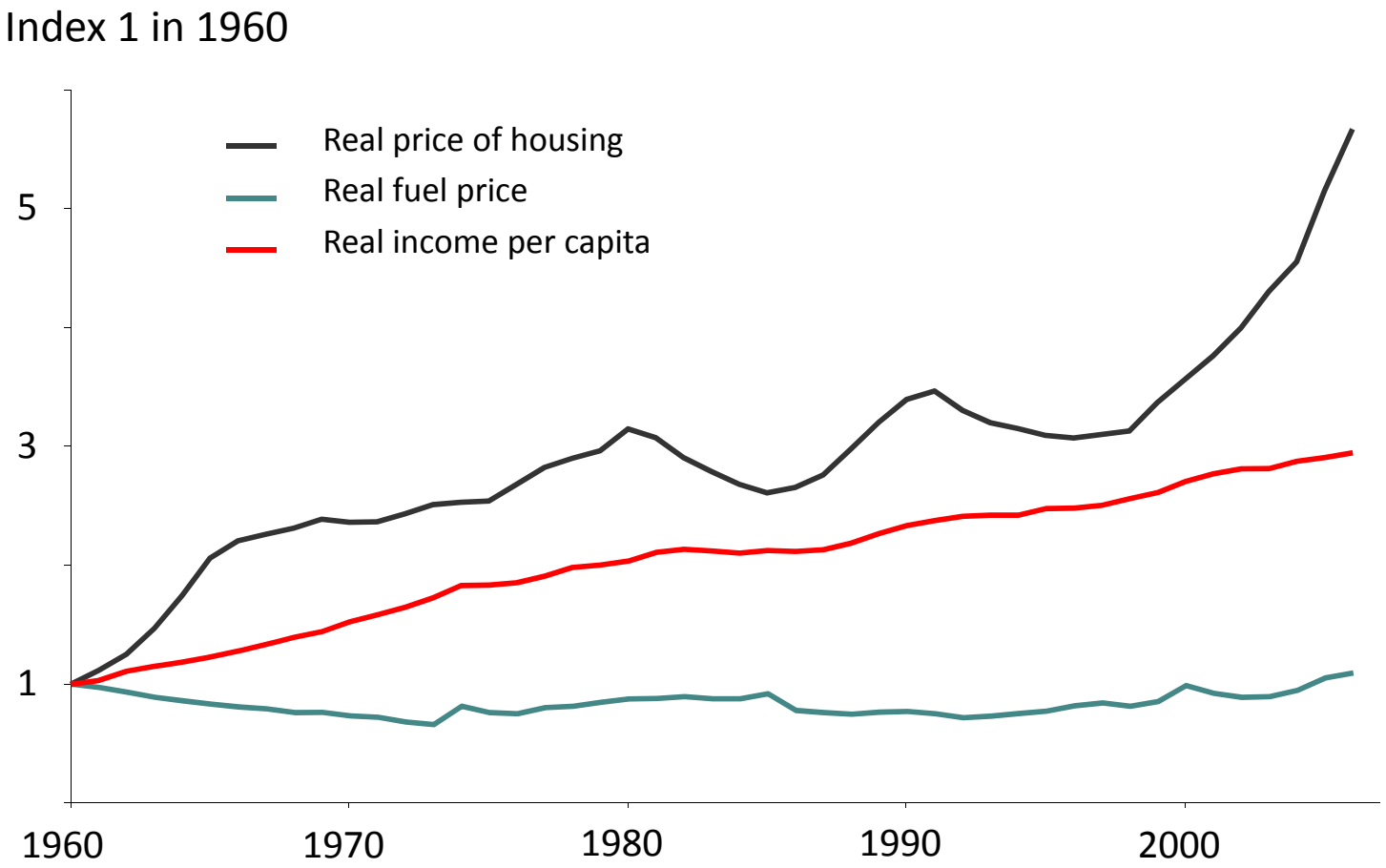
- Inertia of infrastructures, location choices, urban forms
- Rebound effect of mobility needs requires very high carbon prices in the second half of the century

Good news? Early transport infrastructure policies open room for long-run benefits



(550ppm CO2-eq stabilisation scenarios, +3 ° K)

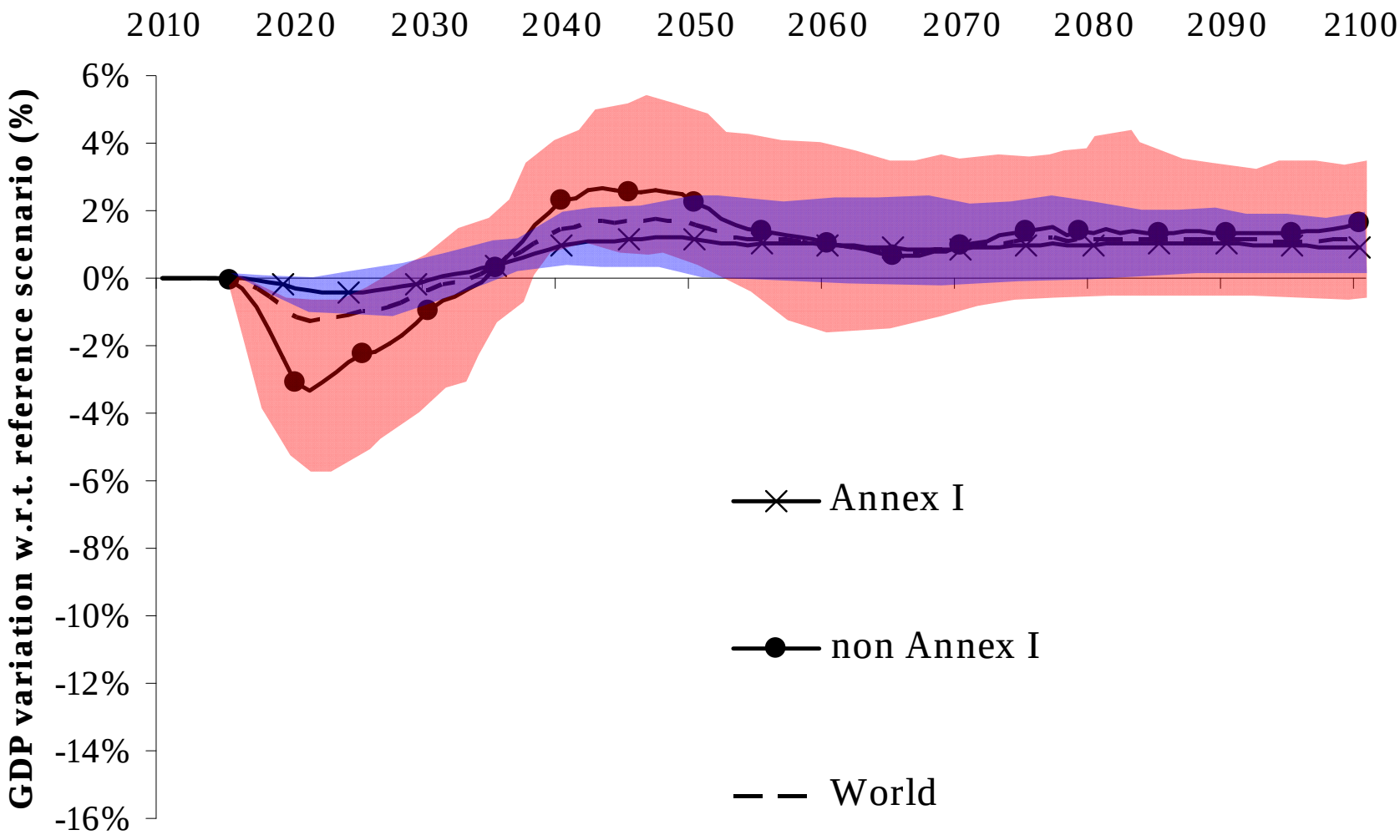
Why a wider palette of signals?



Combet, Ghersi, hourcade, Thubin, 2009 « Economie d'une fiscalité carbone en France »

Source : INSEE

Good news again : fiscal policies to smooth the transition



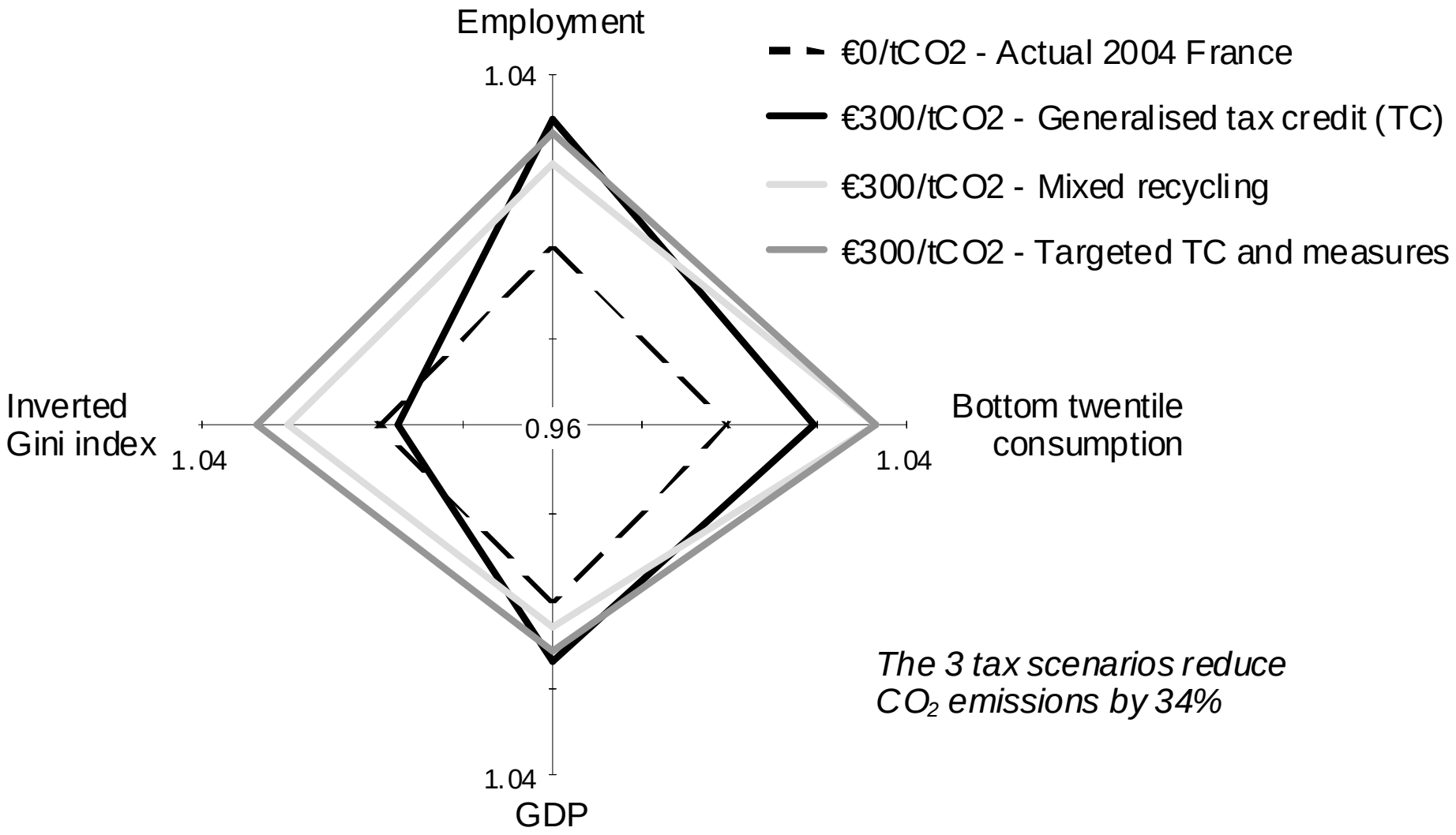
(550ppm CO2-eq stabilisation scenarios, +3 ° K)

Lessons from Attempts in the French Context

Jean-Charles Hourcade

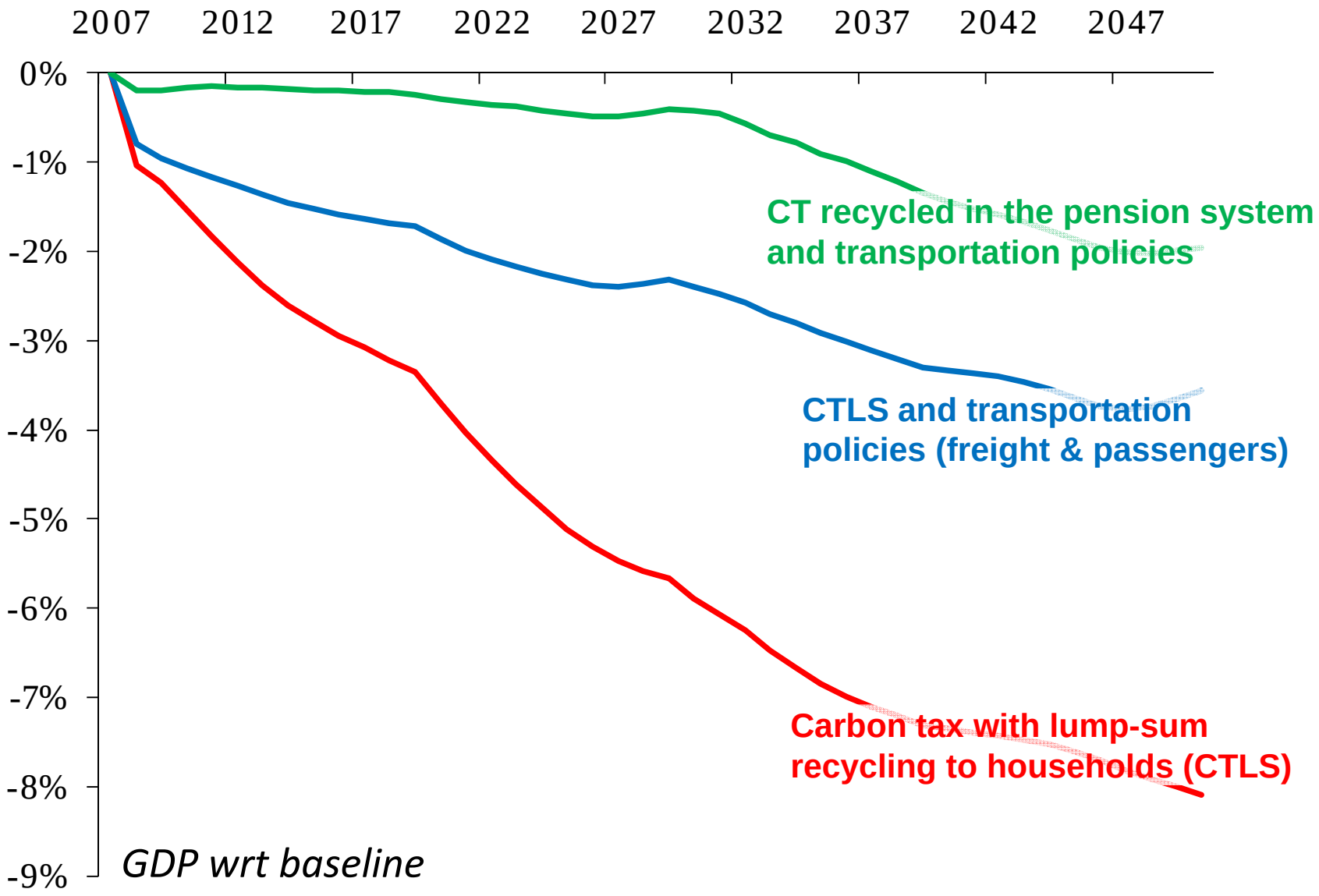
with the contribution of Gael Callonec – Ademe

The equity/efficiency issues in the context of the "Mission Rocard" on the "carbon tax"



The 3 tax scenarios reduce CO_2 emissions by 34%

From “bad” to “good news”: what lubricant for a transition towards a LCS ... (in the ‘worst’ case)



In the context of current crisis, a new modelling venture launched by the Ademe: back to Keynesianism

- A new modelling venture to capture transitions in a neo keynesian perspective
- *THREEME: Multi-sector Macroeconomic Model for the Evaluation of Environmental and Energy policy*
- Main policy oriented objective: to capture the spill-over effect on growth and employment of a transfer of final demand from energy intensive industry on low intensive ones (with higher labor intensity and lower import content)
- A 1st set of results: let a carbon tax redistributed 1/3 to households, industry and rail+buildings
  - Higher GDP growth: + 0.31% in 2012, + 2.26% in 2020, + 9.84% in 2050
  - Higher households consumption: +0.05% in 2012, +1.54% in 2020, + 15.31% in 2050
  - Lower unemployment: -0.04 in 2012, - 1,09 in 2020, - 6.42 in 2050 (8.07 in 2006)

A prerequisite: a science/policy dialogue freed from ‘political correctedness’

- In the policy process tenants of ambitious action tend to put forward the idea that climate policy is not so costly
- After close to 20 years of failures is this the right way to proceed?
- Why not say?
  - here are the costs .... They might be high
  - here are the means of reducing these costs
  - Here are possible co-benefits: energy security, employment...

“NO REGRET” IS NOT “NO PAIN”

Back to the modelling agenda

- Progressing on the endogenous technical change impact of norms and standards
- Coupling energy models, land-use models, urban models in a consistent macroeconomic framework
- Constructing comprehensive databases on the cost structures of alternative low-carbon technologies
- Progressing on the modelling of labour markets in a shifting world with migrations and informal economies
- Modelling the formation of “scarcity rents’ and their reallocation: fossil fuels, land, real estate
- Capital flows and savings and financial markets over the century?
- What about the ‘endogenisation’ of preferences?

What would we like to represent?