

Electric vehicles in Stockholm, Sweden - Eva Sunnerstedt, City of Stockholm



Electric vehicles in Stockholm

- Experiences with electrical mobility in the past
- Strategies to establish Stockholm as the electric vehicle city 2030
- National joint procurement of EVs and PHEVs



Stockholm – Capital of Sweden

- 750 000/1,8 million inhabitants
- 250 000/800 000 cars
- Built on 14 islands connected with appr. 50 bridges
- 50 % public transport (75 % in peak hours)
- Congestion charging zone
- Environmental zone for heavy vehicles
- Improved air quality but problems with NOx and PM
- European Green Capital 2010



What is a clean vehicle?

- Program since 1994
- Clean car:
 - Electric or hybrid
 - Renewable fuels e.g ethanol, biogas, biodiesel
 - Low fuel consumption (<120g/km)
- We need different technologies in parallel



Sweden - a country for EVs

- Electricity mix with low emissions – 90% from hydro or nuclear
- Production system with good capacity
- Low electricity price, i.e. low EV driving costs
- Good infrastructure and distribution system for electricity in place
- World leading in usage of environmental vehicles
- Good test market - Swedes are "early adopters" of innovations



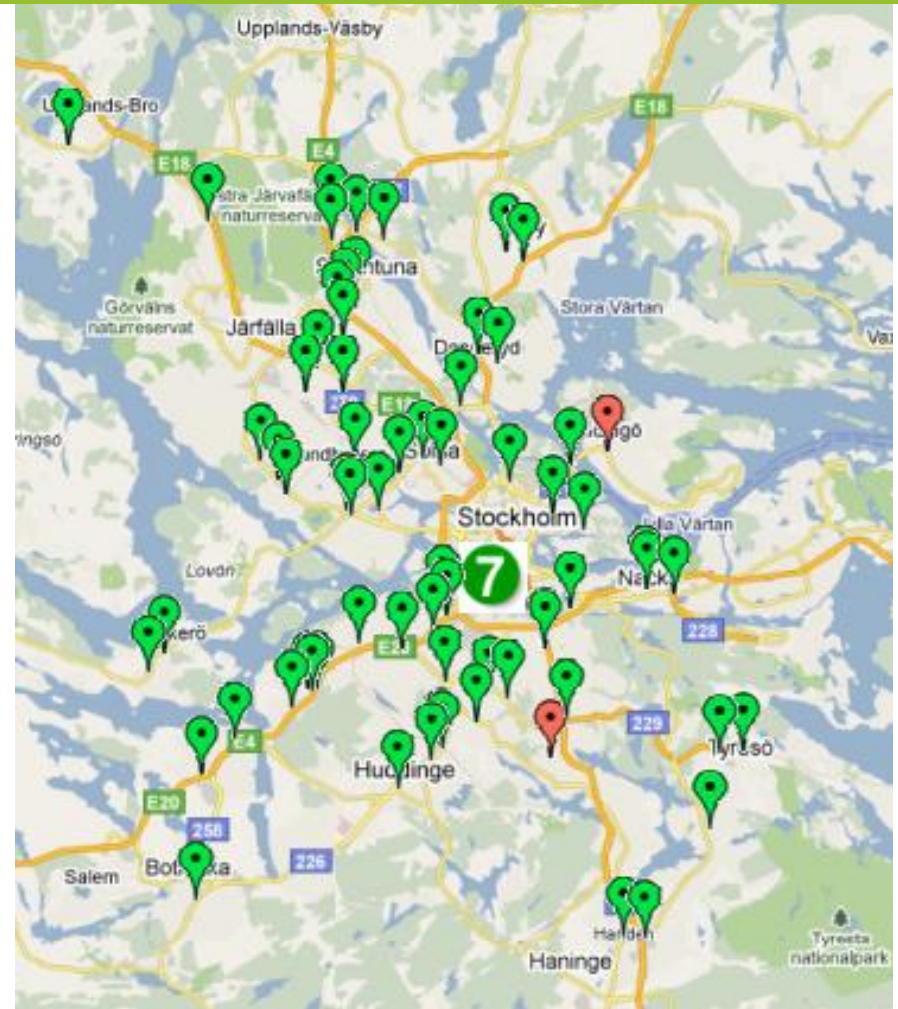
Existing infrastructure: 65% of households in Sweden have access to charging/electric outlets by their parking place

- The electricity system in Sweden is very well established - a large scale introduction of EVs will not have a significant impact on electricity networks
- The Swedish grids are dimensioned for cold winter days, when the electricity demand from industry and households peaks
- Approximately 65% of the Swedish population has easy access to electrical outlets at home or at work - through the engine block heaters



Charging infrastructure in Stockholm (September 2010)

- There is enormous potential for electric vehicles in the Stockholm region
- The map illustrates 78 locations offering 135 charging points for electric vehicles, of which:
 - 52 are 230V 16A
 - 73 are 400V 16A
 - 6 are 230V 10A G
- There are more charging points located in neighbouring towns, e.g. Uppsala, Södertälje, and along major routes such as the TEN-T Nordic Triangle (E4,E18,E20)
- There are countless block heaters, located in parking garages and private residences, which can be used to charge electric vehicles
- ... and the total is increasing all the time!



<http://www.elbilsverige.se/index.php/laddplatser> (21 Sep 2010)

Cars and driving behavior in Sweden

- In total 4,4 milion vehicles
- Every year approx. 250 – 330 000 vehicles are sold
- Growth of 48 000 vehicles/year
- Over 55 % of the new cars are sold to companies
- 25 % of the households have 2 cars
- Over 60 % of the daily trips are made with a car (lower in the larger cities)
- Average distance from home - work: 10 km
- Half of the people working have < 5 km to work, 3 % have over 50 km
- Avereage yearly distance for a car:
 - 15 000 km/year & **40 km/day**





Clean Vehicle Strategy

- Local authorities are key players to start a market development
- Use your procurement power
- Introduce step-by-step
- A long term perspective is necessary
- Incentives are very helpful
- Subsidies and tax relieves may be needed initially

Stockholm demands clean vehicles in the city fleet

- The Stockholm City council has decided:
 - All new vehicles that are bought to the city fleet in Stockholm should be clean
 - 100 % clean vehicles in the city fleet by 2010
 - 85 % clean fuel in city fleet
 - 35 % new clean cars sold in the Stockholm Region 2010



Promote to other users

National incentives

- No tax on renewable fuels - 2012
- Lower tax on company cars if they are clean - 2011
- Lower vehicle tax for clean cars
- 100 % of all vehicles bought by state administrations should be "clean" in 2010
- NEW on its way: 40 000 Skr for users buying a new super clean car (from 2006-2009 10 000 Skr)



Clean Vehicles in Stockholm



Local incentives

- Clean cars are demanded in various procurements
- (free parking)
- (no congestion charging)
- information
 - sales promotion & market research
 - web-portal: www.miljofordon.se
 - newsletter
 - test fleet
- Clean taxi cars "cut the line" at Arlanda Airport



Clean Vehicles in Stockholm



- Target: Fossil fuel free by 2050
- Vision "Electric Vehicle City 2030"
 - *City traffic almost emission free*
 - *Access to recharging where needed*
 - *Renewable or CO₂ free electricity*
 - *Stockholm sets an example in terms of electric vehicles and recharging infrastructure*
- Strategy for electric vehicles
- PHEV demo Project "MobilEI" is the starting point



Electric vehicles in Stockholm 1994-2005:



- 160 pure electric cars
- 90 hybrid electric vehicles
- 50 electric two-wheelers
- 6 electric hybrid buses
- 6 electric hybrid truck
- 3 fuel cell buses

- Common procurement
- Free parking
- 4 fast charging facilities
- 40 normal charging facilities
- Information

Lessons learnt

- Drivers are the key ambassadors !!
- The vehicles mostly worked well and were popular!
- Fuel cell technology is still on the prototype stage but show great potential.
- Co-ordinated procurements important
- Public charging facilities not essential – very little in use – but good for marketing and information



PHEV demonstration 2008-2009

- Convert five Toyota Prius to PHEV
- Install public recharging points (Fortum)
 - 5 in 2008
 - 100 in 2009
- Evaluate
 - energy use
 - driver attitudes
 - regulations and permits
 - environmental benefits
 - location of future recharging points

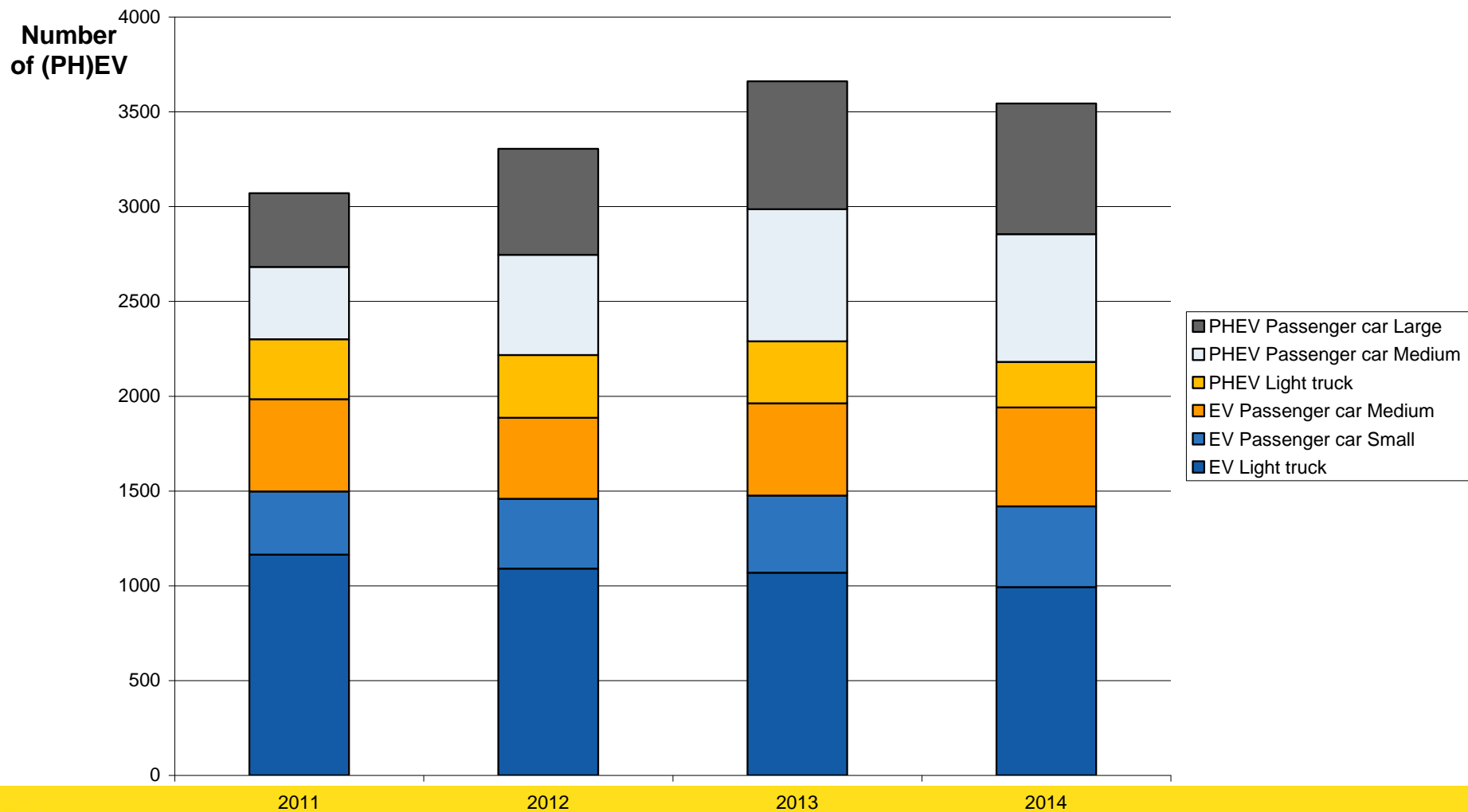


Strategy for electric vehicles

- Infrastructure for charging units
 - Lacking city and national regulations both for indoor and outdoor charging
 - Standards and regulations needed for paying
- Procurement of vehicles
 - Get vehicles on the Swedish market, service and maintenance
 - Electric vehicles tested by Euro NCAP
 - High purchase price – how to attract buyers?
- List of obstacles, how to and who should solve them! To be decided by the City Council.



Our pre-study Nov 09-Jan10 showed a high demand for EVs in organisations: 14.000 vehicles in 2011-2014



Procurement overview

- Aim: a procurement resulting in a good agreement regarding electric vehicles (EVs and PHEVs)
- We invite both procuring entities (municipalities and county councils) and private companies to participate
- Goal : at least 150 organisations will show an interest to buy 6000 vehicles
- The Swedish Energy Agency gives financial support
- Compensation for additional cost to the first 1000 vehicles that are bought through the procurement agreement:
 - Organisation receives 25 % of additional cost, max € 5000
 - 2/3 of compensation paid out initially, 1/3 in year 2013 or 2014
 - Vehicle must be new and operated at least 36 months
- A few simple requirements are made on organisations buying vehicles to receive funding

Categories of EVs & PHEVs in the Procurement

Categories

- **Cars** – EVs and PHEVs, both small, medium and large sized cars
- **Vans** – EVs and PHEVs both small and large vans under 3,5 tons

Several vehicle suppliers per category can apply to join in the procurement process – there is no limit in number!



Thank You!

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