



SUSTAINABLE VEHICLES AND FUEL DEVELOPMENTS IN ROTTERDAM AND THE REGION

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Co-funded by the Intelligent Energy Europe
Programme of the European Union

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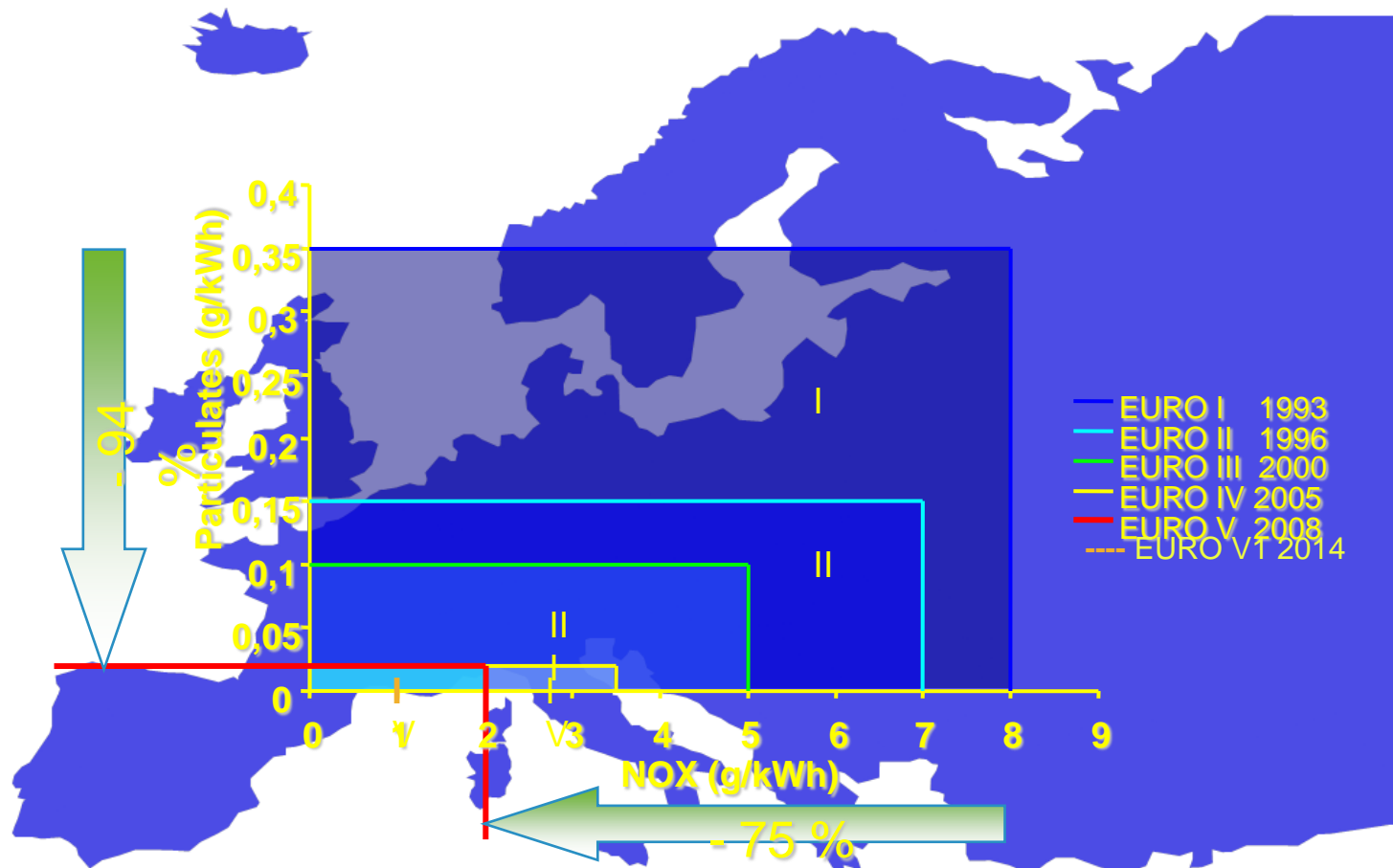
Roteb Lease purchases, manages, maintains and repairs a wide range of specialist vehicles and equipment (est. 5000 units)

- » Garbage trucks
- » Sweeping Machines
- » Sewing vehicles
- » Sky workers
- » Container vehicles
- » Ambulances
- » Firefighting vehicles
- » Trucks up to 3500 kg





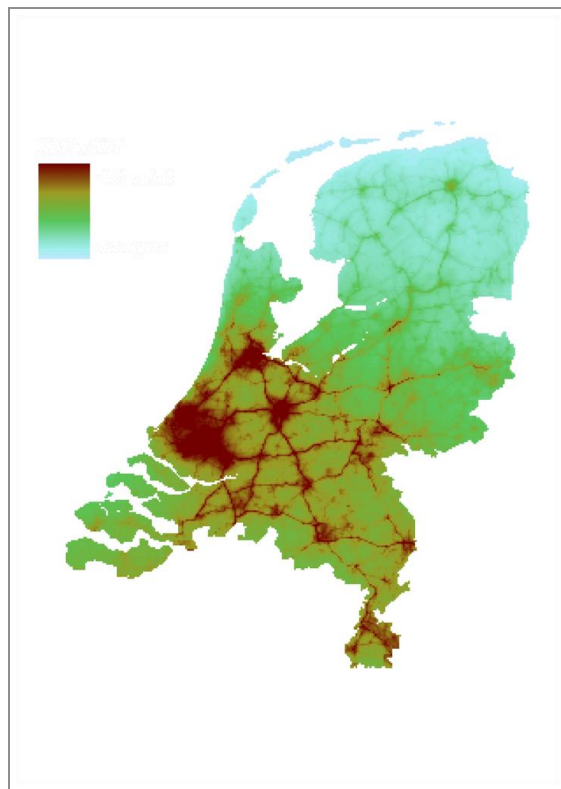
Emissions in EU



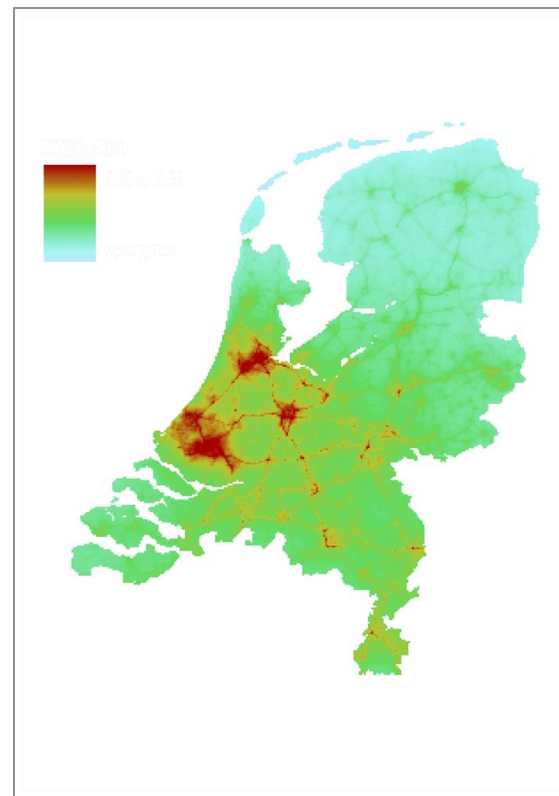


Our area, one of the most polluted areas of The Netherlands
Lots of traffic, industry and one of the biggest ports worldwide

2007



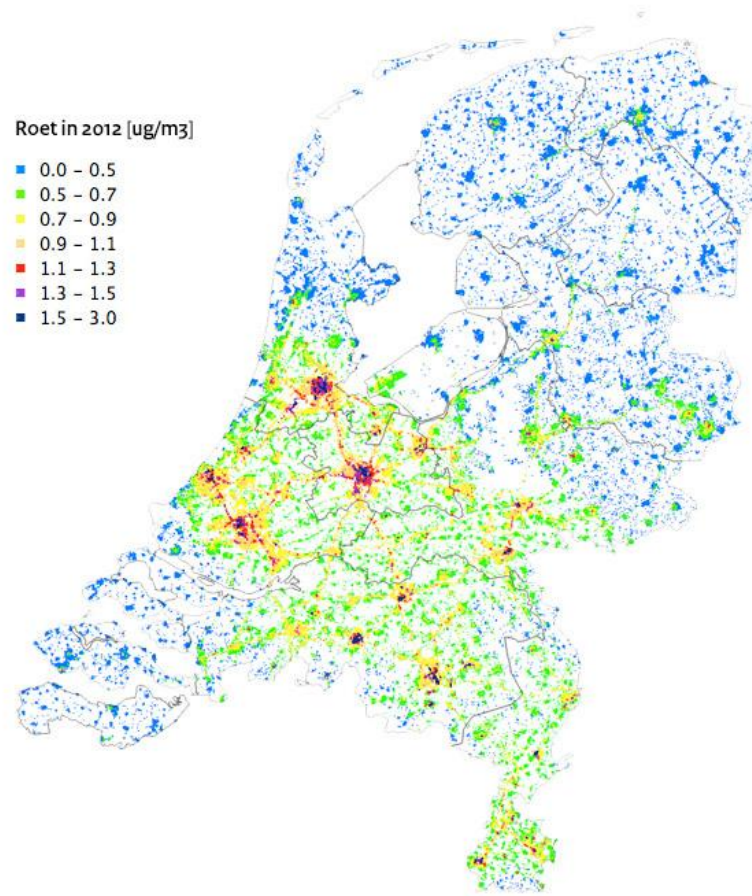
2012



NOX



Particles (PM)





Clinton Climate Initiative



Target Rotterdam and region

- **50% CO₂ reduction in 2025 compared to 1990**
- **Sustainable reduction NOX en PM10 (RAL)**
- **25% municipal vehicles (1500 units) elektrik/hybrid 2014**



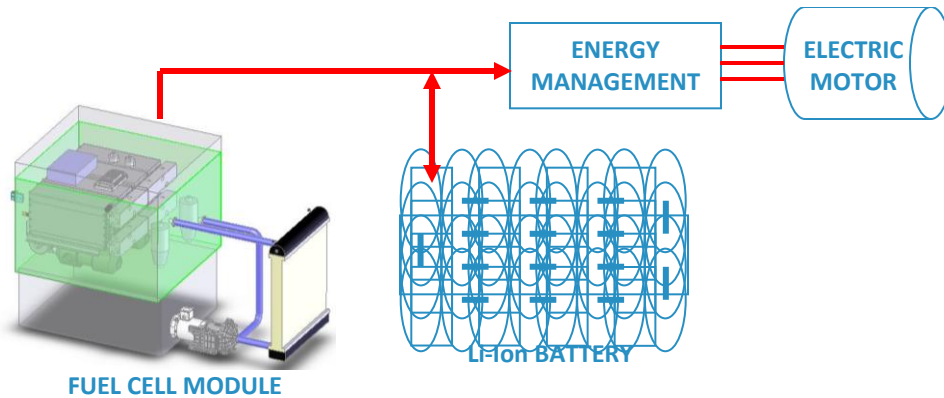
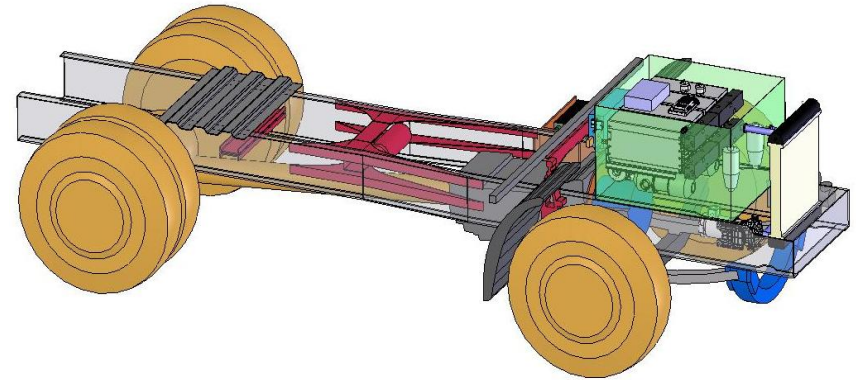
Hybrid technology

Not only for Luxury cars but also for Trucks

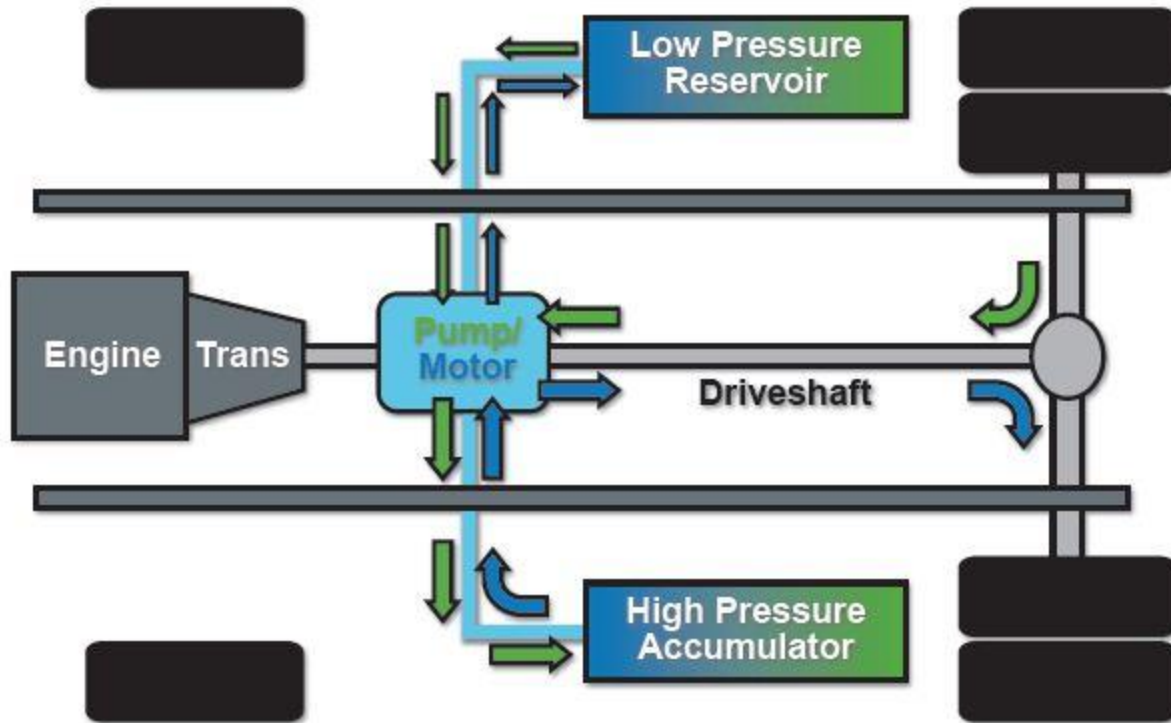




Fuel cell



Hydraulic accumulation





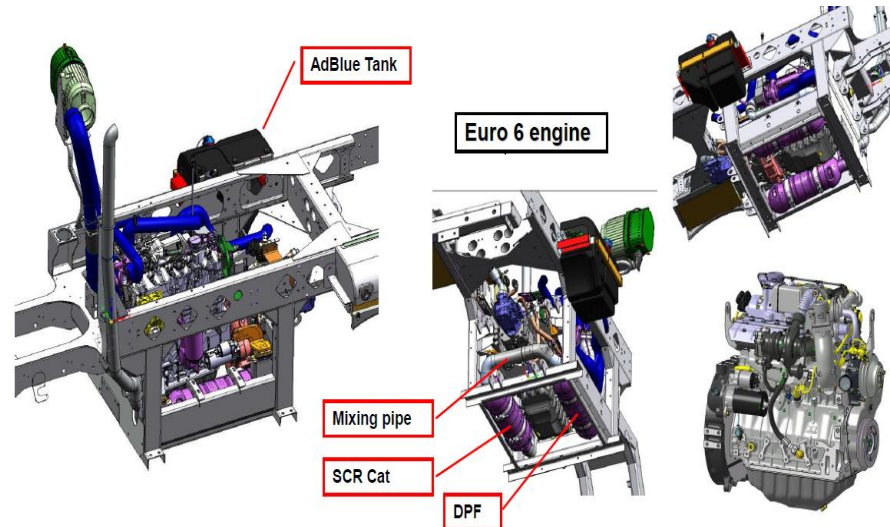
Electric





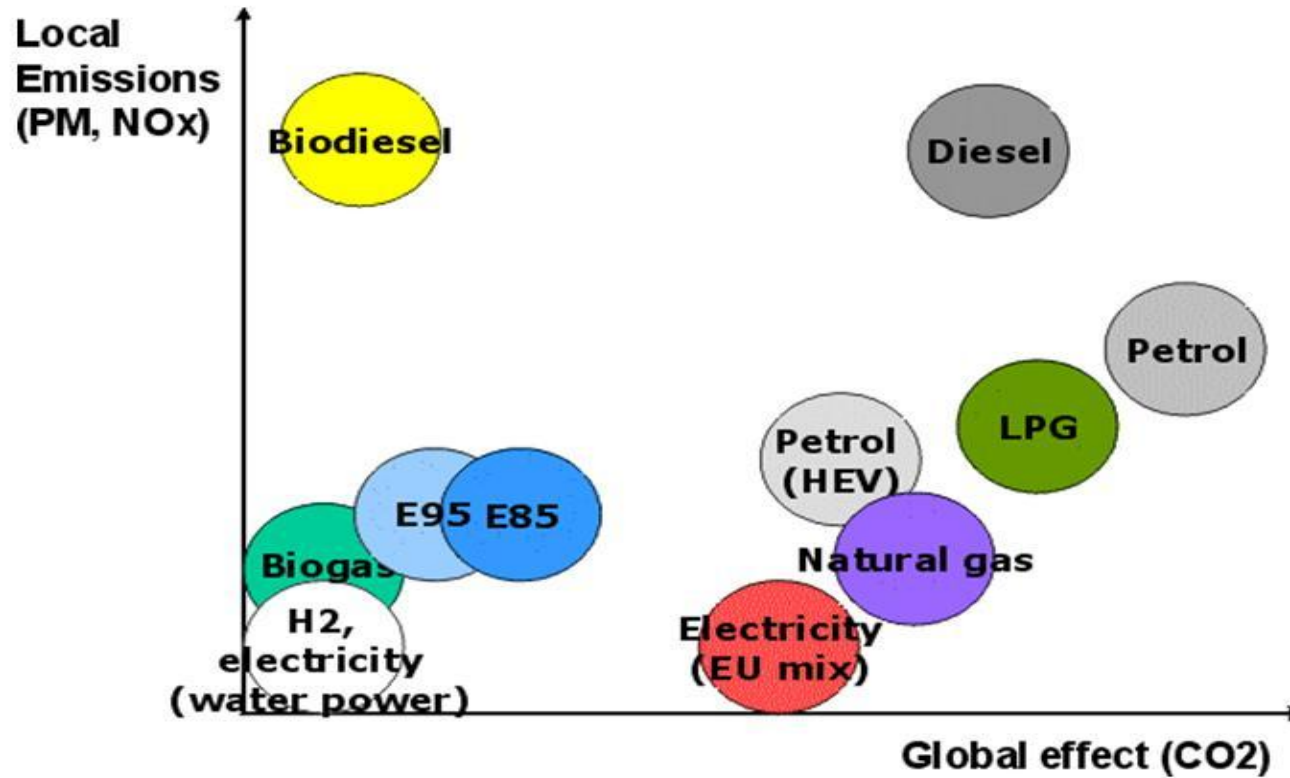
Euro 6 for compact sweepers

- CNG/LNG : problem dimensions/weight
- Plug in Hybrid : energyrecovery (braking) too low
- Euro 4 industrial engines allowed
- This sweeper Euro 6 combined with GTL





Fuels





Fuel Developments

- Gas (CNG/LNG/LPG/**GTL**)
- B30 Biodiesel for trucks and lorries
- Bio-ethanol E85 (flexifuel vehicles)

Issues to solve;

- Tank infrastructure
- Vehicle adjustments retrofit/OEM
- Fuelspecifications / stability
- Warranty-issues
- Price related to consumption





Advantage for use GTL

- Reduction NOX (15%) and PM10 (50%)
- In any blending with normal diesel useable
- No vehicle-adjustments necessary
- Useable in existing tank infrastructure
- No extra truck maintenance needed
- Reduced noise (approx.)-3dba
- Possible argument for Euro 0-4 to enter low emission zone



Issues to consider

- OEM warranty
- Effects on Euro 6 engines
- Monitoring emissions (also CO2 effect)
- Comparable prices to standard diesel fuels





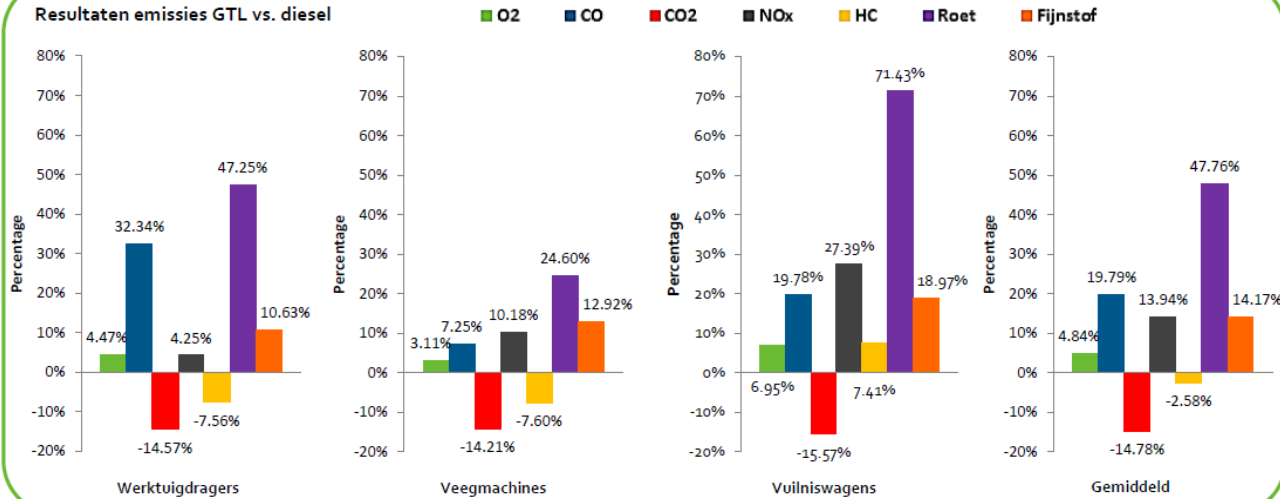
GTL tested on emission reduction

Klik op Opmerking en Delen om PDF-bestanden te maken, te markeren en te verzenden.

WEL Mobiliteit*

LM Tracks
Sweepers
Garbage trucks

Resultaten emissies GTL vs. diesel



Aanbevelingen

- Vanuit het perspectief luchtkwaliteit wordt het gebruik van Shell GTL Fuel aanbevolen;
- Met oog op het broeikas effect wordt het gebruik van Shell GTL Fuel niet aanbevolen;
- Het gemiddelde geluidsniveau bij gebruik van Shell GTL Fuel daalt en wordt om deze reden aanbevolen;
- De financiële aanbeveling is negatief;
- Het wordt aanbevolen de toekomstige beschikbaarheid en hoeveelheid van Shell GTL Fuel te waarborgen bij verdere investeringen;
- WEL Mobiliteit raadt aan om aanvullend technisch onderzoek omtrent interne motoronderdelen uit te voeren.



‘CLEANING THE FLEETS’ OF LOCAL AUTHORITIES

- Implementation Clean Fleets
- Embedded in EV Action program Rotterdam city region
- Goal is to stimulate local authorities in city region to incorporate EV's in their fleet
- How: showing the Total Cost of Ownership of EV's is cheaper than ICE vehicles





RESULT

10% of the total fleet of municipalities in city region of Rotterdam is already EV!



✓ all municipalities show commitment for a sustainable and clean fleet



TCO
calculations are an effective way to convince municipalities about the potential of EV





Thank you for paying attention

