



## Sustainability And Road Transport In Norway

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### ABSTRACT

Road transport of goods and people is still increasing in Norway despite initiatives on improving systems for public transportation, walking and cycling. Most frequently sustainability of road transport is limited to direct energy use and accompanying emissions from the vehicles [1, 2]. In this study initiated by Norwegian Public Roads Administration the sustainability of road construction is evaluated for two highways.

The study evaluates energy usage and greenhouse gas emissions during construction (including the climate impacts of purchased materials), operation, maintenance, and end-of-life (recycling and final disposal) phases of the road infrastructure (known as the indirect phases). The change of carbon sequestration on the road area is included, and construction work on secondary roads necessitated by the motorway is included in this study. Data on energy consumption during the construction was collected from the contractors on a voluntary basis. The reports from the contractors cover diesel and electricity consumption for all internal work such as rock and soil excavation and transport. Energy data for materials was derived by help of the ICE database [3], the most important materials as concrete and asphalt also were discussed with the contractors.

The greenhouse gas emissions measured as CO<sub>2</sub> equivalents during the construction of the two highways was quite even and in average:

- Main road asphalt area 0.24 tonnes CO<sub>2</sub> m<sup>-2</sup>
- Main road length (4 – lane) 5,200 tonnes CO<sub>2</sub> km<sup>-1</sup>

A comparison between a 30 km old road replaced with a new 26 km parallel motorway shows that road building causes heavy energy consumption, and it will take decennials to balance even nice energy savings for medium size traffic, in the scale 10-15 000 cars pr. day.

### REFERENCES

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