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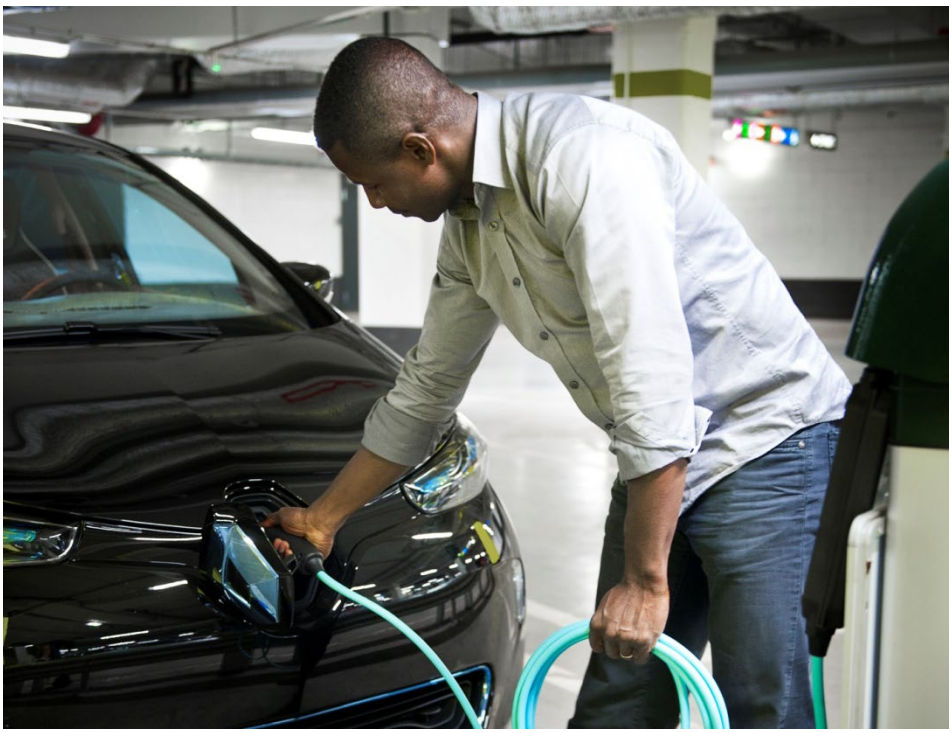
FACTSHEET

SUSTAINABLE URBAN MOBILITY

Normal charging infrastructure for electric vehicles

SMART SOLUTION 11: ALTERNATIVE FUEL DRIVEN VEHICLES



- Normal charging stations close to the home enable electric vehicle drivers to start their daily trips with a full battery of about 150 km of CO2 free driving range before needing to recharge.
- Normal charging stations can fully charge batteries in 8–10 hours.
- Electric Vehicles increase in share of car sales and charging infrastructure is important to facilitate the transition to an improved vehicle fleet in cities.

Stockholm

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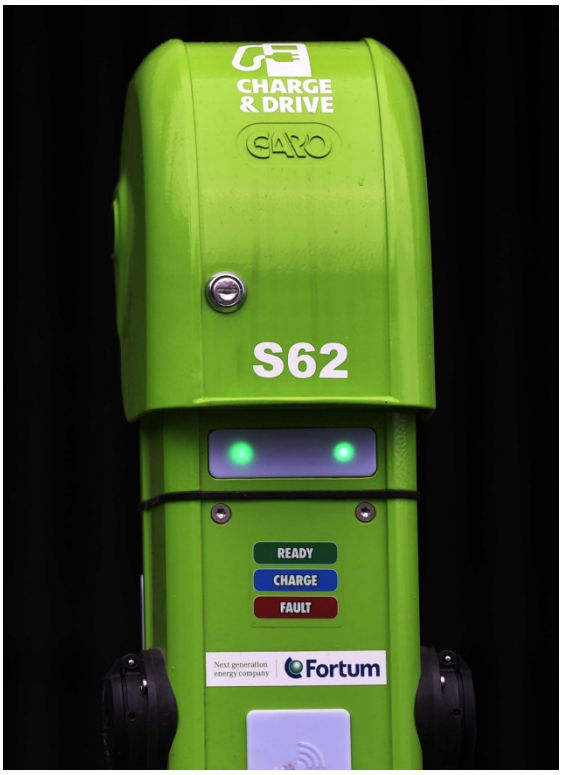
What is the solution?

In Stockholm, Fortum is providing public and private normal-speed charging stations in cooperation with the housing company Stockholmshem. Five to ten normal charging stations will be installed in different locations in Stockholm. Fortum has extensive experience of installing and operating normal chargers.

All chargers will be equipped with two outlets for electric vehicle (EV) charging, enabling two cars to charge at the same charger at the same time. The outlet of the chargers will meet the EU standard Mode3Type2. Each outlet will deliver 16A 230V, which gives a power of 3.7 kW. This power is enough to fully charge a regular EV within 10 hours.



How does it work?

There are different ways of recharging PEVs (Plug-in Electric Vehicles - generic term for all vehicles that have batteries that can be charged externally i.e. electric vehicles and plug-in hybrid electric vehicles).

The most common is normal charging where you charge the car battery over a longer time, usually overnight, at a low current. Another type is fast charging, where an almost empty battery can be charged in less than half an hour at a high-power charging station, fast charging.

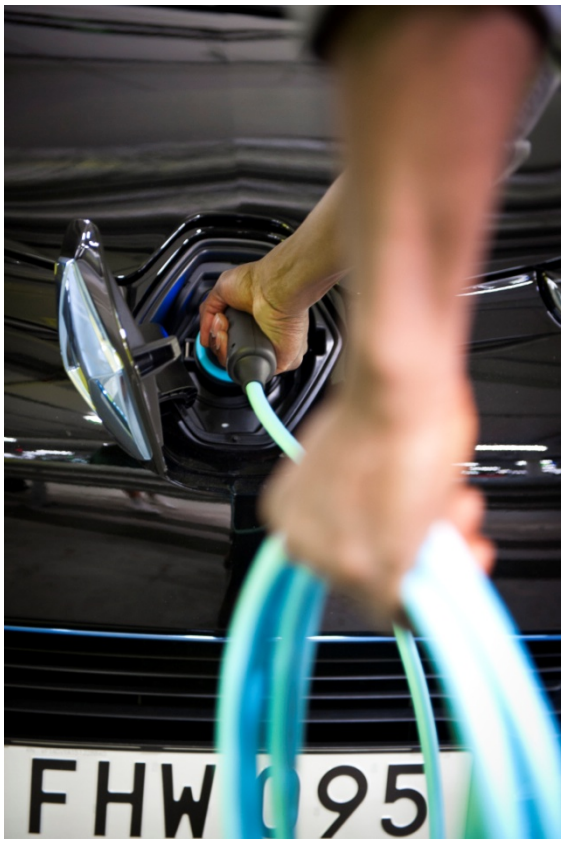
Normal charging takes place while the vehicle is parked whereas fast charging is more similar to fuelling a petrol or diesel car. The normal-speed chargers will be located outside apartment buildings to allow residents to charge their EVs during the night.

Some of the chargers will be private and only available for the residents to charge and some chargers will be public chargers where a first-come, first-served rule will be applied.

Customers will have to pay for the charging and a pricing model with a given cost per hour will be applied. The price will be approximately 60 cents to 1 Euro per hour of charging. Payments will be processed using RFID tags or via a web app that is connected to the customer's credit card. It is possible to register for charging at the site so no prior registration is needed.

Expected Impact

In Stockholm PEVs have doubled in number each year for the past four years and are expected to continue to do so for the years to come. Electric vehicles are more energy efficient and powered with electricity for the Nordic energy mix they can reduce CO2 emissions by over 80 %. Electric vehicles create no local exhaust emissions and make much less noise.



PEVs are increasing in numbers in many parts of Europe and almost every vehicle supplier on the European market has PEVs for sale. Charging facilities for PEVs are something that most energy utility companies and cities are thinking about and while doing so need to consider actions.

The majority of PEV charging takes place at home during the night and therefore accessible normal charging is a crucial way of enabling PEVs to flourish. A co-operation between different stakeholders seems to be a fruitful way to achieve this.