Range & Performance of Electric Vehicles in Nordic Driving Conditions

01/12

RekkEVidde

ABOUT THE PROJECT

The RekkEVidde project has collected data on Nordic driving conditions and performed laboratory and field tests at cold temperatures. By producing scientific measurements and analysis, a simple method to measure range and compare different electric vehicles in Nordic conditions will provide necessary information and statistics

THE OBJECTIVE

The main objective is to produce realistic performance figures for electric vehicles operating in Nordic driving and weather conditions. This may help the industry to reduce the number of necessary test activities and to build suitable electric vehicles for the Nordic region, as well as more accurate customer information.

THE RESULTS

The test drive cycle data and information on Nordic driving patterns and conditions collected by the project shows that on average the total range is reduced by 27% in -20° C compared to +23° C without cabin heating. With electric cabin heating activated, the total range reduction can be up to 76% under the same conditions. However, the NEDC (New European Driving Cycle) laboratory tests show that the Nissan Leaf's drop in range to just 58 km in -20° C conditions could be avoided. Simply by equipping electric vehicles (EVs) with a fuel-fired cabin heater, the range can be increased to 98 km. Studies show that a typical driving distance in a day is less than 50 km divided into more than 3 trips.

Therefore it is obvious that electrical heating can be used for most trips, whereas the fuel heater can function as a range extender in colder Nordic conditions. The project has recognised the policy need for an EV energy labelling that shows the use of energy per km, the range and the average cost of annual use. This labelling should also compare vehicle performance to the electric vehicle models available on the market at different temperature ranges. For the future, field test procedures for simple and advanced testing of EV range should be performed through laboratory UN-ECE regulation No. 101 tests in cold conditions. The influence of EV cabin heating to the range with new heat pump EV models also needs to be tested further. Electric vehicles are, due to the large share of renewable energy supply in the Nordic countries, expected to become an increasingly competitive and environmentally friendly option. Some manufacturers already provide cars suitable for the harsh Nordic climate, but the range limitations related to local temperature conditions is an issue that should be worked with further to tailor cars better to Nordic driving conditions.

PROJECT PARTNERS

VTT Technical Research Centre of Finland (FI), Green Net Finland (FI), Test Site Sweden (SE), City of Stockholm (SE), Institute of Transport Economics (NO) and Icelandic New Energy (IS).