An Introduction to Concawe's Integrated Assessment Model: SMARTER

Les White/Lucia Gonzalez

43rd TFIAM Meeting: Helsinki

May 6th,2014

Background

- First developed and deployed during the CAFE programme
- Designed to compliment GAINS with a particular emphasis on efficiently exploring a wide range of sensitivity scenarios to understand the full 'policy envelope' including the influence of uncertainties
- Incorporates the main 'working engine' (S-R functions and impact algorithms) of GAINS (at least up to and including the GAINS version used to support the GP revision process)
- Incorporates detailed GAINS output cost-curves
- While maintaining consistency with GAINS, it incorporates a number of additional features

Main Features (1)

- Designed to allow the user to directly interact with the tool in a given session
- Optimisation can be
  - Target driven (equal €/unit improvement in impact) or
  - Technology driven (equal €/tonne abatement cost)
- Allows SLCFs CO_2 compensation costs to be determined (based on CO_2 price) and has the option to account for these costs in the target driven optimisation strategy
- Allows exploration of the implications of reduced secondary to primary $PM_{2.5}$ toxicity while maintaining the overall toxicity of mix
- Incorporates a similar strategy to GAINS to assess compliance with $PM_{2.5}$/PM_{10} AAQS

Main Features (2)

- Incorporates the ability to assess the implications of moving from single country to grid S-R functions for PM to S-R functions which differentiate between high level and low level emitters
  - based on the detailed results of the Euro Delta project (limited to the Big six countries and Benelux)
- User interface incorporates features to readily assess some further ‘what-ifs’ e.g.
  - What if NH3 emissions remain at the baseline?
  - What if additional ECAs beyond the Baltic and North Sea were designated?

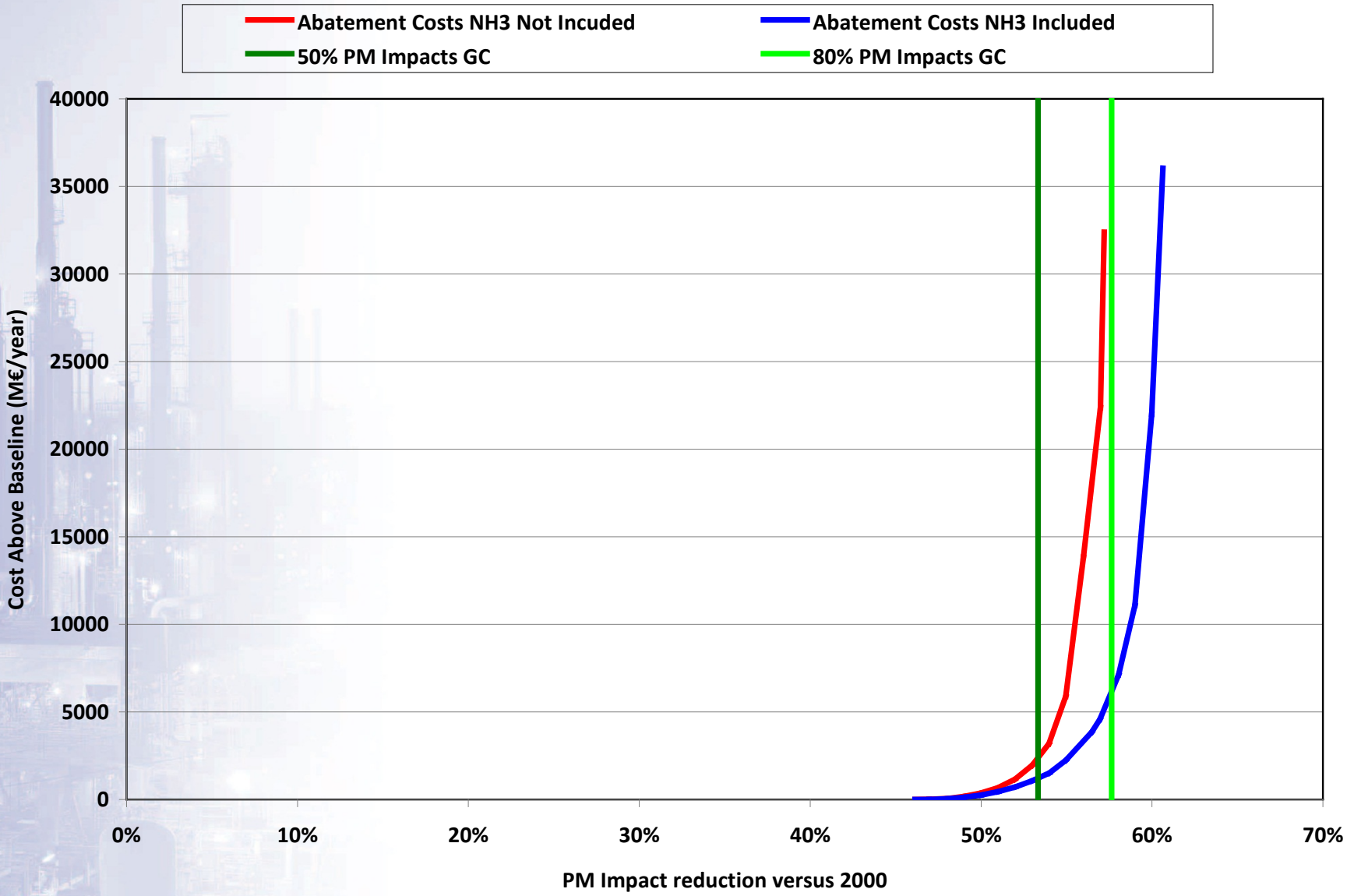
Some Examples of Sensitivity Assessments

Taken from Concawe's recently published 'Special Issue'

https://www.concawe.eu/Content/Default.asp?PageID=580&DocID=5258

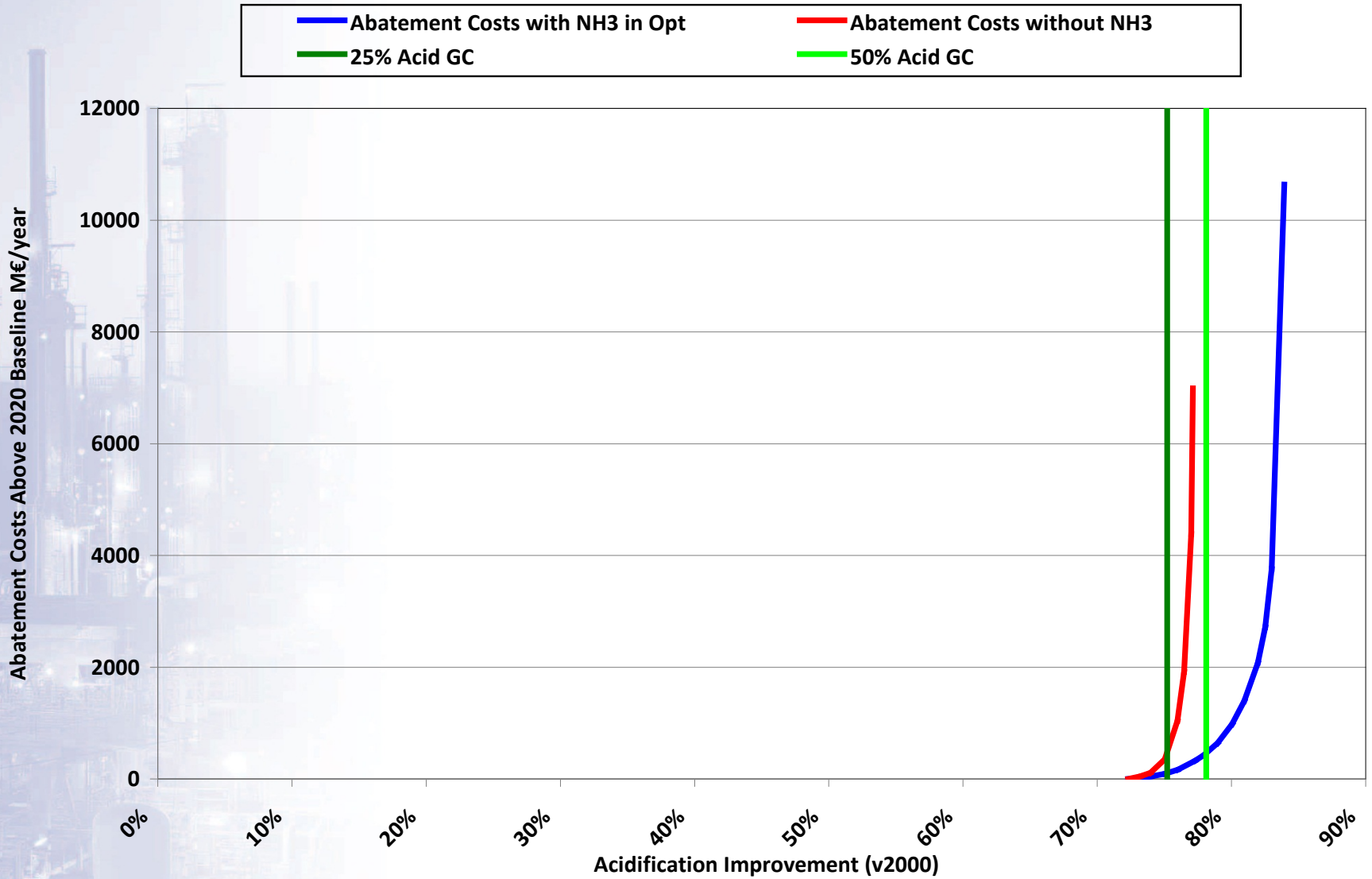
Exploring the Importance of Ammonia Reductions

NH_3 and PM Impact Reductions

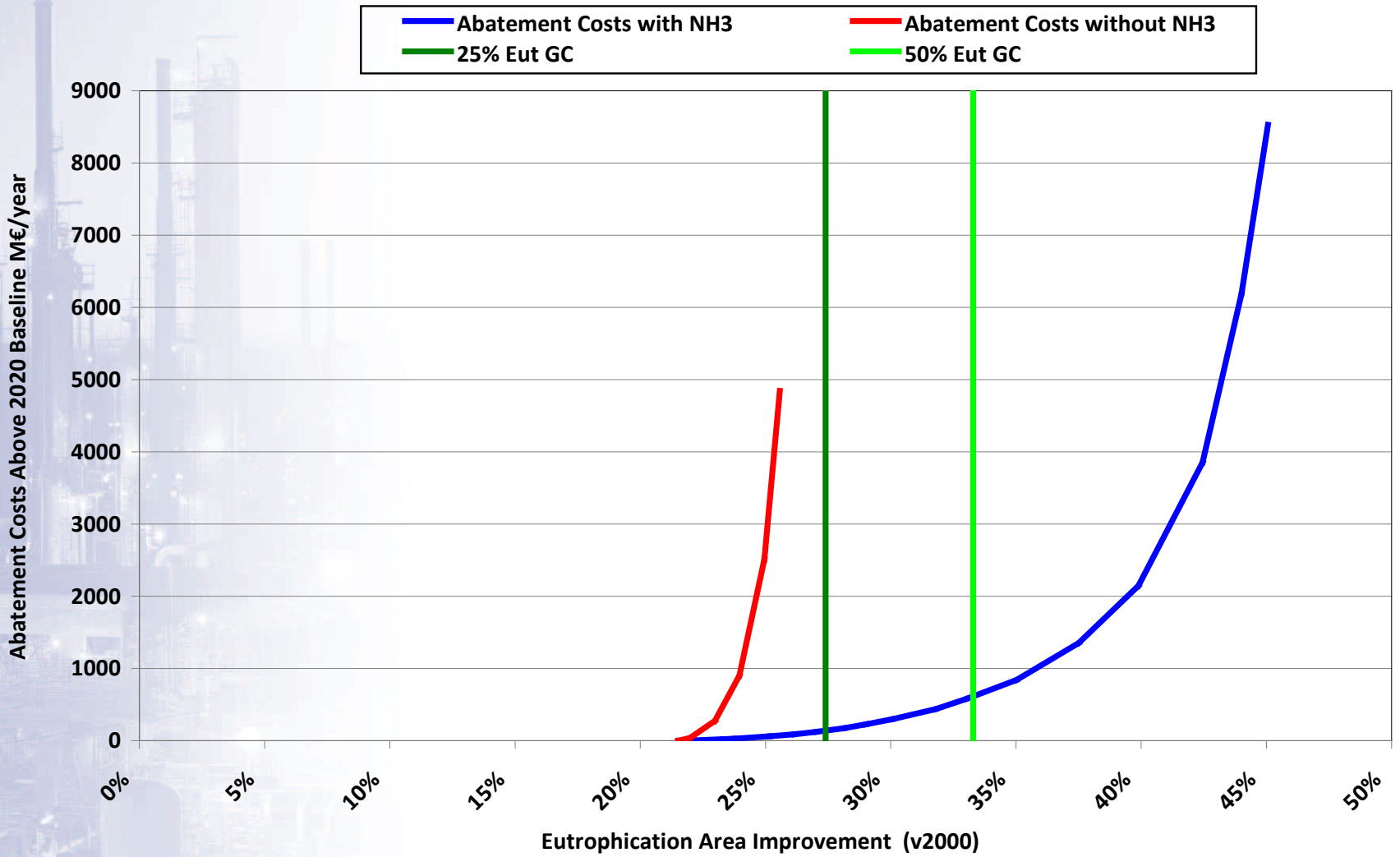


concawe

NH_3 and Acidification Reduction

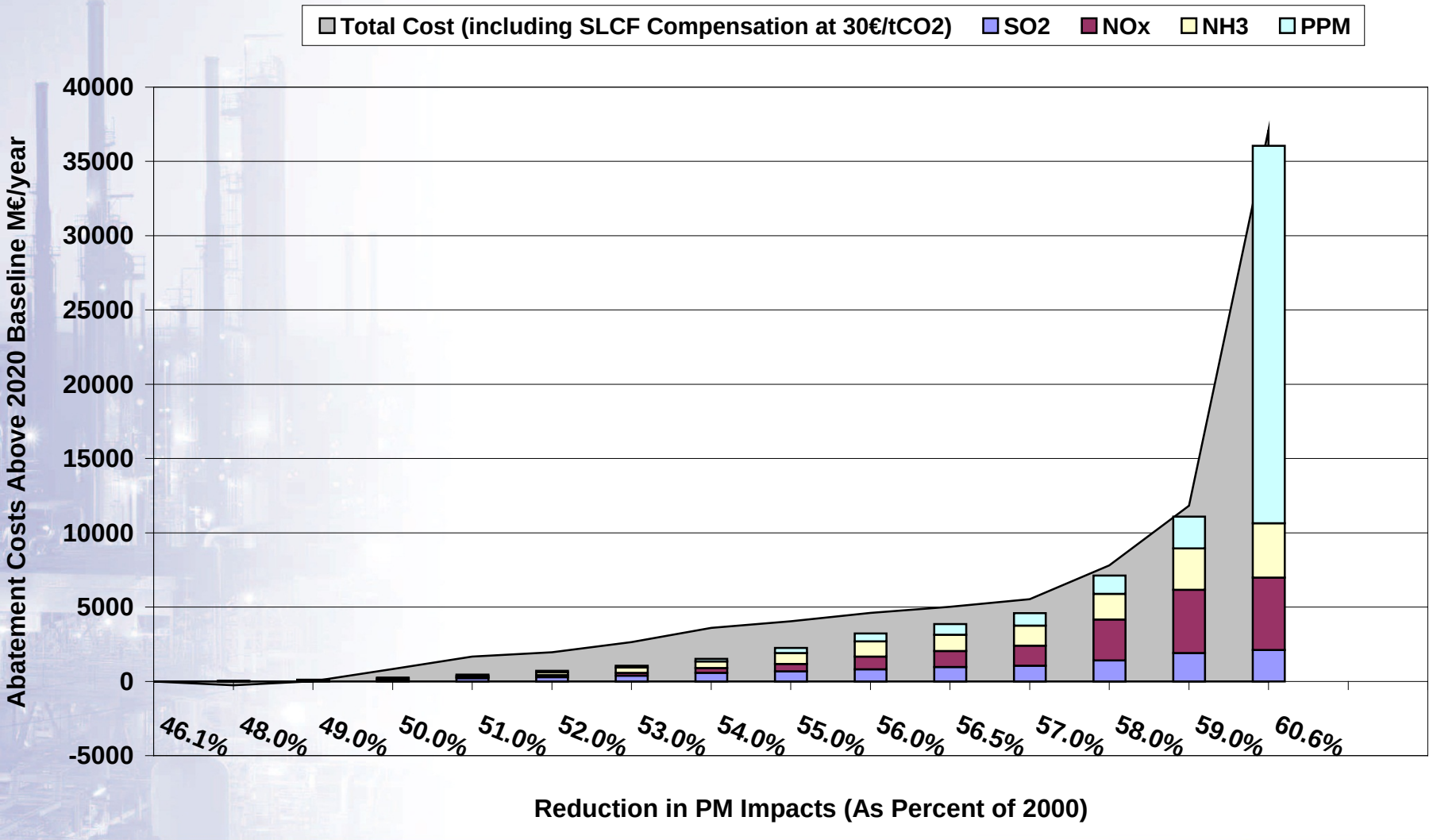


NH_3 and Eutrophication

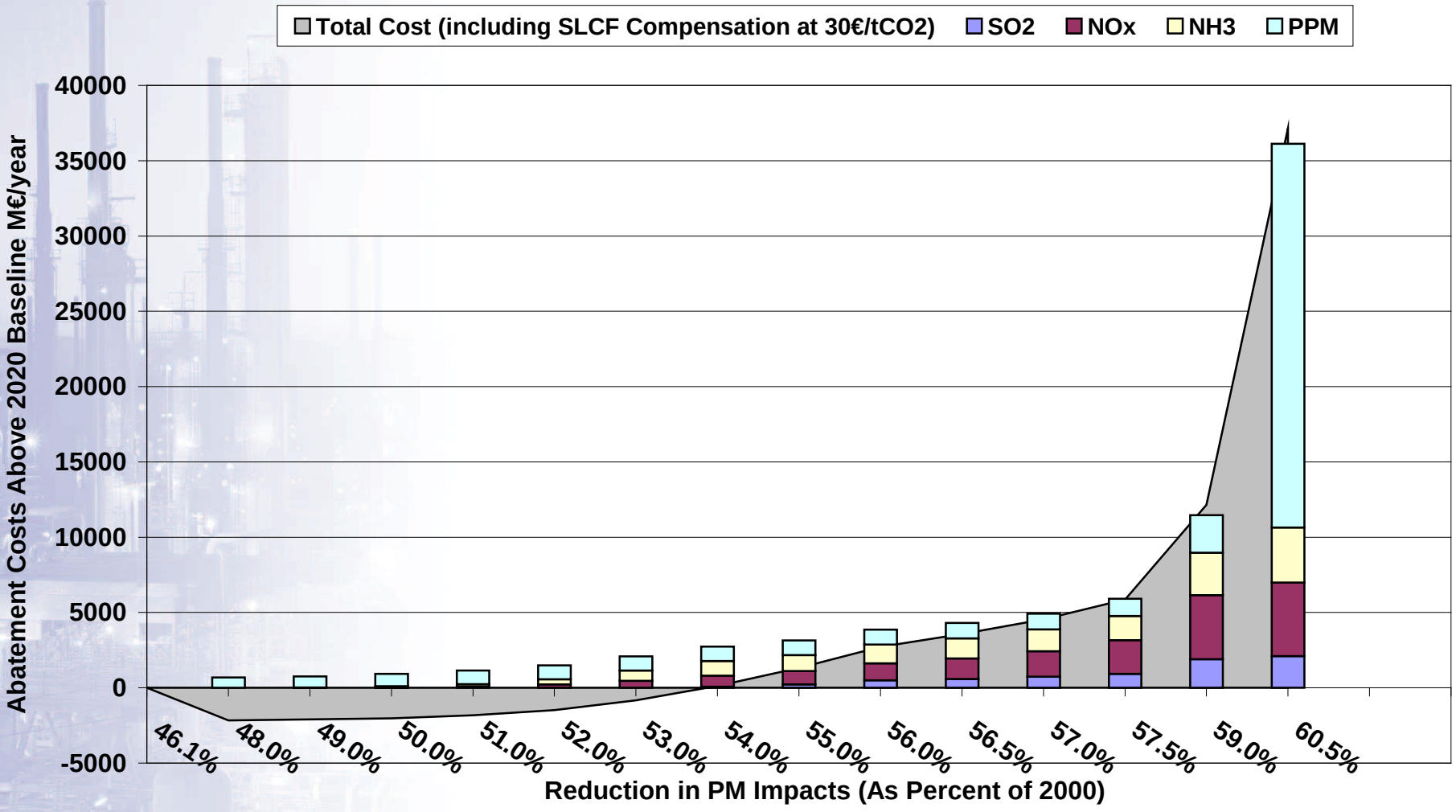


Exploring the Implications of Accounting for SLCF ‘CO2 Compensation Costs’ within in the Optimisation Strategy

SLCF CO2 Compensation Costs Outside Optimisation

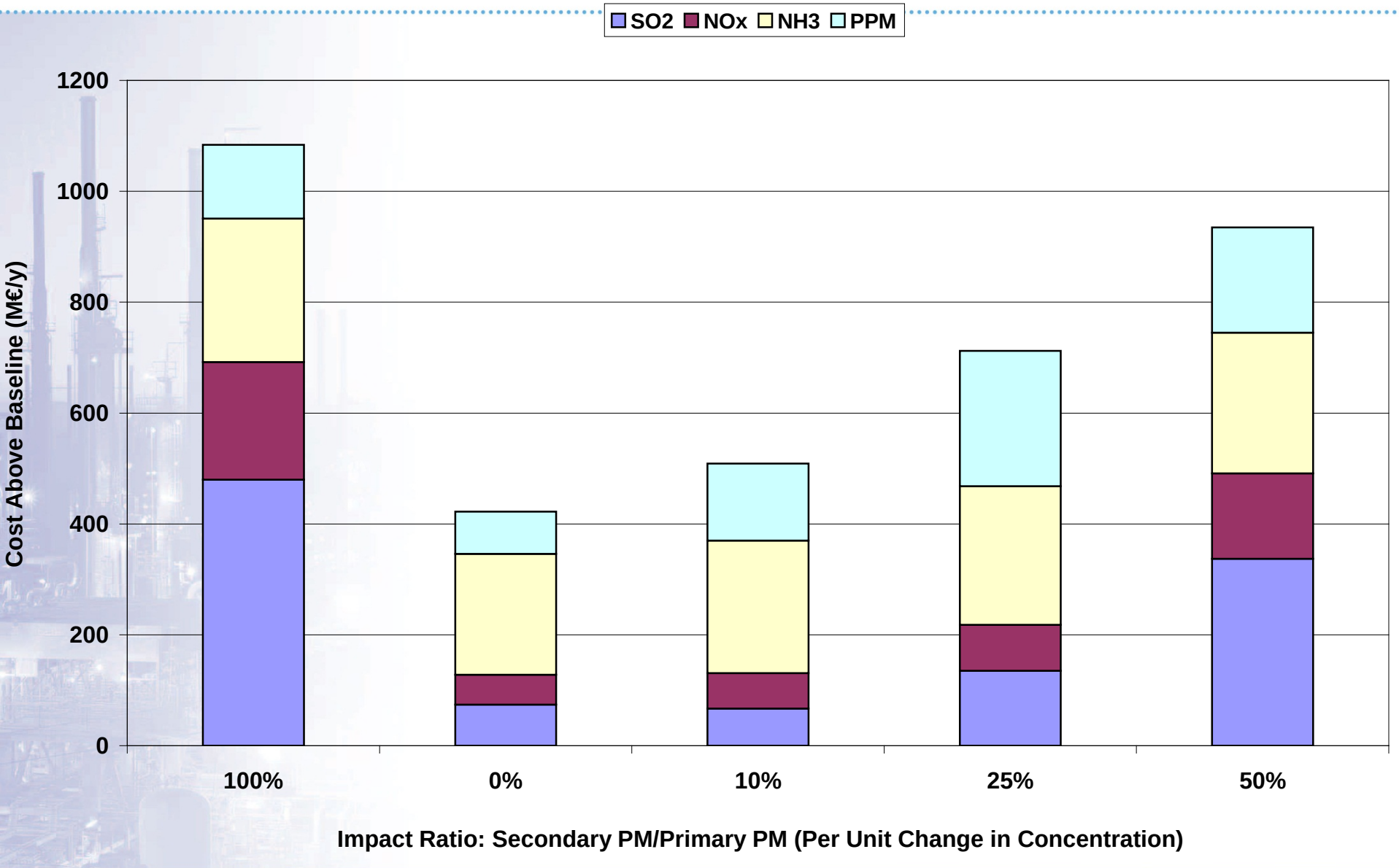


SLCF CO2 Compensation Costs Inside Optimisation

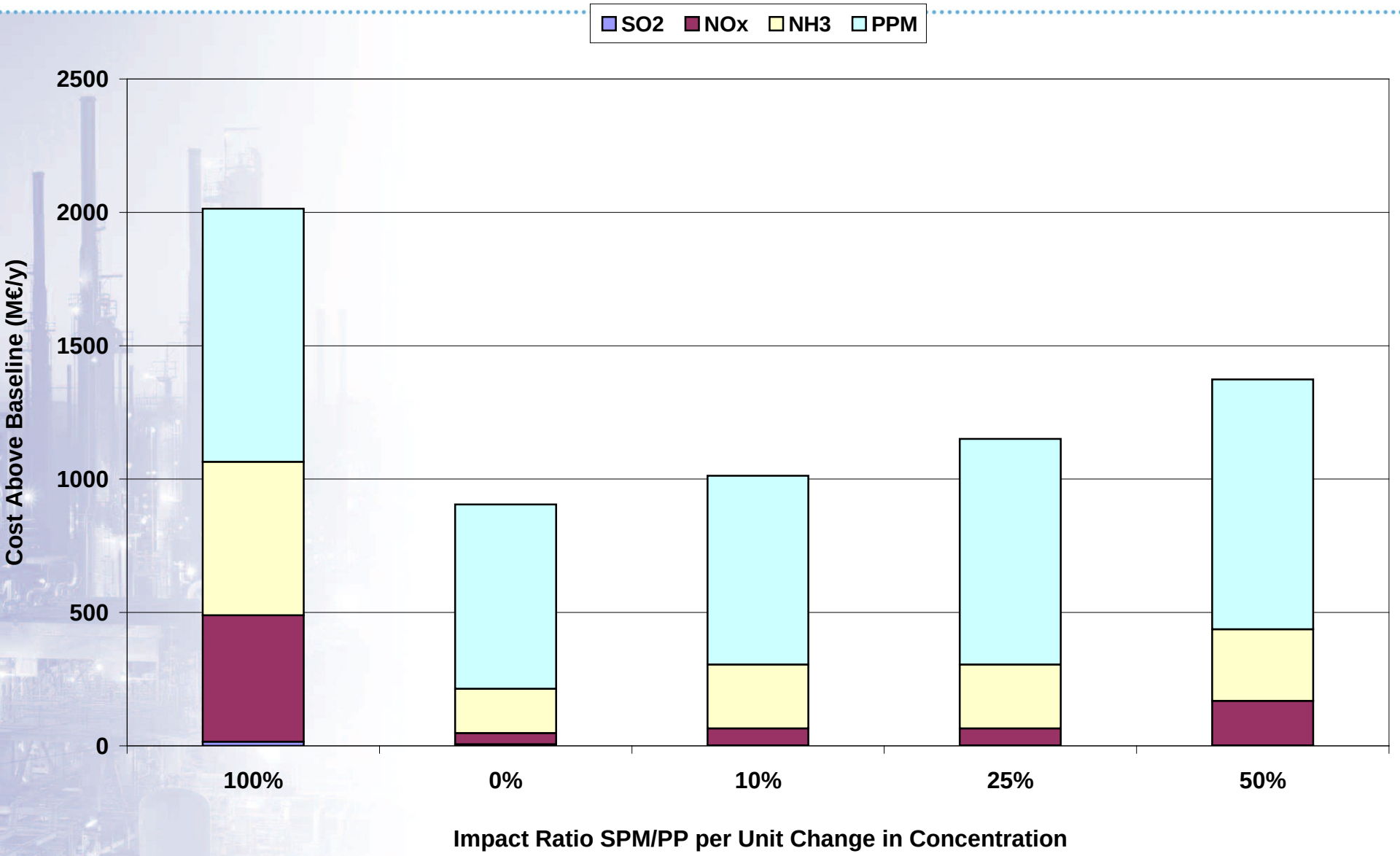


Exploring the Implications of Lower Secondary and Higher Primary PM Impacts/Unit Concentration

Influence on 'Optimum 50 % PM GC' with Reduced Secondary Toxicity



Influence on 'Optimum 50 % PM GC' with Reduced Secondary Toxicity and SLCF in Optimisation



SMARTER interactive Session!