



GREEN TRANSITION
DENMARK

Black Carbon and health

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Air pollution:

- 4.2 million deaths/year due to outdoor air pollution.
- 3.8 million deaths/year due to indoor air pollution.
- **In total 8 million deaths every year !**

Other risk factors:

- Tobacco smoking: 7.5 million deaths/year.
- AIDS, malaria and tuberculosis: 3.5 million deaths/year.
- War, terrorism and murder: 0.5 million deaths/year.
- The flu (an average year): 0.5 million deaths/year.
- Corona: 2.5 million deaths in 2020 (not every year)

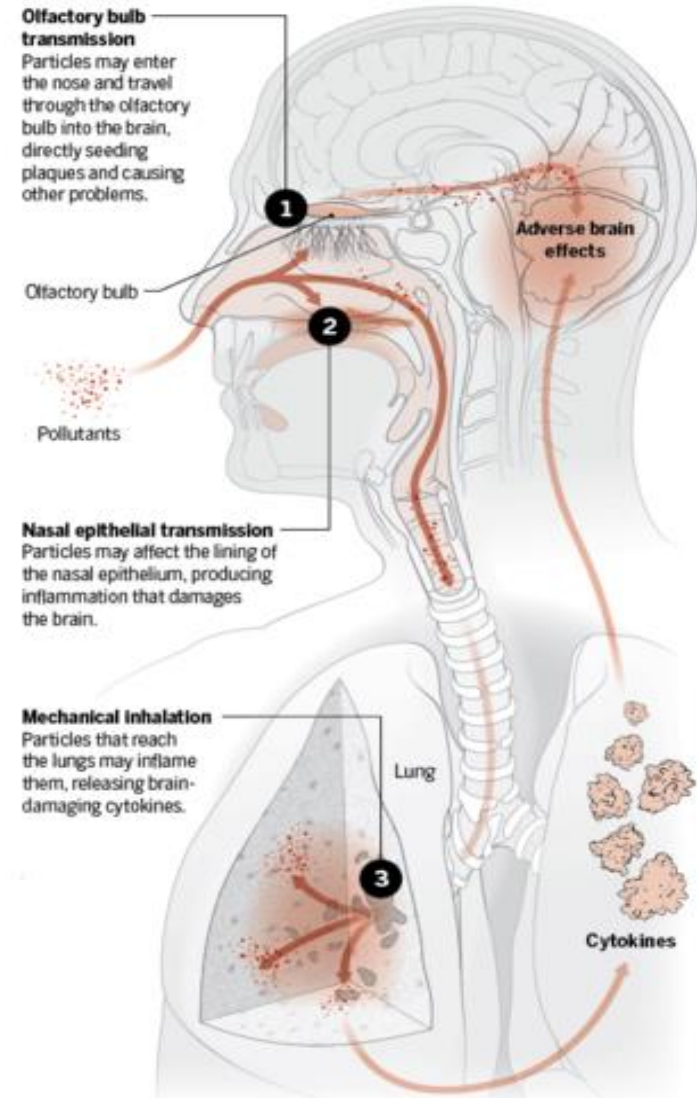


Black carbon

90 % of air pollution deaths are caused by particles.

BC is a dangerous cocktail of two important properties:

- BC is coated with PAHs & heavy metals.
- Particle sizes allowing BC to reach all sensitive parts of the organism.



Health effects

BC (and $PM_{2.5}$ from SO_2) increases the risk of:

- Cardiovascular diseases and thereby premature death.
- Airway diseases: Asthma, bronchitis, smoker-lungs etc.
- Cancer: BC is level 1 carcinogenic (like tobacco smoking).
- Diabetes 2, decreased intelligence and lung capacity etc.
- Sick days and B-days (reduced productivity in society!)
- Likely brain diseases (Alzheimer's, Parkinson's etc.)



CBA of a HFO ban: Greenland

- **Total costs:** 5.9 million USD per year.
- **Air quality benefits:** 10.1 million USD per year
(less BC and SO₂/PM_{2.5})
- **Other benefits:** Climate benefits + oil spill benefits.
- An Arctic HFO ban is a very favorable investment for Greenland, the climate and nature.

(Impact assessment submitted by Denmark for PPR 7)

BC measurements from Reykjavik port



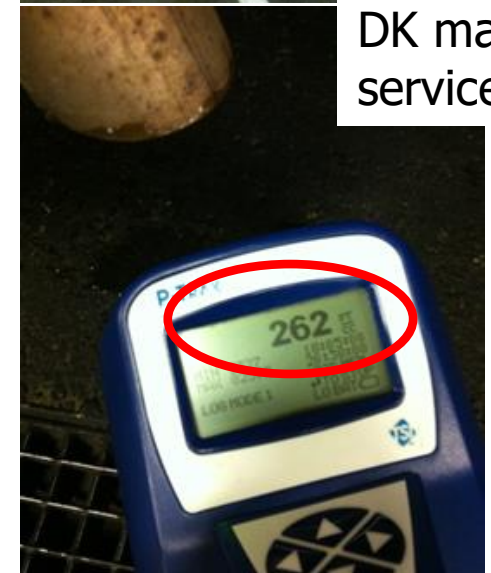
Up-wind ships



Down-wind ships



2015:
DK mail service



BC movie from Nuuk

- <https://www.dropbox.com/s/st75jc6kylx9i6u/Video%2020-07-2018%202021.12.51.mov?dl=0>

