

# **Swedish analysis of the attainability of ambition targets based on national data**

Stefan Åström, IVL, 2011-05-19

# Outline

- A short presentation of the new Swedish long term energy projection
- Comparison of Swedish and CIAM (March 2011 scenarios) emission projections
- Comments to the ambition targets
- The Euro VI is here

# **A new national baseline (March 2011) - difference from March 2009**

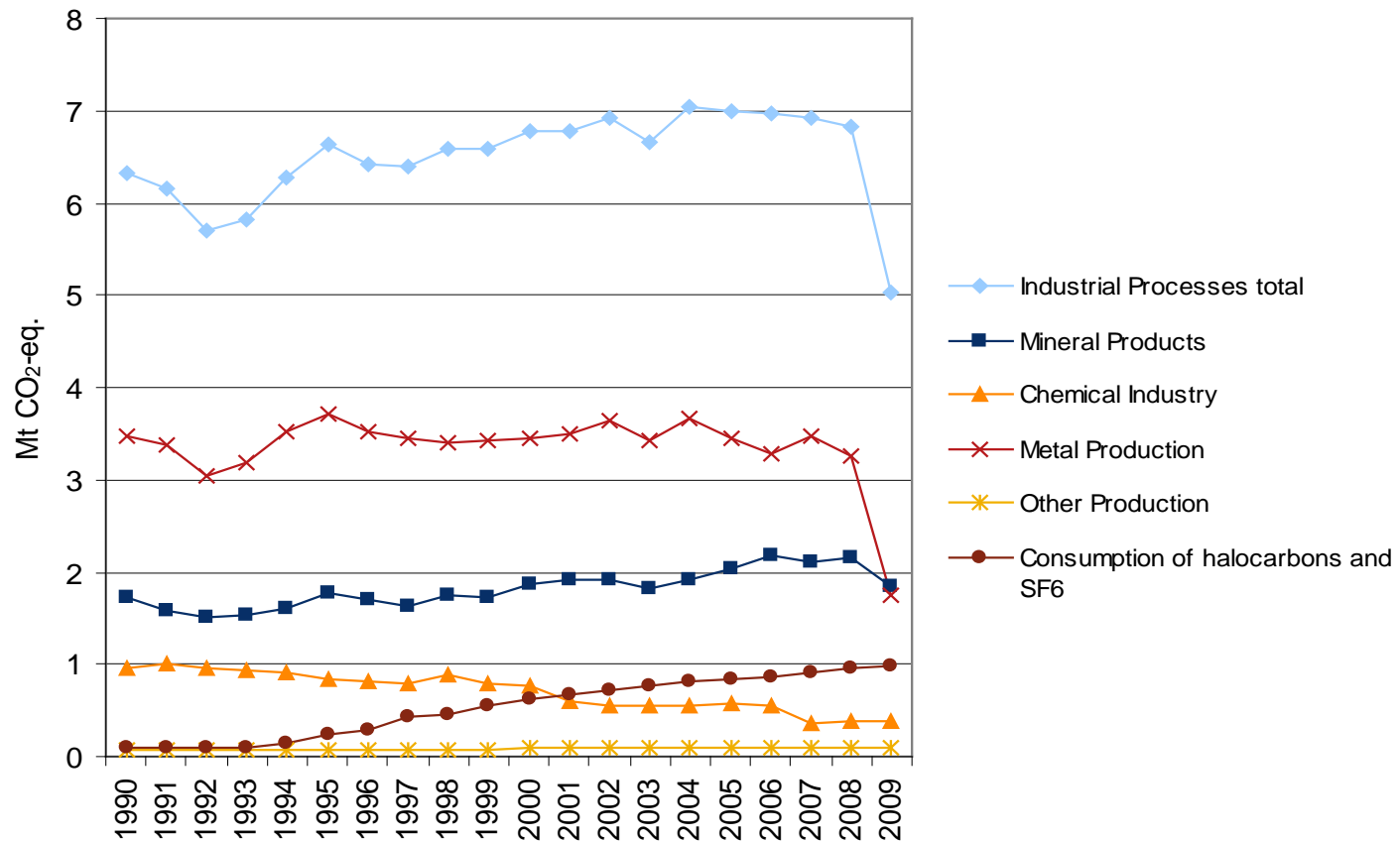
- The latest Swedish baseline includes the financial crisis
- It also includes a faster introduction of energy efficient vehicles in road transport
- Macro economic assumptions differ from earlier baseline projections
- March 2011=SWE11, March 2009=SWE09 in this presentation

# Macroeconomic assumptions

Assumptions for 2020	SWE09	SWE11
GDP growth / year (2010- 2020)	2.1%	2.4%*
CO <sub>2</sub> ETS price (€/ton)	30	16
Oil price (US\$/barrel)	83.5	98
Coal price (US\$/ton)	89.1	102.1
Gas Price (US\$/Mbtu)	8.5	11.9

\*The larger growth includes the recovery from the financial crisis

# The financial crisis in Sweden – Impacts on CO<sub>2</sub>



# The new Swedish projections – The Swedish energy system 2020

	SWE09	SWE11	CIAM BSL	
Primary energy carriers (excl nuc)	435	429	400	TWh
Primary energy carriers (incl nuc)	659	645	618	TWh
Coal usage	25	26	21	TWh
Oil products	205	184	188	TWh
Biofuels & waste	129	138	115	TWh
Other renewables	76	81	75	TWh
Electricity exports	23	24	9	TWh

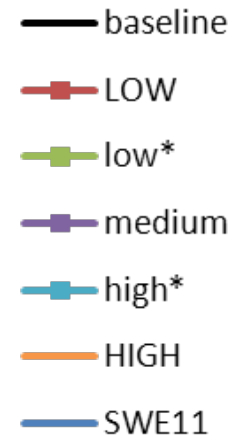
# The new Swedish projections – The Swedish energy system 2020 (continued)

SWE11, Selection of indicators for Sweden		
Energy use in industry	+5	TWh, compared to 2007
Energy use in transport	+1	TWh, Compared to 2007
Energy use in households etc.	-2	TWh, compared to 2007
Use of renewable fuels in road transport	10.4	%
Renewable energy total	50.2*	%

\*The Swedish obligation under the EU C&E package is 49%

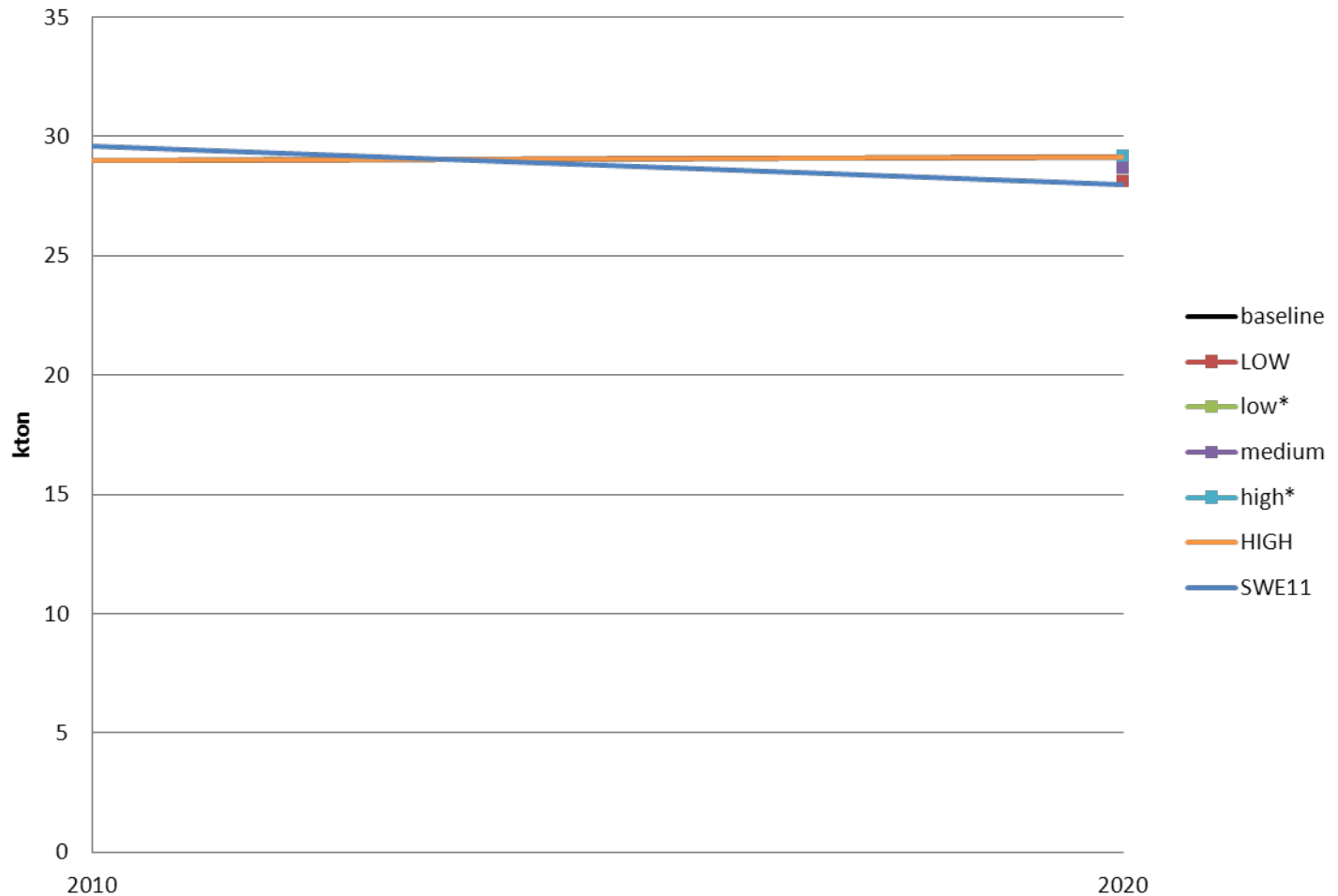
# Emission comparison

- Compares projected emissions for Sweden
- National projections from SWE11 are compared with CIAM report 1 / 2011 scenarios
- Comparisons are made for SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>, VOC, PM<sub>2.5</sub>
- Lines are shown for baseline, HIGH and SWE11, dots for LOW, low\*, medium, and high\*



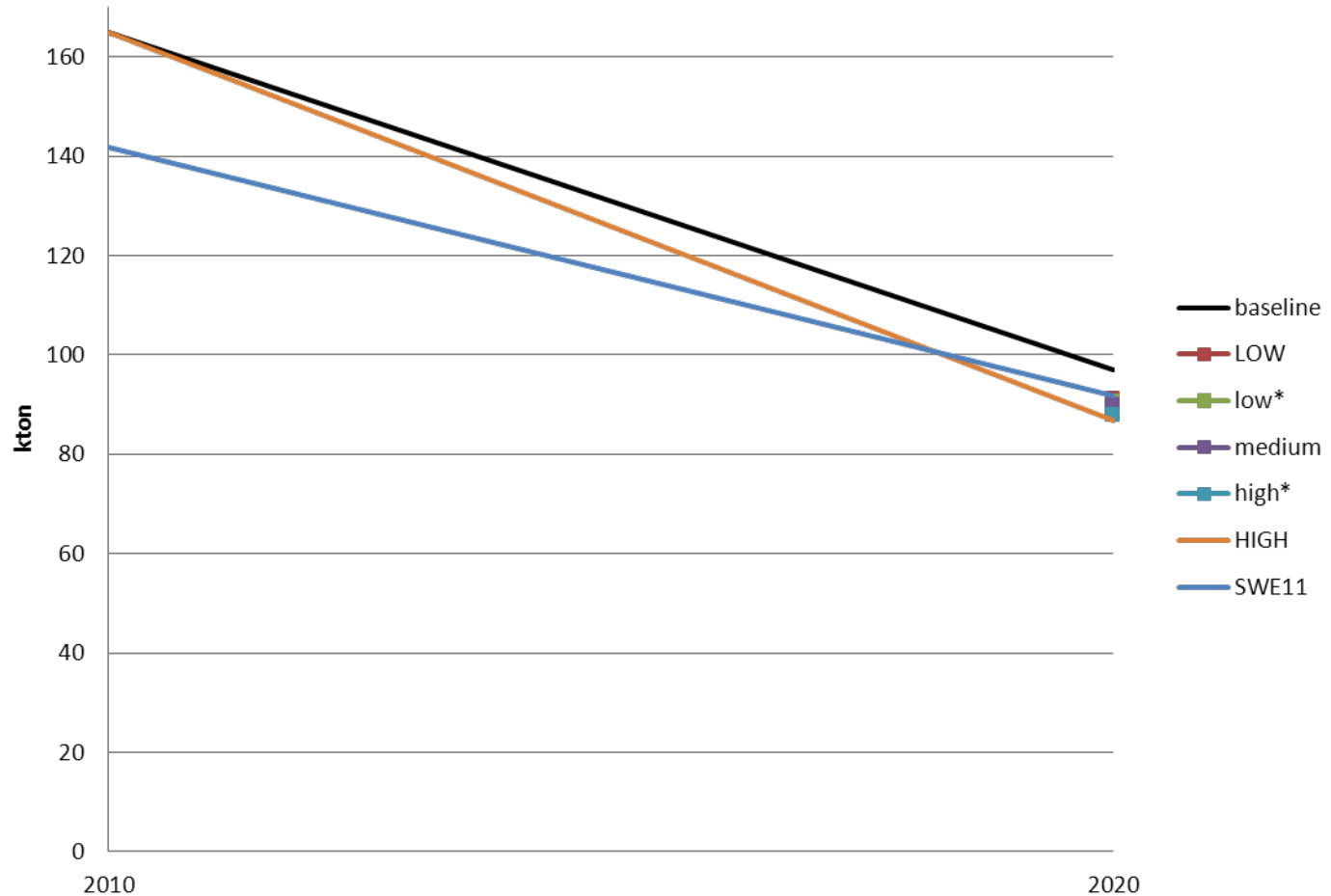


## SO<sub>2</sub> emissions Sweden - scenario comparison



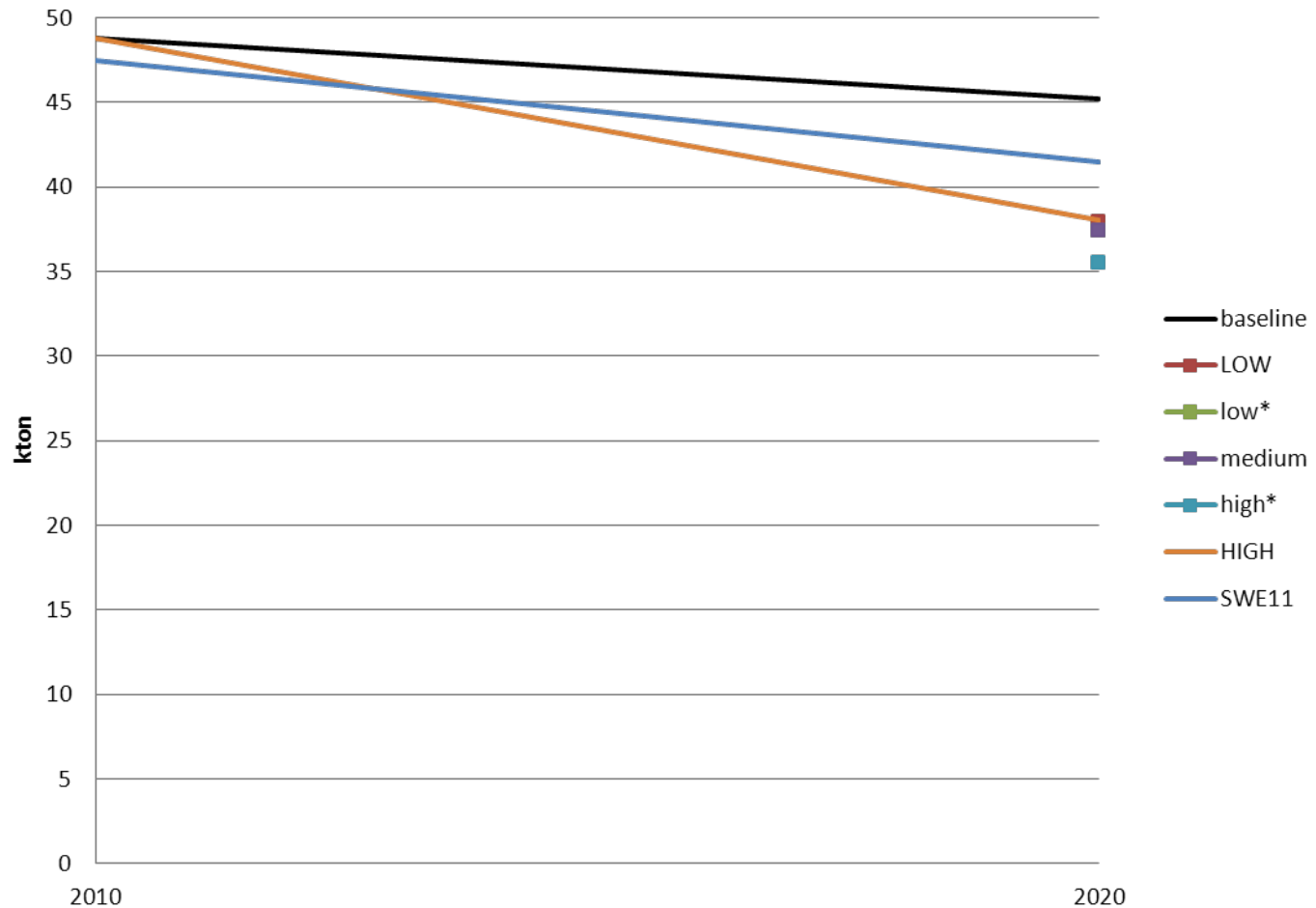
For SO<sub>2</sub>, NO CIAM scenario is more ambitious than SWE11

## NO<sub>x</sub> emissions Sweden - scenario comparison



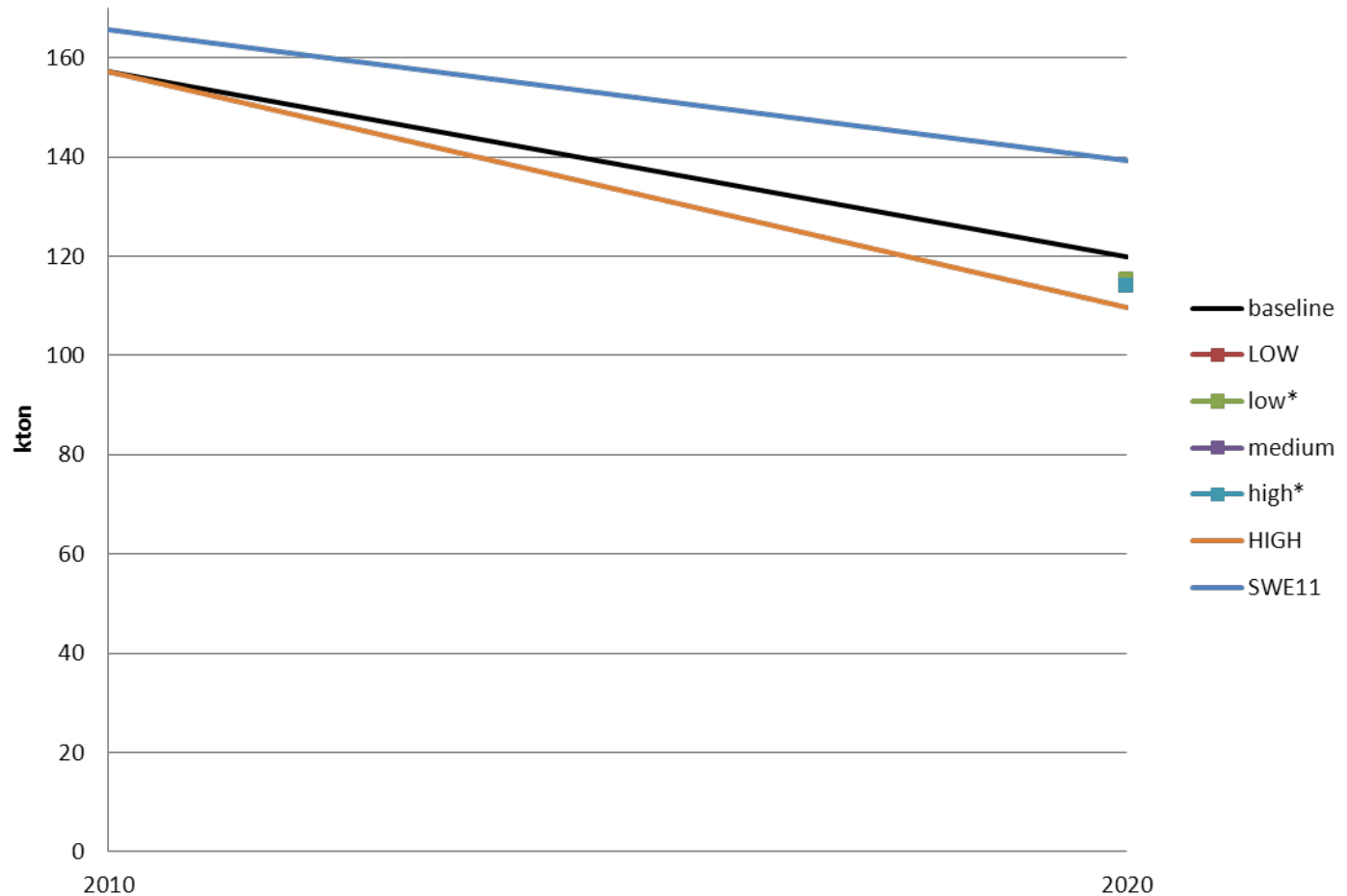
For NO<sub>x</sub>, ALL CIAM ambition scenarios are more ambitious than SWE11

## NH<sub>3</sub> emissions Sweden - scenario comparison



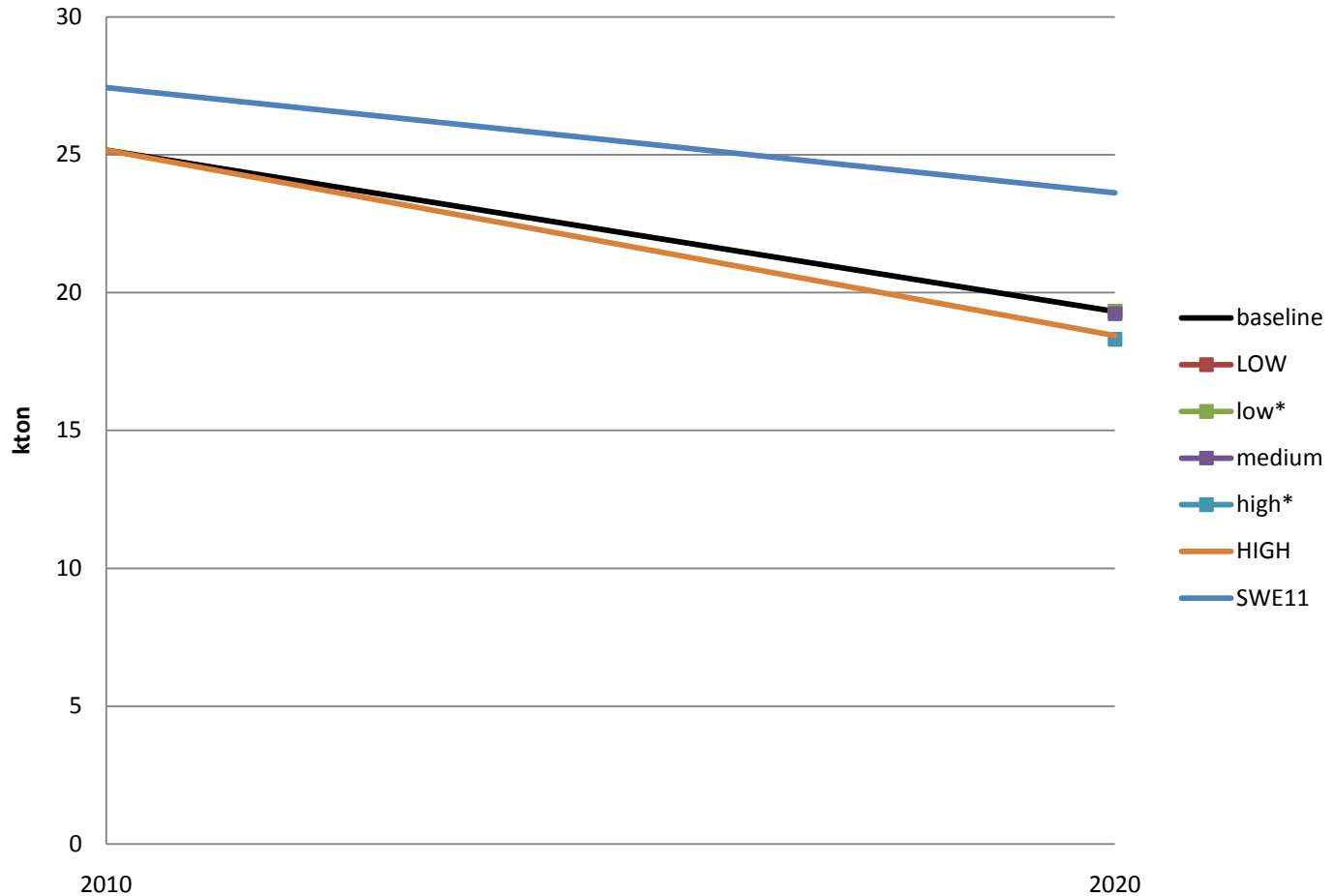
For NH<sub>3</sub>, ALL CIAM ambition scenarios are more ambitious than SWE11

## VOC emissions Sweden - scenario comparison



For VOC, ALL CIAM scenarios are more ambitious than SWE11

## PM<sub>2.5</sub> emissions Sweden - scenario comparison



For PM<sub>2.5</sub>, ALL CIAM scenarios are more ambitious than SWE11

# Sweden

## SWE11 distance to CIAM targets in 2020?

	SO2	NOx	NH3	PM2.5	VOC	
<b>baseline</b>	-4	-6	-9	18	14	%
<b>LOW</b>	0	1	9	18	18	%
<b>low*</b>	-4	1	10	18	17	%
<b>medium</b>	-2	2	10	19	18	%
<b>high*</b>	-4	4	14	23	18	%
<b>HIGH</b>	-4	5	8	22	21	%

# Comments to the ambition targets

- Sweden should have no problems with the ambition levels for SO<sub>2</sub> in 2020
- Sweden was close to missing the NO<sub>x</sub> target for 2010. But a 5% reduction (HIGH) in 2020 should be feasible for NO<sub>x</sub>.
- For NH<sub>3</sub>, all CIAM scenarios will imply further efforts for Sweden in 2020
- The difference between SWE11 and CIAM PM<sub>2.5</sub> and VOC emissions motivates the initiation of a discussion on which emission reporting system that should be used in future compliance checks.
  - Differences are found both in energy projections, as well as emission factors
  - Technologies for emission reductions needs to be identified (VOC)

## Euro VI 'concept engine' is here

- EGR + Common Rail + SCR + turbo + particle filter
- 0,4 g NO<sub>x</sub> / kWh
- 0,01 PM / kWh
- No fuel penalty in vehicle
- "The cost is an issue for the marketing department"



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**Thank you**