AGENZIA NAZIONALE
PER LE NUOVE TECNOLOGIE, L'ENERGIA
E LO SVILUPPO ECONOMICO SOSTENIBILE

# Analysis of the attainability of ambition targets based on national data

## ITALY COMMENTS

*D'Elia Ilaria*

40th TFIAM meeting – OSLO 18-20 may 2011

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# INDEX

1. Comparison between emission scenarios based on PRIMES and on national data
2. Reasons of discrepancies: the ENERGY SCENARIO ANALYSIS
3. Consequences on emissions and cost analysis
4. Conclusions

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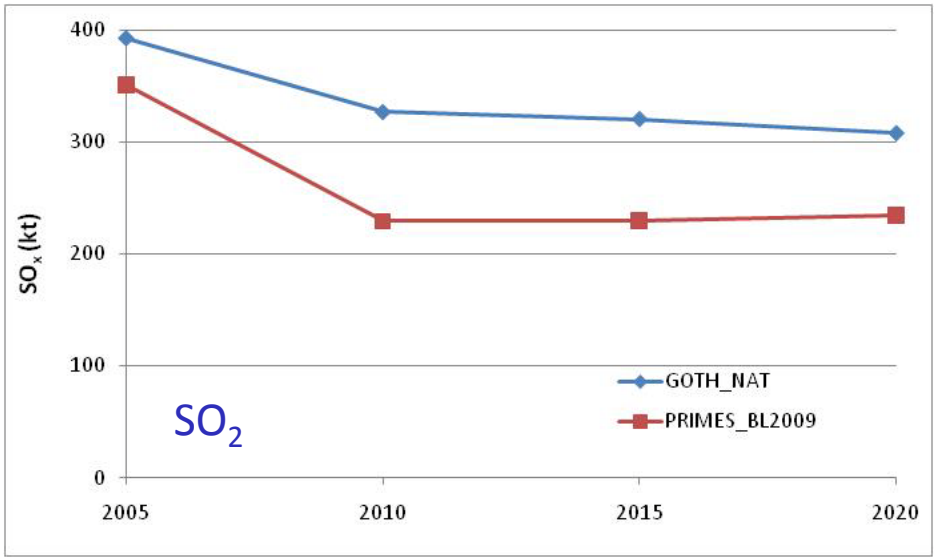
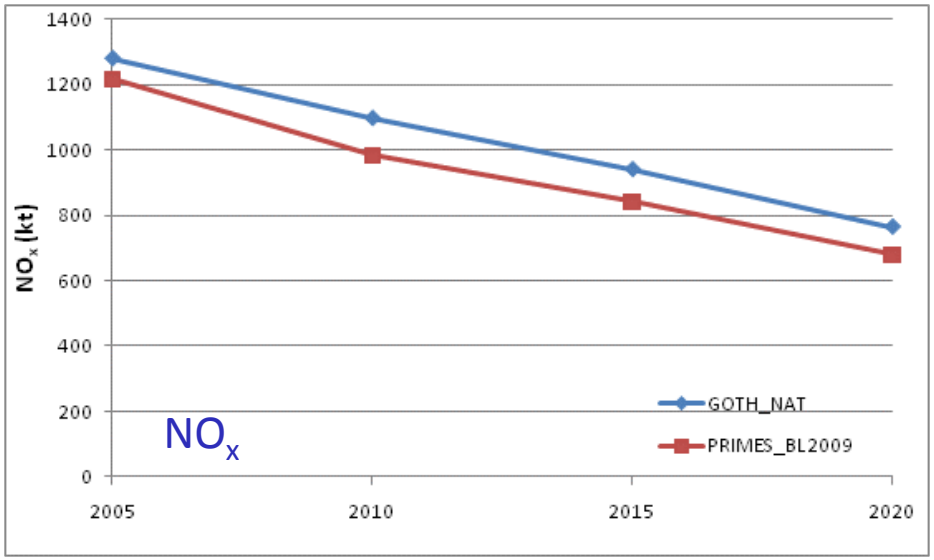
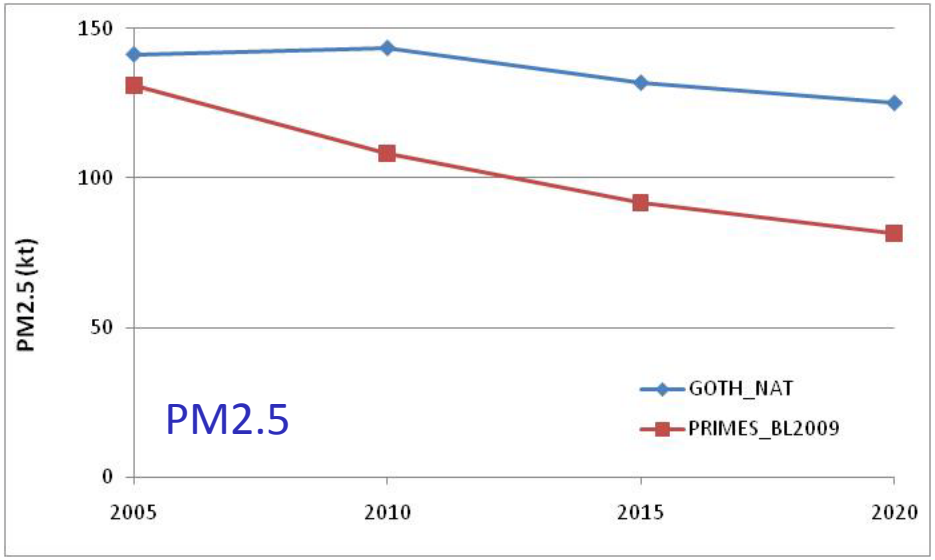
# Comparison between GOTH_NAT_baseline_rev1 and GOTH_PRIMES_BL2009_baseline_rev1 emission scenario




Baseline emission scenarios based on PRIMES for $SO_2$, $NO_x$ and PM2.5 **UNDERESTIMATE** baseline emission scenario with national data

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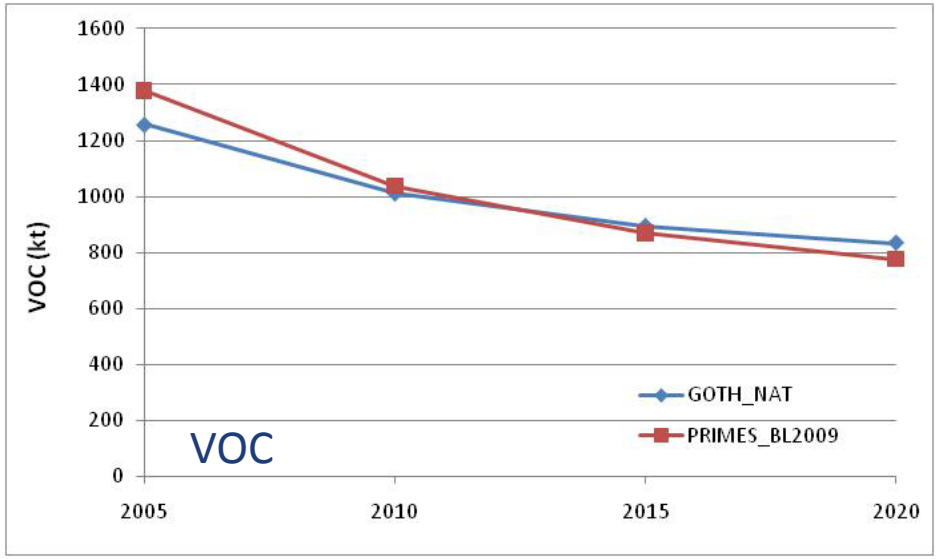


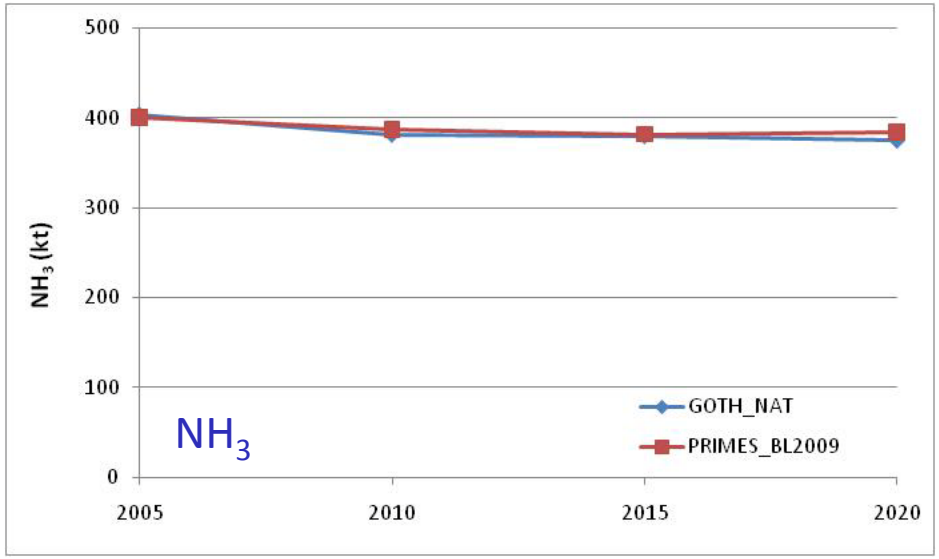


VOC and $NH_3$ total emissions in both baseline scenarios are similar

# Comparison between GOTH_NAT and GOTH_PRIMES_BL2009 emission scenario

*… looking at 2020*

| YEAR 2020 | GOTH_NAT | GOTH_PRIMESBL2009 | | | | | |
|---|---|---|---|---|---|---|---|
| | Baseline | Baseline | LOW | Low* | Mid | High* | HIGH | MTFR |
| SO2 (kt) | 308 | 234 | 234 | 234 | 234 | 160 | 171 | 117 |
| NOx (kt) | 763 | 679 | 644 | 644 | 617 | 603 | 561 | 548 |
| PM2.5 (kt) | 125 | 81 | 77 | 77 | 75 | 70 | 71 | 61 |
| NH3 (kt) | 375 | 384 | 346 | 298 | 286 | 252 | 269 | 224 |
| VOC(kt) | 833 | 777 | 757 | 758 | 748 | 737 | 710 | 622 |

Discrepancies in the baseline emission scenarios lead to a different emission starting point at 2020 with important consequences in the consequent emission values of the 5 ambition level scenarios

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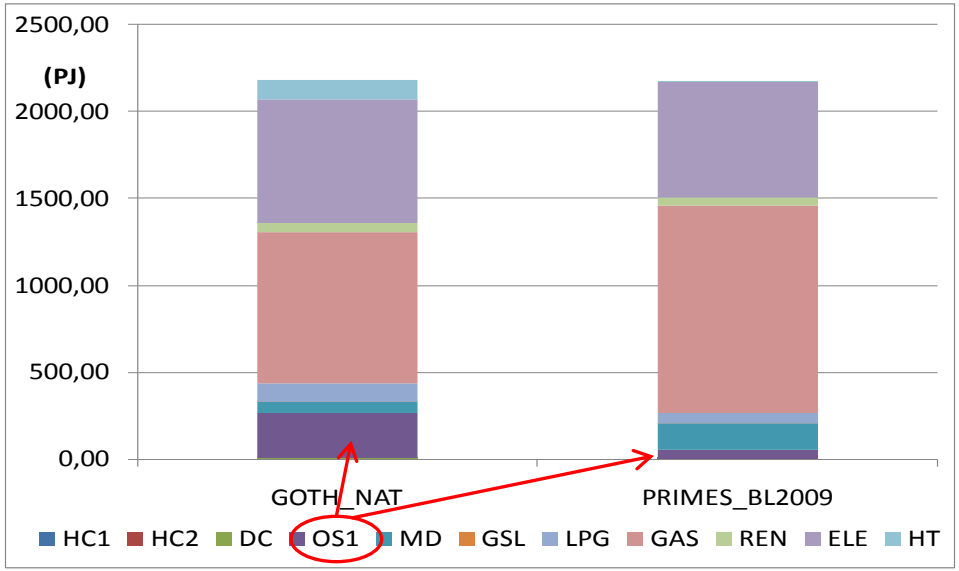
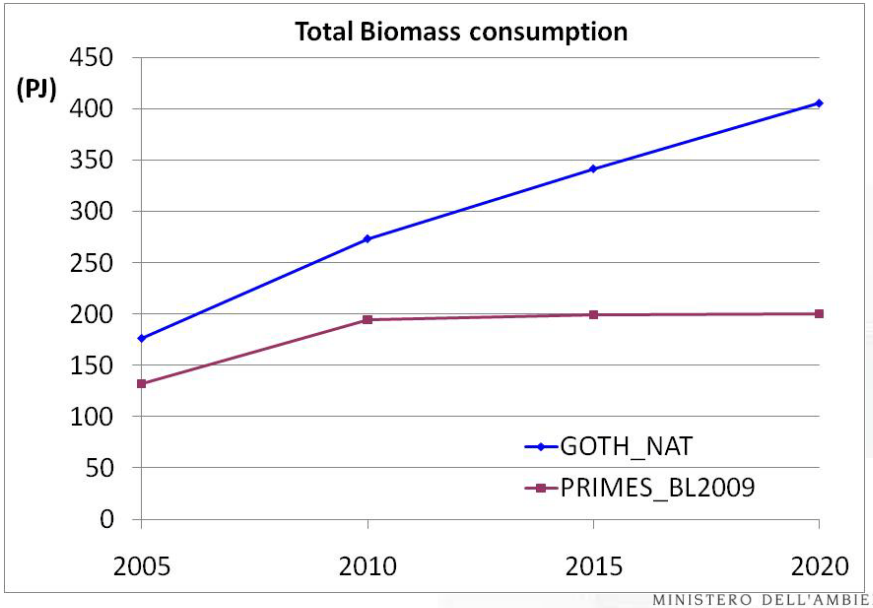
# Reasons for discrepancies: the ENERGY SCENARIO ANALYSIS by sector

## DOMESTIC SECTOR AT 2020




-TOTAL domestic fuel consumption is the same in both energy scenarios;
- fuel type contribution is completely different;
- in the national projections, biomass consumption in the domestic sector is almost 5 times the biomass consumption in PRIMES (a difference of 200 PJ circa)

- TOTAL biomass estimation in PRIMES NOT RELIABLE because only marketed biomass is considered and it is kept constant from 2010 on
- TOTAL NATIONAL BIOMASS at 2020 double than PRIMES




**HUGE CONSEQUENCES especially on PM2.5 and VOC emissions**

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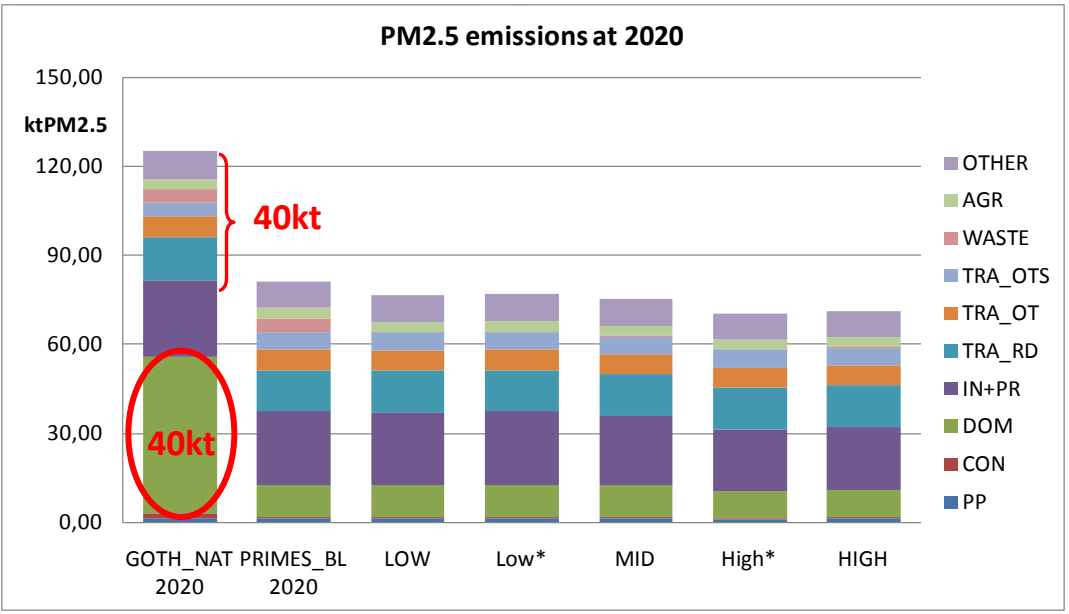
# Differences in PM2.5 at 2020



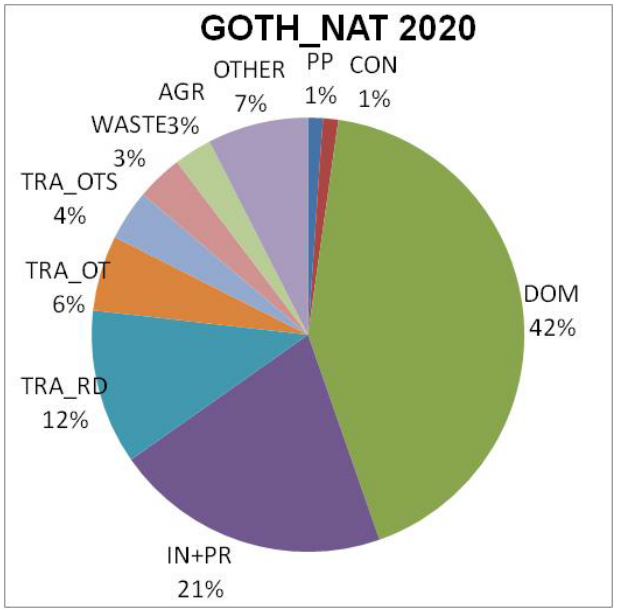

The underestimation of biomass consumption in the DOM sector in PRIMES energy scenario leads to a difference of PM2.5 emissions in the DOM sector of 40 kt circa

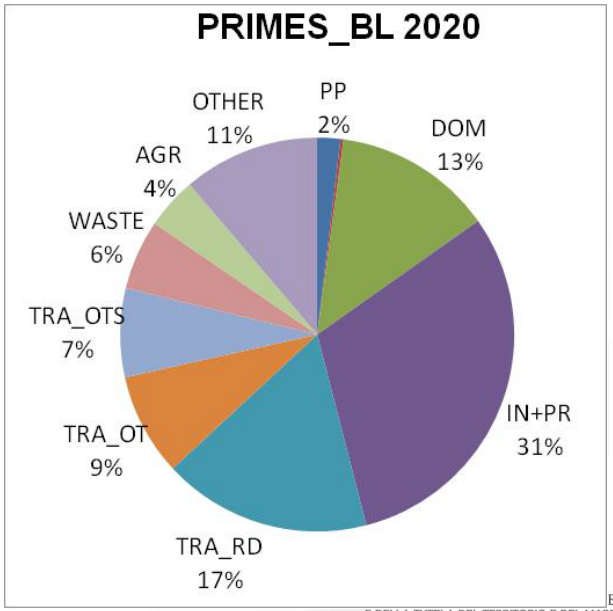
The difference of TOTAL PM2.5 emissions is entirely ascribable to the DOM sector

In GOTH_NAT scenario DOM sector is the main PM2.5 emission sector (41% vs 13% in PRIMES) while in PRIMES is IN+PR

**Influences on cost analysis**:

- MEASURES in DOM only from High*
- MEASURES IN WASTE_AGR and PR

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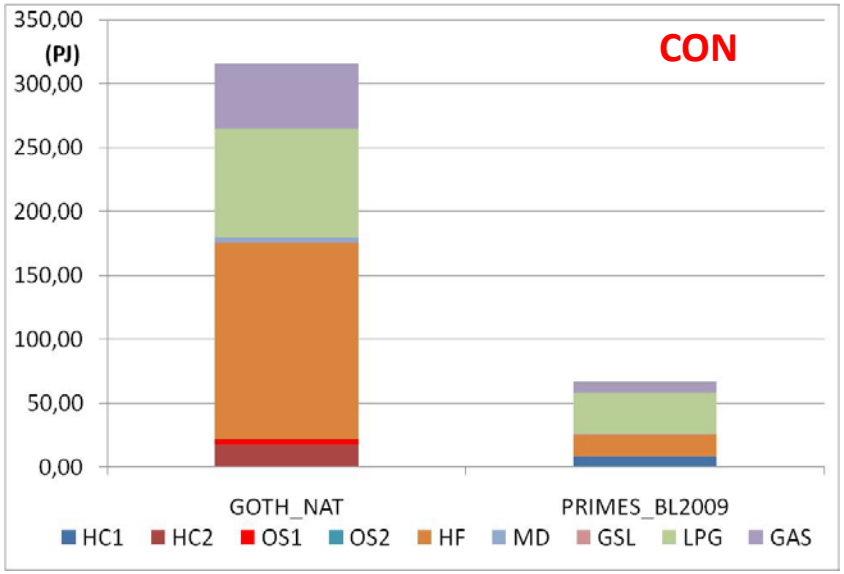
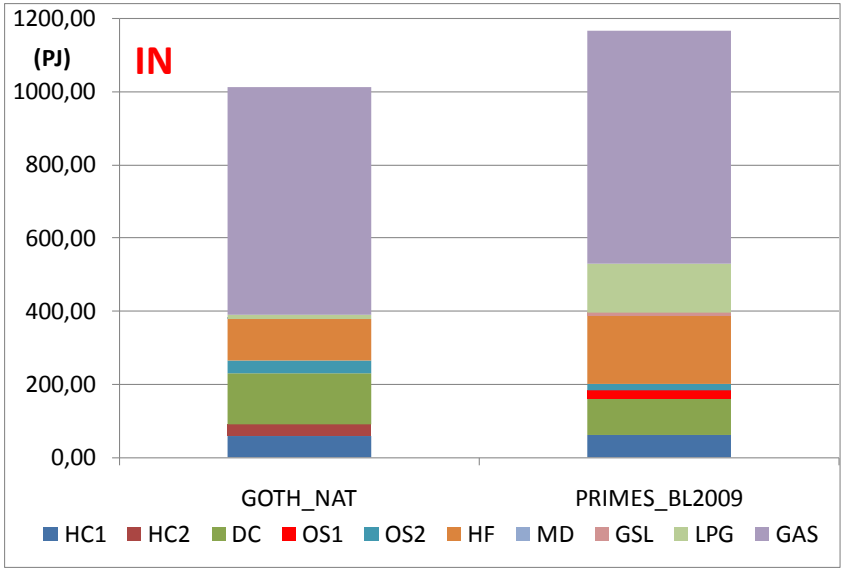
# Reasons for discrepancies: the ENERGY SCENARIO ANALYSIS

## CONVERSION and INDUSTRIAL SECTOR AT 2020




**CONVERSION SECTOR** at 2020

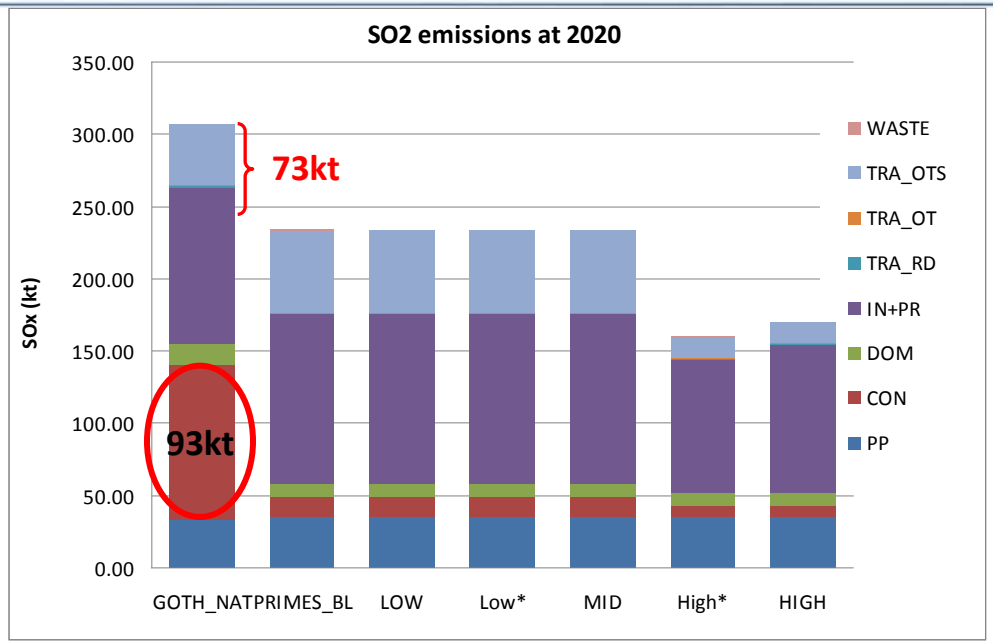
PRIMES energy scenario respect to the GOTH_NAT scenario:

- HF extremely low (-140 PJ);
- No carbon consumption
- underestimation of LPG and GAS (-52 PJ and – 42PJ respectively)
- probably fuel compensation with industrial sector

PRIMES also largely overestimates the non-energy use of heavy fuel oil.

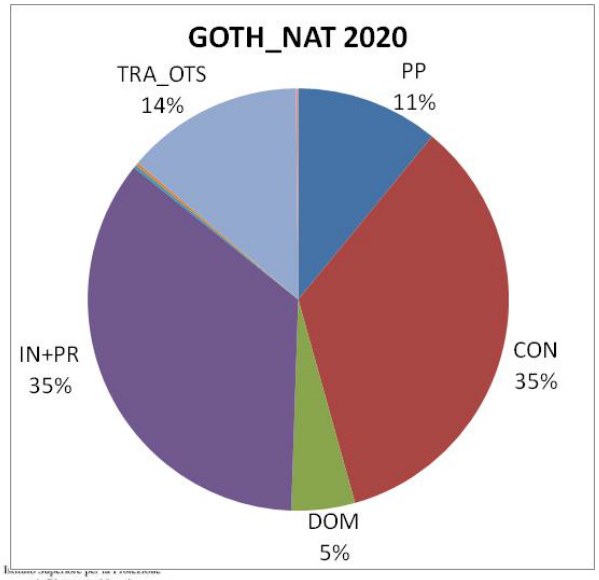
**IMPORTANT CONSEQUENCES on $SO_2$ and $NO_x$ emissions**

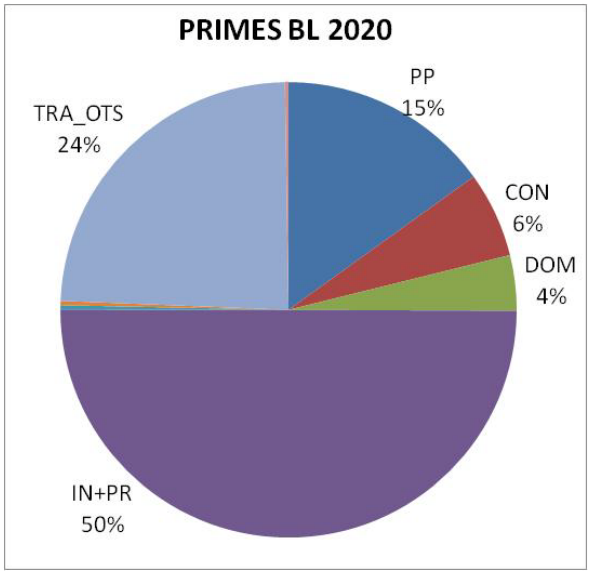
# Differences in SO2 at 2020




The PRIMES underestimation of heavy fuel consumption in the CON sector leads to a difference of $SO_2$ emissions in the CON sector of 93 kt and a TOTAL DIFFERENCE of 73 kt

In PRIMES the most polluting sector is the industrial sector (51%) and the conversion sector weights for only the 6%



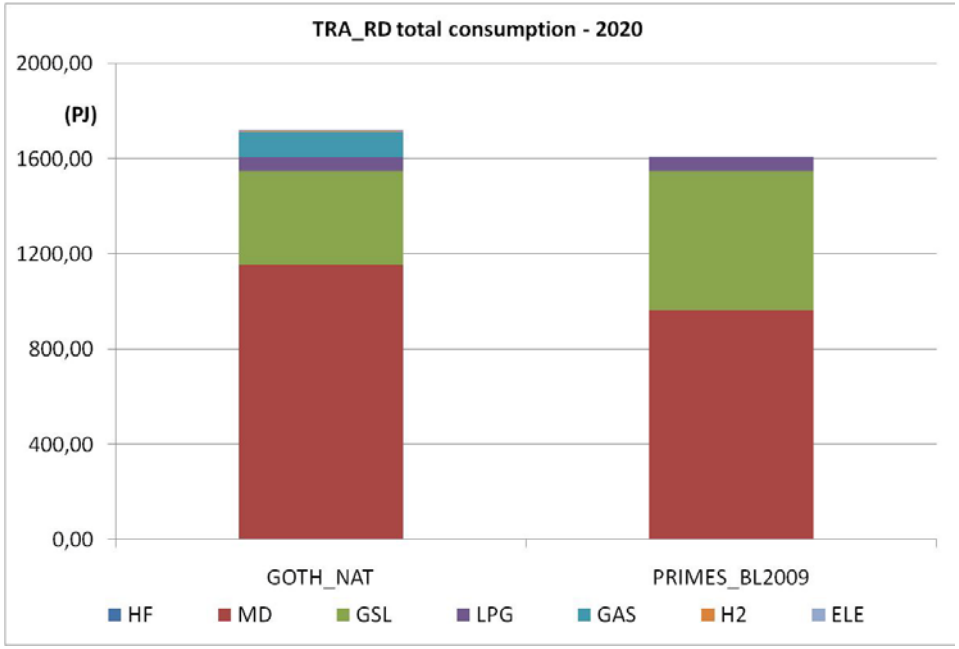

In the GOTH_NAT scenario CON is one of the most polluting sector (35% like the industrial sector)

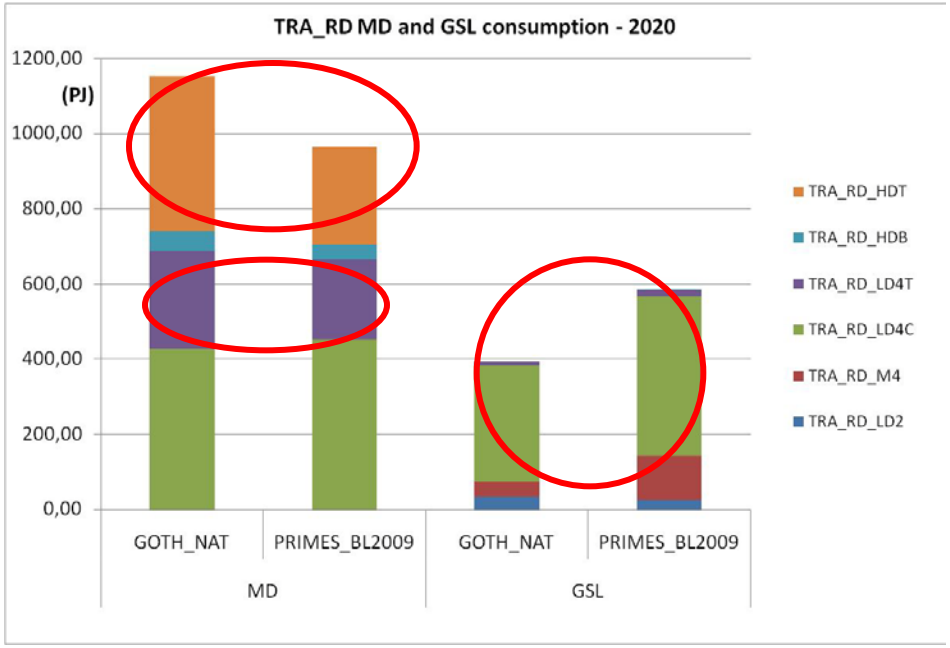
**Influences on cost analysis**:

- MEASURES in CON only from High*
- Main measures in the INDUSTRIAL SECTOR

# Reasons for discrepancies: the ENERGY SCENARIO ANALYSIS

## ROAD TRANSPORT SECTOR AT 2020




- TOTAL ROAD TRASPORT fuel consumption is the same
- gasoline and gas oil allocation is completely different
- MD in heavy duty vehicles and light commercial trucks is underestimated in PRIMES
- A considerable difference in gasoline projections for cars and 4T motorcycles

This means a lower freight transport and higher private mobility in PRIMES, NOT REALIABLE for the structure of Italian transport demand

# INDEX



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# CONCLUSIONS

✓ The emission scenarios for $SO_2$, $NO_x$ and PM2.5 based on PRIMES energy scenario underestimate emissions based on national data

✓Main discrepancies regard the energy scenario

✓ PRIMES energy scenario heavily underestimates DOMESTIC biomass consumption causing at 2020 an underestimation of at least 35% of TOTAL PM2.5 emissions

✓ PRIMES underestimates fuel consumption in the CONVERSION sector at 2020 with a consequence underestimation of TOTAL SO2 emissions of 24%

✓ The structure of Italian transport demand is NOT REALIABLE in PRIMES

✓These discrepancies lead to a different emission starting point at 2020 and influence the whole ambition level analysis

✓ The cost analysis based on PRIMES energy data do not consider measures in the most polluting sectors according to emission scenarios from national energy data