



Extreme weather impacts on European networks of transport

Seventh framework programme | Transports, call ID FPT7-TPT-2008-RTD-1

The EWENT project addresses the European Union (EU) policies and strategies related to climate change, with a particular focus on extreme weather impacts on the EU transportation system.

EWENT Work Package 4: Summary report on the costs of extreme weather for the European transport system

The full version of EWENT D4 report is available at: <http://ewent.vtt.fi/>

The main objective of WP4 is to provide concrete monetary valuations of extreme weather phenomena on the transport system by combining:

- State of the art monetary valuations and
- Future changes in extreme weather phenomena occurrence

The WP4 deliverable provides first ever European level estimates of costs of extreme weather conditions on the transport system. The analyses cover costs to transport system users (accidents and travel time changes), to operators (delays and cancellations) and to freight operators.

By transport mode, the impacts are very different, due to the different mechanisms of influence as well as volume of traffic. From the passenger transport point of view, at the European level, the most dominant impacts are accident costs in road transport and travel time losses in the aviation industry. Annual impacts on transport system users amount to billions of euros.



The following results were obtained in study:

- Road transport: EU and regional level estimates of accident costs, examples of time costs using Helsinki

region as an example, examples of freight costs, examples of maintenance costs

- Rail: EU level estimates of accident costs, examples of time costs using Helsinki region as an example, examples of freight costs
- Aviation: EU level estimates of time costs and operator costs
- Maritime: EU level estimates of accidents costs, examples of operator costs (Port of Limassol)
- Inland waterways: EU level estimates of accidents

With regard to the induced effects caused by extreme weather phenomena in the supply chain, six empirical studies on freight transport, logistics and infrastructure provider in different European countries covering several climate zones, were performed. These examples covered both road and rail transport.

Main conclusions for the future

WP4 emphasizes the fact that there is a massive loss at the European level encountered from extreme weather phenomena whereby operators' costs are less in the volume than the social costs borne by the passengers, the European Community and its Member States.

For the aviation industry, it marks the first attempt to monetize the costs caused by such events on a European level. Concerning total social costs in aviation, the volume will increase due to changes in weather conditions and higher value-of-time with the rate of increase depending on airport related performance ratios.

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In road transport, expected developments in vehicle technology and emergency systems are expected to result in a significant decline in the volume of accidents. This impact can be further enhanced through direct measures to tackle the impact of weather.

In other transport modes the picture is less clear. For instance, currently in maritime transport delays in the ports are due to impact of wind on loading the cargo. In inland waterways, the total amount of accidents involving fatalities or injuries is very small and is not foreseen to change. In rail, it is expected that, similarly to road transport, new technologies will improve safety and the net result will be even less accidents in the future.

For inland waterways, focus is laid on freight transport as for passengers transportation social costs are of low importance compared to other modes. However, even the shippers' costs for freight delays remain on a marginal level compared to the costs of other modes.

The results also show the trends in costs for 2040 and 2070 without particular attention on possible mitigation efforts. Should mitigation measures take place, the future impacts are likely to be significantly smaller than those calculated in this study.

Summary of major costs resulted by extreme weather			
	<i>At present</i>	<i>2040</i>	<i>2070</i>
<i>(in millions of Euro)</i>			
Road, accident costs	20 700	7 200	5 600
Rail, accident costs	103	72	23
Maritime, accident costs	10	5	3
Inland waterways, accident costs	2	2	2
Aviation, passengers' time losses	980	1 124	903
Aviation, operators' costs	606	555	442