

Capacity Area B2 Topic 2.1 Deliverable 2

Final report on external costs of mobility, accidents, pollution, occupation of space, congestion, noise, etc.

The methods for combining location-dependent environmental impacts and external costs assessment with full Life Cycle Assessment (LCA) developed earlier, have been extended to include more modes of transportation.

A comparison of current and near future battery electric cars with different vehicle masses and different electricity supply technologies is shown in Figure 1. Quite high uncertainties in the estimates of costs induced by climate change are illustrated as well as significant impacts of car mass as well as electricity supply.

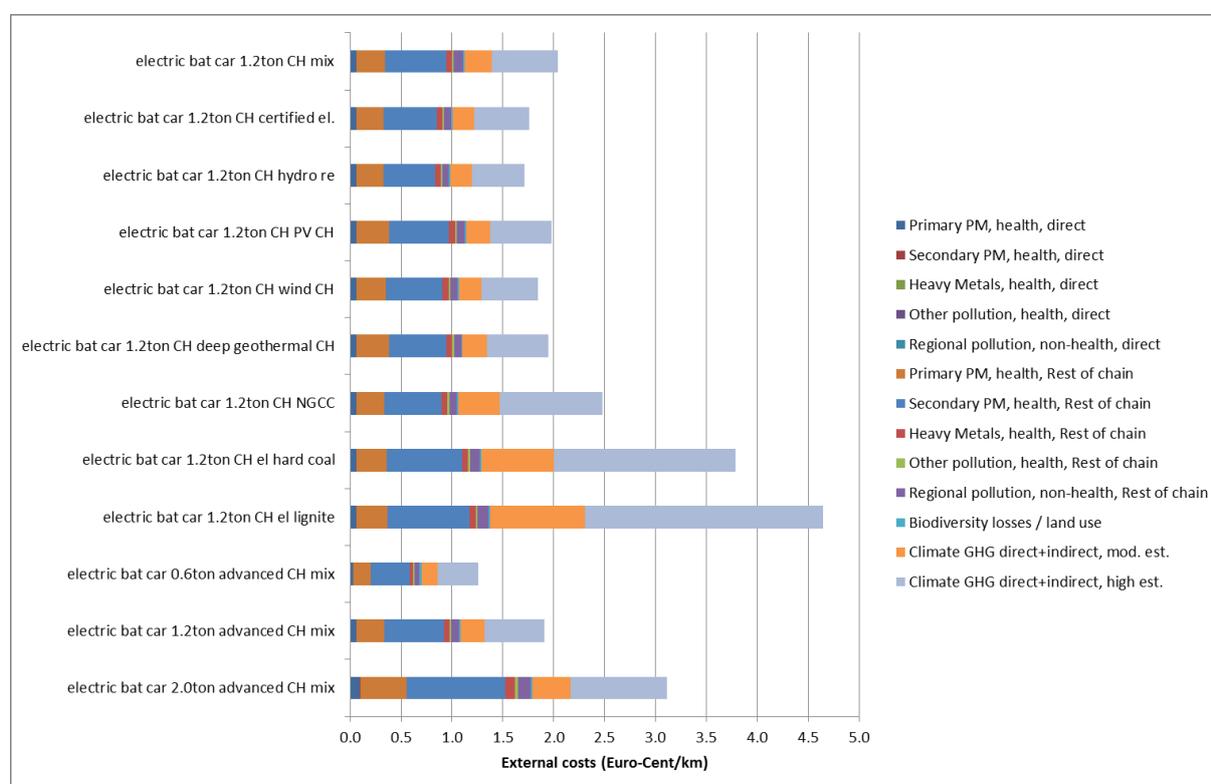


Figure 1. Estimated external costs of current and near future electric cars with different mass and electricity supply options.

Apart from various types of passenger cars other options of public passenger transport have been newly included for comparison with private motorized passenger transport (Figure 2). The advantages of clean alternatives for public transport are demonstrated.

Furthermore, different options of freight transport have been analyzed and included in the model. For the first time, electric trucks were included in the modelling combined with various options for electricity supply. Freight transport options by various diesel trucks and electric trucks were compared to diesel trains and electric trains (Figure 3).

The modeling of environmental impacts covers also non-exhaust emissions from brakes, tires and road abrasion since these contributions are becoming more important in relative terms given reductions in exhaust emissions. Non-exhaust emissions will remain an issue for land transport also in the far future because they are related also to electric vehicles (electric cars, electric trains, electric busses, electric trucks, etc.).

The work on the assessment of external costs of mobility options provides the scientific basis for the internalization of external costs as well as essential input to sustainability assessment. Currently the set of analyzed mobility options is being extended both for current technologies and the future ones.

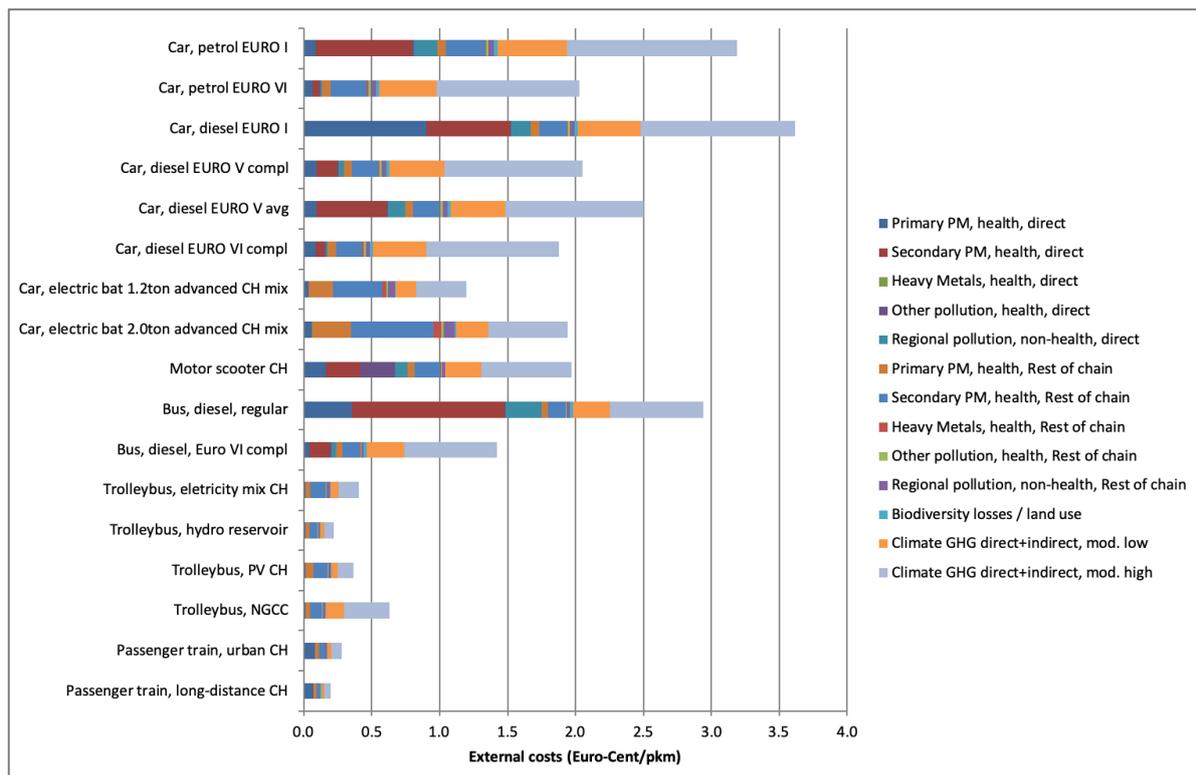


Figure 2. Estimated environmental external costs of various technologies of passenger transport per person-km (compl = in compliance with EURO emission norm, avg = realistic average 2015, European valuation).

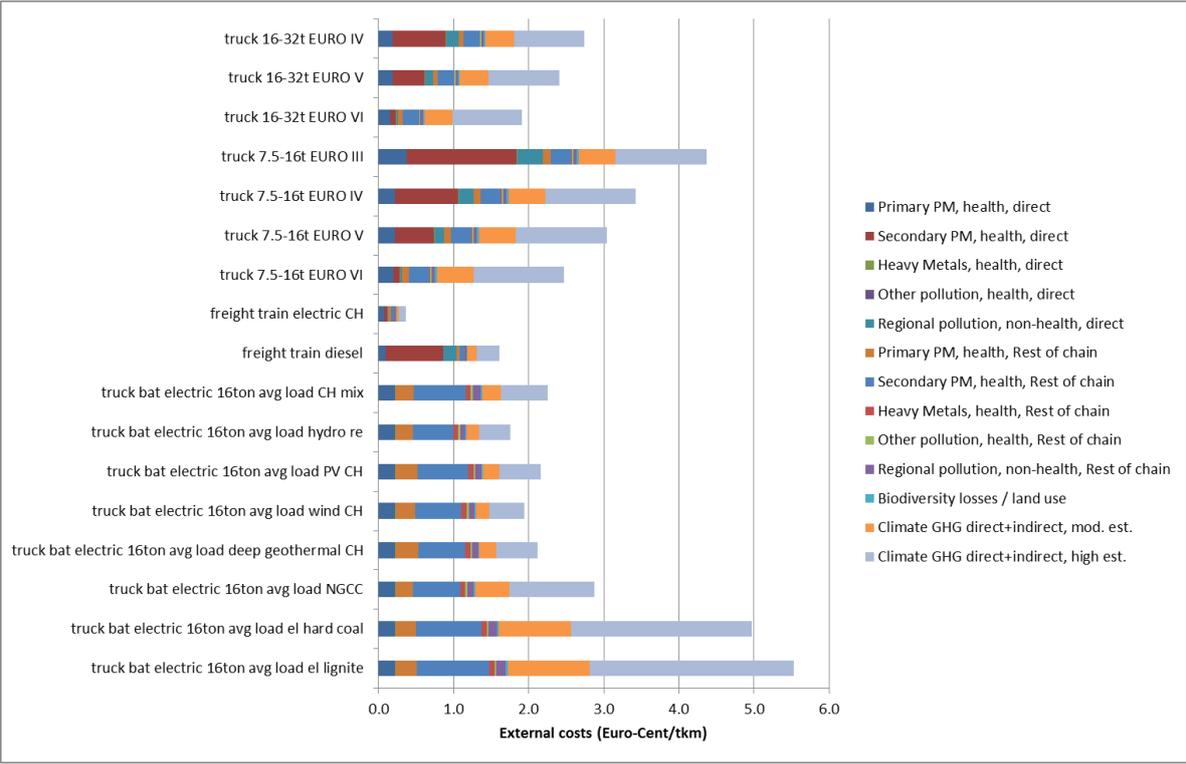


Figure 3. Estimated external costs of freight transport per ton-km with diesel trucks, trains, and battery electric trucks.