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An analysis of the effects of peak oil on the Wallon territory

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Outline of the talk

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1. Peak oil: bird eye's view of an economist's standpoint
2. 2025: vulnerability in Wallonia
3. 2050: the mobility – location nexus
4. The need for R&D in support of decision-making



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Objectives of the CPDT project

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To propose recommendations to be integrated into SDER (*Schéma de Développement de l'Espace Régional*) for anticipating the effects of peak oil and related oil price increase on the wallon territory.

Researchers associated to the project: C. Bazet-Simoni (ULB), P. Obsomer (ULB), F. Quadu (UCL), V. Rousseaux (UCL), M. Servais (UCL) and Th. Zeimes (UCL).



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1. An economist' standpoint

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Optimists versus pessimists: an outdated debate

- ① Oil will not disappear suddenly
- ② Oil is not an homogeneous good: there exist many oil qualities
- ③ For many uses, there also exist substitutes; for some, not
- ④ What matters is not oil itself, but energy services
- ⑤ What matters is not **oil supply** but **oil price**, and the same for candidate substitutes (concept of relative prices)
- ⑥ In Belgium or France, gasoline is 2.8 times cheaper today than it was in 1970 (concept of *real cost*)

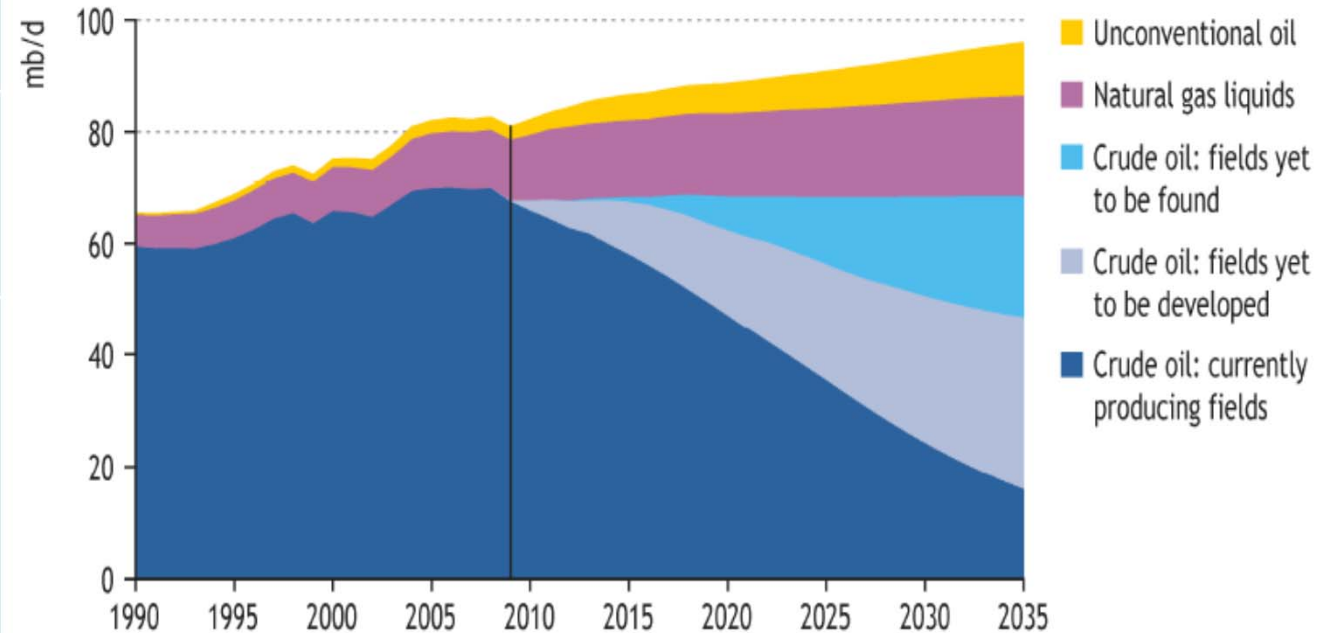
Forecasts by the International Energy Agency

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The production of conventional oil declines (from 2006, onwards),

...non-conventionals and liquefieds come out...

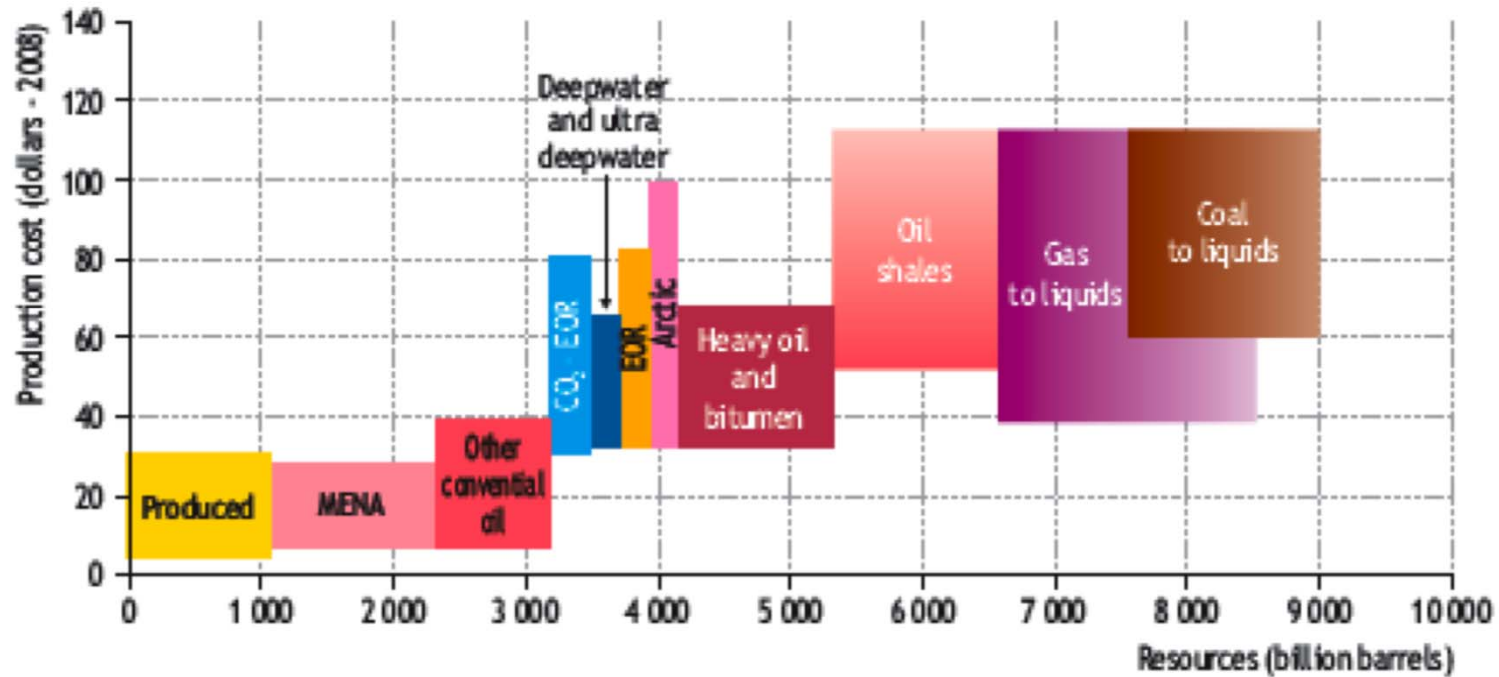
No global shortage?



Forecasts by the International Energy Agency

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Figure 9.10 • Long-term oil-supply cost curve



Scarcity

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On every market **scarcity** is the rule in equilibrium

-> there exist potential consumers that are not served because they are not willing (or capable) to pay for the price

Same with peak oil: the price increase will reinforce scarcity

-> some consumers will keep on consuming (at a higher cost), some others will stop consuming

This effect is not mechanical: **price** and **income elasticity** concepts (in short and medium terms)



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What can be expected?

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Sustained high price level for conventional oil

- > threshold price defined by substitutes and technology
- > current threshold: about \$150 - \$180 per barrel?

In other words: the peak is not the problem *per se*

Huge uncertainties for global energy supply (not only for oil)

- > the end of cheap and reliable energy supply



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Relationships between oil, mobility and territory

A prospective analysis

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In 2025 (« *short term* », « *temps court* »)

Assumption: conventional oil at \$170 (a doubling)

Question: vulnerability of walloon communes?

In 2050 (« *long term* », « *temps long* »)

Assumption: mobility, localisation, travelling modes, technology...

Question: how to reduce oil dependancy?



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2. Vulnerability 2025

Assumption: oil at \$170 (a doubling)

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Macroeconomic impact on the Walloon economy:

(Source: HERMREG macroeconomic model: IWEPS, IBSA, SVR et Bureau fédéral du Plan)

- A slowdown of economic growth (no recession)
- But contrasting sectoral impacts

Households' reaction (after 10 years):

- Heating costs increase by 40%... and consumption decreases by 13%
- Gasoline cost increases by 40%... and consumption decreases by 15%

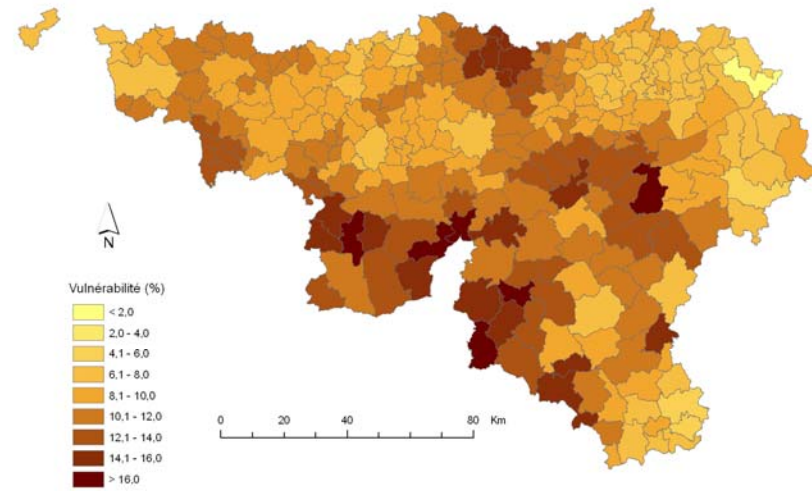
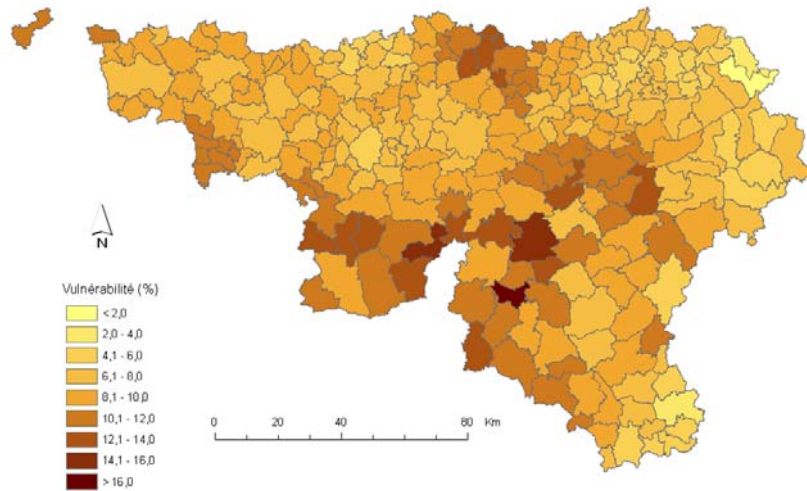
Vulnerability 2025

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**Transportation expenditures (for working only),
in % of median income in the commune**

Oil at 85\$

Oil at 170\$



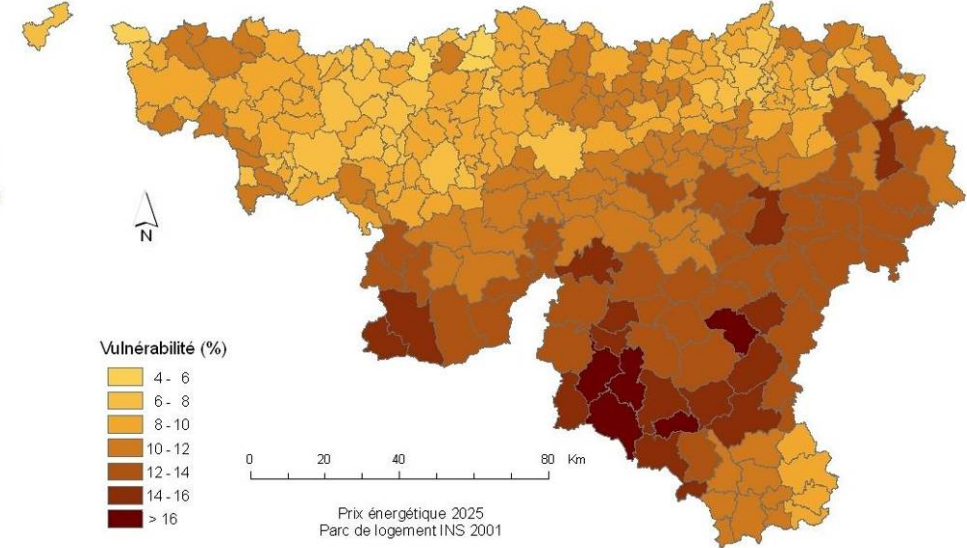
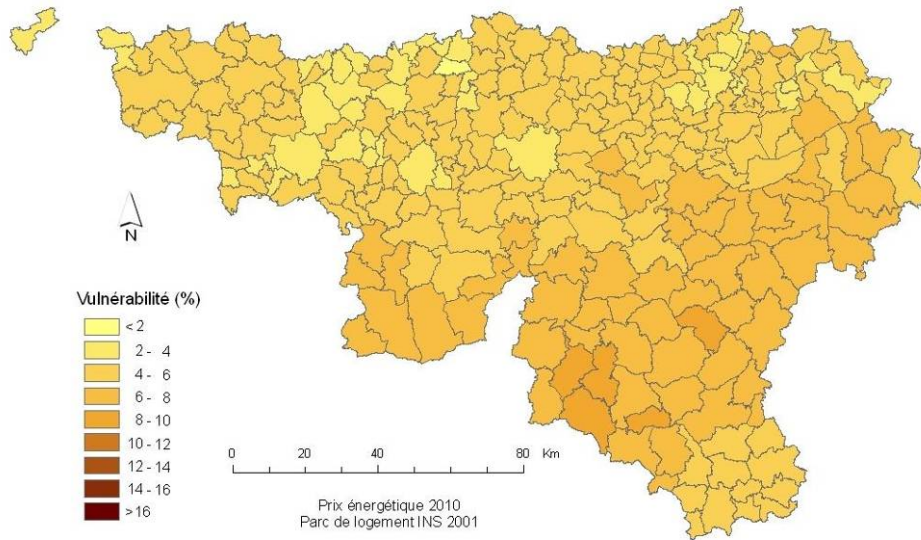
Vulnerability 2025

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Heating expenditures in % of median income in the commune

Oil at \$85

Oil at \$170





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Vulnerability 2025

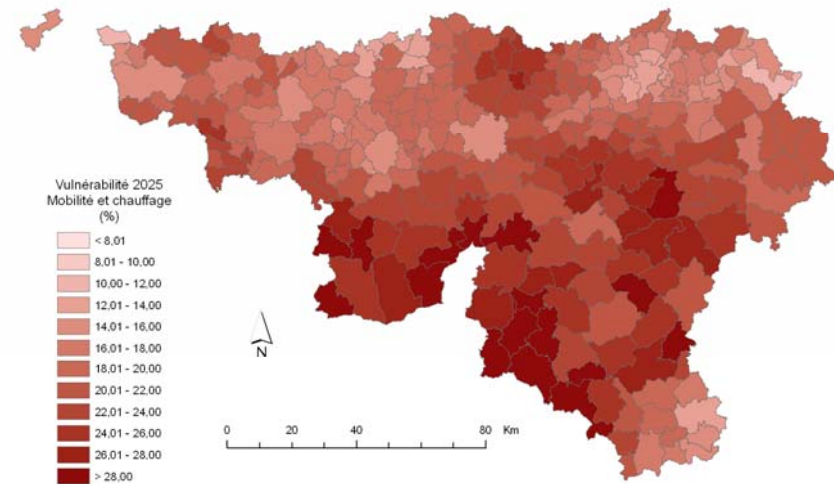
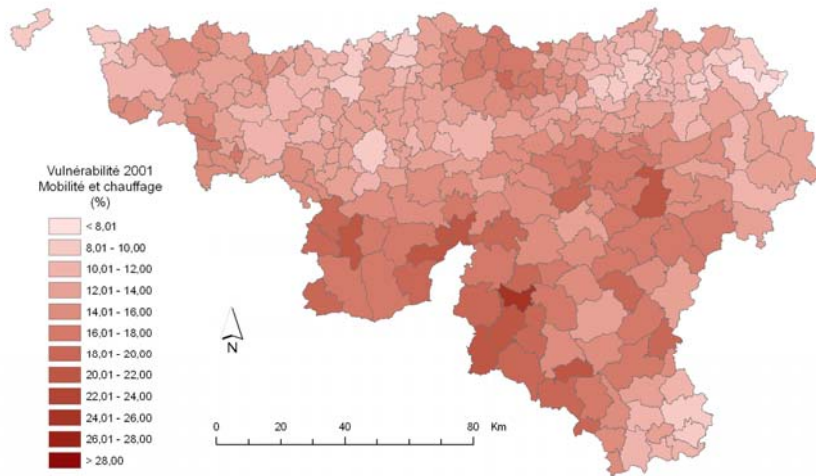
Synthetic vulnerability index

**Transportation and heating expenditures,
in % of median income in the commune**

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Oil at \$85

Oil at \$170





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Vulnerability 2025

Summary

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1. An increase in oil price will mainly impact rural communes, thus reducing their relative attractiveness
2. Cities are more resilient, but their relationship with the sprawl should be reconsidered
3. The relative merits of rural and urban communes will have to be reconsidered, and mobility will be key in this respect



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3. Mobility & Location 2050

The MILES model

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MILES : *Mobility - Location Integrated Energy System*

A linear-programming model that allows to assess 'integrated scenarios' about:

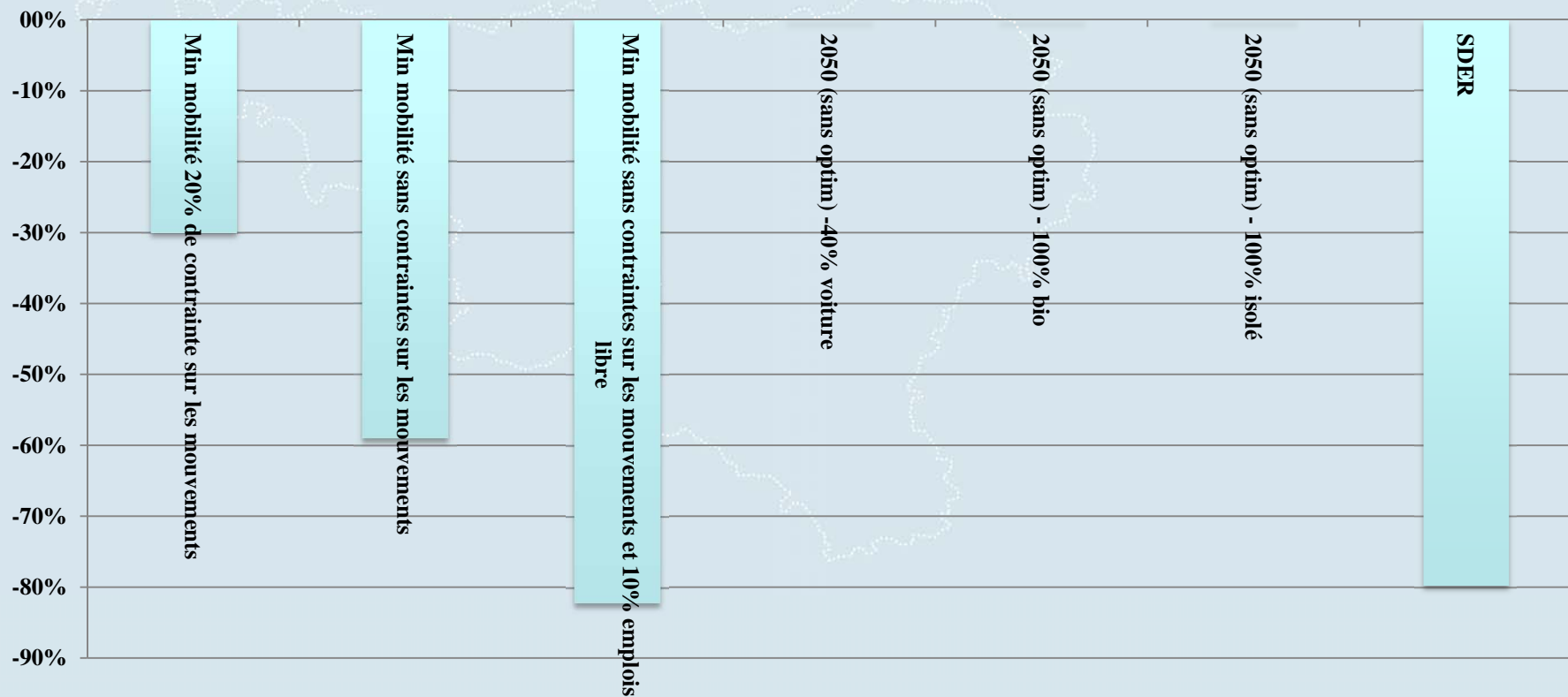
- location of employment
- location of population
- commuting
- transport modes (car, train...)
- types of dwellings
- types of agricultural techniques and feeding
- ... at the commune level

Prospective 2050

Importance of 'wasteful commuting'

Commuting minimization: effect on total commuting distance in Wallonia

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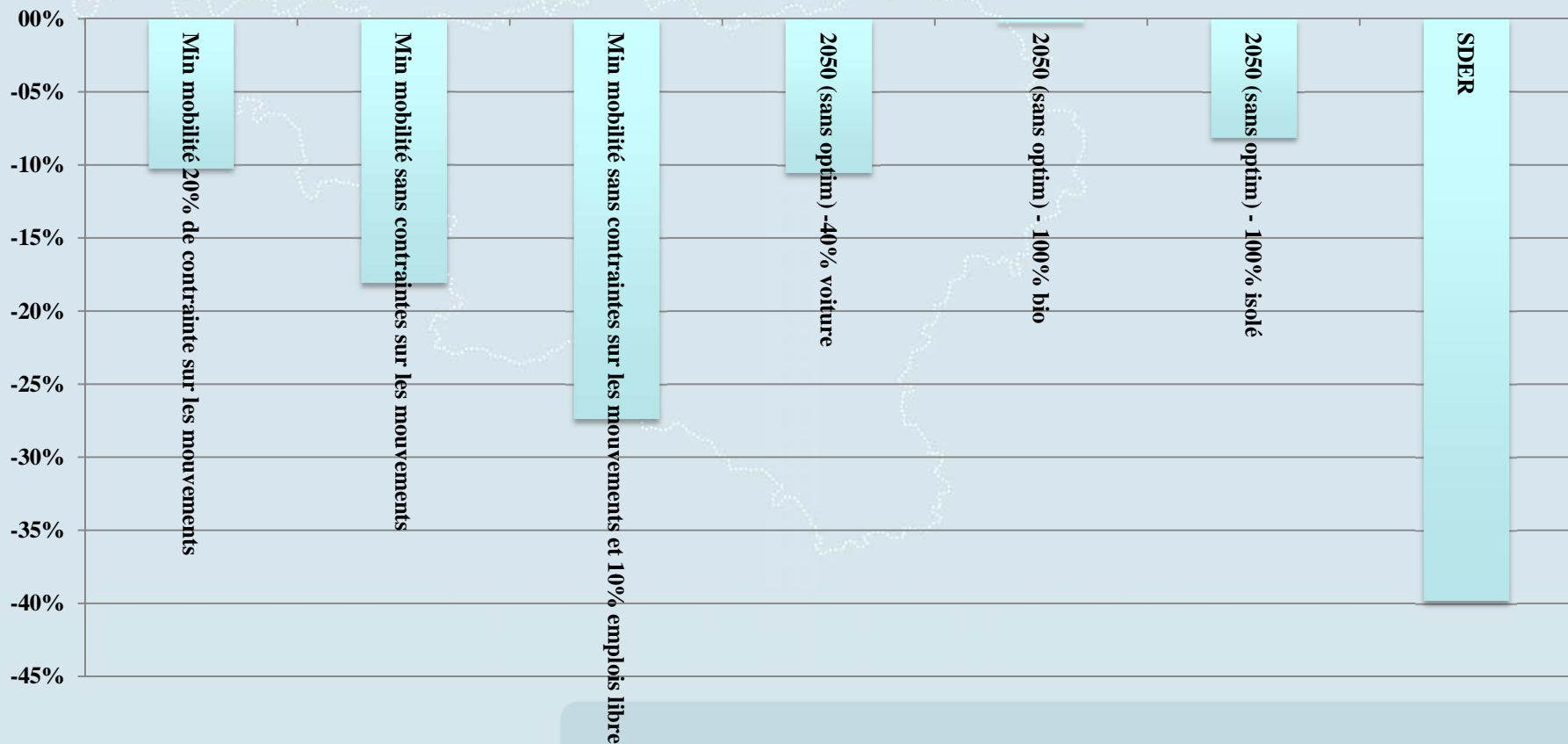


Prospective 2050

'wasteful commuting'

Commuting minimization: effect on global oil consumption in Wallonia

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Prospective 2050

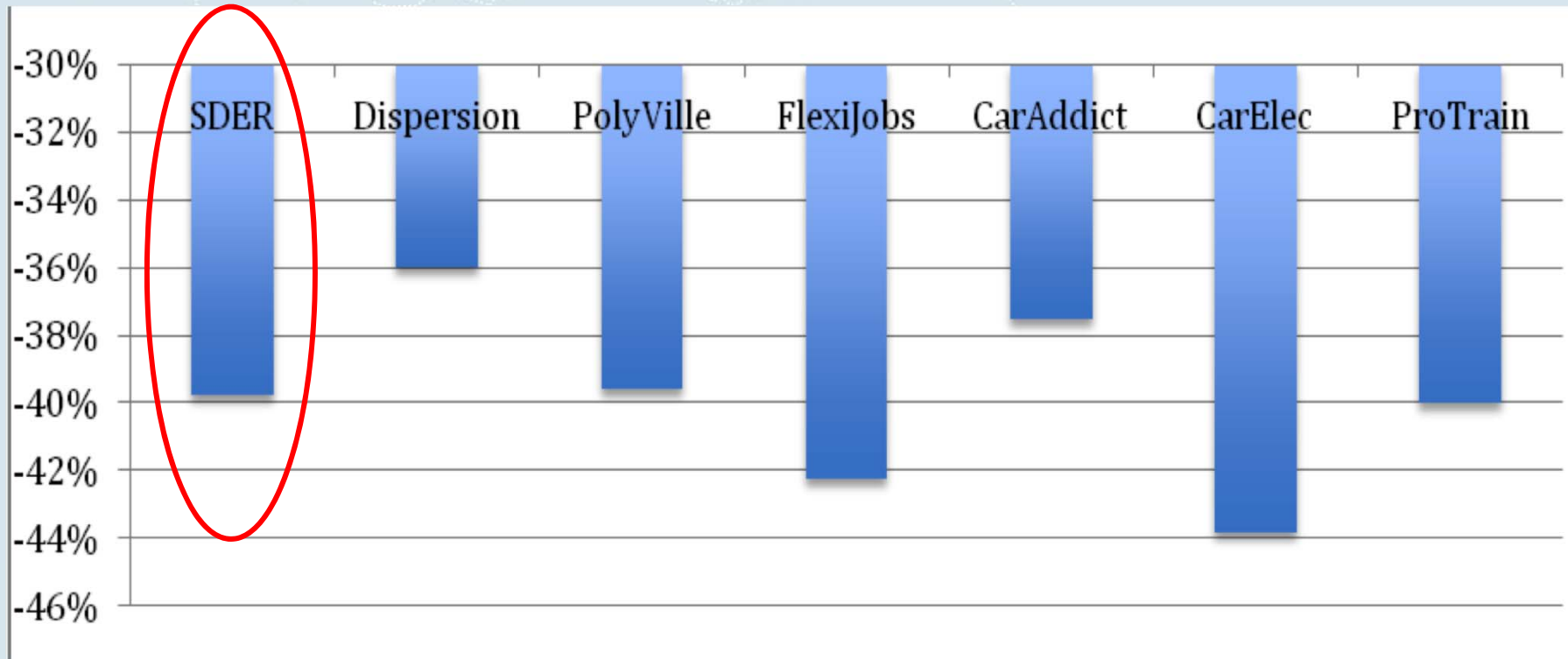
A brief analysis of 3 scenarios

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Scenario 'SDER'

- Minimisation des déplacements domicile – travail
- Max 10% des emplois peuvent se relocaliser
- Réduction de 50% de la population située hors des pôles
- Réduction de 25% dans les pôles ruraux
- Réallocation à moitié dans les pôles majeurs,
à moitié dans les communes d'agglomération
- Part modale de la voiture réduite de 40%
- Alimentation 25% bio et -25% de viande

Global oil consumption in Wallonia



Scenario 'Dispersion' (Spreading)

Mêmes hypothèses que SDER, sauf:

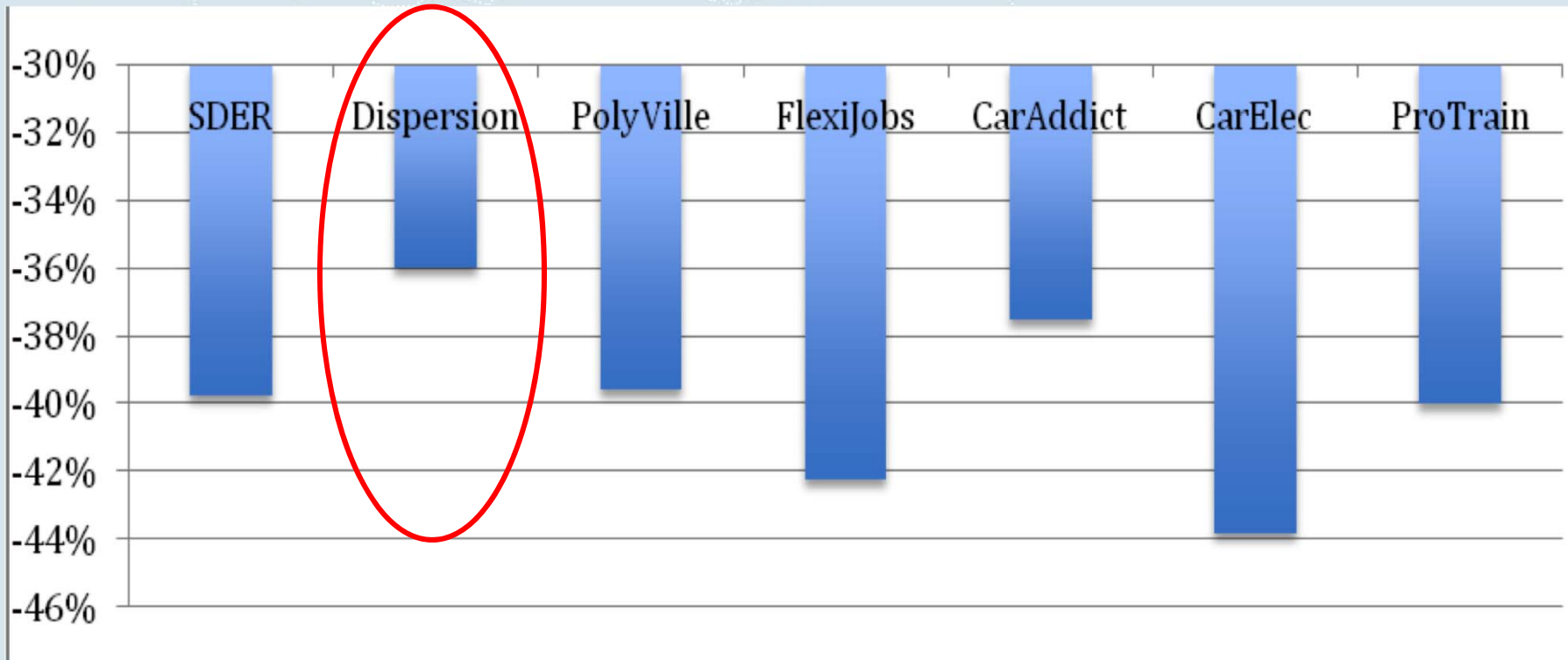
- Réduction de 50% de la population située dans les pôles majeurs, de 25% dans les communes d'agglomération
- Réallocation de cette population pour moitié dans les pôles ruraux, pour moitié dans les communes 'non-pôles'

Scenario 'PolyVille' (Concentration)

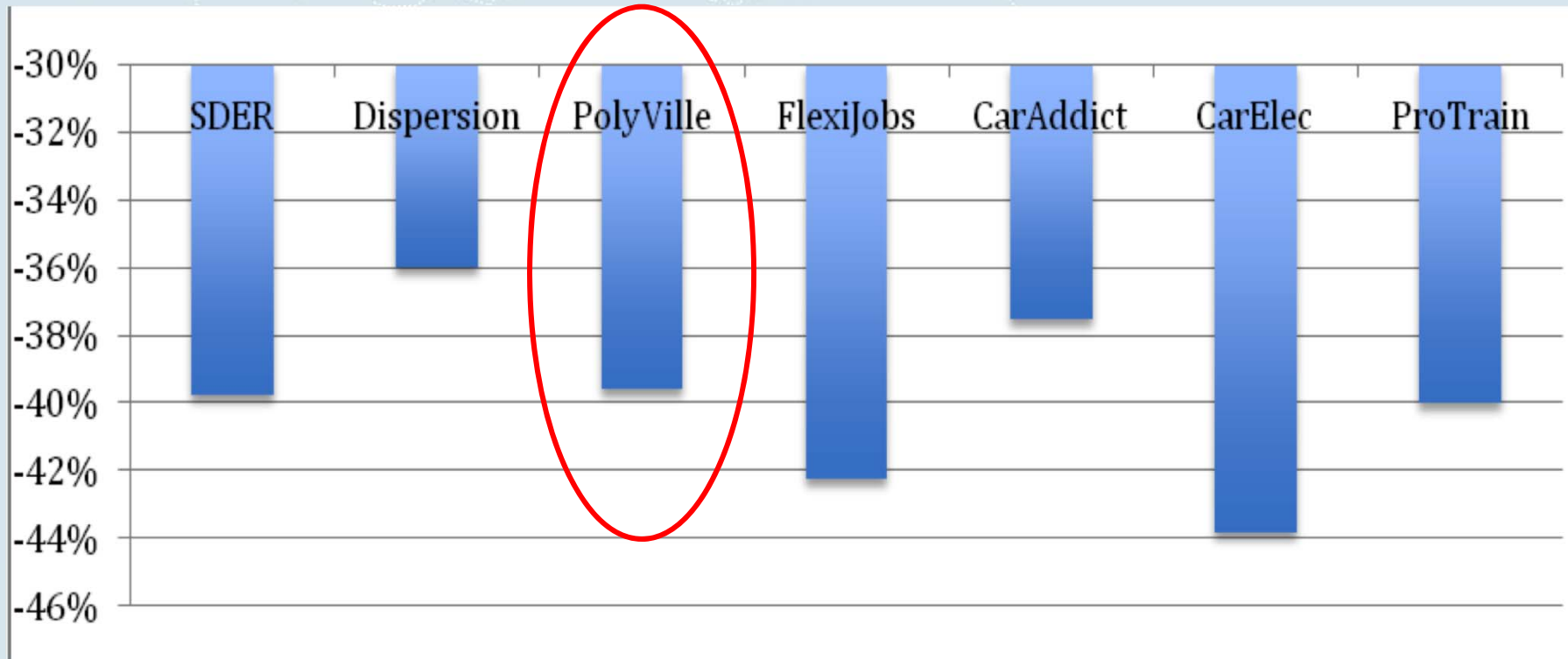
Mêmes hypothèses que SDER, sauf:

- Réduction de 50% de la population dans les non-pôles, pôles ruraux et pôles
- Réallocation pour moitié dans les pôles majeurs, et pour moitié dans les communes d'agglomérations

Global oil consumption in Wallonia



Global oil consumption in Wallonia





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Policy recommendations

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- 1. Reduce excess commuting**
land use and planning, fiscal measures, home-working...
- 2. Transport modes**
complementary to a better mobility
- 3. Improve energy efficiency of dwellings**
densification, insulation
- 4. Agricultural techniques**
free agricultural space for the production of biofuels
- 5. Synergy between measures**
some measures and more effective or efficient than others

4. R&D for decision-making

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Oil depletion is one issue, among other energy issues (access to energy, nuclear safety, climate change,...)

What kind of tools to underpin decision-making
in the context of peak oil?

Such tools should be able to handle (Boulanger and Bréchet, 2005):

- Risk and uncertainty
- Interdisciplinarity
- Glocality (global and local issues are linked)
- Intra- and inter-generational dimensions
- Stakeholders participation



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References

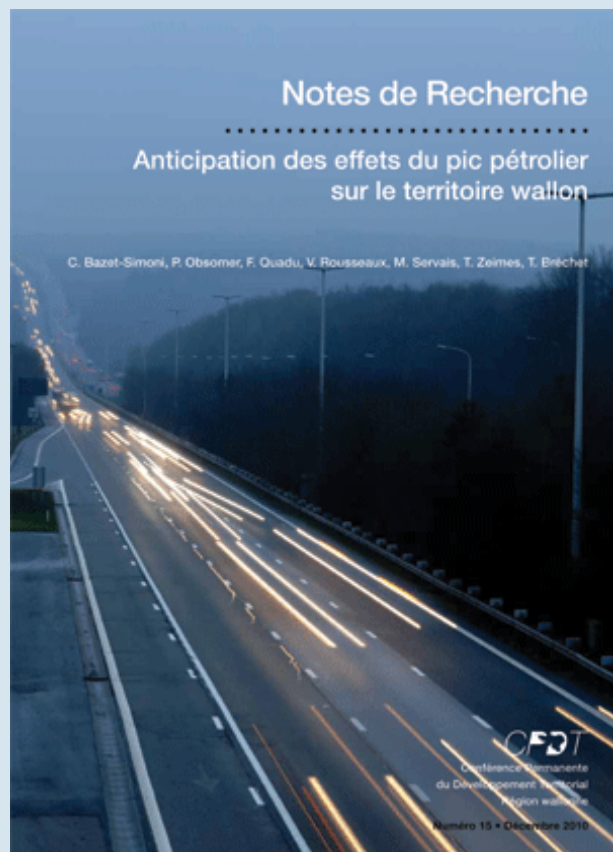
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« Face à l'épuisement du pétrole: quel rôle pour l'aménagement du territoire en Wallonie? », Regards Economiques n. 87, 2011, C. Bazet-Simoni, Th. Bréchet, P. Obsomer, F. Quadu, V. Rousseaux.

« Le pic pétrolier: un regard d'économiste », Reflets & Perspectives de la Vie Economique, XLVI (4), 63-81, 2007, Th. Bréchet, P. Van Brusselen.

« Models for sustainable development policy-making : state of the art and perspectives for research », Ecological Economics, 55(3), 337-350, 2005, P-M. Boulanger et Th. Bréchet.

... and the reports to CPDT



Dossier spécial Mobilité

Pic pétrolier : « Il faudra bouger moins et mieux »

C'est inéluctable. Les prix du pétrole vont doubler dans les années qui viennent. Avec une augmentation de la demande et une raréfaction de la production de pétrole facilement extractible, les prix vont s'envoler. Une équipe de la recherche de la Conférence permanente du développement territorial (CPDT)¹ s'est penchée sur les conséquences du renchérissement de l'or noir sur le développement territorial de la Wallonie. Les résultats de l'étude plaident pour la mise en place de nouvelles politiques, en particulier dans les domaines de la Mobilité et de l'Aménagement du territoire.

AlterEchos-décembre 2010

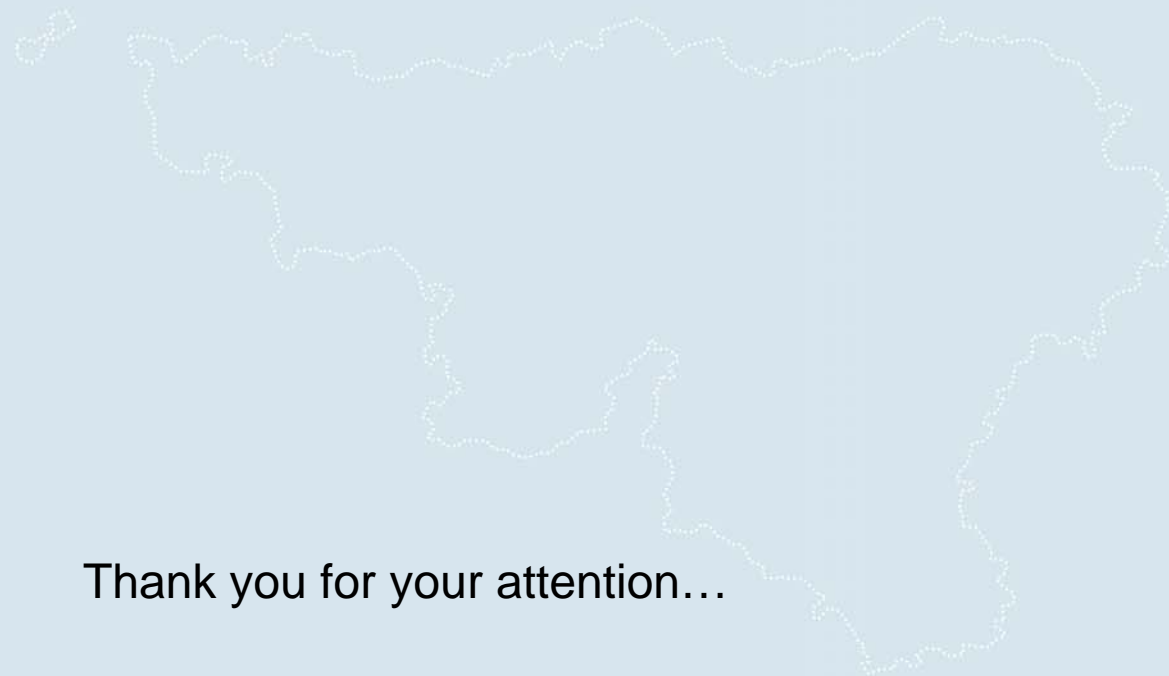
<http://cpdt.wallonie.be>

Recherches/programme de travail 2009-2010/
Anticipation des effets du pic pétrolier sur le territoire



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Thank you for your attention...