



Present consumption rate of fossil based fuels amounts to ~ 200 ton/s

Environmental impact:
600 ton CO₂/s

Photo: Dettifoss, Iceland

Emissions from land, sea and air (Sweden):

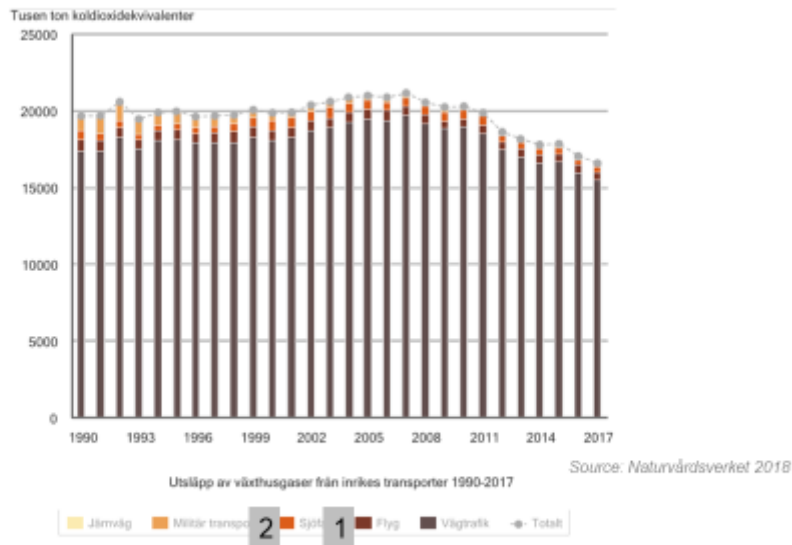
	Nox (t)	SO ₂ (t)	CO ₂ (kt)
Flight	1030 (2%)	99 (35%)	545 ¹ (3%)
Ships	3214 (7%)	68 (24%)	305 ² (2%)
Road	42775 (88%)	61 (21%)	15344 (93%)
(Trucks)	10166 (21%)	8 (3%)	3262 (20%)

Source: IVL/Naturvårdsverket 2018

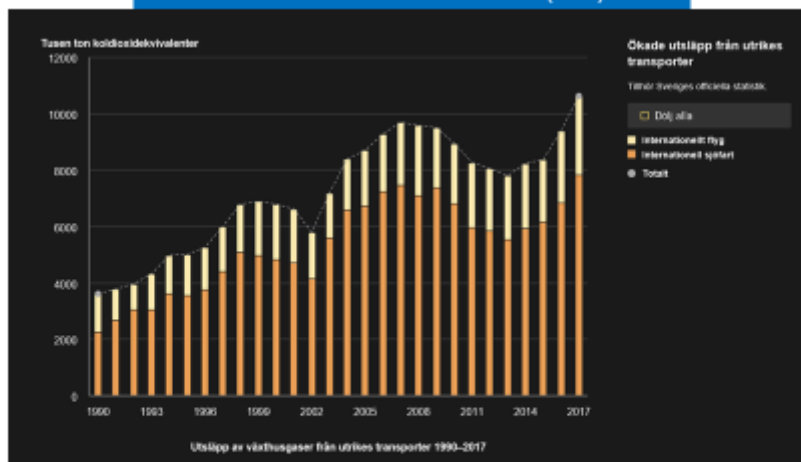


- 1) int'l 6 times higher
- 2) Int'l 60 times higher

Emissions from land, sea and air (Sweden):



Emissions from Sea and air (Int'l):



Source: Naturvårdsverket 2018

- 1 *int'l flights: 6 times higher*
- 2 *int'l shipping: 60 times higher*

Part of the Problem and part of the solution

- 20% of all CO2 from road transports
- Yet, 15% of all food in Europe
- "Public transport of goods" =efficient
- Electrification possible.

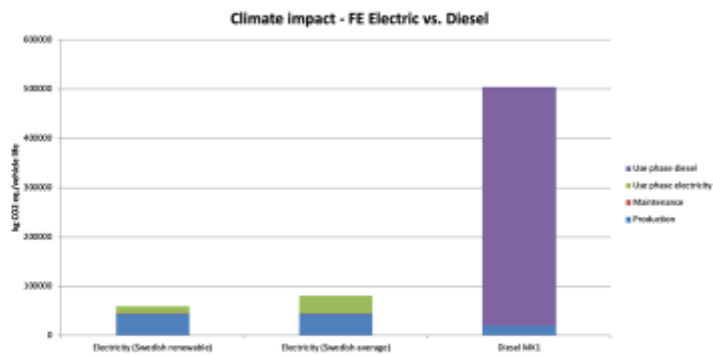


Source: COOP 2018

Volvo Group Trucks Technology

VOLVO

CO₂-Lifecycle:



Volvo Group Trucks Technology

VOLVO

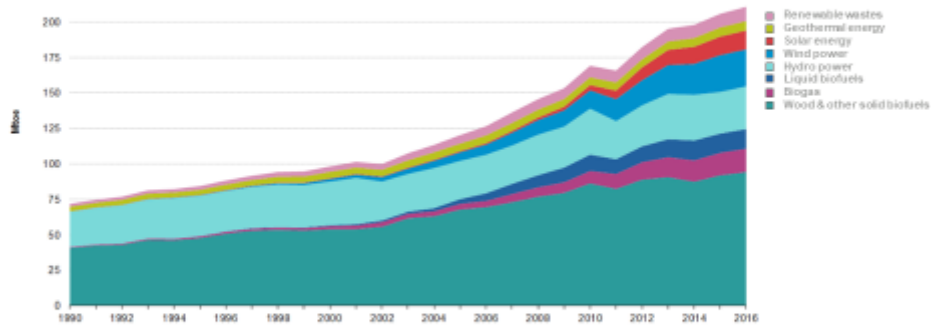
Global and city challenges

Growing population

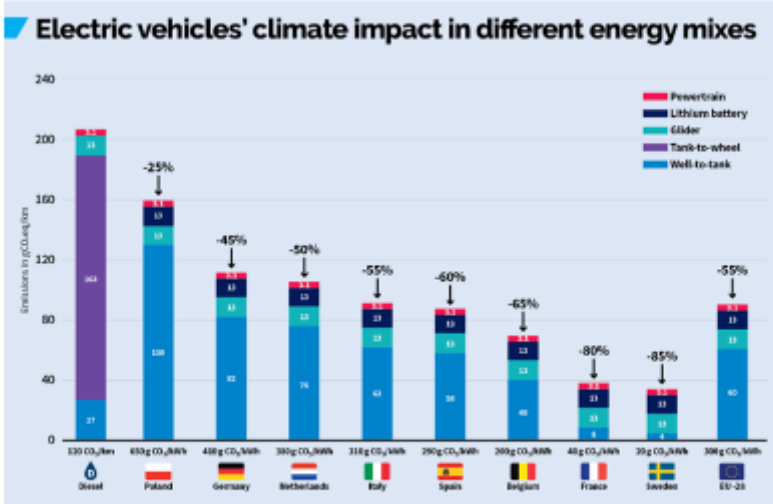
Changes in consumption

Air quality and Noise

EU Electricity production

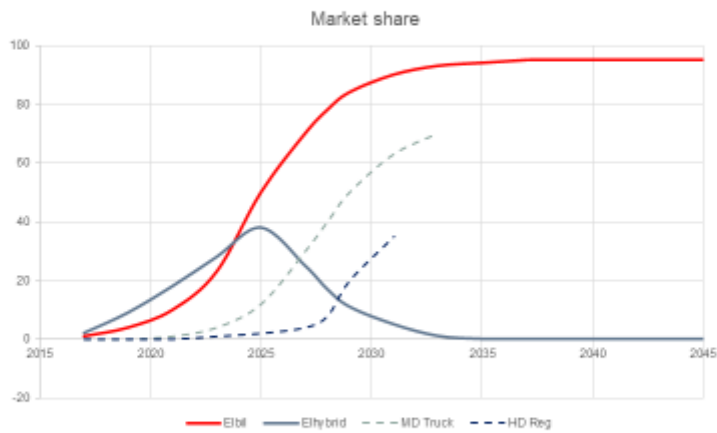


Myth: Diesel vs electric



Source: VUB University, Brussels, oct 2017

Future ?



Source: Powercircle: Etbl/target 2018

Uncertainty:



Source: Powercircle, Ebilalaget 2018.

Uncertainties and disruptive effects:

- Urban ban of diesel trucks
- Diesel price ↗
- Business models/Battery prices
- Transport companies own CO2-targets
- Life of trucks (depreciation)
- Circular economy
- Charging infrastr.
- Other technology



Charging ?

- AC at depot !
- DC at depot ?
- DC in a public location ?
- "Energy stations" vs Tank stations ?
- Electric roads ?



CHAdeMO (IEC 62196 type 4, DC), IEC 62196 combo2 (DC only), and IEC 62196 type 2 (AC).

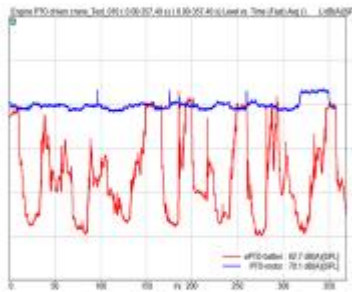


Other benefits I

- Less noise
- Work environment
- Living conditions
- Less stress
- Saved life years



Jag Anders Allén är bussförare vid Göteborgs Spårvägar. "Efter en dag som förare av en ledstjärnbuss känner jag mig yngre". Foto: Ida Helsing



Source: FFI ePTO 2015

Combining electrification & automation I

https://www.youtube.com/watch?v=7_MNmX6s29Y

