

Electrifying the Amsterdam Metropolitan Region

Current practices from The Netherlands

Hamburg - November 28, 2012

Dr. Peter van Deventer MPA



PRESENTATION

What is going in the Amsterdam Metropolitan Region?

Which opportunities do we see for the e-mobility sector?

Which conclusions can be made?

What advise for e-Hamburg?

Questions and discussion

What is going on?



No auto shows without E-cars



More than just fancy e-cars...



More than just fancy e-cars...



More than just fancy e-cars...



More than just fancy e-cars...



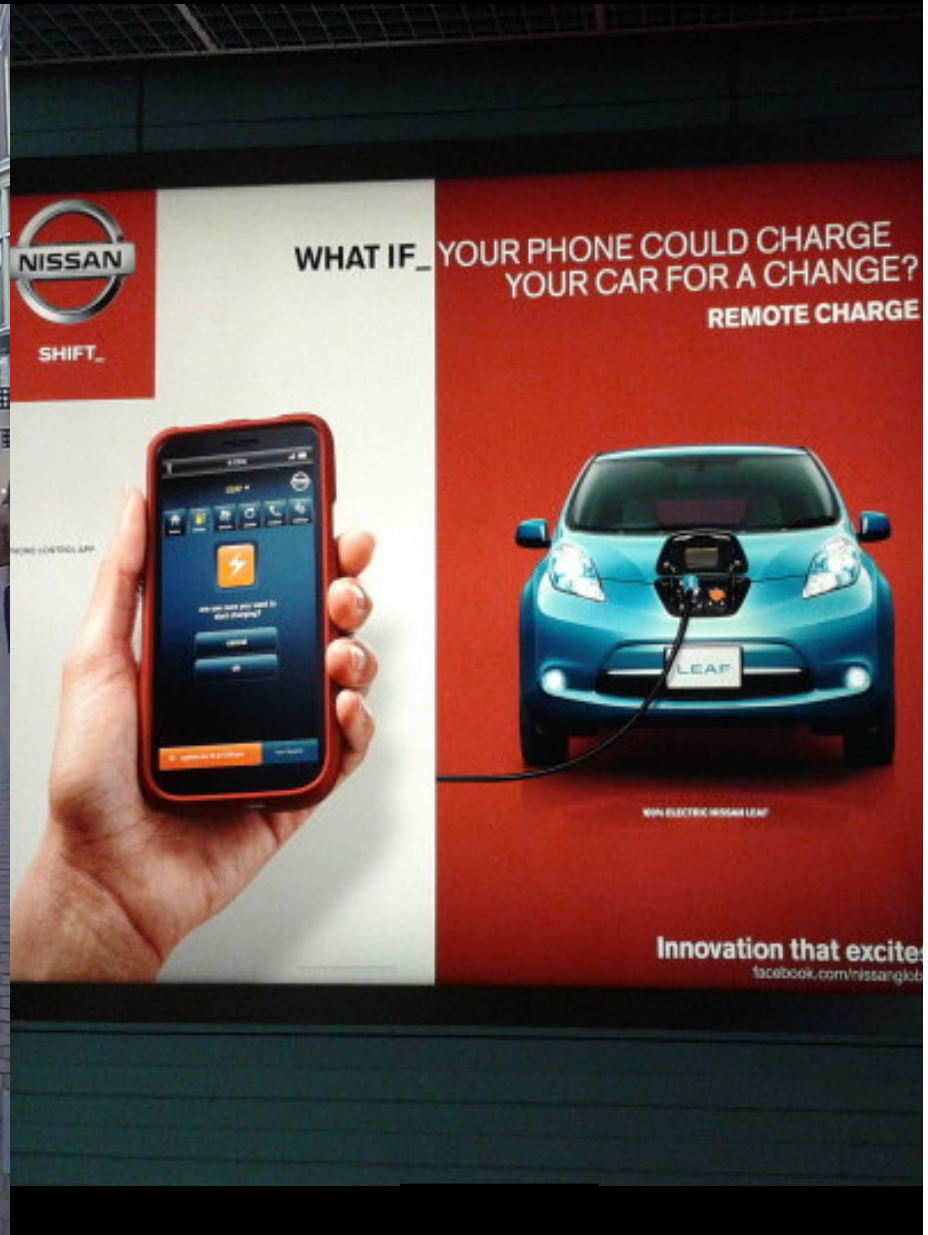
More than just fancy e-cars...



Investments: charging, parking, funds



Bill Boards everywhere



Developing IT/charging industry



Fast charging at the dealer



Knowledge sharing via social media

The screenshot displays a web browser window with the URL <http://www.zerauto.nl/>. The browser interface includes a menu bar (File, Edit, View, Favorites, Tools, Help), a toolbar with various utility icons, and a search bar containing the text "bert hesseling stanford".

The main content area of the website features an advertisement for GreenSource, with the slogan "We connect and make you move!" and an "EV CHARGER" logo. Below the advertisement is the ZERAuto logo and the tagline "nieuws / discussies / achtergronden over elektrisch rijden". Navigation links include "VEELGESTELDE VRAGEN", "CONTACT", and "BEGRIPPENLIJST". A search bar with the button "ZOEK" is also present.

The website's main navigation menu includes: HOME, NIEUWS, DISCUSSIE, KENNISHUIZEN, MARKT, LINKS, INLOGGEN, and AANMELDEN.

The content area is divided into two columns: "Nieuws" and "Agenda".

- Nieuws:**
 - 15 juli 2011, LEAFplan strand net voor finishlijn Alpe d'Huez
 - 15 juli 2011, Deel wil... (partially visible)
- Agenda:**
 - 27 september 2011, Rotterdam
 - Ecomobiel-vakbeurs naar Ahoy (27/28 september): Stop Thinking, Start Acting

On the right side, there is a "Column" featuring a portrait of Marc Bolier.

The browser's status bar at the bottom shows "Internet" and a zoom level of "100%".

Integrated e-car concepts



Done



European headquarters in NL (e.g. ZERO invests 5M\$ per year)

The screenshot shows a web browser window displaying the ZERO Motorcycles website. The browser's address bar contains the text "ZERO DS Electric Motorcycle | ZERO MOTORCYCLES". The website's header features the ZERO Motorcycles logo on the left and a search bar on the right with the text "FIND A ZERO NEAR YOU" and "SIGN-UP FOR THE NEWSLETTER". Below the header is a navigation menu with icons and labels for "DIRT", "STREET", "DUAL SPORT", "GALLERY", "FASTEST", "CLEANEST", "LIGHTEST", "NEWS", "LOCATOR", and "STORE". The main content area features a large image of a ZERO DS electric motorcycle, with the text "ZERO DS" overlaid on the right side. Below the motorcycle image is a navigation bar with links for "INTRO", "FEATURES", "SPECS", "PHOTOS", "ORDER", and "DEMO".

NL investments abroad (e.g. navigation innovations)

X


★ Favorites ☆ Gmail - Nieuw bericht - pete... Suggested Sites M Free Hotmail M MSN.com Radio Station Guide Web Slice Gallery

ZERAuto - Nieuws

Nieuws

02 augustus 2011

TomTom leidt Amerikaanse EV-rijders naar oplaadpunten



toon

- nieuws
- agenda

kennishuizen:

- Technologie
- Energie
- Milieu
- Verkeer
- Economie
- Showroom

Zoeken in nieuwsberichten:

ZOEK

Blijf op de hoogte:

RSS

Internet

Ecomobiel 2012: Industry/governments “growing up”



September 14, 2012: World Record: 270+ EV Rally!



However: barriers and uncertainties

- **Technology:** batteries, range, safety?
 - **Social impact:** job loss, only for the rich?
 - **Infrastructure:** public charging, strong grid, building process home charging quick enough?
 - **Environmental impact:** more power plants, clean energy, well2wheel, battery recycling?
 - **Cost:** electricity price, tax increase?
 - **Market:** enough choice, will they produce?
- **Policy games:** Wait and see? First mover advantage?



EV-policy complexity

technological complexity

low

high

low

implement

study hard

multi actor
complexity

high

negotiate,
network
management

wicked
policy
problem;
strategic
complexity



Governance strategies for transition

Governing the transition to e-mobility: small steps towards a giant leap

Dr. ir. A.P. van Deventer MPA | Dr. M.A. van der Steen
Prof. mr. dr. J.A. de Bruijn | Prof. dr. M.J.W. van Twist
Prof. mr. dr. E.F. Heuvelhof | Prof. dr. K.E. Haynes

Governing the transition to e-mobility: small steps towards a giant leap

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Which opportunities for e-mobility sector?

Value Chain = ±\$250 billion (2020)



SAVE World Bank says "new global electric vehicle ...
Published to Electric Cars | No reactions yet

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World Bank says "new global electric vehicle value chain" worth \$250 billion by 2020

Unsurprisingly, China will play a huge role



By Sebastian Blanco
Posted May 5th 2011 7:48PM



Comments 7

"When you do some of the back-of-the-envelope calculations, it really points to a massive shift."

That's the takeaway point from a new study – "The China New Energy Vehicles Program: Challenges and Opportunities" – released by the World Bank Transport Office and global management consulting firm PRTM. We recently had the chance to talk to PRTM's Oliver Hazimeh, who said the study shows that there's really no chance that plug-in vehicles are *not* going to make a huge impact in the coming decade. One way is through a new global value chain for electric vehicles that is estimated to reach \$250 billion by 2020.

People's crystal balls differ, but Hazimeh believes that it is "more than doable" and "likely" that somewhere between nine and ten percent of the vehicles sold in 2020 will be plug-ins. Add up all the different pieces that make up these vehicles (especially batteries) and things like the associated expansion at utilities due to a smart grid, and you get to the study's \$250 billion headline number:

Given what we see the OEMs committing to, given the cost curves and what we expect from ICE technology and fuel costs, the trends point to a direction where the economics will create enough pull for that number.

The study authors didn't need to use outrageous oil prices for 2020 – just \$120 a barrel – to get to the 10 percent number. If the real price of oil hits \$150 or \$160, something Hazimeh said was "more likely," then some of the pressures get applied even stronger. "When it starts making economic sense, then we think it's more than the early adopters – the two or three percent – who will buy these things," he said.

Even 10 percent annual sales is still only two-three percent of the total fleet, but this is still a very optimistic prediction. Hazimeh has been studying these numbers for a long time, though, and hasn't changed his

Saab hoping to secure \$157M

Internet

100%

Integration E-mobility sector with Clean Energy sector

Green Vision Clean Energy Showcase Live Energy Generation



Live Data

How It Works

Current Generation

Data as of: Tuesday, 9:17 am, April 26, 2011

GENERATING

1.35 kW



Conditions: A Few Clouds

Recorded at: San Jose International Airport, CA

Updated at: Apr 26 2011, 10:53 am PDT

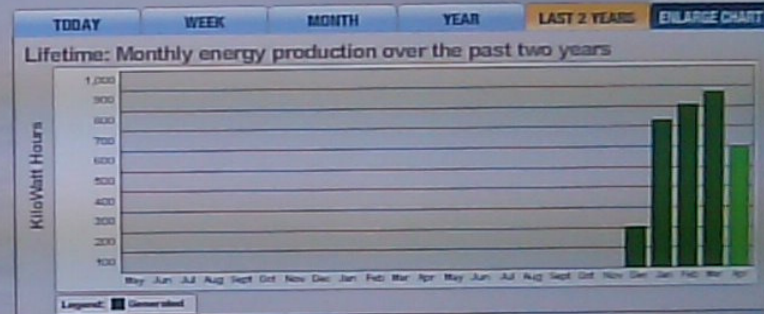
Visibility: 10.00 mi.



Historical

GENERATED

3,213.66 kWh



Environmental Benefits

Since Installation

Greenhouse gases avoided by use of solar energy

CO₂

3,998 lbs.

NO_x

1 lbs.



We've generated enough power to operate 1 home for 1 year.



We've generated enough power to operate 1 car for 1 year.



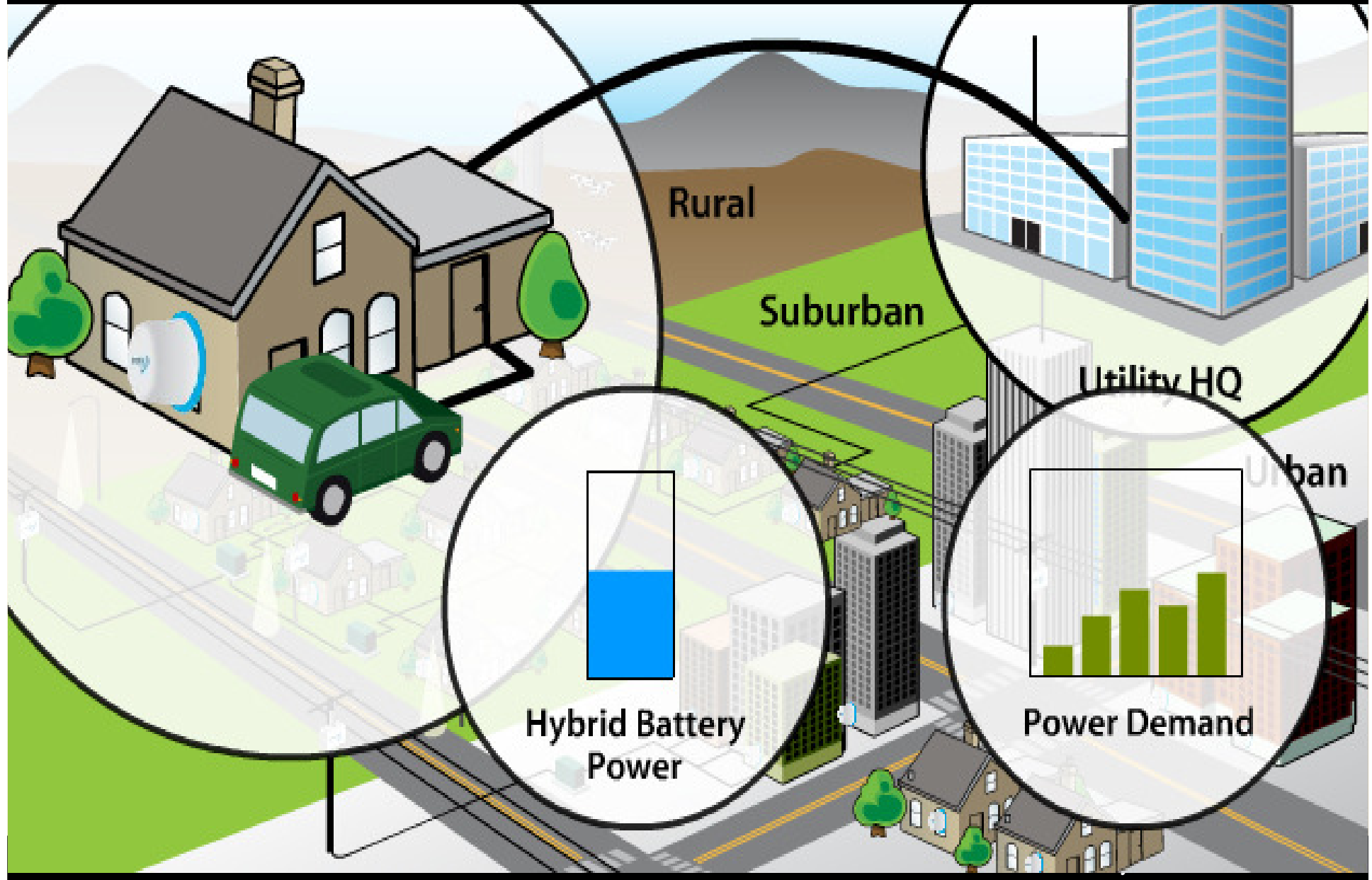
Battery Leasing Programs (ZERO ambition: 100M\$ per year)

The screenshot shows a web browser window displaying the ZERO Motorcycles website. The browser's address bar shows the URL "ZERO DS Electric Motorcycle | ZERO MOTORCYCLES". The website header features the ZERO Motorcycles logo and a navigation menu with icons for DIRT, STREET, DUAL SPORT, GALLERY, FASTEST, CLEANEST, LIGHTEST, NEWS, LOCATOR, and STORE. A prominent banner image shows a side view of the ZERO DS electric motorcycle, which is white and black with red accents on the wheels. Below the banner, a navigation bar includes links for INTRO, FEATURES, SPECS, PHOTOS, ORDER, and DEMO. The browser's toolbar shows various utility icons like Print, Preview, Clip, and Auto Clip, along with a search bar and a list of favorite sites.

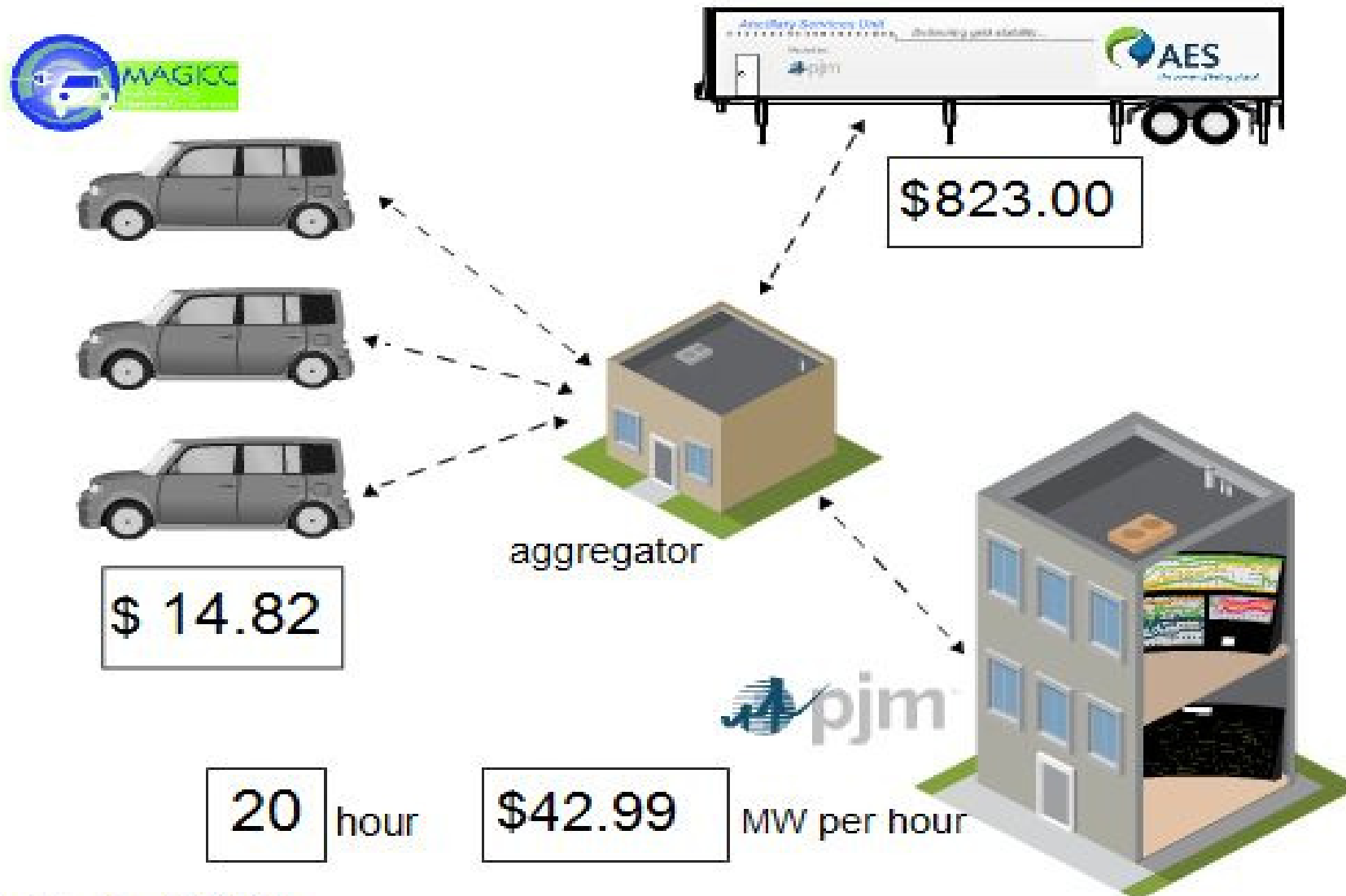
Car sharing → Mobility sharing → public space?



E-vehicle ↔ Smart-grid development



Free battery thru utility companies?



* Data taken from 01/11/10

Innovation → viable business model



Silicon Valley

E-HUBS: integration cars, bikes, trains



Fast Charging: range anxiety reduction

The screenshot shows a browser window displaying the website <http://www.ultra-fast.nl/>. The browser's address bar shows the URL, and the page title is "Ultra-Fast Network". The website header features the "Ultra-Fast" logo, flags for the United Kingdom, Netherlands, Germany, France, and the USA, and a "CONTACT" button. Below the header is a navigation menu with links for "ULTRA-FAST NETWORK", "TANK-LOCATIES", "STROOMPRIJS", "LAADPAS AANVRAGEN", "ADOpteER EEN PAAL", and "CONTACT".

The main content area is divided into two columns. The left column contains a large image of a solar panel array at a charging station. The right column contains the following text:

ULTRA-FAST NETWORK

Ultra-Fast plaatst en beheert een landelijk dekkend netwerk van snelladers, waarmee u komende jaren zorgeloos elektrisch kunt rijden door heel Europa. In Juni 2012 plaatst Ultra-Fast samen met Rijkswaterstaat snelladers bij benzinstations langs de A1, A2, A4, A8, A9, A12, A27 en de A28.

Wilt u ook een snellader exploiteren met goede rendementen, laat dit ons dan weten en u wordt franchisenemer van Ultra-Fast met uw eigen merknaam en verdienmodel.

On the right side of the page, there is a Twitter feed for the account "Ultra-Fast NL" (@ultrafastnl). The feed shows several tweets, including one from "MisterGreenEV" about 5 charging stations in Zeeland and another from "ultrafastnl" about a Los Angeles test. At the bottom of the Twitter feed, there is a "Join the conversation" button.

The browser's status bar at the bottom shows an "Error on page" message, the "Internet" icon, and a zoom level of "75%".

Public transport: inductive charging

The screenshot shows a web browser window displaying the Proov website. The address bar shows the URL <http://www.proov.nl/en/how-it-works>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The toolbar contains various icons for search, navigation, and social media. The website header features the Proov logo with the tagline "unplugged e-mobility" and a navigation menu with links for "our vision", "how it works" (underlined), "roadmap", "cases", "partners", "news", and "contact". The main content area is titled "how it works" and includes the sub-heading "How does inductive charging work?". Below this is a diagram illustrating the inductive charging process. The diagram shows a blue bus with an "Inductie adapter" on its side, positioned over a green ground surface. A blue "Inductielus" (inductive loop) is embedded in the ground, connected to a blue "Elektriciteitskost" (electricity cost) meter. A "Communicatie systeem" (communication system) is also shown, represented by a blue Wi-Fi symbol. A blue "Accu" (battery) is located on the bus. To the right of the diagram is a video player with the title "a day in the life of the mobilist of tomorrow" and the subtitle "the future according to proov". Below the video player is a "stay informed" section with the text "Submit your name and e-mail address here". The browser's status bar at the bottom shows "Done" and "Internet" with a 100% zoom level.

proov
unplugged e-mobility

our vision how it works roadmap cases partners news contact

how it works

How does inductive charging work?

Elektriciteitskost

Communicatie systeem

Inductielus

Inductie adapter

Accu

a day in the life of
the mobilist of tomorrow
the future according to proov

stay informed

Submit your name and e-mail address here

Done Internet 100%

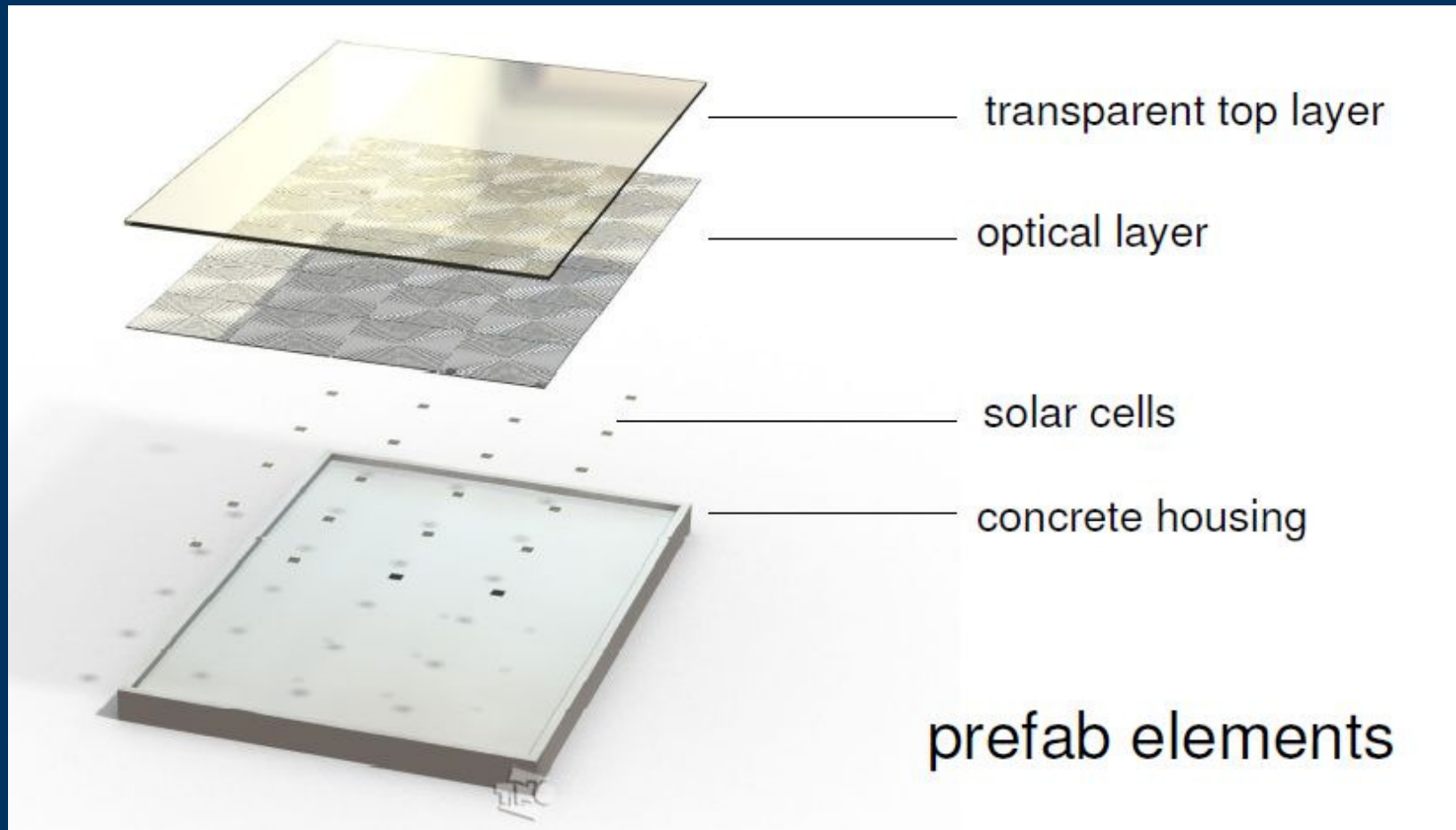
Industry innovators invest in NL



Location: the Netherlands
Tesla European distribution
& assembly

 **Hollandi.**
Pioneers in international business

SolaRoad: 'the road that pays for itself'



Ooms
Avenhorn Groep bv



Conclusions

- **Total Global EV Value Chain = \$250 billion PER YEAR**
- **Many uncertainties/high cost for innovation** hamper full market potential
- **Past and current policy research** indicates that successful introduction depends on cooperation between regions, industry, universities
- **To not get stuck in the “Valley of Death”**: opportunities for economic growth and renewal, particularly through cooperation, are essential!



Advise for e-Hamburg

Focus on themes which best fit Hamburg (e.g.):

1. Automotive (parts & components)
2. Bio-based Materials & Light Composites
3. Charging Infrastructure & IT
4. Batteries & Energy Storage (V2G/G2V)
5. Engineering & Consulting
6. Construction & Maintenance
7. Safety & Incident Management
8. Car Sharing, Fleets and Leasing
9. Smart Mobility & Traffic Management
10. Governance & Introduction of e-mobility
11. ...



Advise for e-Hamburg

Organize yourself at various levels:

Local (e.g. roundtables, fleets)

Regional (e.g. incentives, policies)

Interreg (e.g. knowledge development&exchange, symbolic links)

International (e.g. unexpected third parties, innovation)

Public private partnerships (e.g. Coast to Coast EV Connection)



Questions and discussion !



Thank you very much, Hamburg!



Brabantse Ontwikkelings Maatschappij

