13th UIC Sustainability Conference

VIENNA 2016

SNCF

Total pollutant emissions of Diesel traction

Workshop “Emissions and Air Quality”

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12, 13, 14 October 2016

METHOD Step 1

ENGINES' MEASUREMENTS ON A RIG

- CO
- HC
- NOx
- PM

g/kWh

- Consumption | litre/kWh

According to:
- Directive 97/68/EC & 2011/88/EU
- UIC 624
- ISO 8178-4 (representative cycles: F & C1)
- EN 590 (fuel characteristics)

30 types of engines

ROLLING STOCK'S EMISSIONS

- gCO / litre
- gHC / litre
- gNOx / litre
- gPM / litre

20 series of train

ROLLING STOCK'S DATA BASE

- Numbers and types of engines / train number

METHOD Step 2

ROLLING STOCK'S CONSUMPTION

- litre / km

350 000 refuelling / year
3400 different trains
(190.000 m³ / year)

40 000 data (monthly distances) / year
(130.000.000 km / year)

CONSUMPTIONS' DATA BASE

- Litre / train number

Taking into account:
- Daily traffic hazards,
- Driving style,
- Route profile,
- Energy used while not in traffic (parked train, maintenance and servicing moves),
- Daily and seasonal climatic variations…

ROUTES' DATA BASE

- km / train number

METHOD Step 3

Rolling stock's emissions

- gCO / litre
- gHC / litre
- gNOx / litre
- gPM / litre

Rolling stock's consumption

- litre / km

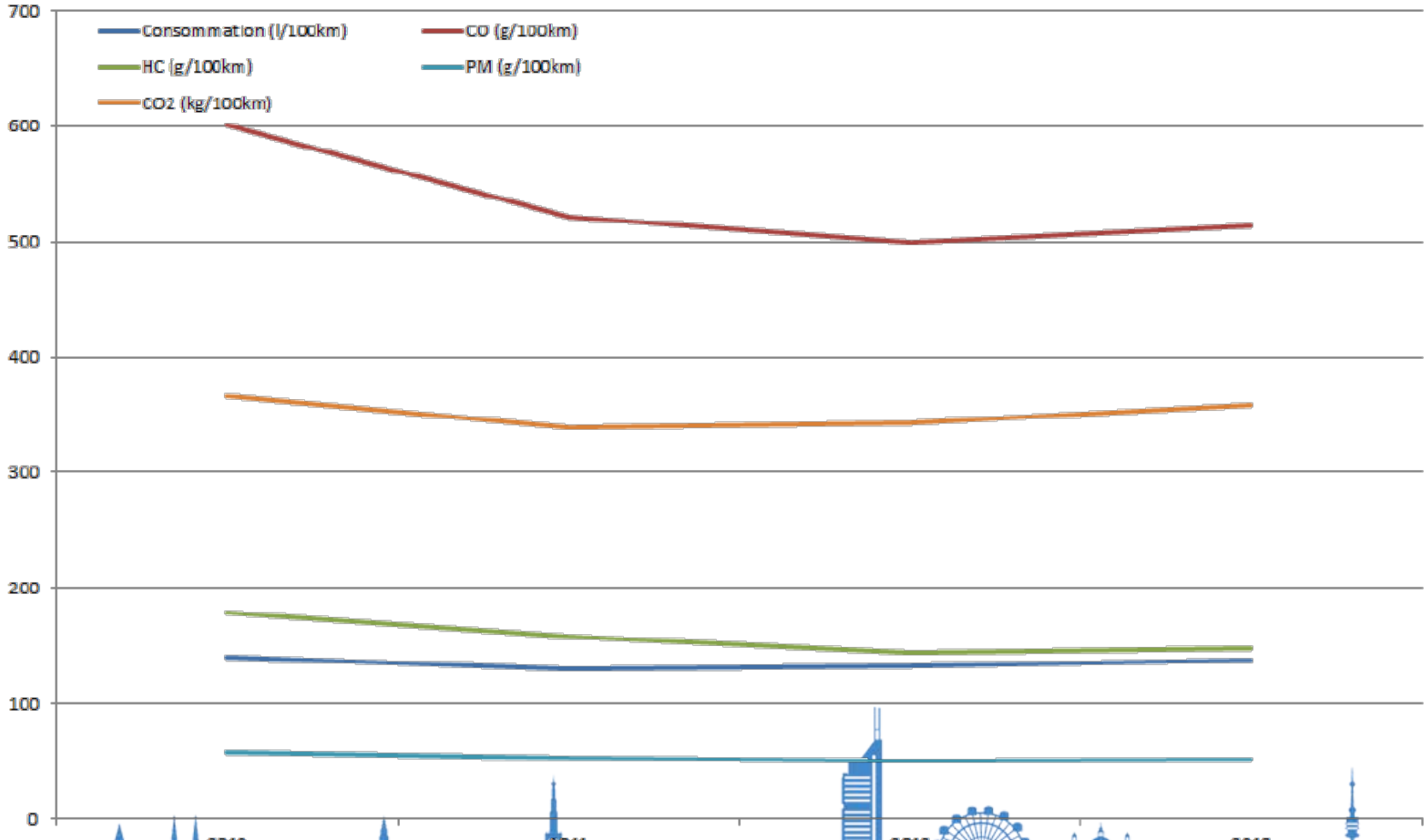
Rolling stock's emissions & consumptions

- gCO / km
- gHC / km
- gNOx / km
- gPM / km
- litre / km

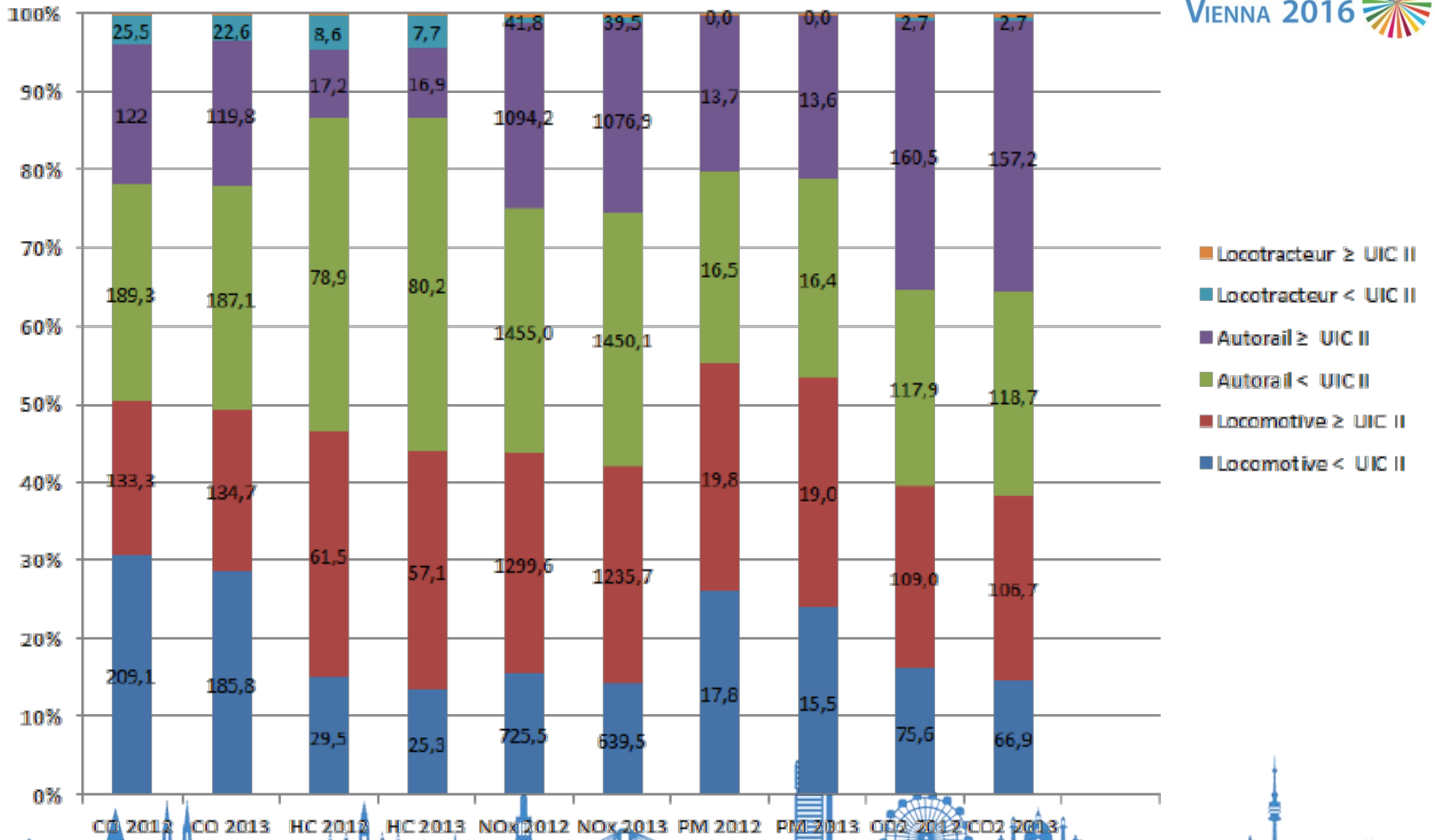
Communication

- Information to promote railway

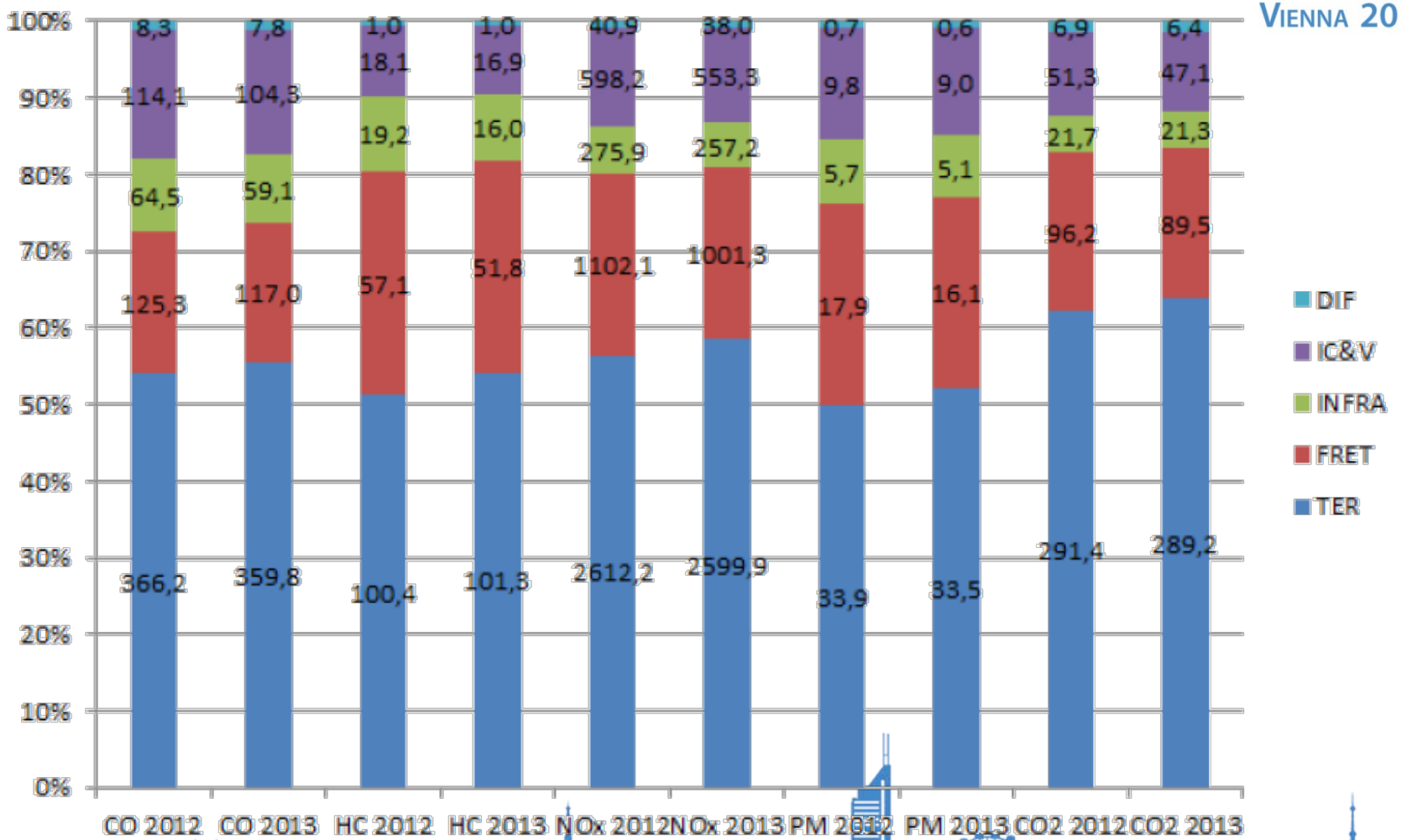
RESULTS per years



RESULTS per regulations



RESULTS per Activities



ESTIMATIONS FOR 2021

- Hypothesis
  - Traffic evolution (km) : constant
  - Rolling stock evolution
    - Some new trains with lower emissions for regional activity
    - Partial refurbishment of old trains with new engines
  - New technologies : too short time to have an effect on emissions
    - Maintenance trains with lowering emissions device
    - Partial refurbishment of old trains with stop & start technology

ESTIMATIONS FOR 2021

- Results

	2013	2021	2021/2013
CO (t)	624	492	-21%
HC (t)	178	136	-24%
NOx (t)	4 378	3 558	-19%
PM (t)	64	50	-22%
CO2 (kt)	447 736	459 539	2,6%

CONTACT

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