



*Liberté
Égalité
Fraternité*



CITEPA



Laboratoire d'Économie
Appliquée de Grenoble



*maîtriser le risque
pour un développement durable*

Paris Agreement: Co-benefits and Risks for Air Quality

French research project ACRA

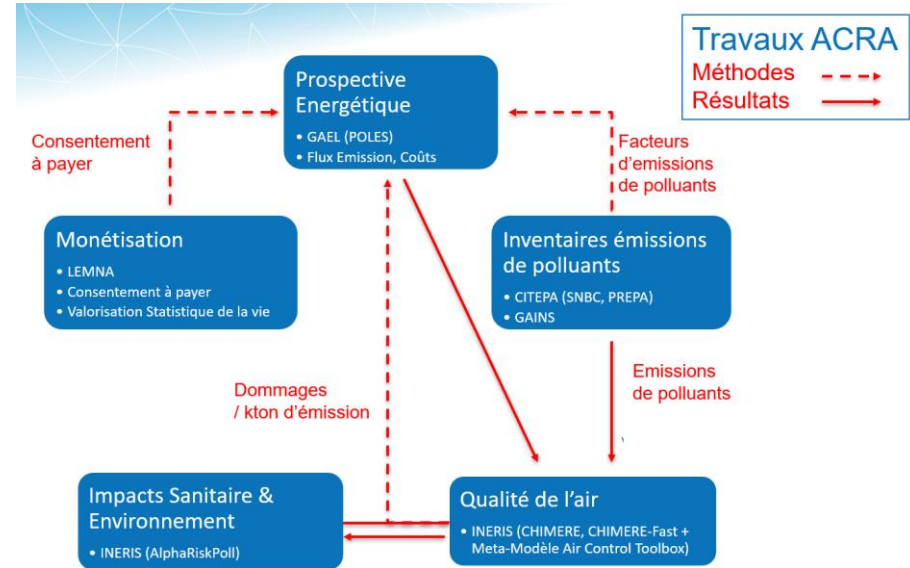
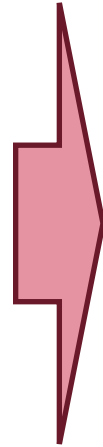
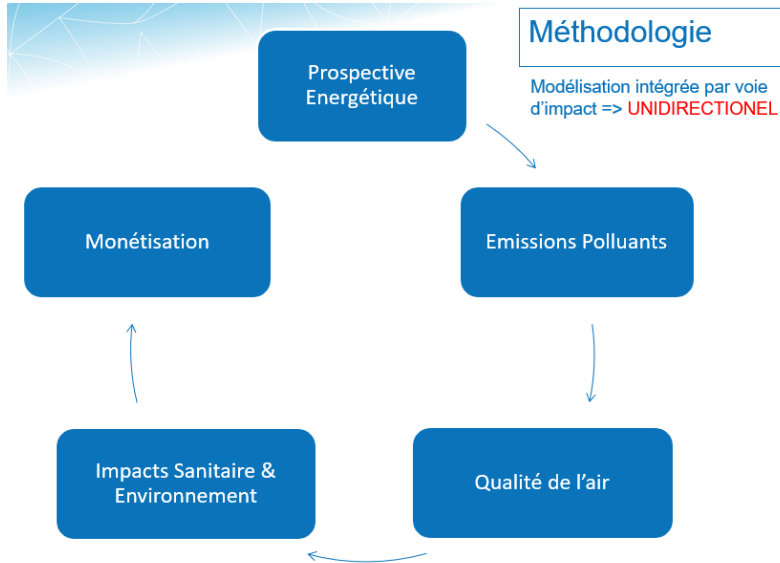
Simone Schucht

54th annual meeting of the TFIAM, 3-4 April 2025, Laxenburg

French research project

- Primequal project financed by ADEME and the French Ministry in charge of the Environment
- 2020-2024 (soon to be published)
- Partners
 - Ineris: project lead, atmospheric modelling, health impacts, cost-benefit analysis
 - GAEL/Uni Grenoble (Laboratoire d'Économie Appliquée de Grenoble): energy modelling
 - CITEPA: atmospheric emissions
 - LEMNA/Uni Nantes (Laboratoire d'Économie et de Management Nantes-Atlantique): choice experiment - preferences
- Cooperation with IIASA
 - Interface POLES – GAINS

Towards a more integrated modelling of energy and air pollution policies



Selected objectives

- Account for co-benefits and risks relating to air quality in energy/climate projections
- Improve the integration of the different models involved in the impact pathway approach
 - from a unidirectional to a multidirectional exchange of information
- Incorporate upstream indicators of air quality impacts into energy forecasting models
 - Emission factors and costs of air pollutants
 - External costs of air pollutants
- Assess co-benefits for air pollution and health of recent energy scenarios
- Develop the surrogate model Air Control Toolbox (ACT, CAMS)
 - to explore multiple scenarios and assess the relative “potential impact” of individual activity sectors in the mitigation potential
 - see E. Real & A. Colette for further details

Integrated assessment of energy/GHGs/air quality

Improving the representation of air pollutant issues in POLES

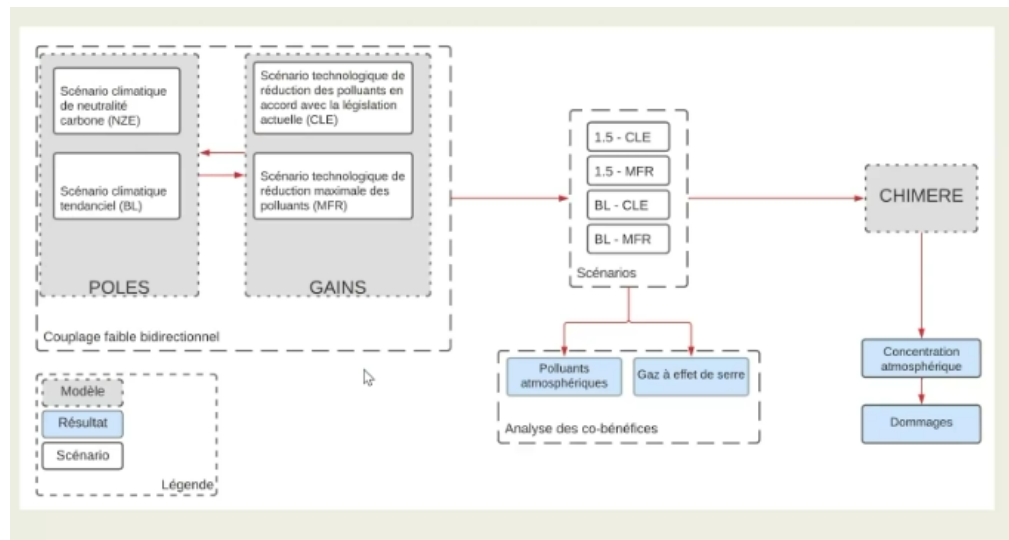
Work carried out at GAEL, with the support of INERIS, and in collaboration with IIASA/GAINS

Sectoral « mapping » between GAINS & POLES

- Improved reliability of emissions calculations
- Introduction of GAINS cost-factors for air pollution technologies (next to the cost of climate/energy policy measures)

Introduction of marginal damage costs for air pollutants

- INERIS-EMRC etc./EEA work on cost per tonne of pollutant (next to the model's carbon tax)



Prospective scenarios used

French policy scenarios by the Ministry in charge of the Environment

- National low carbon strategy
- Based on assumptions by the Ministry and translated into pollutant emissions by CITEPA

} + CHIMERE & ARP

Alternative scenarios

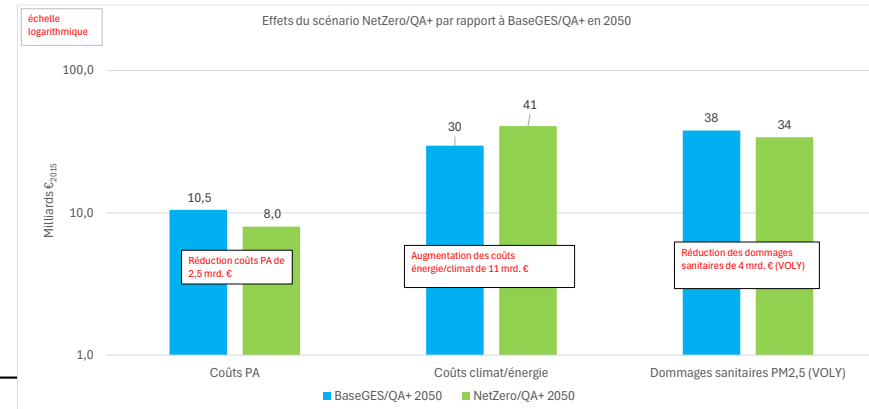
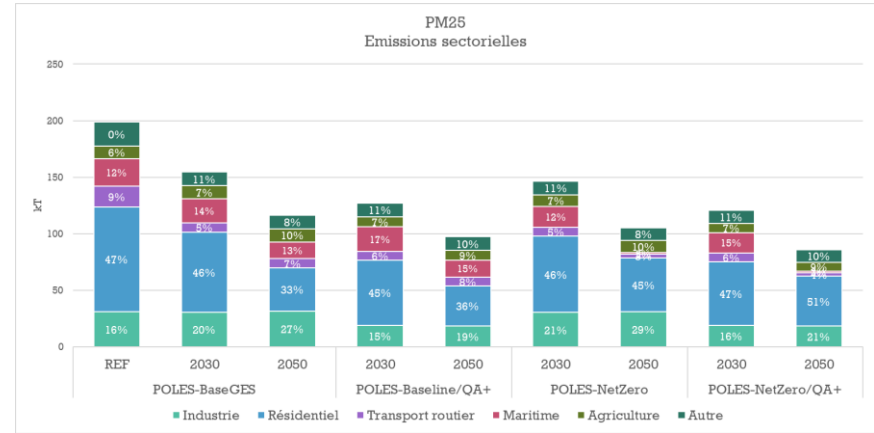
- European scenarios (IIASA) : ECLIPSE, Clean Air Outlook
- Assumptions on GHG reduction
- Assumptions on the implementation of air pollution measures
- Integrated into POLES

} + ACT & ARP
=> CBA

For ACT see <https://policy.atmosphere.copernicus.eu/act.php>

Interest of POLES scenarios

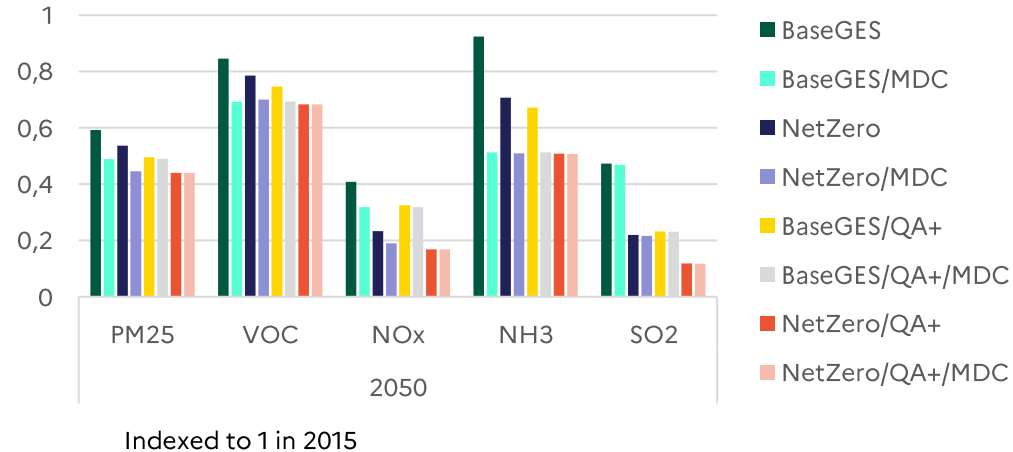
- Comparing alternative scenarios
- Exploring impact of introduction of air pollution related costs
 - Costs of energy/climate measures (including carbon tax) versus cost of abatement technologies for QA
 - Addition of "Marginal damage cost" (QA externalities)
- Quantification of technological costs (Air Pollutants and Climate/Energy)
- Quantification of emissions
- Complemented by an impact analysis
 - On air quality with CHIMERE / ACT
 - In terms of health effects and damage with ARP
- Cost-benefit analysis



Effect of introducing air pollution related costs into POLES

- Air pollution end-of-pipe costs
 - Much lower than POLES energy systems/technology costs
 - Limited effect on energy mix
 - Some effect on emissions
- Air pollution damage costs (health & environment)
 - Results in significant reductions in pollutant emissions
 - Particularly in baseline scenarios
 - Allows for some rebalancing with the carbon tax pushing the model to meet predefined climate targets
- Further assessments necessary to ensure that these results represent optimal technological choices

Evolution des émissions de polluants atmosphériques après intégration des coûts externes



Thank you