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Technology optimism is not enough

Some considerations on the difficulty of triggering low-carbon transition in France

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Question: How can one trigger transition towards factor 4 by 2050 in France?

Not doing anything is not an option

Policies are needed!

Reference

-33% CO₂ emissions in 2050 relative to 1990
(analysis using IMACLIM-R France)

A set of 'consensus' policies & measures still insufficient for factor 4

Including:

- Energy efficiency **norms** in new buildings
- **Financial** incentives for energy efficiency renovation
- **Eco-taxes** on trucks and kerosene

EncilowCarb PM

Reference

=> **-61%** CO₂ emissions in 2050 relative to 1990

Despite 'engineer optimism', a transition cost

	2010-2015	2010-2020	2020-2030	2030-2040	2040-2050	2010-2050
REF	0.77	0.83	1.09	1.47	0.85	1.06
PM	0.73	0.9	1.32	1.46	0.9	1.15

GDP mean annual growth rate (%)

	2015	2020	2030	2040	2050
PM	-2	26	183	254	307

Employment variation relative to BAU (1000s full-time jobs)

Computed with IMACLIM R France

- **PM have positive macroeconomic implications in the long-run**
- **Time-lags between expenditures and benefits create short-term loss**

P&M + carbon tax improve environmental performance

Quinet report carbon tax:

- 32€/tCO₂ in 2012
- 100€/tCO₂ in 2030
- 300€/tCO₂ in 2050

Carbon tax

EncilowCarb PM

Reference

Revenue recycling:

- 1/2 labor tax cuts
- 1/2 'green checks' to households

=> **-68%** CO₂ emissions in 2050 relative to 1990

But transition costs persist

	2010-2015	2010-2020	2040-2050	2010-2050
REF	0.77	0.83	0.85	1.06
PM	0.73	0.90	0.90	1.15
PM + T	0.69	0.86	0.87	1.09

GDP mean annual growth rate (%)

	2015	2020	2030	2040	2050
PM	-2	26	183	254	307
PM + T	2	5	166	174	202

Employment variation relative to REF (1000s full-time jobs)

■ PM+T underperforms PM

- Economy-wide propagation of energy costs not compensated by lower labor taxes given recycling rule and time profile of carbon tax

P&M + carbon tax + negotiation do not improve environmental performance

Carbon tax + negotiation

EncilowCarb PM

Reference

Share tax revenue between labor tax reduction and green checks to balance:

- Competitiveness risk of low reduction in labor tax
- Demand risk of low redistribution towards households

=> **-68%** CO₂ emissions in 2050 relative to 1990

Now transition costs disappear

	2010-2015	2010-2020	2040-2050	2010-2050
REF	0.77	0.83	0.85	1.06
PM	0.73	0.90	0.90	1.15
PM+T	0.69	0.86	0.87	1.09
PM+T+N	0.81	0.96	0.88	1.14

GDP mean annual growth rate (%)

	2015	2020	2030	2040	2050
PM	-2	26	183	254	307
PM+T	2	5	166	174	202
PM+T+N	36				628

Employment variation relative to REF (1000s full-time jobs)

- This result is not tax carbon specific..
 - ... But the carbon tax provides degree of freedom for social negotiation through wider tax base

Adding financial device overshoots factor 4

**Financial tool, signal
credibility**

Financing device lowers
investment risk in low-
carbon projects

Carbon tax + negotiation

→ modeled as lower
discount rate

EncilowCarb PM

Reference

Increased credibility of
carbon signal

→ modeled as ‘less myopic’
decisions

⇒ **-85%** CO₂ emissions in 2050 relative to 1990

While transition cost do not reappear

	2010-2015	2010-2020	2040-2050	2010-2050
REF	0.77	0.83	0.85	1.06
PM	0.73	0.90	0.90	1.15
PM+T	0.69	0.86	0.87	1.09
PM+T+N	0.81	0.96	0.88	1.14
PM+T+N+F	0.77	0.9	0.94	1.2

GDP mean annual growth rate (%)

- Complementarity between financial device and carbon tax:
 - Lower carbon tax (50€/tCO₂ instead of 300€ in 2050) yields Factor 4 and improves growth
- However, **this result assumes political, social and technical capacity to enforce a diverse set of measures**

Conclusion

Question: How can one trigger transition towards factor 4 by 2050 in France?

A heuristic tale suggests that ...

... **technology is not enough** and deep decarbonisation is possible only if embedded in a broader **social contract**, including:

- sectoral policies
- carbon fiscal reform
- labor markets and labor regulations
- financial intermediation



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Thank you

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References

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- Mathy, Sandrine, Meike Fink, and Ruben Bibas. 2014 "Rethinking the Role of Scenarios : Participatory Scripting of Low-Carbon Scenarios for France." *Energy Policy* 77:176–90. <http://dx.doi.org/10.1016/j.enpol.2014.11.002>
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Appendix: Finance is needed in an uncertain world

