Fast Chargers in the Netherlands

e-mobility NSR

Investing in the future
by working together for a
sustainable and competitive region

Provincie
Noord-Holland

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Innovations

Hamburg 15 March 2012

Marketing research fast charging

- **Electric transport 2009-2011**
- **Development Electric Vehicle market**
- **Technology, difficulties and behaviour of fast charging**
- **What does the field of players look like**
- **How to make the next step**

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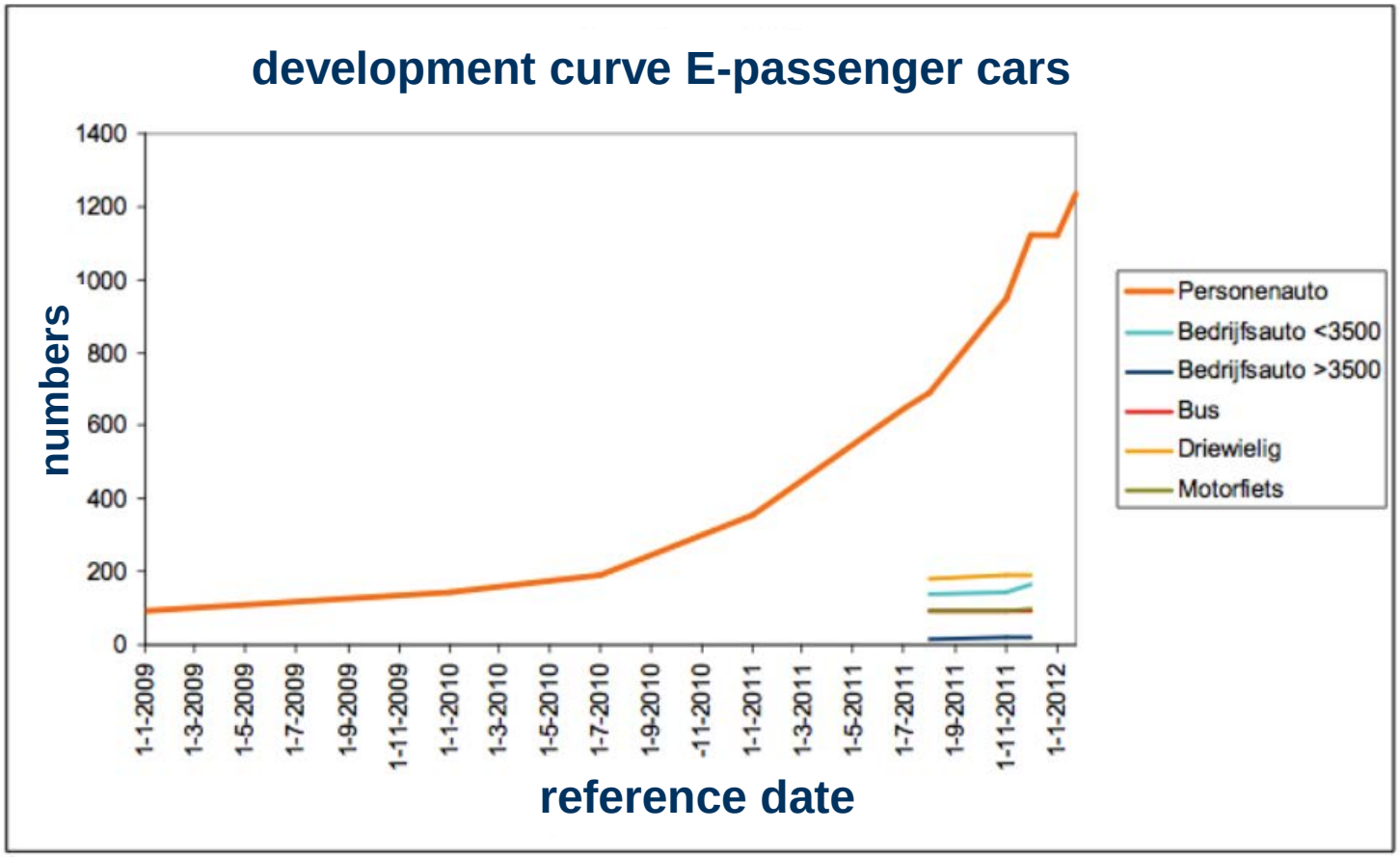

Sales of new passenger cars 2011: 550.000

Total amount of cars in NL 8.000.000

Biggest part of EV's in lease Via Mr. Green and Athlon

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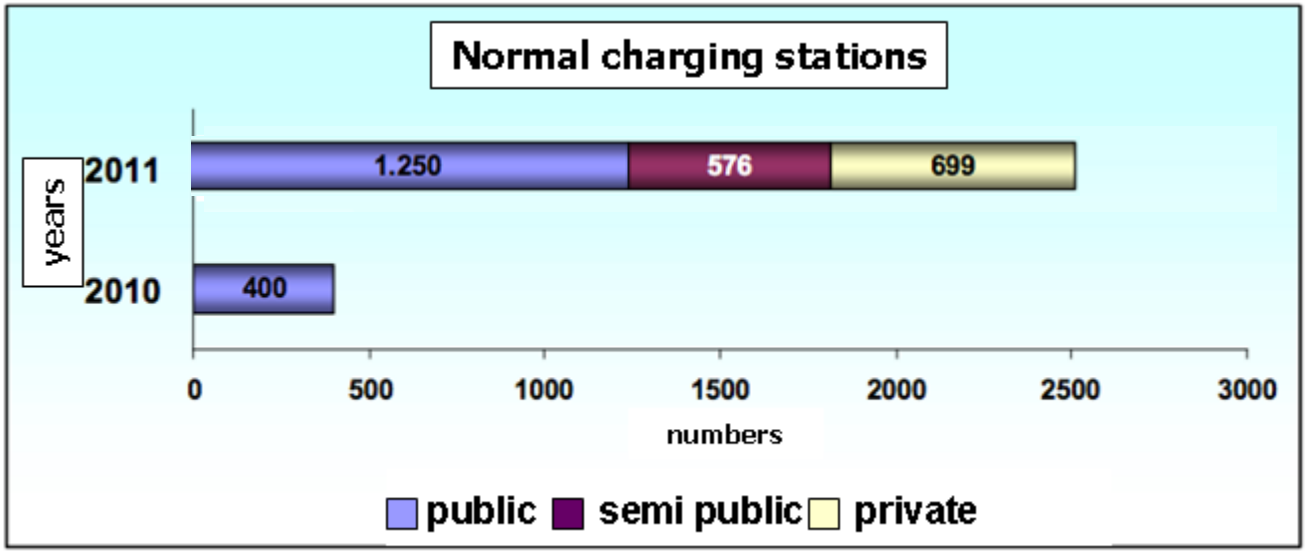
Normal (slow) charging stations NL 2009 - 2011

Amount of charging stations	2010	2011
Public		**1250**
Semi Public		**576**
Private		**699**
Total	**400**	**2525**



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Fast chargers in the Netherlands 2009 - 2011

- province Friesland / Essent 1
- City of Amsterdam / Essent 2
- ANWB 6
- BP 3
- Total 2
- Nissan 6
- Prestige Taxi 1
- **Total** **21**

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Expected growth of the EV market in the Neherlands

	2011	2012	2013	2014	2015	2020
Total EV's	1.250	3.000	6.000	10.000	20.000	200.000
Total EV's DC Fast Charging	500	1.500	3.000	5.000	10.000	100.000
Total Fast Chargers in NL	21	50	150	200	300	1.500
Total AC Slow Charging	1.000	6.000	12.000	20.000	30.000	200.000

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Technology, difficulties and unpredictable behaviour of fast charging

Te present way of fast charging is not the only method available

- At the moment standards are modified from DC to AC-combo (BMW/ GM/ VW)
- Fast charging technology improves and battery capacity increases
- Very large impact on the power grid
- Impact (ageing) on batteries as a result of fast charging is unknown
- Range extenders ⇨ No fast charging
- Battery swap (Better place) as a variant
- Wireless charging (induction) as a variant
- Parking = Charging ??
- Price of fast charging or maybe inductive charging vs price of home charging ??

This results into poor business cases for DC fast chargers!!

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Complex landscape of cooperating parties

	E-power connection
Locations	Landowner
Energy	Energy supplier
	Supplier
	Installation
Charger	Management & Maintenance
	Charge / invoice
	CRM-system
	Customer service
	Location information
Subjects of customer services	Marketing & (after)sales
€	Financing

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Organization of road authorities in the Netherlands

National road authority

Provincial road authority

Local authorities or Water board district

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In January 2012 the national road authority tendered to qualify for 459 locations to install various charging facilities

1. DC fast charging
2. AC slow charging
3. Battery swap
4. Wireless (induction)

The companies that want to be qualified have to also take care of:

1. Facilities to work (Wi Fi)
2. Facilities to recreate (i.e. play grounds)
3. Facilities to eat or drink

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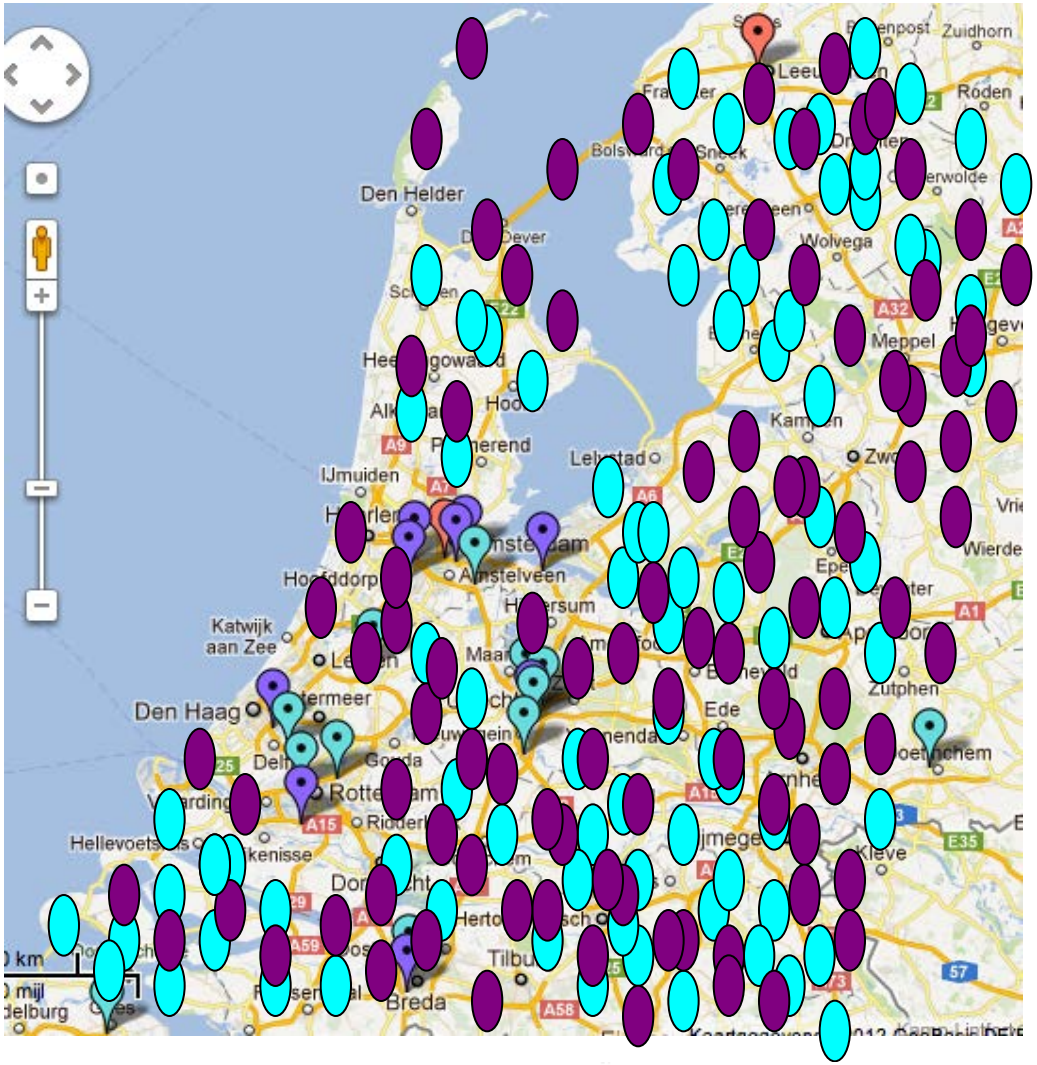
The idea is to deal with the range anxiety and to cover the whole country.



Every municipality must be accessible by fast charging

Some companies that reacted are:

MisterGreen.

anwb

IAM Electru

Fastned

bp

TOTAL

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thenewmotion

Elektrisch rijden geregeld!

Because of the poor business cases companies are making alliances

MisterGreen.

anwb

IAM electru

Fastned

bp

TOTAL

thenewmotion
Elektrisch rijden geregeld!

Every combination is possible!

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The tendering companies themselves can make suggestions for charging locations along the national highways.

So, there is the possibility that two or more companies go for the same location

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Expected growth of the EV market in the Netherlands after the permits have been given

	2011	2012	2013	2014	2015	2020
Total Fast Chargers in NL	21	50	150	200	300	1.500
Total FC / bat swaps AC chargers / induct expected after permits ??		100?	250?	350?	500?	1750?

There are too many uncertainties for the investors.

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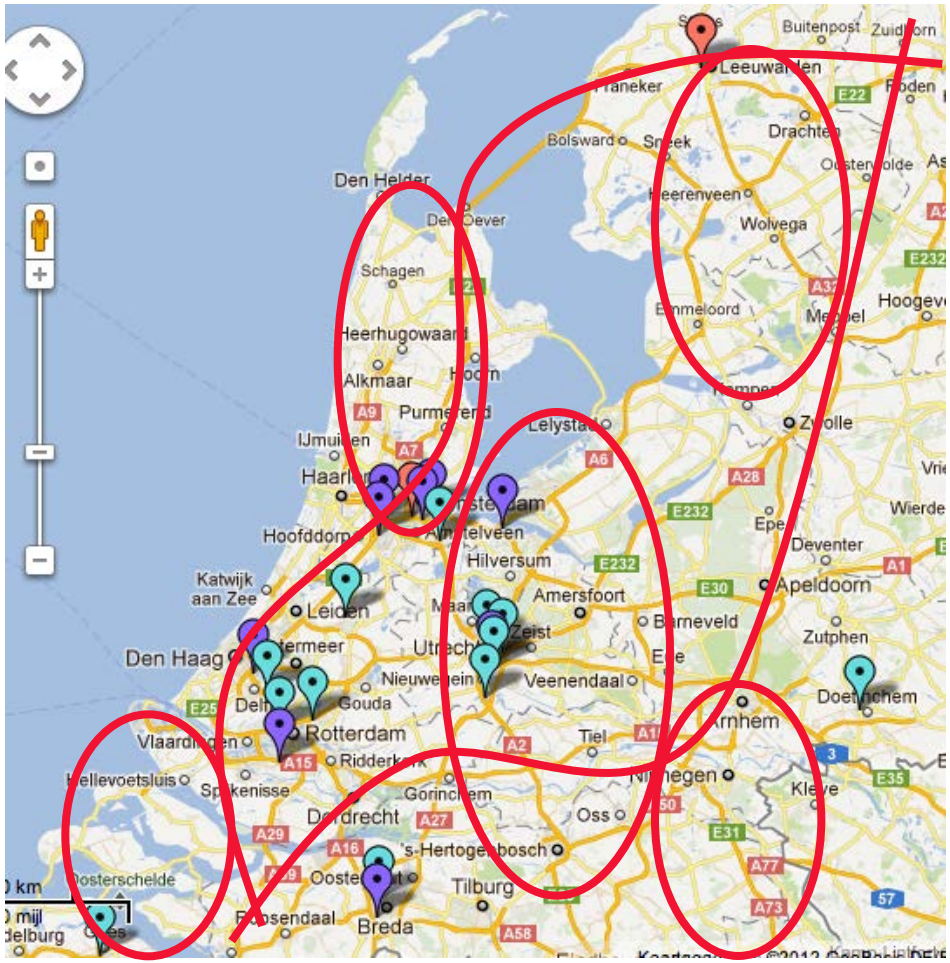

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Proposal for EV-highway in North Sea Region

The Interreg IVB North Sea Region Programme

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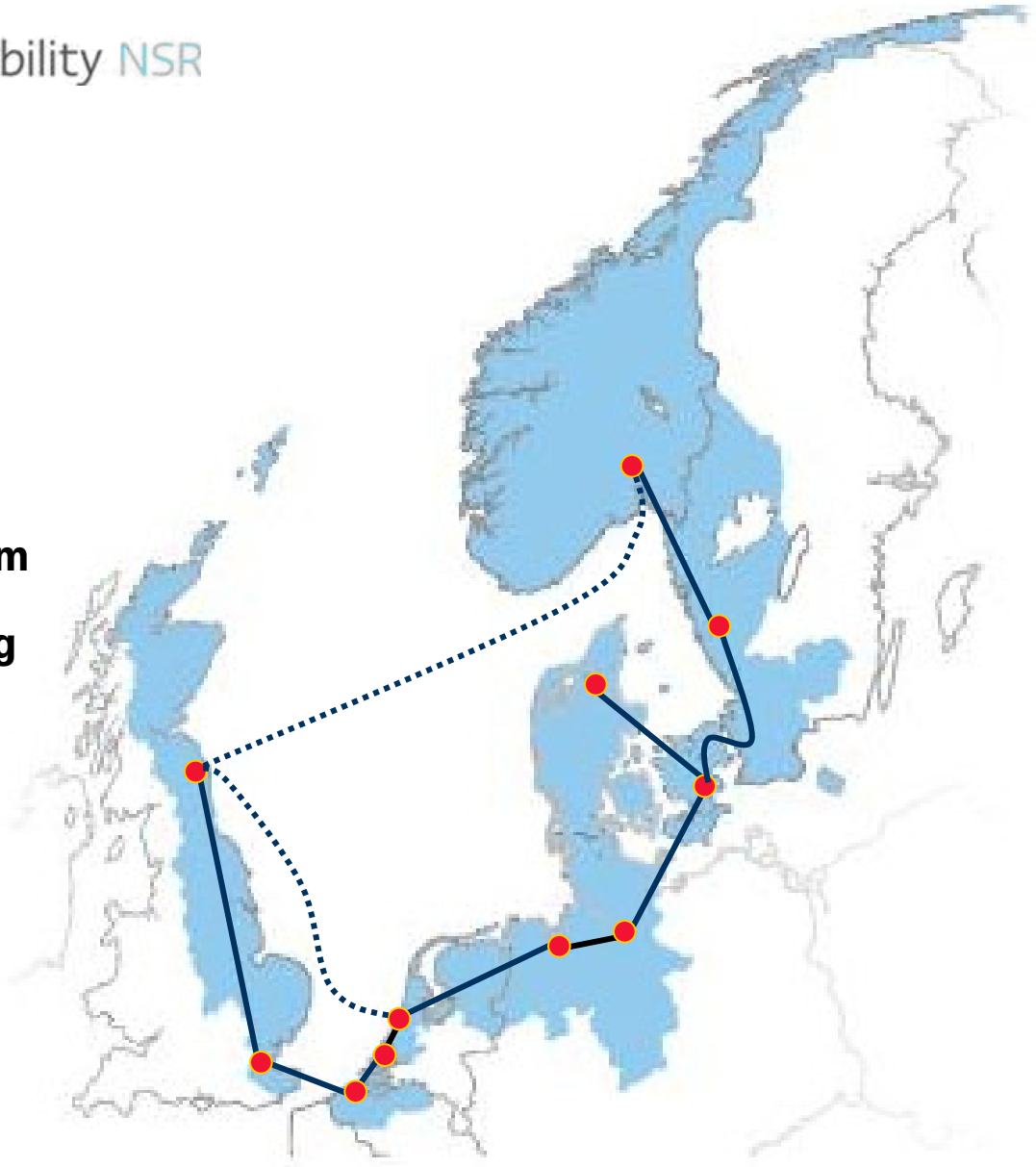
- Newcastle
- London
- Antwerpen
- Delft - Amsterdam
- Bremen-Hamburg
- Kopenhagen-Høje Taasrup
- Göteborg
- Oslo



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Questions??

Thank you for your attention

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