Metropolitan perspectives on EV deployment and charging infrastructure: Insights from Hamburg

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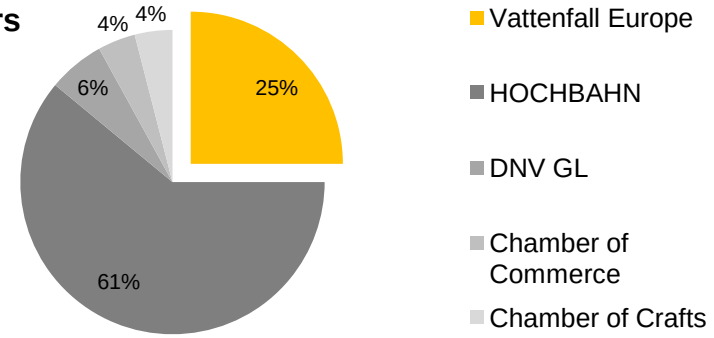
hySOLUTIONS

Basic Facts

Founded:	2005
Tasks:	Project development and management in hydrogen / fuel cell technology and in battery electric drives
	Coordination center for Hamburg, formally mandated by Hamburg Senate
Portfolio:	Some 80 projects (predominantly R&D) both national and international still running or successfully completed
Networks:	Initiating or joining regional, national and European organizations, working groups and expert committees

Shareholders



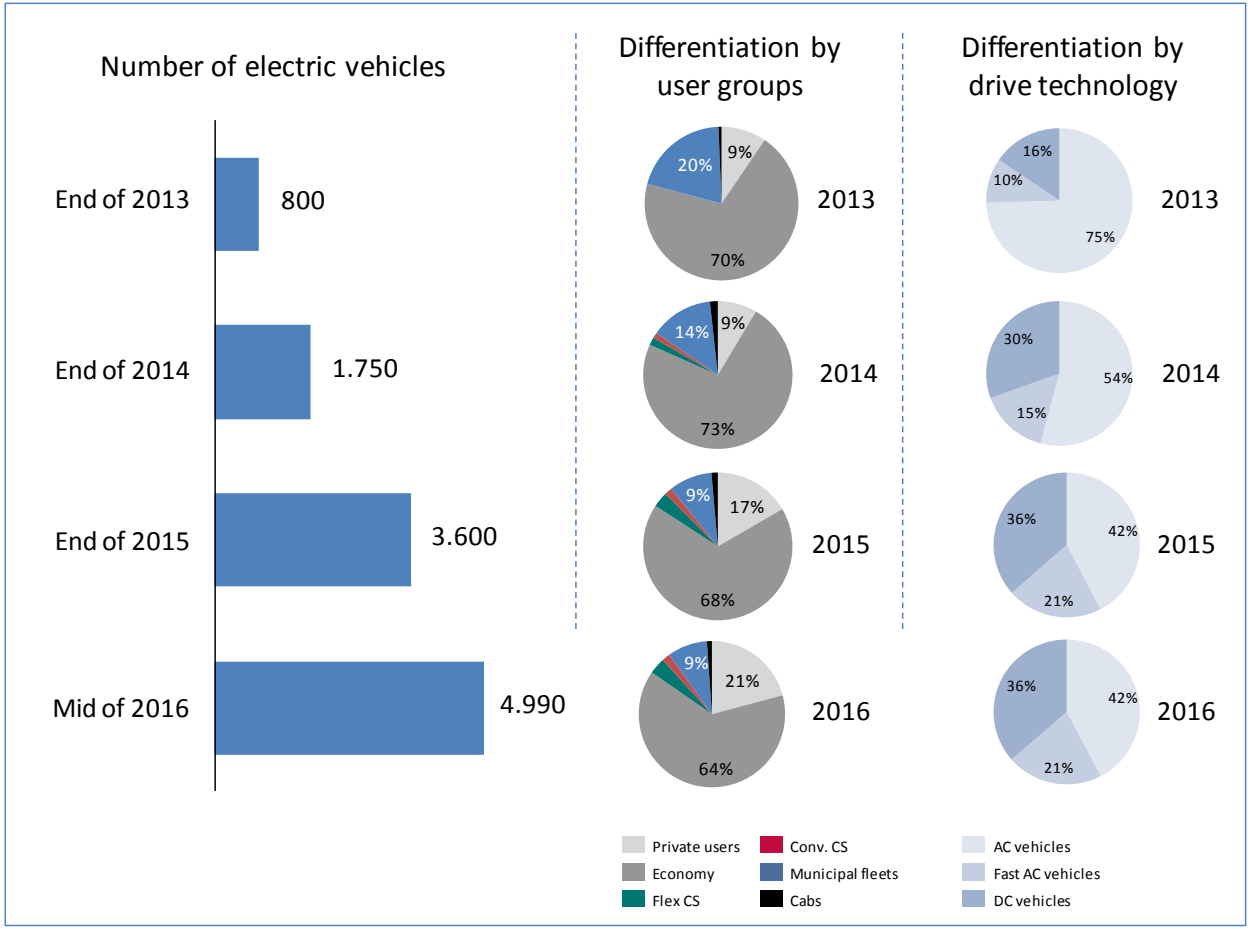
Clean Urban Transport in Hamburg

The overall approach

- The main drivers for low-emission technology in the urban transportation system are sound planning requirements , the environmental and climate protection (EU directives) and economical reasons (generating regional added value)
- The strategic approach is based on 3 fundamental principles :
  - Coherency of technologies (FCVs and BEVs are part of the same technological path!)
  - Complementary use rather than competition between ZE car use and public transport
  - Use of renewable energy is mandatory
- Strong political ties to the federal government (BMVI, BMUB), marked by strong political commitment on site
- More Diversification on the project level, expanded objectives, additional target groups
- Fields of action:
  - Integration into corporate fleets and municipal fleets
  - Integration into urban planning procedures and housing projects
  - Integration into intermodal concepts ("complementary mobility")
  - Full substitution in the local bus system: systematic approach for green procurement from 2020

EV Roll Out in Hamburg

Scenario 2014 - 2016



EV Roll Out in Hamburg

Commercial fleets

Hamburg Chamber of Commerce: survey with member companies

- All 46,000 member companies were involved , some 1,700 responders
- 3 out of 10 companies believe that they have a 50% EV share within the next 2 years

Results

- Up to 2020 some 18,200 EVs (2,800 delivery vans included) in the corporate fleets of the Chamber's member companies
- Local market share of 12% of all registered corporate cars in Hamburg
- Currently a new survey has been launched with 400 responders so far
- Procurement initiative with significant car orders to be launched asap (tranches of 300/500 / 1,000 units)

EV Roll Out in Hamburg

Municipal fleets

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Municipal Fleets in Hamburg

- are bound to the First Mayor's directive, not to constitute the purchase of an EV but to constitute the continued procurement of conventional ICE vehicles; this changed reasoning subsequently opens new perspectives,
- have been undergoing a systematic analysis of use cases, operation schedules and potentials for a comprehensive EV use. Accordingly all public institutions in Hamburg will face a fundamental change in their fleet operations and logistics with regard to a substantial EV procurement strategy.

= **Results**
~ 30 % of all cars in stock will be replaced by EV, REEV or PHEV

Current Status: **255 electric vehicles** in public fleets in Hamburg (210) and in the entire region (45)

EV Roll Out in Hamburg

Taxi fleets

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e-Taxi Hamburg

- will integrate up to 50 EV/PHEV into Hamburg's taxi fleets in strong cooperation with Nissan Europe and others,
- will offer local taxi companies to join the trial by incentivizing with funds from federal programme (up to 50% of leasing costs),
- will have a strong impact on environmental effects due to the substitution of an overall mileage of some 7.5 m kilometers with electric drives,
- will serve as a booster programme to create public awareness for EV deployment in the overall urban transportation system.

= **Results**
~ 350,000 zero emission cab rides per year

Commercial Fleets Hamburg

„Electrified Economy“ (Wirtschaft am Strom) / „Eco Fleet“

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- 860 EV / PHEV already in operation
- Project scope “Electrified Economy”:
  740 EVs for companies and municipal fleets.
  Focus on site-specific industry branches such as port management, logistics and aviation, as well as a number of SME (service and trade),
  already more than 450 vehicles in daily operation
- Project scope “Eco Fleet”:
  450 EVs in corporate fleets, focus on German OEMs such as BMW, Daimler and Volkswagen,
  scientific monitoring on eco parameters

HAMBURG SCHOOL OF BUSINESS ADMINISTRATION
TUHH Technische Universität Hamburg-Harburg
Öko-Institut e.V. Institut für angewandte Ökologie Institute for Applied Ecology
RCI Banque groupe RENAULT
DB Mobility Networks Logistics
Alphabet
Hamburg
DAIMLER
Mercedes-Benz Bank
HK Handelskammer Hamburg
VATTENFALL
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EV business innovation approaches

e-Quartier Hamburg

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e-Quarter Hamburg

- follows the rationale that residents use electric vehicles communally ("neighbourhood pools") in different classifications,
- lays stress on the qualification of locations with regard to planning variations for the area allocations, intermodal traffic aspects, decentralized energy supply,
- will enable the derivation of urban planning scenarios and parameters, standardization methods and create indicators for planning procedures.

= **Results**
Residents will benefit from new mobility schemes and quit their own cars

up to 10 sites
2,000 users
120 vehicles

Classifiations:

1 closed vehicle pools and intermodal mobility concepts for private local residents
2 closed vehicle pools, integrated energy concepts and intermodal mobility concepts for private local residents
3 closed vehicle pools and intermodal mobility concepts for private and commercial users
4 public car-sharing in reference to the residential region
5 public car-sharing combined with closed vehicle pools and intermodal mobility concepts
6 individual use for private residents with integrated energy concepts

EV charging infrastructure

Status quo

HAMBURG

Das Netz für Hamburgs Autos

Elektromobilität als Motor der Zukunft – Stadt will weitere 370 E-Autos anschaffen

ZWISCHENRUF

Zurück in die Zukunft

100 charging points on public space (streets) and on Park-and-Ride-Facilities are implemented and in operation

Requirements:

- Charging power is 100% green power from renewable sources
- “discrimination-free” use of charging infrastructure (all energy providers accepted)
- Charging stations have to be in line with cityscape

Corporate charging infrastructure

- wallboxes all linked to backend
- “delayed charging” helps balancing the grid
- more renewable energy in the grid

Up to 150 charging points on corporate ground

- predictable charging patters
- lower costs
- innovative charging modes

EV charging infrastructure

Outlook

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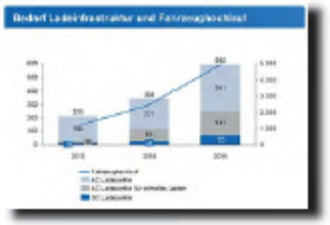
Masterplan CPI Hamburg

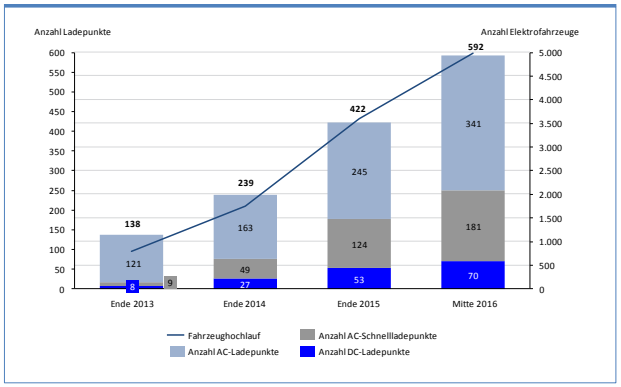
Assumptions based on today's CP portfolio:

- increasing availability of charging points will lead to more access,
- accelerating the distribution of RFID-cards and enforcing green power standards will lead to higher customer acceptance,
- the ongoing diversification of use cases (private clients, corporate clients, taxi, car sharing) will lead to a more specific distinction between fast charging modes and usual AC charging,
- the estimation of demand is according to EV deployment within the respective use cases, CP use frequency (regular use, intensive use), mileage, individual attractiveness of inner-city destinations and discrimination-free CP use (low barriers).



= **Results**
~ 600 public accessible CP (AC and DC)
by the end of 2015

EV readiness and „good governance“



Criteria of Success

Availability

Connectivity

Scalability

Visibility

Thank you very much!

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