AIR QUALITY IMPACTS of NETS 2020

Analysis and Discussion of the Impact of Ireland's 2020 Non-Traded Sector Target on Air Quality

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AP EnvEcon

IMP Ireland INTEGRATED MODELLING PROJECT

Work Completed Under the

Irish Integrated Modelling Project

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Presentation Structure

Context

- The Non-ETS Target in Europe
- Ireland's Non-ETS Challenge

Analytical Setup

- Summary of the analytical setup

Results

- Outcomes of the Analysis

Discussion

- Further work and discussion

I of V

THE NON-ETS TARGET IN EUROPE

European Emissions Trading Scheme (ETS)

EU wide cap and trade system

No individual national targets

Principally incorporates power sector and heavier industry operators – often larger point sources

Annually declining emissions allowance across all ETS sectors from 2013 to 2020

Target is currently a 21% reduction in ETS Sector emissions by 2020 relative to 2005

ETS covers approximately 40% of total 'EU' GHGs

Non Emissions Trading Sector Target (NETS)

EU wide target …

With individually agreed/negotiated national targets

Includes all 'Non' ETS sectors.

The big three are :

Agriculture, Transport, Heat

Annual limits applied from 2013 to 2020 to keep countries on track

EU Target is a 10% reduction in NETS emissions by 2020 relative to 2005

NETS covers approximately 60% of 'EU' GHGs

II of V

IRELAND’S NON-ETS CHALLENGE

Figure 1: Official Non-traded sector 2020 GHG emissions targets, relative to 2005 levels
International Effort Distribution

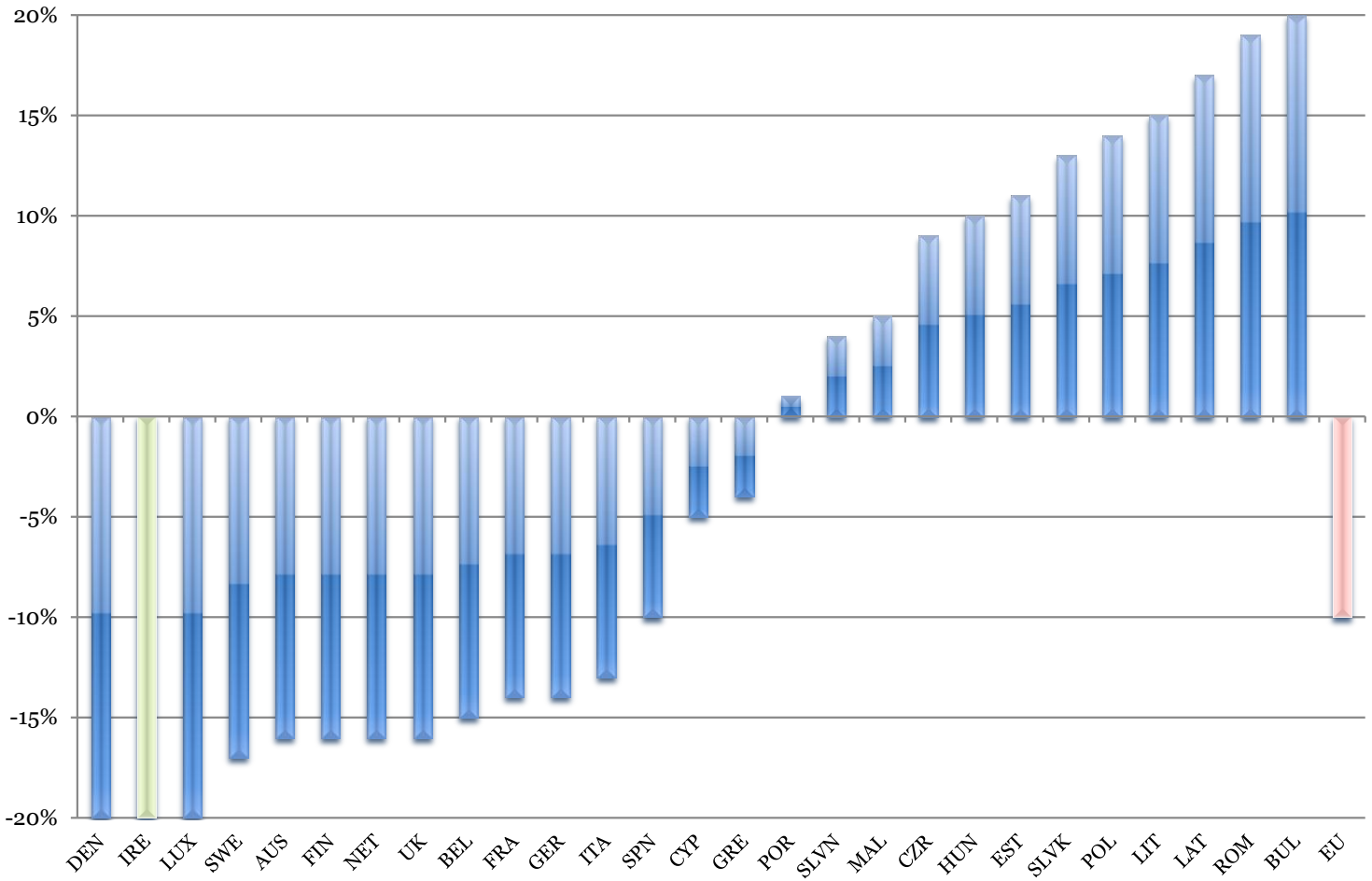


Figure 2 **Ireland's NETS Sector 2013 – 2020 Greenhouse Gas Emissions Pathways and Target Estimates (EPA Forecast 2012)**

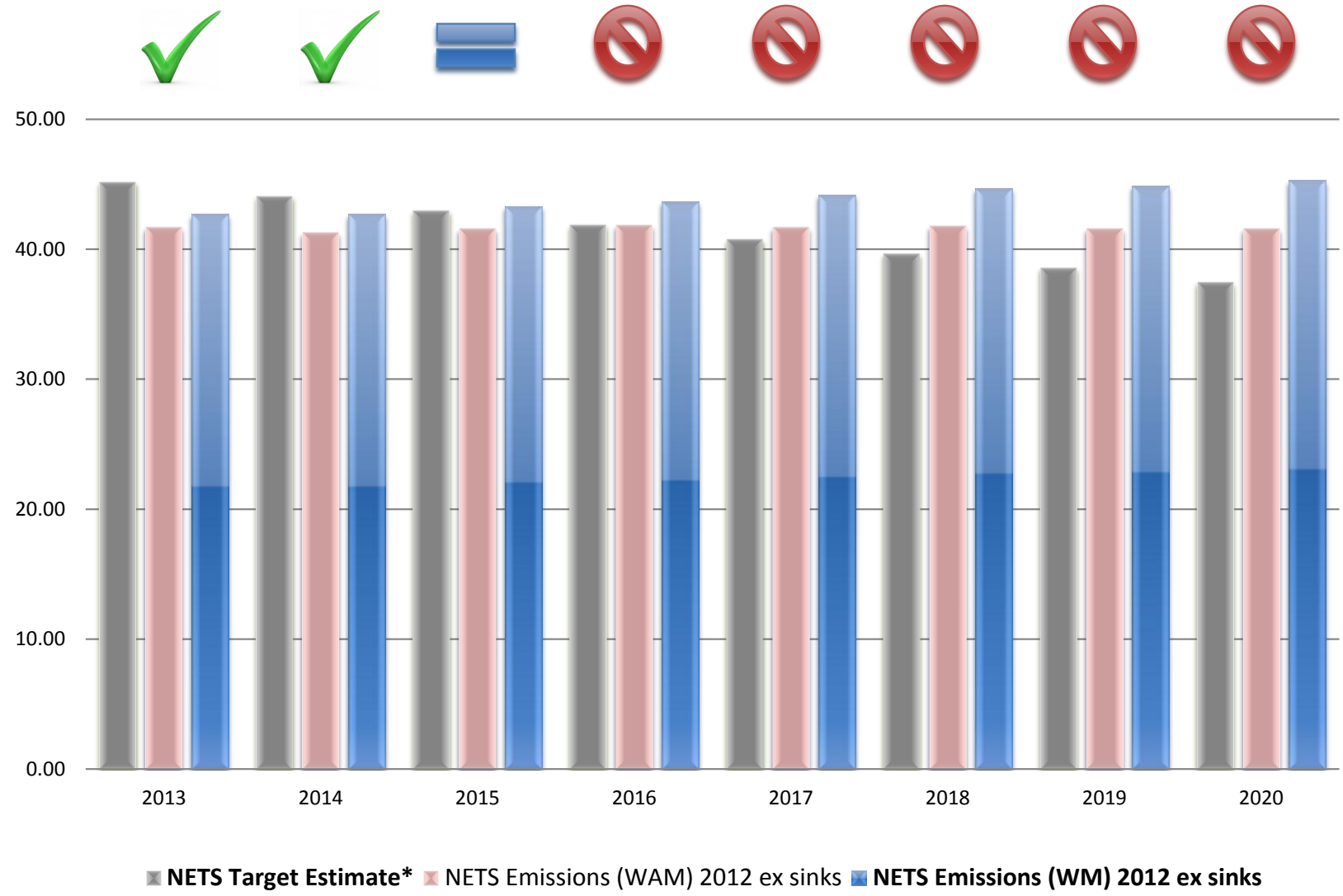
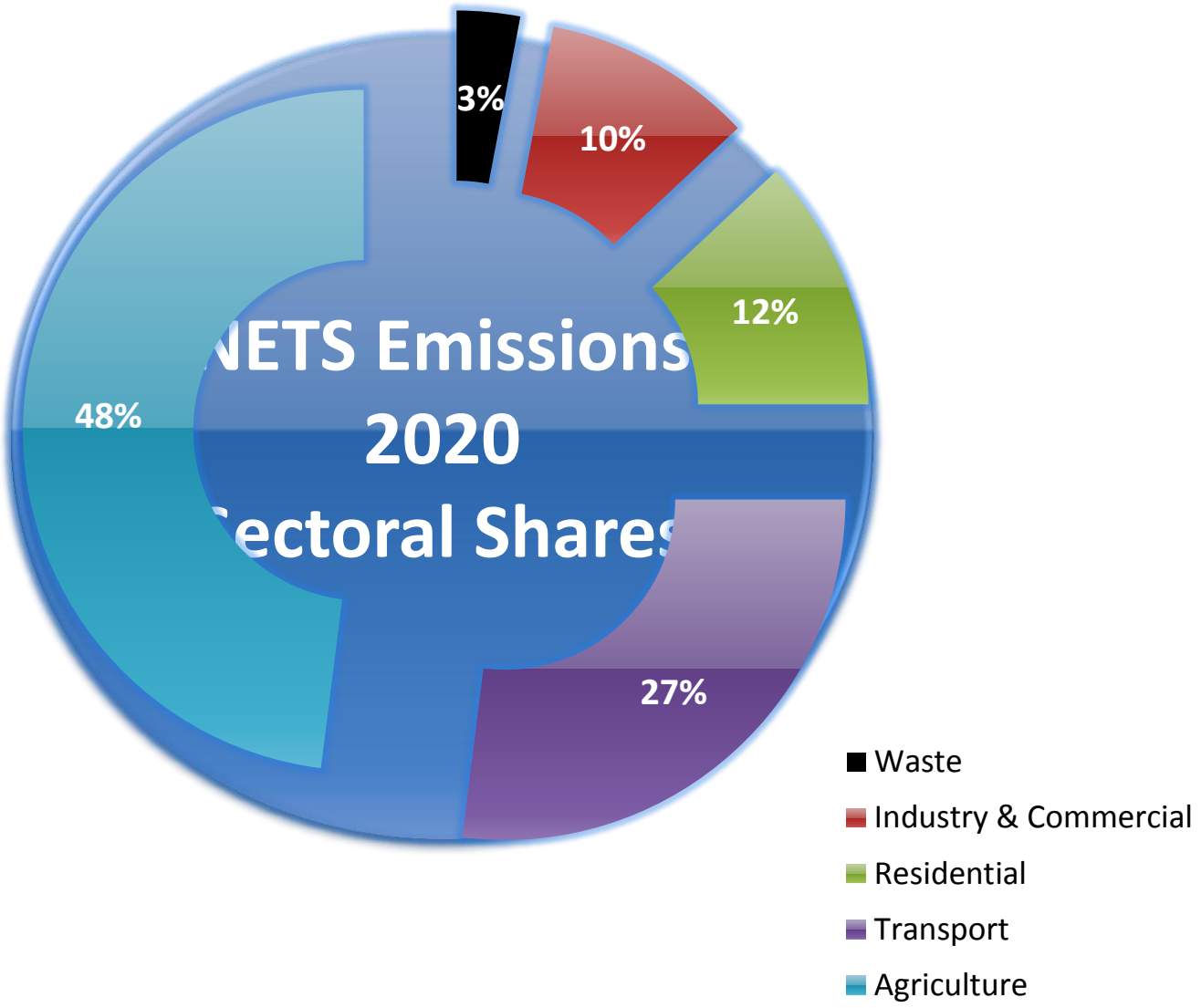


Figure 3 Sectoral Shares of 2020 NETS GHG Projections in Ireland (EPA 2012)



III of V

SUMMARY OF THE ANALYTICAL SETUP

Optimisation Mode

GENERAL APPROACH

Build the starting Scenario

Calibrate options and parameters

Set the Constraint for the scenario

Optimise (i.e. solve) for the solution

SPECIFIC APPROACH

Scenario Developed	1st Stage Menu Created	Constraint Defined	Output Delivered
Official Energy WM 2010	Focus on calibrating GHG abatement potentials	Calculated NETS Target for 2020 alone	Results delivered in terms of emissions reduced and distance to target
Ag scenario 2010	1st round work for GHG abatement menu options in many cases	Various GHG marginal cost constraint levels used	Broader model data also available e.g. ETS impact, ***Air Quality impact***
All Sectors but divide of ETS - NETS	Further options available	€50 (LCO) and €225 (MFR)	
		Applied to all sectors	

Agriculture

Fertiliser App Control

Animal Feed

Farm Scale AD

Advanced Agro-Chemicals

Precision Farming

Power

Fuel Switching

CHP

Efficiency Improvement

IGCC

Industry

Fuel Switching

Energy Saving Stages

Good Practices

Efficiency Improvement

N_2O and F-Gas Controls

Waste

Res/Comm

Transport

Diversion & Treatment

Flaring & Gas Utilisation

Wastewater management

Waste burning Regs

Energy Saving *Stages* by:

HVAC of old/new apartments/houses

HVAC commercial

Appliances

Advanced engines

Efficiency Improvements

~~Hybrids – Plugins - Electrics~~

Selected Specific Calibration Example Notes

Liaising directly with DAFF in regard to perceived potential of measures in Ireland

Adaptation and modification of measures to comparable categories in the model

Variations persist with core model and further evidence will be incorporated over time from multiple sources

Estimation of HVAC performance by aggregate categories *House v Apartment* and *Old v New (post 2005)*

Utilisation of two approaches. BER and separate modelling of stock to reconcile energy balance for sectors with housing data and perceived HVAC demands

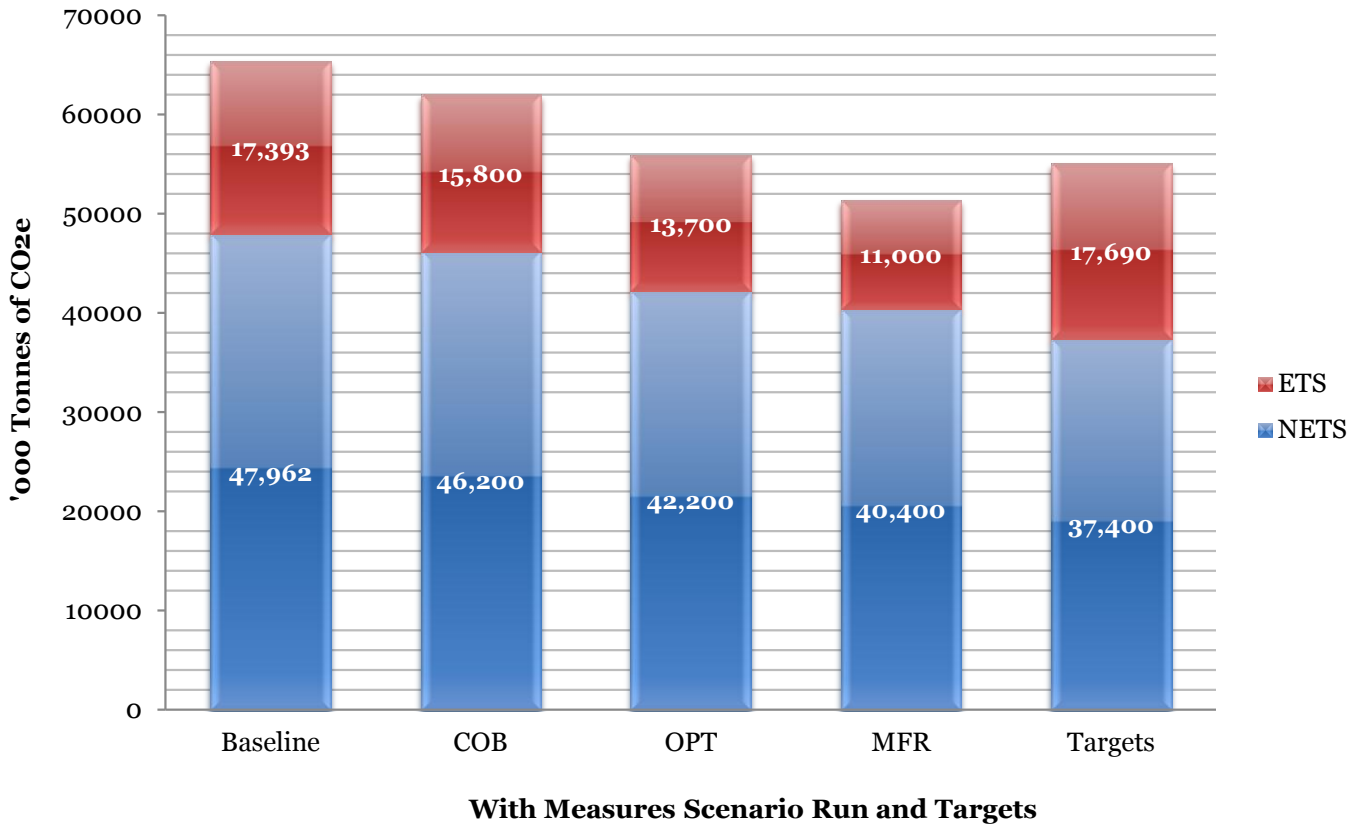
Behavioural influence a difficulty as are variations in the housing stock characteristics, and the measure cost profiles

IV of V

OUTCOMES OF THE ANALYSIS

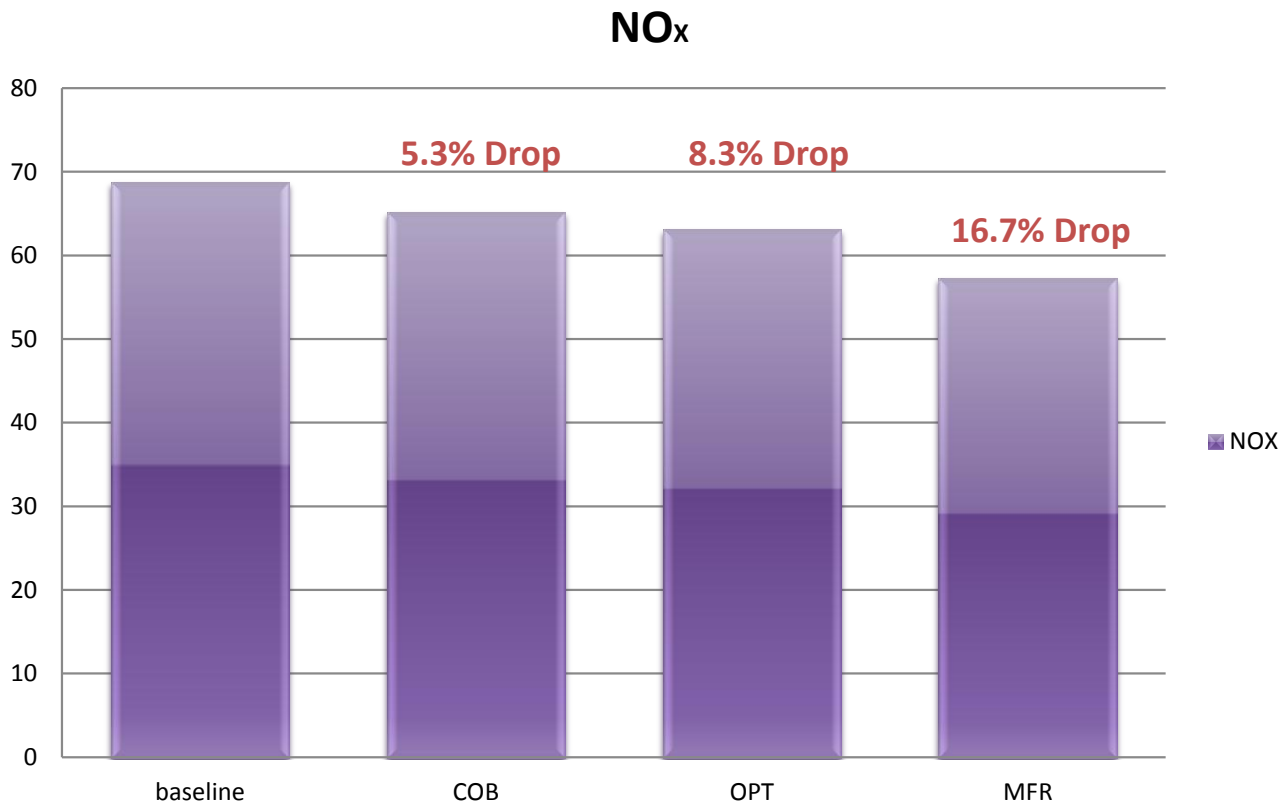
ETS and NETS emissions in 2020 – Baseline, Optimisations and Targets

- Fail to achieve NETS target in 2020 from the WM starting point under MFR
- Menu of options is not complete and requires further R&D
- Sizeable potential impacts on ETS emissions



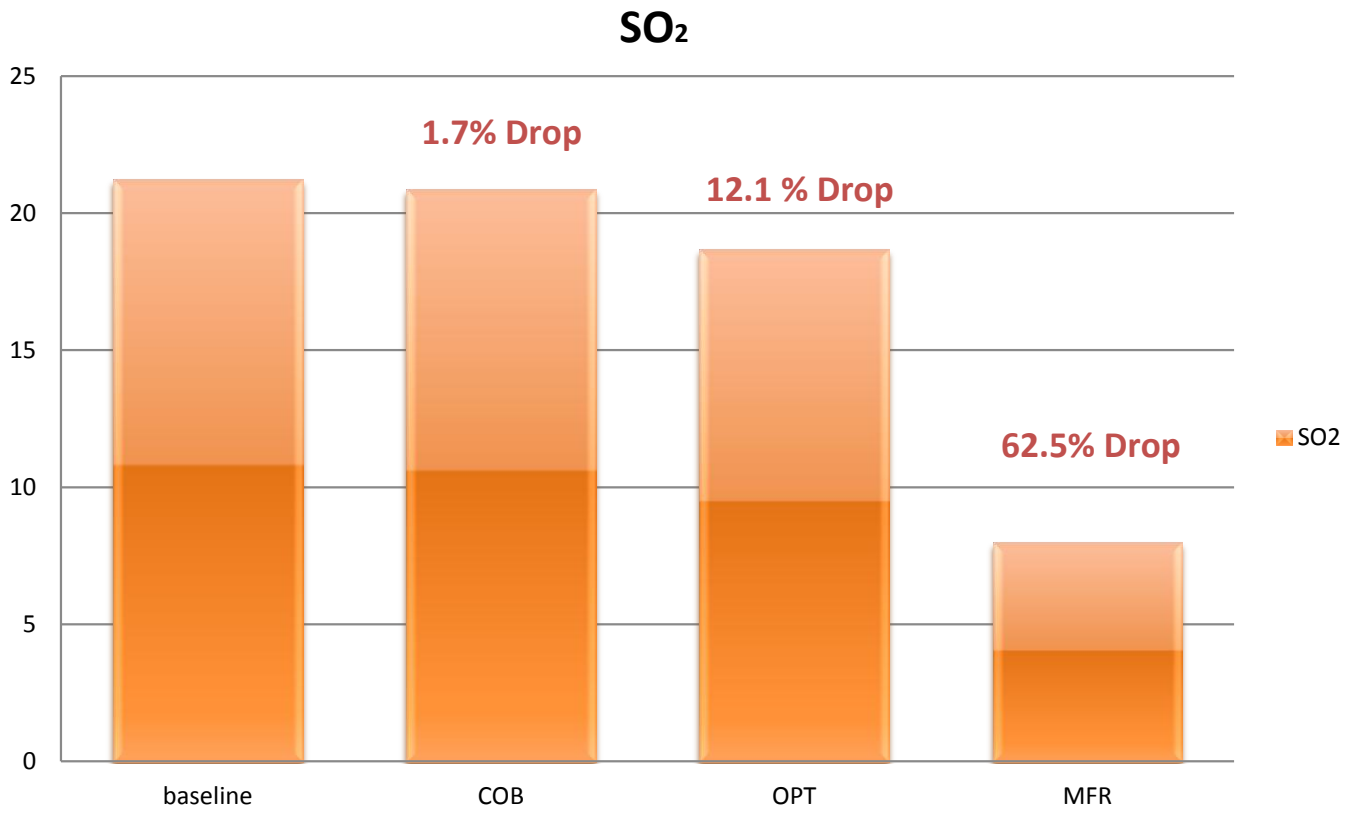
Impact of NETS Optimisations on WM NO_x levels (kt) in 2020

- Moderate impact from COB and OPT- Sizeable MFR drop
- COB through transport / OPT through transport and cleaner power
- MFR pushes far higher efficiency boilers, transport and cleaner power



Impact of NETS Optimisations on WM SO_2 levels (kt) in 2020

- Minor impact from COB by transport as no shift in power sector at COB
- OPT brings in power changes and domestic/industrial efficiency
- MFR impact dramatic and derives from major power and industry shifts



V of V

DISCUSSION

Modelling NETS

Annual Targets from 2013 will see NETS impact policy decisions in the near-term

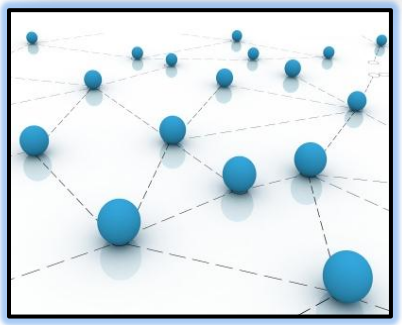
The sectors involved are large complex multi-agent sectors with a recent history of limited emission decline

NETS challenge is of varied significance to member states – mostly 'EU15' member states

Climate policy scenarios to date focus on ETS, efficiency and renewable goals (e.g. PRIMES work)

NETS policies and control strategies are not yet captured in the International work *(and not yet developed in many national cases…)*

Modelling the interaction of these environmentally related targets will require a system such as GAINS

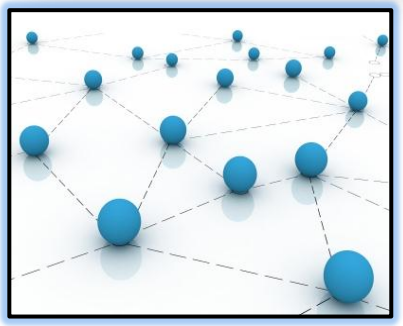


Managing NETS

The NETS challenge may be expected to push more strongly into the realm of behavioural change measures – raising three points for modellers and policy analysts

- Demand management activities deliver win/win options for climate and air – however the social/societal impacts are a consideration and policy measures would benefit from shared international evaluation (www.policymeasures.com)

- Introducing non-technical and other measures to secure abatement from transport, agriculture and residential/commercial will introduce new uncertainties and the policy framework must consider how these will be managed in terms of projections, compliance and cost calculation.



- Would suggest more focus on integrated strategy across climate and air **including** exogenous modelling and *retrofitting* of key NTM options (e.g. carbon taxes, demand management initiatives etc.) and their costs.

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