



Transport Emissions: The Climate Challenge

Results from IP QUANTIFY and SSA ATTICA

Summary

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Conclusions I

- The impact of transport, in particular of aviation and shipping, on climate grows faster than the impact from other sectors of human activity.
- The non-CO₂ effects of aviation and shipping (NO_x, induced clouds) are particularly large in comparison to other modes of transport.



Conclusions II

- A NO_x molecule from aviation produces five times as much ozone than a molecule from road transport.
- A NO_x molecule from shipping is four times more efficient in reducing methane than a molecule from aviation.
- Aircraft-induced clouds warm the atmosphere. The associated radiative forcing (RF) is of similar magnitude than RF from aviation CO_2 .
- Ship-induced clouds cool the atmosphere. The associated radiative forcing (RF) may be as large as one third of the total anthropogenic RF.
- The total RF from road transport and aviation are positive, the RF from shipping is negative.



Conclusions III

- The relative weights of the non-CO₂ effects of transport depend on the metric and time horizon selected. A temperature based climate metric produces a very different picture than GWP based metrics.
- Specific climate impact of passenger transport is much lower for railways compared to road transport and aviation.
- Specific climate impact of passenger air travel approaches that of cars on the time scale of decades.
- QUANTIFY and ATTICA were successful projects.



Additional remarks

- The climate impact of transport can be reduced by technical means resulting in smaller specific emissions.
- An additional reduction can be achieved by a climate optimized routing (in particular for aviation and shipping). ⇒ REACT4C
- Further research is needed to reduce uncertainties in particular with respect to
 - improved modelling capability,
 - induced clouds,
 - effects from NO_x (ozone versus methane),
 - the most appropriate metric,
 - robust decision making in spite of uncertainty.
- Many thanks to all QUANTIFY and ATTICA colleagues for fruitful co-operation.
- Many thank to the European Commission enabling these projects.



Further information

Visit ip-quantify.eu

- ⇒ PDFs of today's presentations
- ⇒ access to the ATTICA reports (online, paper version on request)
- ⇒ QUANTIFY summary paper (in progress)
- ⇒ further QUANTIFY publications
- ⇒ QUANTIFY emission data

