

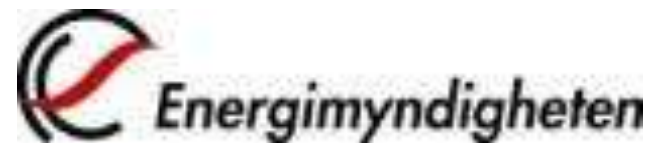
# E-mobility Malmö and Smart Homes

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20 Nov 2012

# E-mobility Malmö summary and conclusions

# Overview E-mobility Malmö

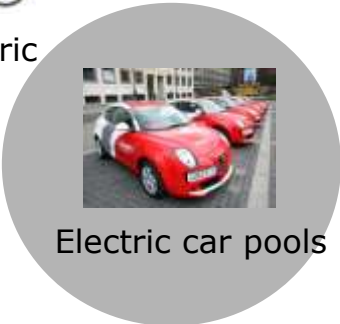
- Demonstration project, co-operation with the City of Malmö; support from the Swedish Energy Agency.
- The City of Malmö is used as a platform for testing and evaluating new technology.
- Target groups: City of Malmö, other municipalities, the public, parking and real estate companies, E.ON employees.
- Project originally from November 2009 to December 2012. Extended two years in 2012.



# Demonstration project E-mobility Malmö



All kinds of electric vehicles in pools



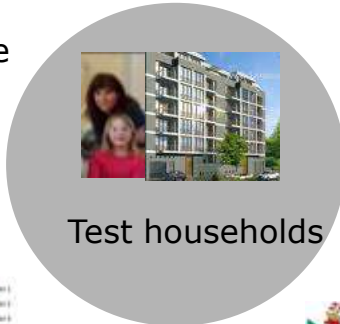
Electric car pools



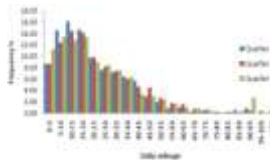
Employee involvement activities



Charging at office and resident parking



Test households



User pattern evaluation



Electric Vehicles



Stake-holder involvement and partnerships

- Leading by example through electrification of our own car pools
- Tackling the “park-n-charge” challenges for city residents & commuters



# Conclusions about electric vehicles

## What we thought

Low fuel cost, silent, zero local CO2 emissions, fully charged every morning

Short range, high battery costs, long charging time, LCA CO2 emissions depend on electricity source

No range anxiety, no need to charge at other place than home and office

Limited use of charged electricity, high cost

Could substitute most car trips

Not everyone dares to try them

Could contribute to more cycling

Expensive, "not real cycling"



## What we learned

Good quality, easy to use, no problems with empty batteries

Partly substitutes cycling, walking and public transport

Fulfills the demands of today's customers. Optimized electric drive if charged two times per day

Attracts less interest than battery electric vehicle, higher cost than expected.

Enthusiastic users

Low quality, issues with traffic safety, parking problems, risk of theft, relatively small user group

Highly appreciated by test households, "no sweat"

Quality too low for pool use, risk of theft

# Learned about charging infrastructure

## What we thought

Enthusiasm about public charging, high expectations on energy companies and cities

Unknown customer demand

No range anxiety, charging at other place than home and office

Unknown customer demand

Where most charging will take place

Uncertainties around using household plug (shŭcko)



Public



Resident, office & parking garage



Private home charging

## What we learned

Good advertisement stands, satisfies charging needs of visitors

Customer demand is low, more expensive than expected, cannot rely on public charging as home solutions

High interest from parking owners and customers, can be both cheap and smart with load control

The lack of market rules and business models is inhibiting

For some customers, a home charging station can satisfy all charging needs, opportunities for smart charging and load control

Can trip main fuse, safety issues with plugging into household plugs are underestimated, wall-box installations can be expensive in some homes

# Thoughts about public charging



## What the customer asked for

- Public street parking and charging in all cities.
- Normal cars occupy E-car parking spaces



## What was agreed in the functional specification

- Public street parking and charging for only E-cars
- As E-cars become increasingly popular, the parking spaces will be occupied by other E-cars. This is not acceptable as home parking or commuter parking.



## What was implemented

- Public street parking for E-cars with advanced booking and payment system
- An expensive way to partially solve the problems in the previous solution



## What the customer needed

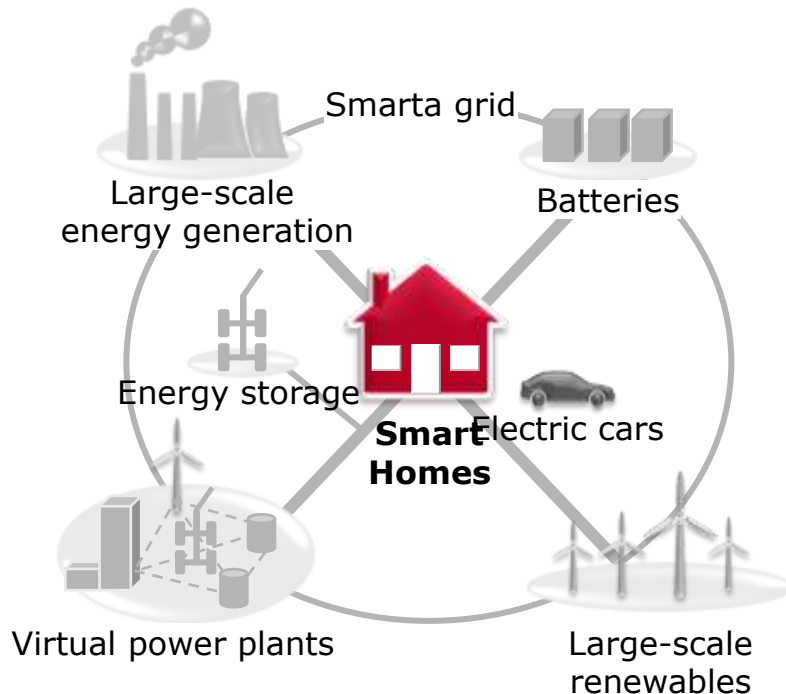
- **At home and at work in the city:** rent a privately reserved parking (in a nearby parking garage is much cheaper than on the street) with charging
- **When visiting another city:** A parking space (pay with cash or credit card) with charging included.

# E.ON Smart Homes & E-mobility



# Customer in focus – Thinking Energy/Smart Home

**The customer plays a main role in the energy system of tomorrow**



## **E.ON Sweden's Smart Homes**

- E.ON builds 8 smart homes in Malmö Western Harbor
- Roll-out of market trial Smart Homes products
- Smart Homes pilot with Roth Fastigheter in Malmö Hyllie Q3 2013



**e-on**

# E.ON builds 8 smart homes in Western Harbour

## Smart solutions- Examples

- Visualization of all energy consumption
- Solutions to optimize energy usage & integration of micro-generation (PV, wind-power, solar heat) and storage
- Automatic energy and cost optimization, delay consumption when electricity price is high
- Optimized electric car charging
- Individual heat control in each room



## Customer values

- Cost reduction
- Improved thermal comfort
- (Remote) control of usage and production
- Decreased climate impact

