



Netherlands Environmental Assessment Agency

# **International climate policies on a pre- and post-crisis baseline**

TFIAM workshop  
February 24<sup>th</sup>, 2010

Corjan Brink / Johannes Bollen / Herman Vollebergh



# Objectives

- Analyse EU air/climate policies considering:
  - international climate policies – various coalitions
  - basic economic variables: w/wo economic crisis
  - impacts on sectors
  - interaction climate & air

- WorldScan
  - CGE-model => accounts for feedbacks
    - *energy (carbon) prices*
    - *macro/sectoral location and growth*
    - *final demand (electricity, transport)*
  - 17 regions: Annex I, China, India, Brazil, ROW
  - 21 sectors
  - CO<sub>2</sub> policies => fuel switch, energy saving
  - CH<sub>4</sub>, N<sub>2</sub>O, SO<sub>2</sub>, NO<sub>x</sub> emissions (energy & other)

# Methodology

- 2 different baselines
  - *pre-crisis: WEO 2008*
  - *post-crisis: WEO 2009*
- data sources
  - Annex I, China, India:
    - *energy and emissions based on GAINS databases*
  - Rest of the World:
    - *TIMER: update baseline OECD Env. Outlook*

# Simulations CO<sub>2</sub>-policy

- Pledges Annex-I countries in different settings
  - countries act alone (ETS in EU)
    - *no CDM*
    - *CDM*
  - emission trading Annex-I
    - *excl. Russia & Ukraine*
    - *incl. Russia & Ukraine*
    - *+ China, India, Brazil*
  
- Results:
  - 2020, EU27, changes relative to baseline

# Macro results 2020 – EU27

## WEO 2008 and WEO 2009

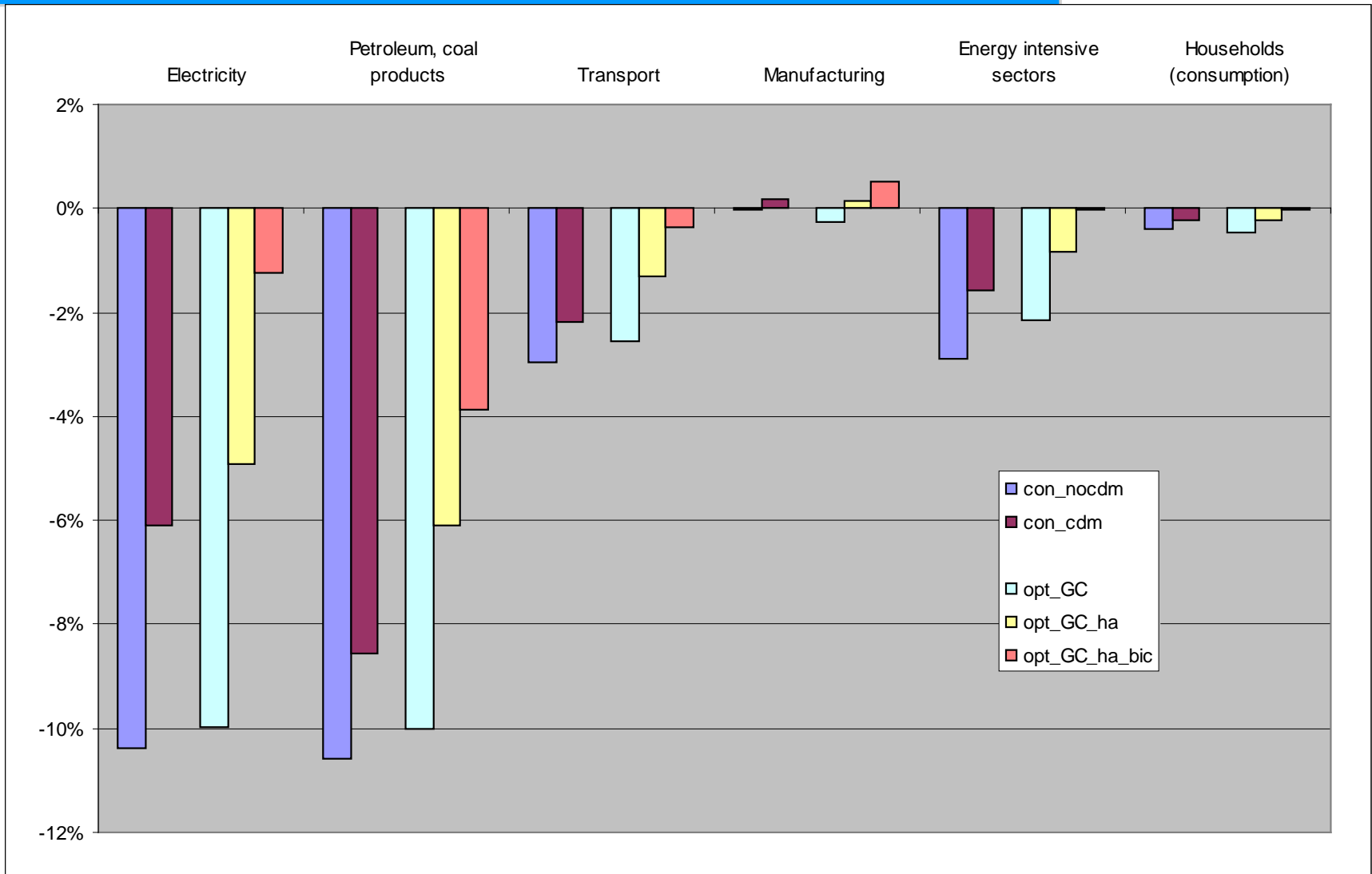
	national income (% of BAU)		ETS price (€/t CO <sub>2</sub> )	
acting alone, no CDM	- 0.5	- 0.1	44	13
acting alone, CDM	- 0.3	- 0.1	22	8
<i>Emission trading within coalition</i>				
Annex-I, excl. Rus&Ukr.	- 0.5	- 0.3	44	30
Annex-I, incl. Rus&Ukr.	- 0.2	- 0.1	23	16
Annex-I + B, I, C (0%)	- 0.0	- 0.0	6	4

# Macro results 2020 – EU27

## WEO 2008 and WEO 2009

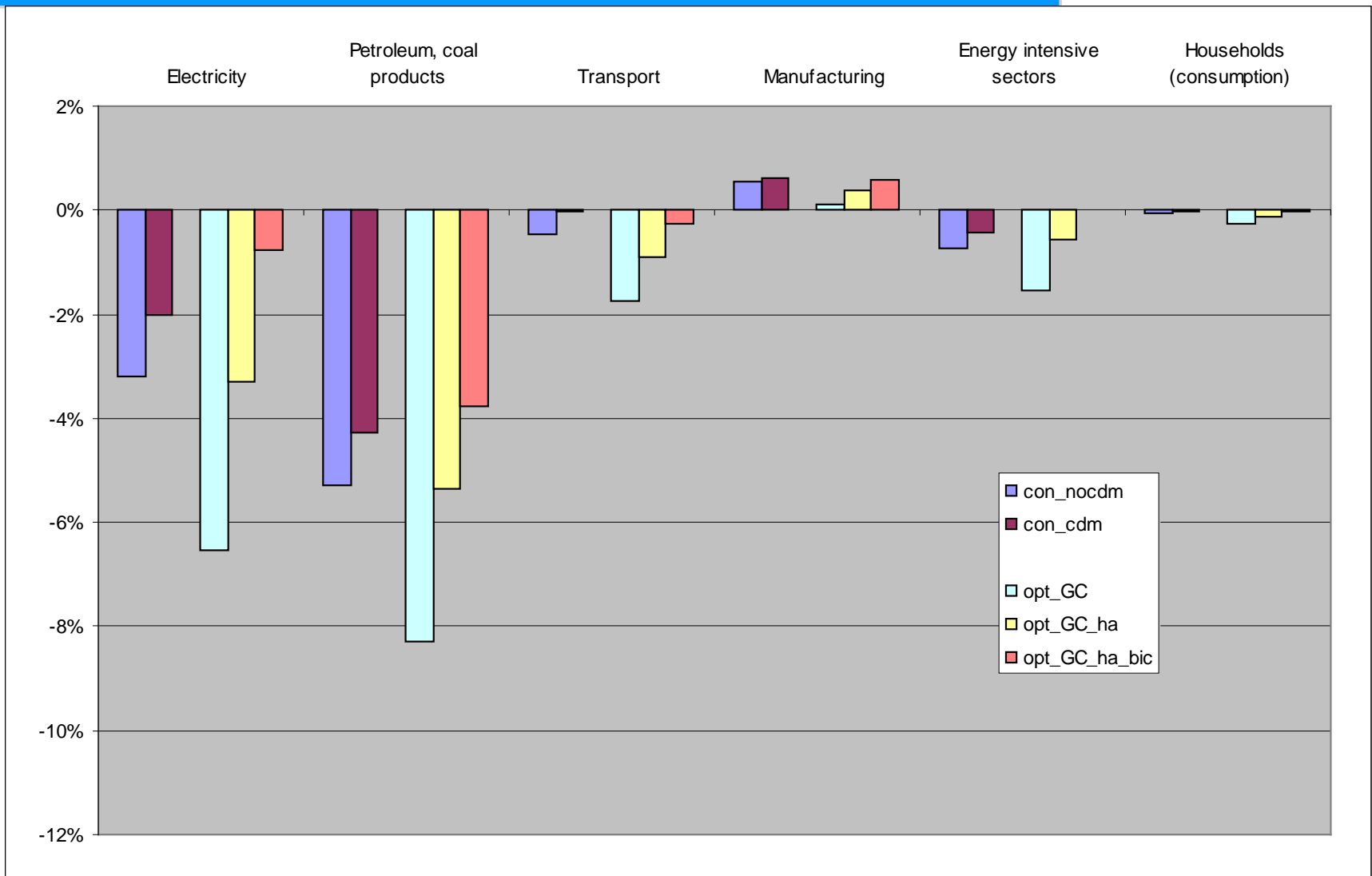
	Energy use (% of BAU)		
	Coal	Petroleum, coal products	Natural gas
acting alone, no CDM	<b>-46 / -22</b>	<b>-11 / -6</b>	<b>-15 / -4</b>
acting alone, CDM	<b>-34 / -14</b>	<b>-8 / -5</b>	<b>-9 / -1</b>
<i>Emission trading within coalition</i>			
Annex-I, excl. Rus&Ukr.	<b>-49 / -41</b>	<b>-10 / -9</b>	<b>-16 / -14</b>
Annex-I, incl. Rus&Ukr.	<b>-35 / -28</b>	<b>-7 / -6</b>	<b>-6 / -7</b>
Annex-I + B, I, C (0%)	<b>-13 / -9</b>	<b>-5 / -5</b>	<b>-1 / -1</b>

# Production by sector – before crisis

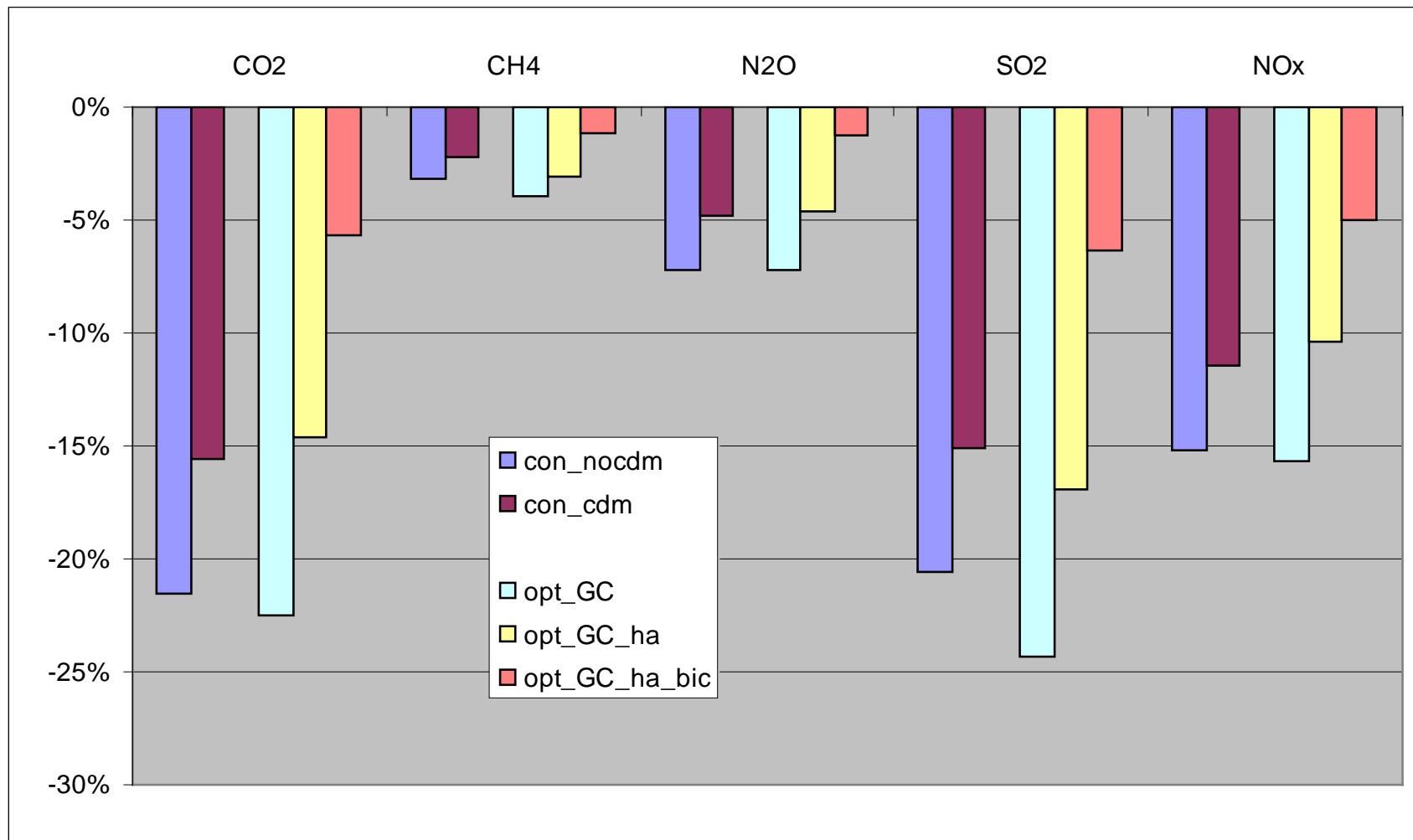




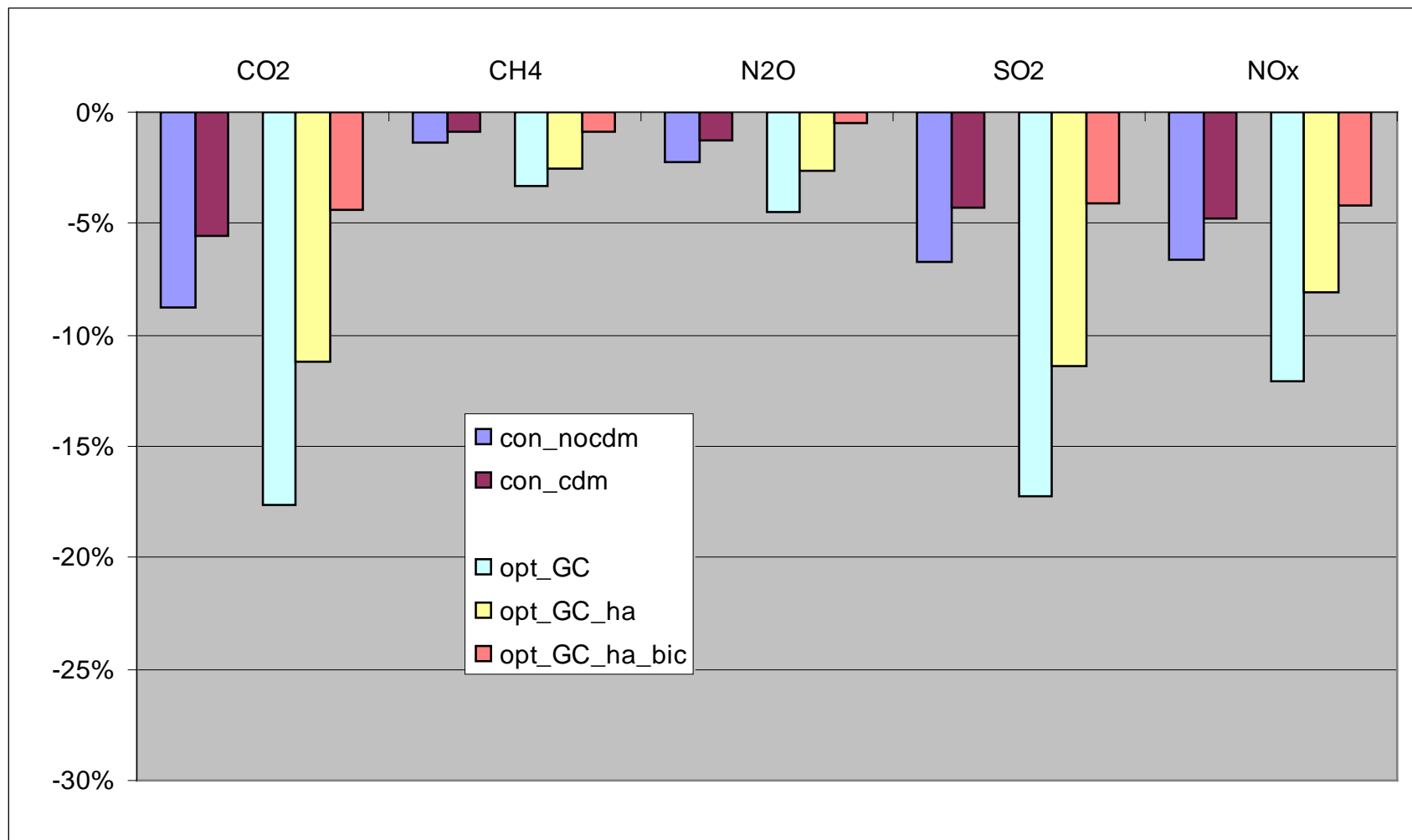
# Production by sector – post crisis



# Change in emissions – before crisis



# Change in emissions – post crisis



# Carbon leakage

- leakage rates in different coalition settings

	leakage rate (% of reductions)		
	WEO 2008	WEO 2009	
acting alone, no CDM	<b>8 – 12</b>	<b>7 – 8</b>	
acting alone, CDM	<b>5 – 7</b>	<b>4 – 5</b>	
<i>Emission trading within coalition</i>			
Annex-I, excl. Rus&Ukr.	<b>8 – 11</b>	<b>6 – 8</b>	
Annex-I, incl. Rus&Ukr.	<b>7</b>	<b>5</b>	
Annex-I + B, I, C (0%)	<b>0</b>	<b>0</b>	

Sectoral impact air policies depends on:

- macro-economic growth
  - lower growth => emission ceilings less binding
  - but also less synergies from climate policies
- ambition level and cooperation global climate policies
  - more ambition => more synergies
  - more cooperation => less synergies

# Recent developments & future plans

14

- End-of-pipe abatement
  - sector-specific
  - different types of emissions
- Abatement cost curves  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}_x$ ,  $\text{SO}_2$

## Future plans:

- EU country detail
- Interactions renewables targets
- Policy instruments for NEC