







ZNSTD



ZNSTD

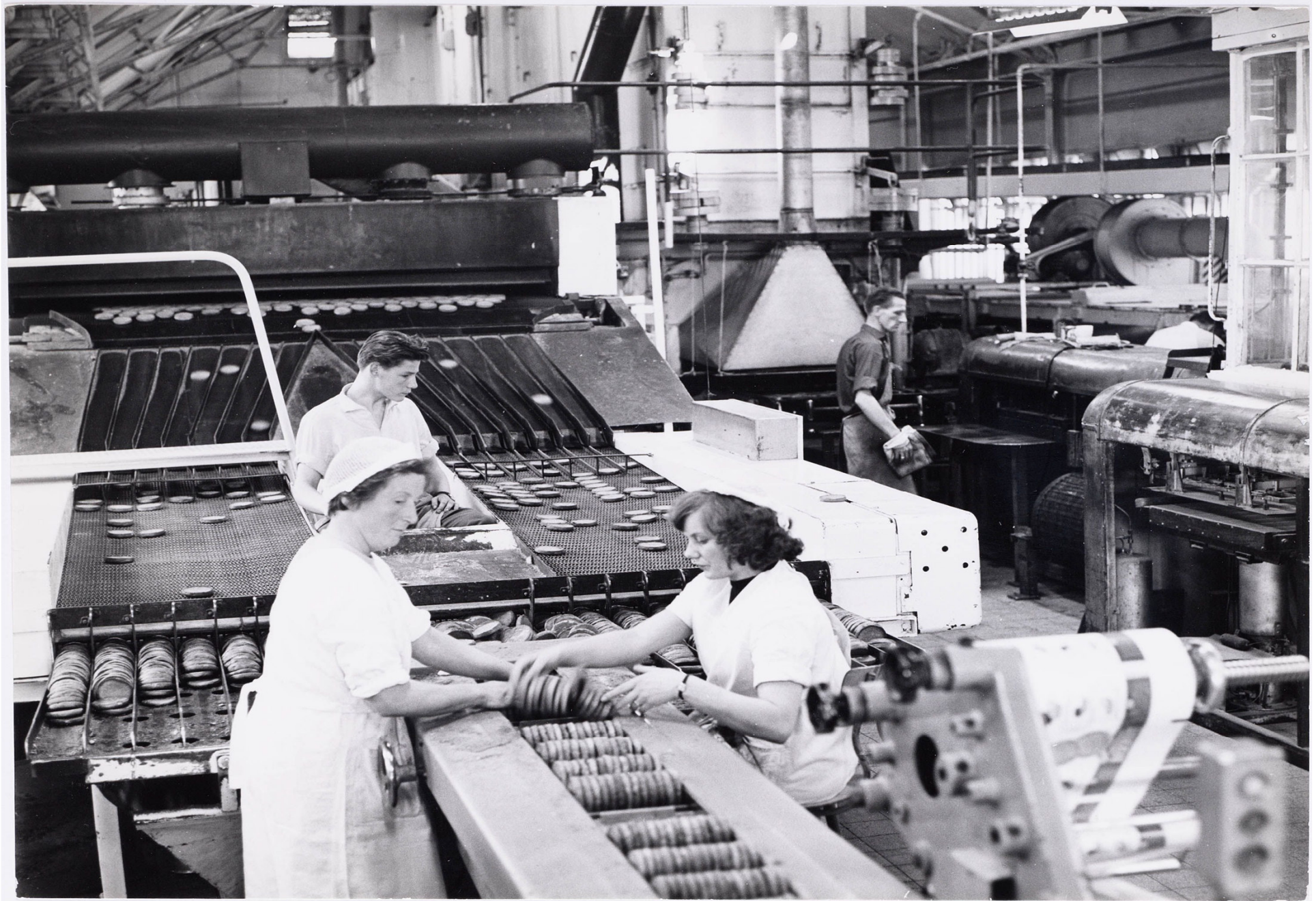


ZNSTD





ZNSTD



ZNSTD



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ZNSTD



ZNSTD





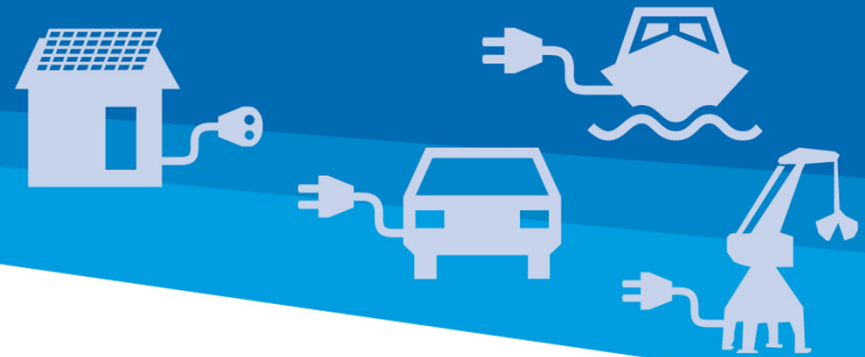
ZNSTD



ZNSTD



e-harbours
electric



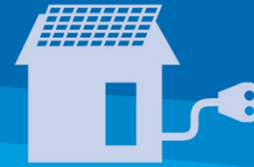
e-harbours



Harbour cities need smart energy

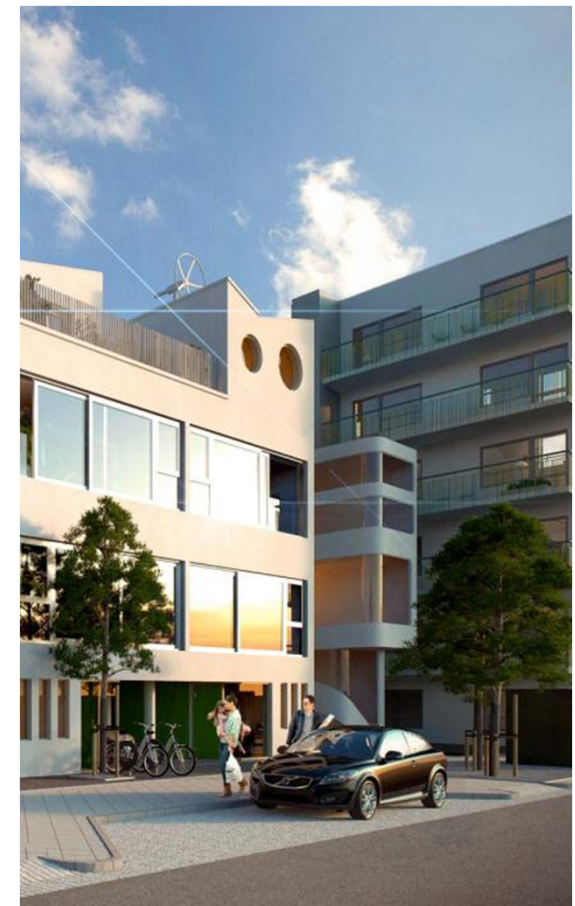


e-harbours
electric

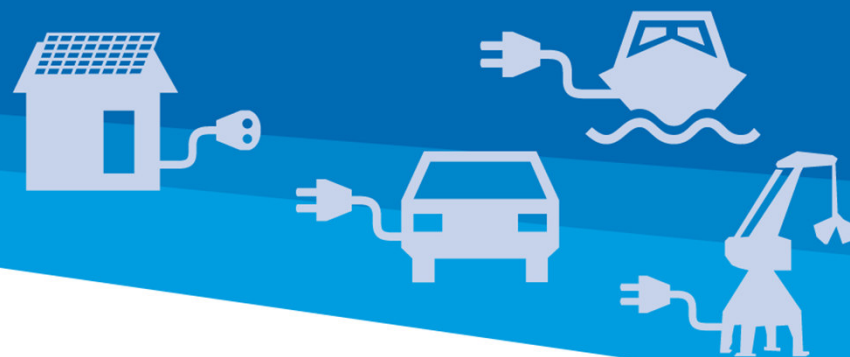


This is e-harbours

- Stimulating renewable energy
- Building and testing Smart Grids in harbour regions
- Searching for flexibility in energy demand
- Promoting electric transport



e-harbours
electric



Partners

- The project runs from 2010 to 2014 and is supported by EU Interreg IVB North Sea Regions Programme.





Why?

The “*Pentecost holiday*” example ...

A nice holiday weekend in Belgium...

- may 2012, the “Pentecost holiday” weekend
- most companies closed
- the weather is perfect
- bright sun, nice breeze

... almost turned into a nightmare

- peak production of solar and wind energy
- nearly no economic activity
- nearly breakdown of the grid
- France finally accepts excess energy
- Belgium **pays** France 18€/MWh!

LATEST NEWS

EXTRA!
EXTRA!

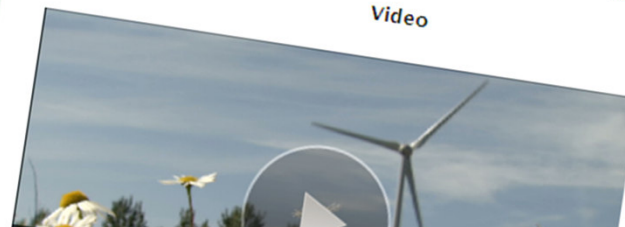
Bijna stroomuitval door overschot aan
zonne- en windenergie

door Michael van Dorp op 30 mei 2012 · 2 comments
in Europa

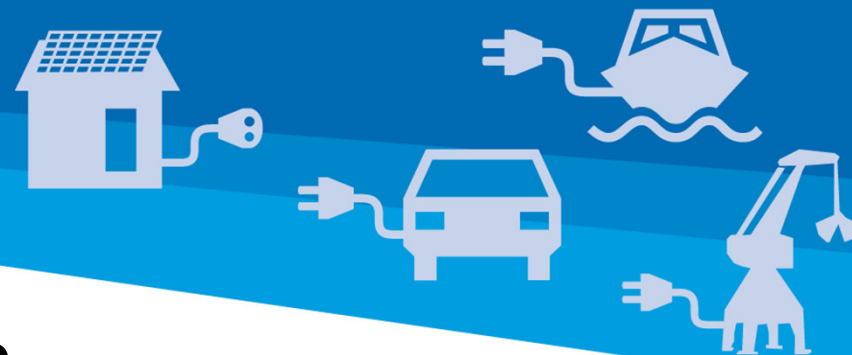


In België viel dit weekend bijna de
uit vanwege een overschot aan zo
windenergie. Vanwege het goede
werd er ongebruikelijk veel energi
opgewekt door zonnepanelen en
windmolens, terwijl de vraag juist
bijzonder laag was. België heeft he
overschot aan energie moeten exp
en heeft daarvoor zelfs moeten be

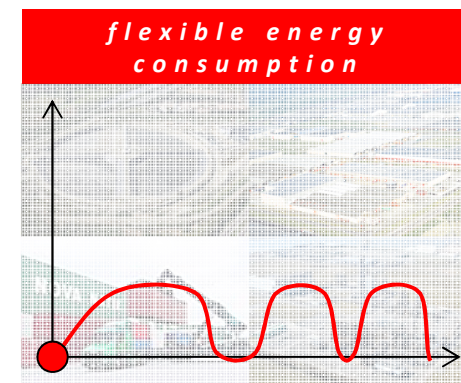
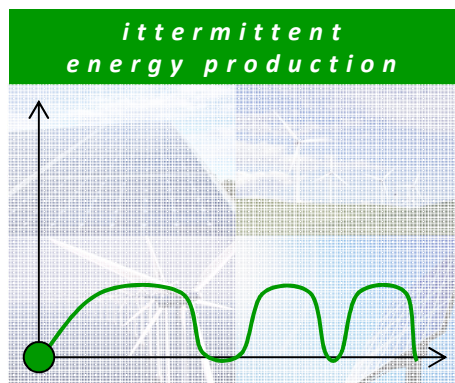
Video



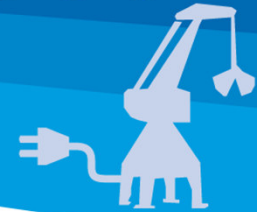
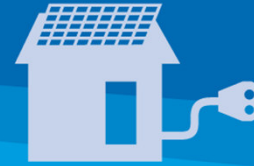
e-harbours
electric



So this is our challenge



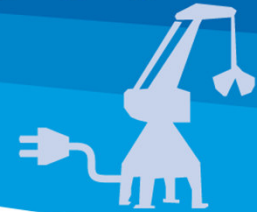
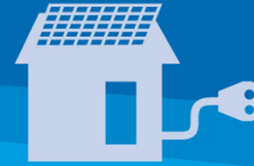
e-harbours
electric



Grids needs stability



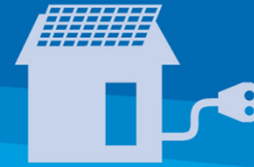
e-harbours
electric



Costs involved



e-harbours
electric



We need energy storage to balance the net!



ANDREW LISZEWSKI – BATTERY – 1/05/12 2:20pm

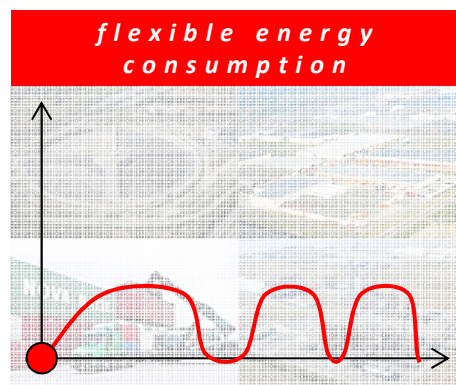
29,246 🔥 ★ 60 💬 ➦

This Boring Warehouse Is Actually the World's Biggest Battery

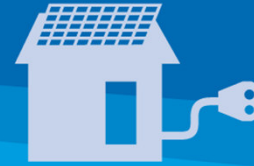




But another option is to flex to the max:



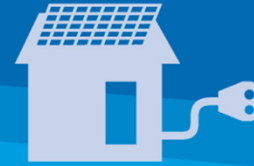
e-harbours
electric



Concrete balancing capacity?



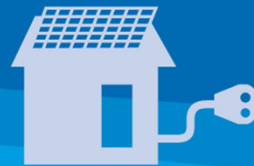
e-harbours
electric



Flat balancing capacity?



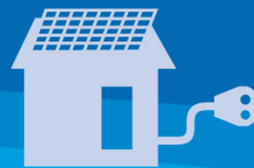
e-harbours
electric



Hidden balancing capacity?



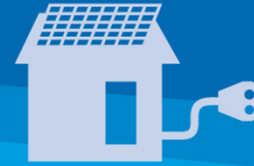
e-harbours
electric



Detailed hidden capacity?



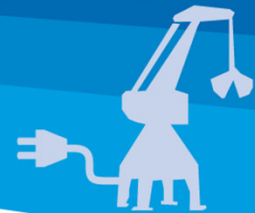
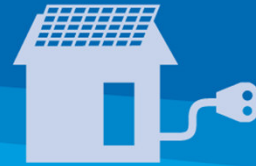
e-harbours
electric



Floating balancing capacity?

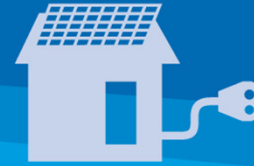


e-harbours
electric



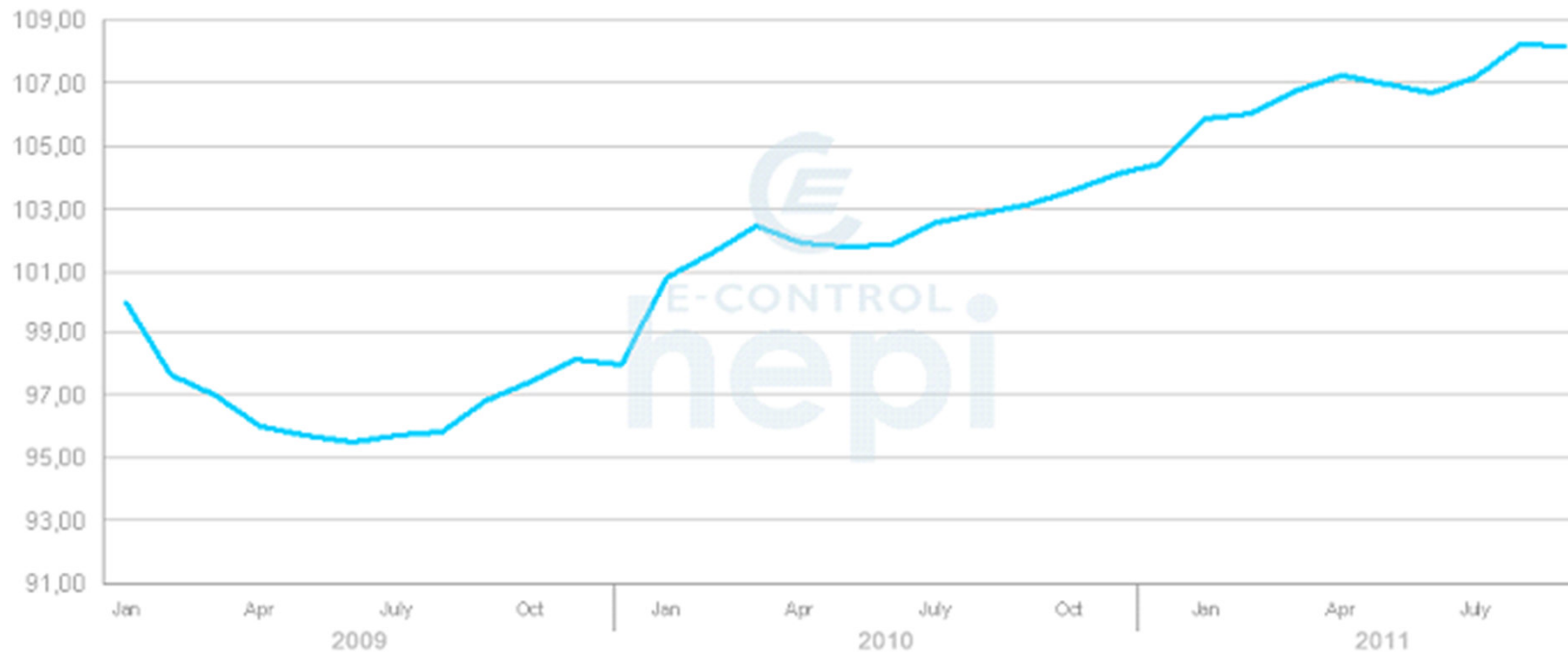
Dispersed balancing capacity?

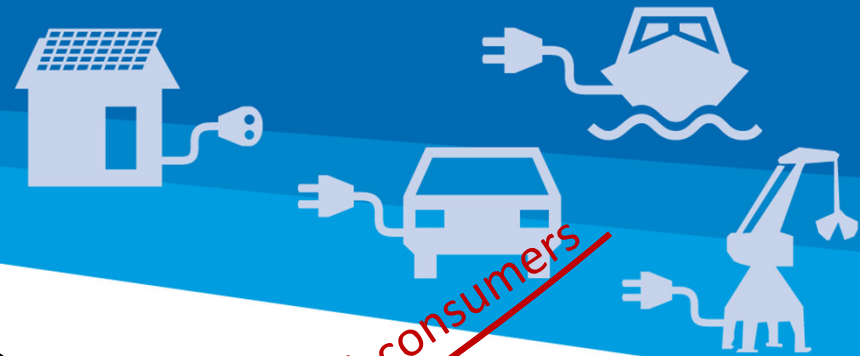




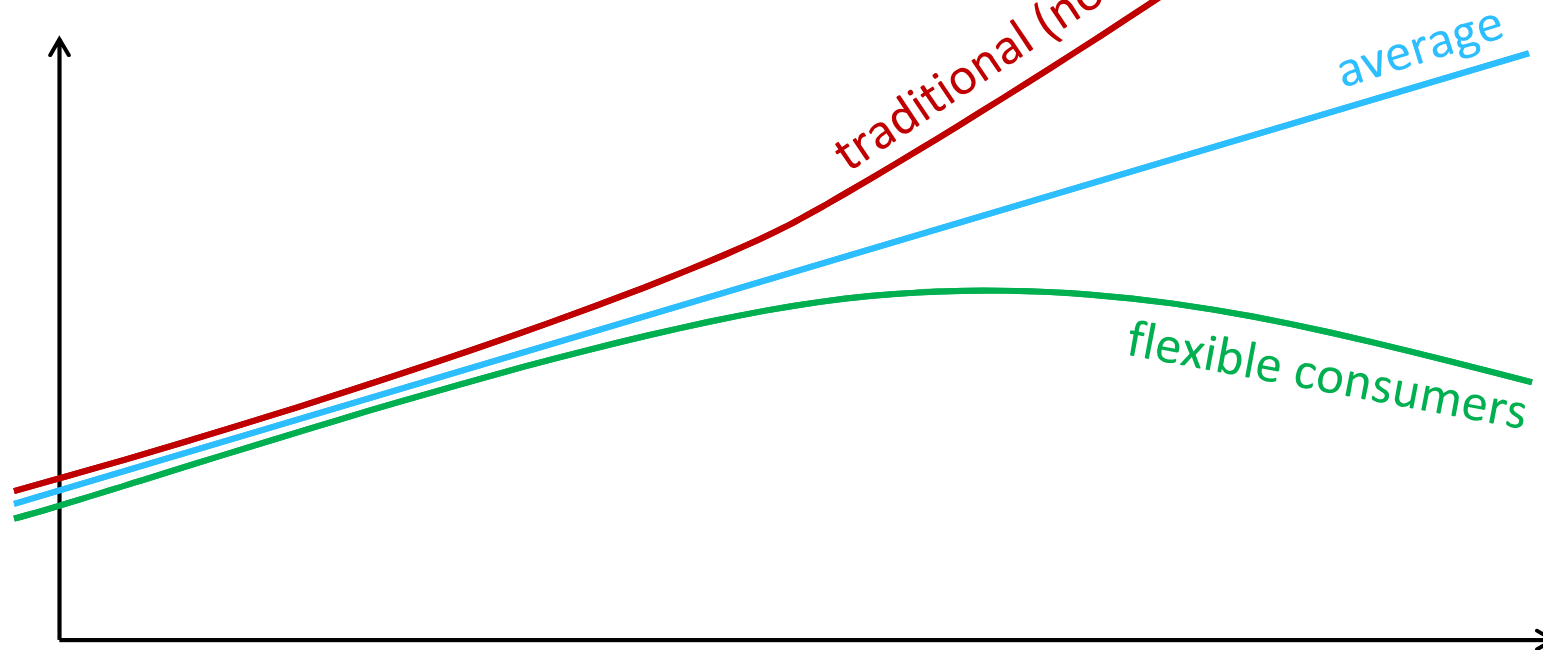
European electricity prices are increasing ...

Development of European electricity prices ⚡

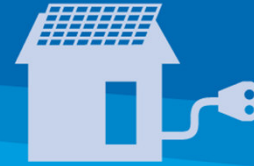




Increasing for everybody?



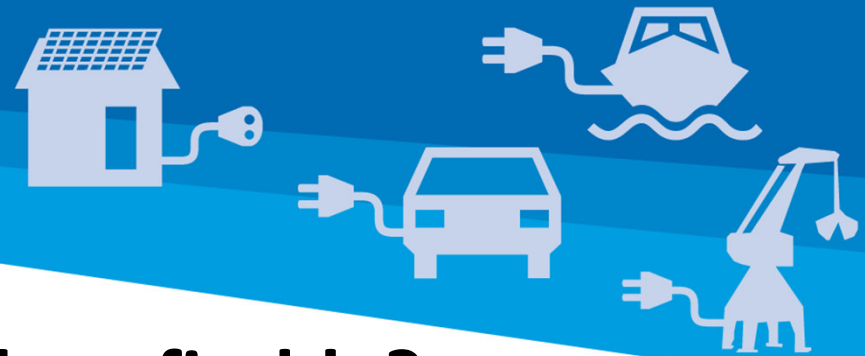
e-harbours
electric



Investigating flexible demand for energy in a competitive logistic environment

- Antwerp, Belgium. VITO and Port of Antwerp.
- Identifying sources of flexibility. Building a Virtual Power Plant.

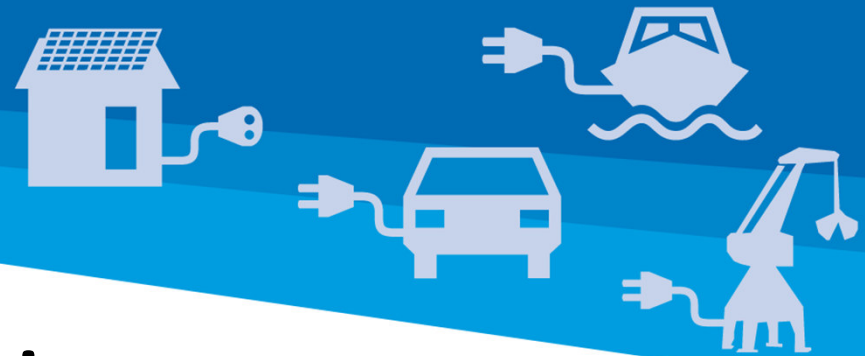




What makes a Smart Grid profitable?



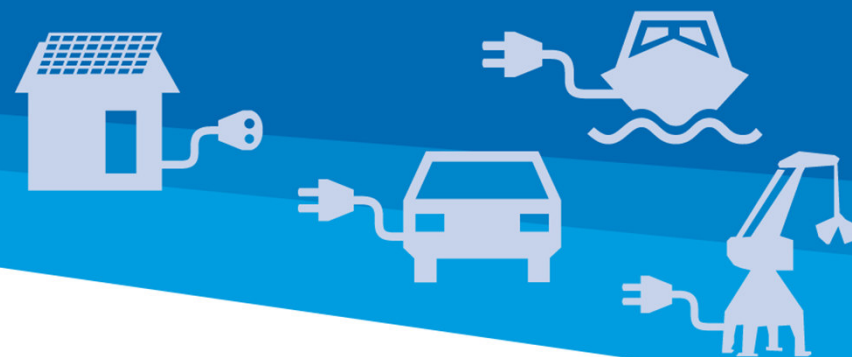
- Hamburg, Germany. University of Applied Sciences
- Assessing the value of flexibility in harbour industries



Charging electric vehicles in a smart way



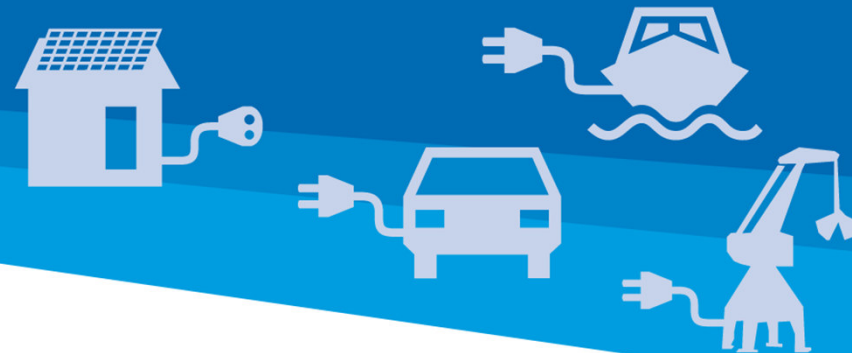
- Zaanstad, Netherlands. City of Zaanstad.
- Building a physical and administrative infrastructure that enhances green and smart energy.



Stimulating electric boating



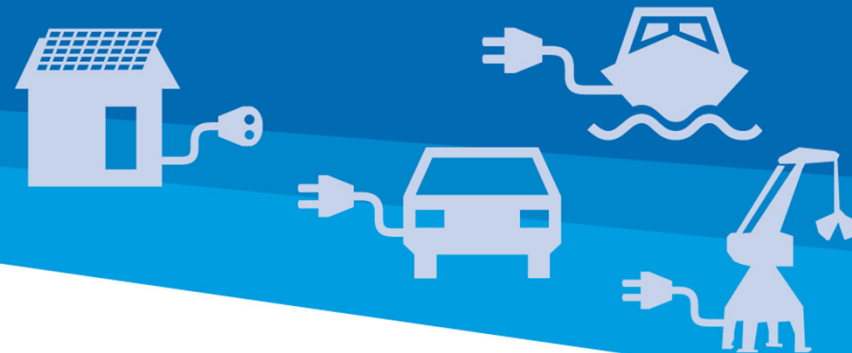
- Amsterdam, Netherlands. City of Amsterdam.
- Fast green charging points for leisure boats along the canals. Developing a smart marina.



Fishing port investigates theadvantages of a Smart Grid



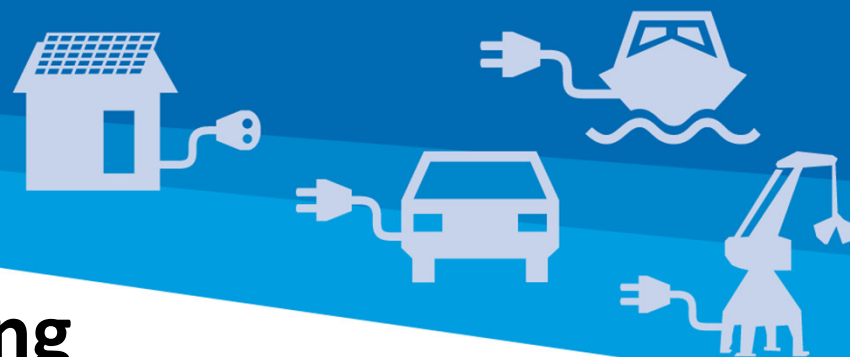
- Scalloway, United Kingdom. PURE Energy Centre.
- Monitoring of energy use and chances for renewable energy.



Testing a smart grid on a household level

- Malmö, Sweden, City of Malmö
- In house charging of electric cars. Housing project in redeveloped harbour area features Smart Grid.

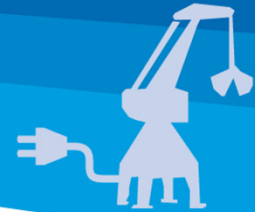
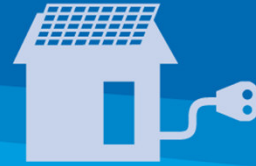




Analysis and benchmarking of the showcases



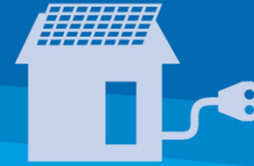
- Aberdeen, United Kingdom. Robert Gordon University
- Facilitating large scale implementation of the results



Mid-term Results

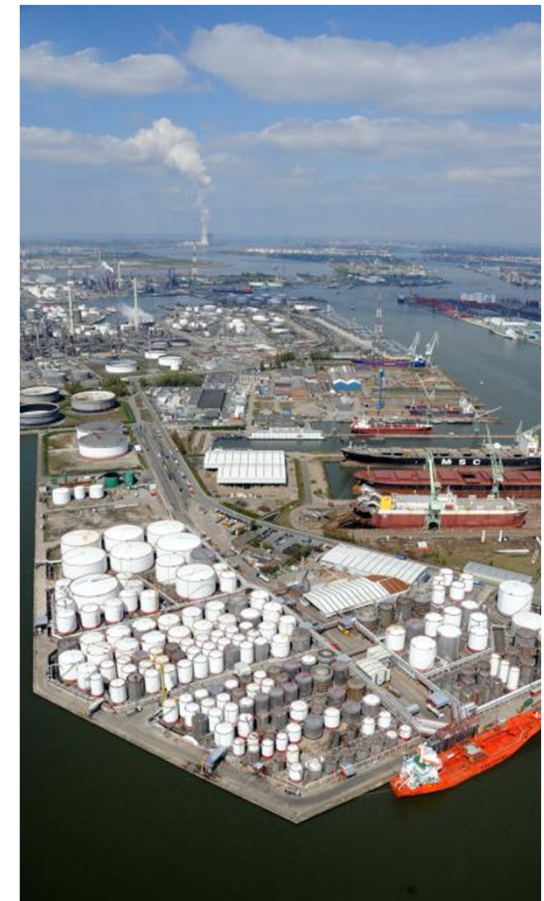
- An important part of electricity consumption (up to 15%) can be made flexible.
- Smart Grids will shortly become indispensable. The electricity grid has to adapt to a fluctuating input. Balancing demand and generation gets ever more important.
- Smart Grids are a viable solution, both on a small scale (in an industrial plant) and in regions.





Barriers to Smart Grids

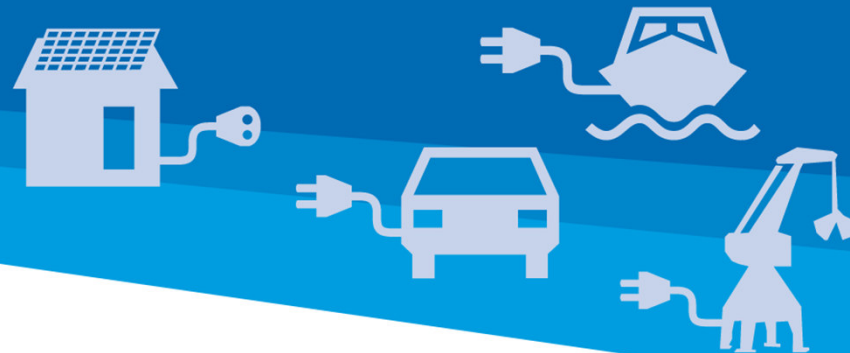
- Many stakeholders hesitate to invest in Smart solutions
- Electricity (and energy in general) is still very cheap for industrial users.
- In many cases the core business of a company seems to ask for an unrestricted availability of energy. The forklift trucks must always be ready to go to work.





Barriers II

- the market value of flexibility (both in production and consumption of electricity) is still quite low. That weakens the business case of a Smart Grid.
- The stakeholders that collect the gains of a Smart Grid are not always the parties that build the system and carry the costs.
- it might take a number of years (perhaps five to ten) before Smart Grids will really take off. That means, we will have to begin building the foundations for that Smart Grids today.



Follow-up:

- Although large amounts of flexibility are available;
- And technology is not a barrier;
- It turns out the ROI not there yet;

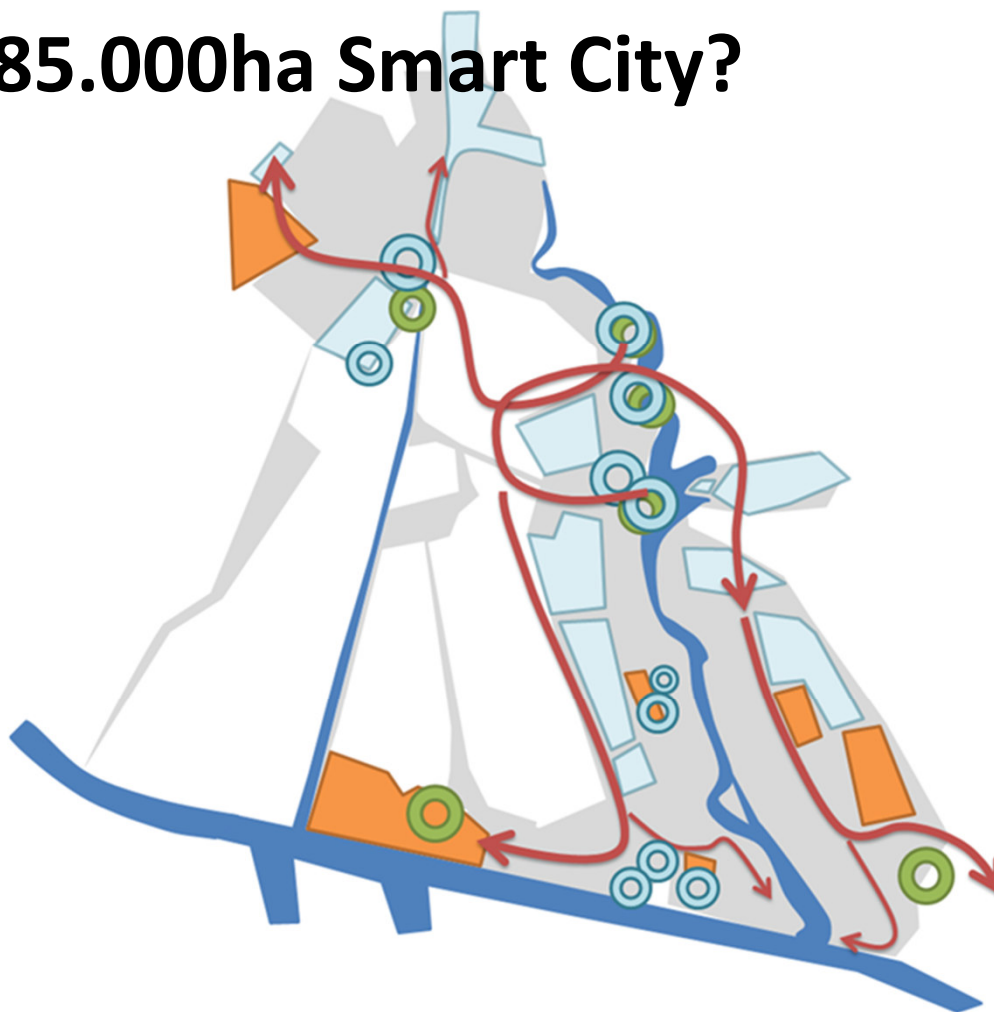
But e-harbours found:

- An opening to large end-users;
- Where energy awareness increased;
- Being the stepping stone to next phase (transition);

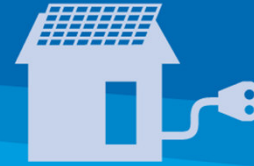
e-harbours
electric



Spin off: 85.000ha Smart City?

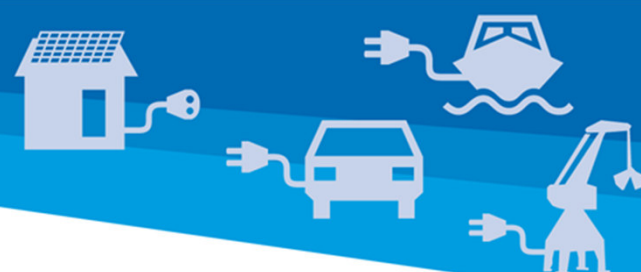


e-harbours
electric



Thank you

- www.eharbours.eu

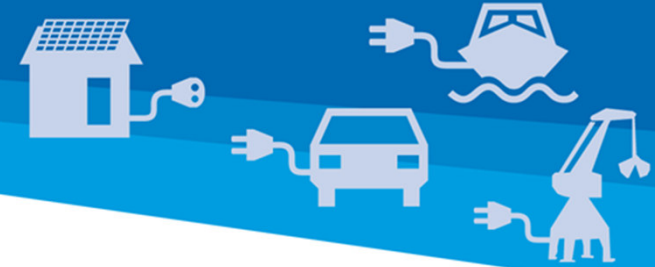


e-harbours presents at North Sea Region Electric Mobility Network (E-Mobility NSR)

Jan Schreuder, Municipality of Zaanstad – representing e-harbours

Policy, Practice and Profitability

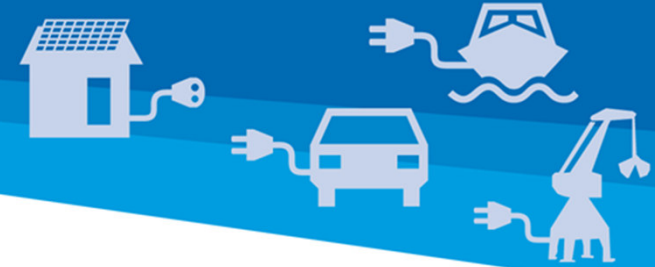
Haarlem, 10 October 2013



Partners

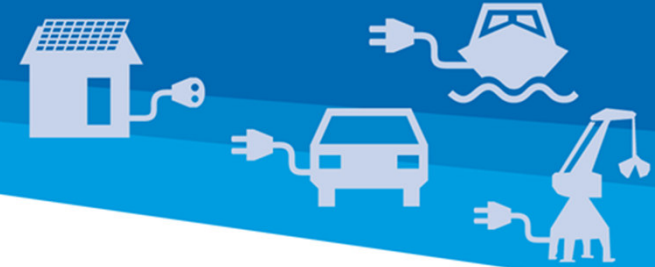
- Municipalities
- SME
- Harbour Authorities
- Knowledge institutions





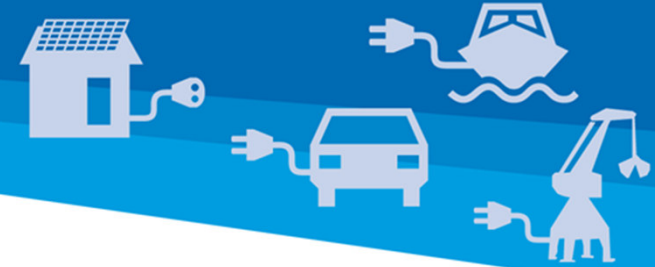
What do we do?

- Energy Logistics
- [Movietime!](#)

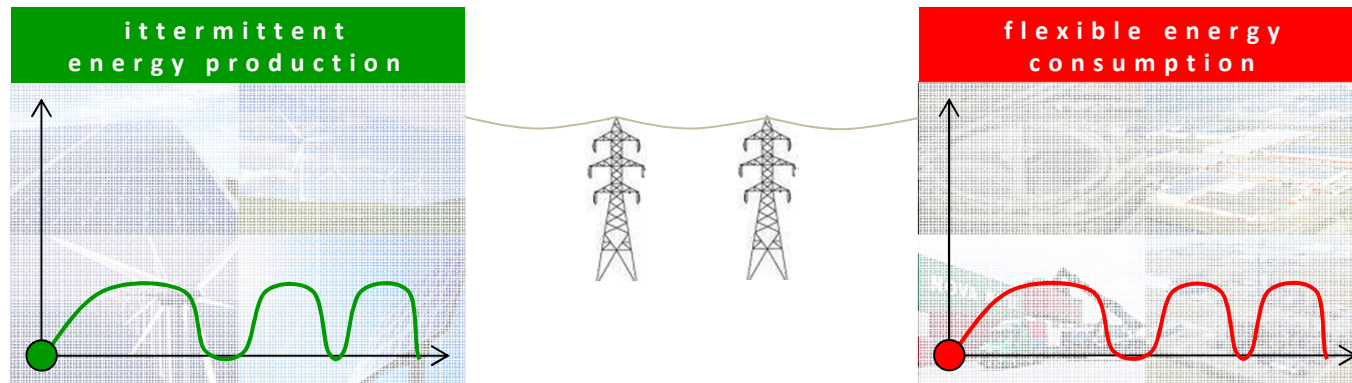


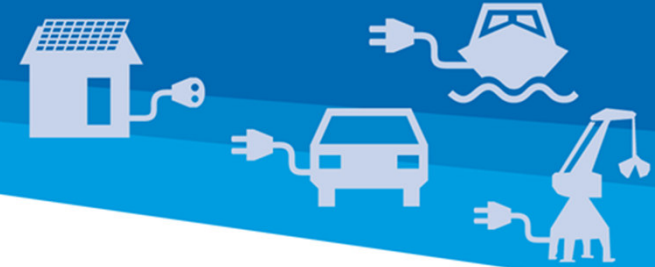
Change of perspective: I need your help!

- Search for Flexibility



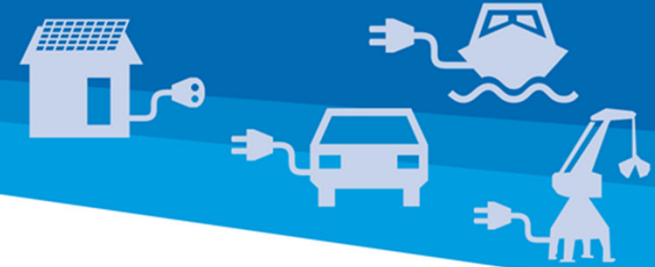
Why? Renewables are intermittent





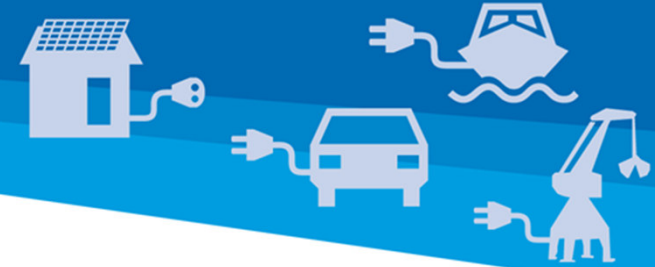
Grids needs stability





Costs involved





We need energy storage to balance the net!



ANDREW LISZEWSKI - BATTERY - 1/05/12 2:20pm

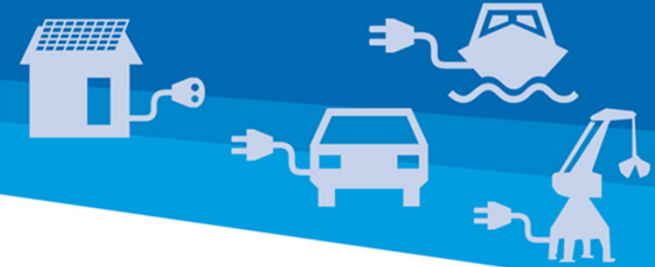
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This Boring Warehouse Is Actually the World's Biggest Battery

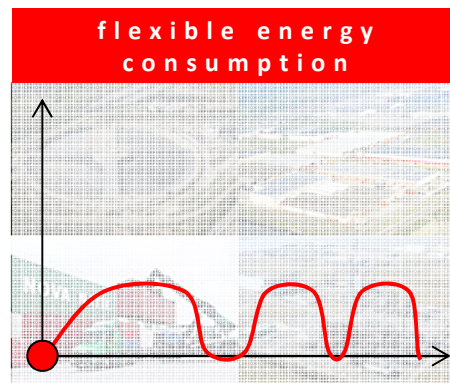


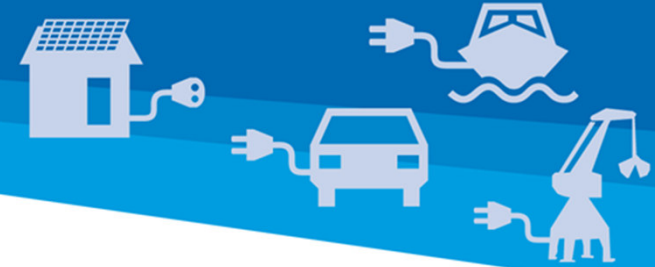
There aren't enough letters in the alphabet to classify this [monstrous battery](#) China's built. D x 1,000? Not even close. With arrays larger than a football field it can store a whopping 36 megawatt hours of power.





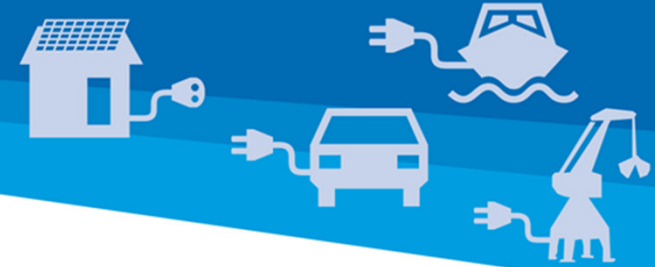
Test your Creativity: help balancing the net....





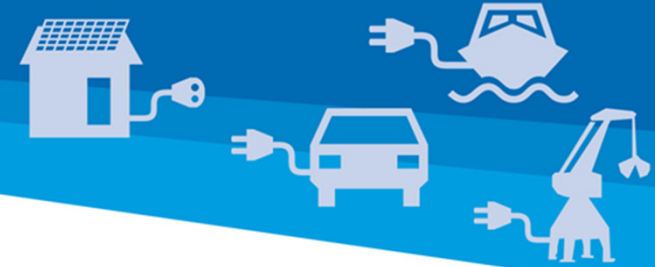
Concrete balancing capacity?





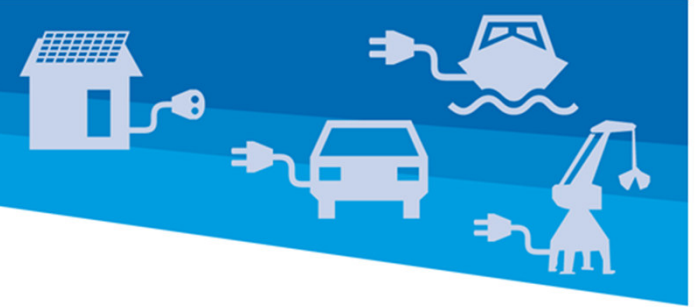
Flat balancing capacity?





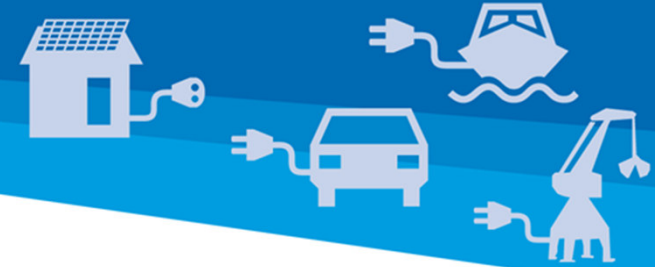
Hidden balancing capacity?





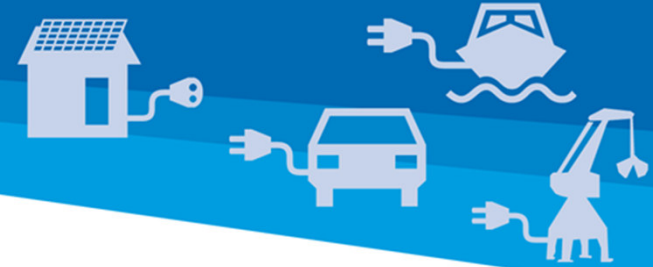
Detailed hidden capacity?





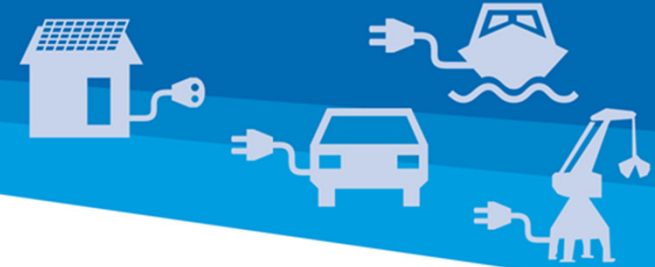
Floating balancing capacity?





Dispersed balancing capacity?

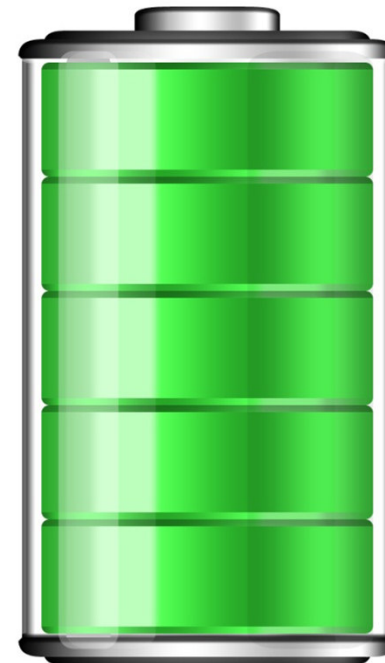


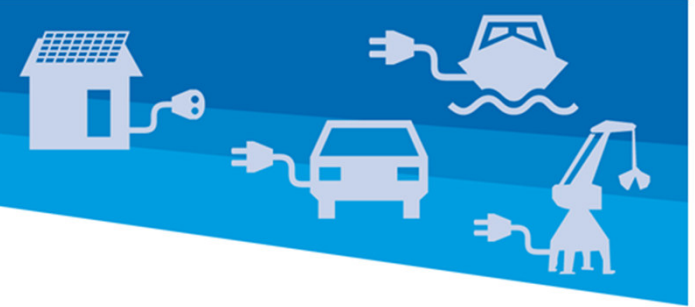


Presumption

- Emobility plays crucial role in transition

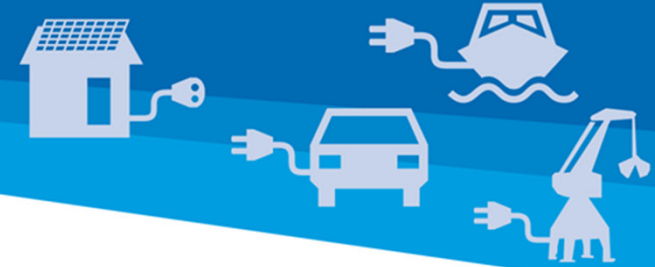
Download more graphics at www.psdgraphics.com





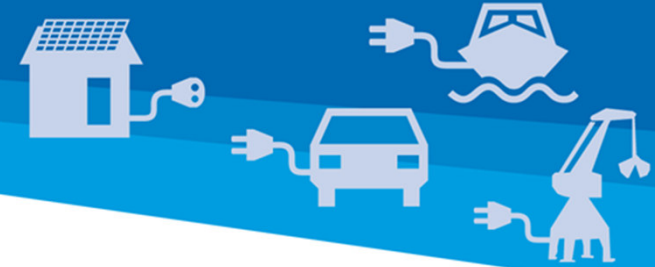
End of Creative Phase

- Now we need to work on Business Cases:
 - Technical
 - Organisational
 - Legal
 - Economical










































The test:

- REloadIT
 - Travel prediction
 - Weather prediction
 - RE production
 - Contract prices
 - Real Time Price



The results

Wagenpark beheerder

WAGENPARK		ENERGIEGEBRUIK					
Voertuig	Kenteken		Status	Laadstroom (W)	Km	Batterij	Actief
Nissan Leaf	34-SJN-5		Opladen	13	648		
Nissan Leaf	01-ABC-3		Opgeladen	0	155		
Nissan Leaf	01-ABC-3		Opgeladen	0	124		
Nissan Leaf	01-ABC-3		Opladen	8	55		
Nissan Leaf	01-ABC-3		Rijdend	0	140		
Think City	Demo-auto		Rijdend	0	454		
Think City	01-ABC-3		Opladen	8	0		
Think City	01-ABC-3		Opgeladen	0	0		
Think City	01-ABC-3		Opgeladen	0	0		
Fiat Qubo	01-ABC-3		Rijdend	0	0		
Fiat Qubo	01-ABC-3		Opgeladen	0	0		
Fiat Qubo	01-ABC-3		Opgeladen	0	0		
Fiat Qubo	01-ABC-3		Opladen	13	0		
Fiat Qubo	01-ABC-3		Opgeladen	0	0		
Fiat Qubo	01-ABC-3		Opgeladen	0	0		
Nissan Leaf	38-SJN-5		Opgeladen	0	1143		

Vandaag

Zonne-energie	15 kWh
Windenergie	70 kWh
Elektrische vervoer	21 kWh

Voertuigen

Opgeladen	9
Opladen	4
Rijdend	3

Weer in Zaandam

Zwaar bewolkt

13.5 °

Electrisch gereden km / kg CO₂

Door u	85 km / 13 kg
Totaal	2698 km / 399 kg

Klik op een rij voor een overzicht van reserveringen van het voertuig

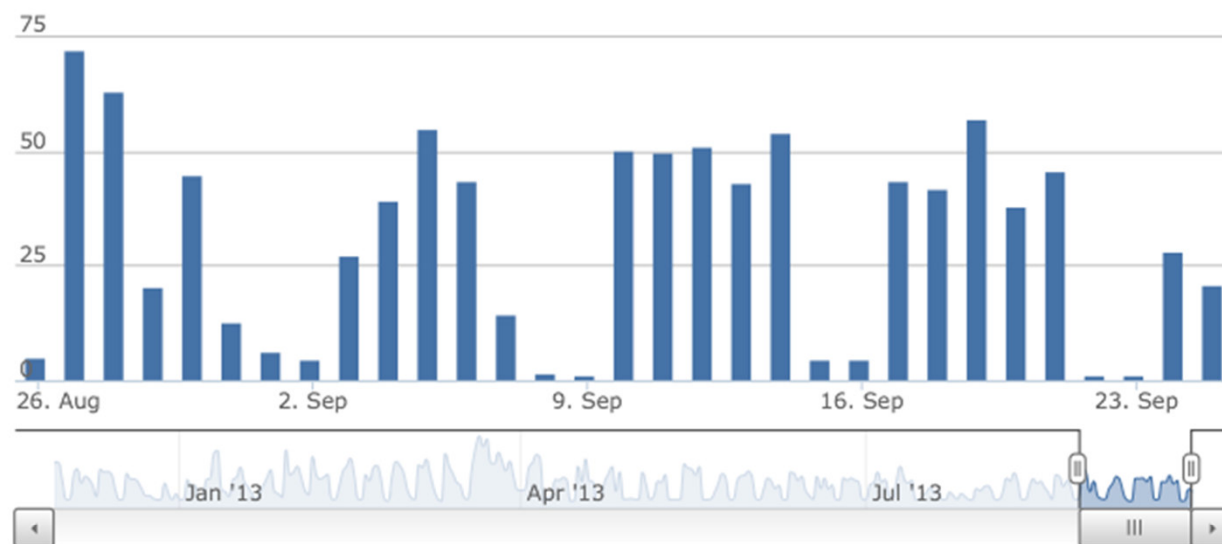
WAGENPARK

ENERGIEGEBRUIK

Energiegebruik Elektrische voertuigen (kWh)

Zoom 1m 3m 6m YTD 1y All

From: Aug 25, 2013 To: Sep 24, 2013



Gebruik de schuif balk onder de grafiek om een bepaalde periode te bekijken. De knoppen links boven de grafiek kunt u gebruiken om uw selectie te veranderen.

Vandaag

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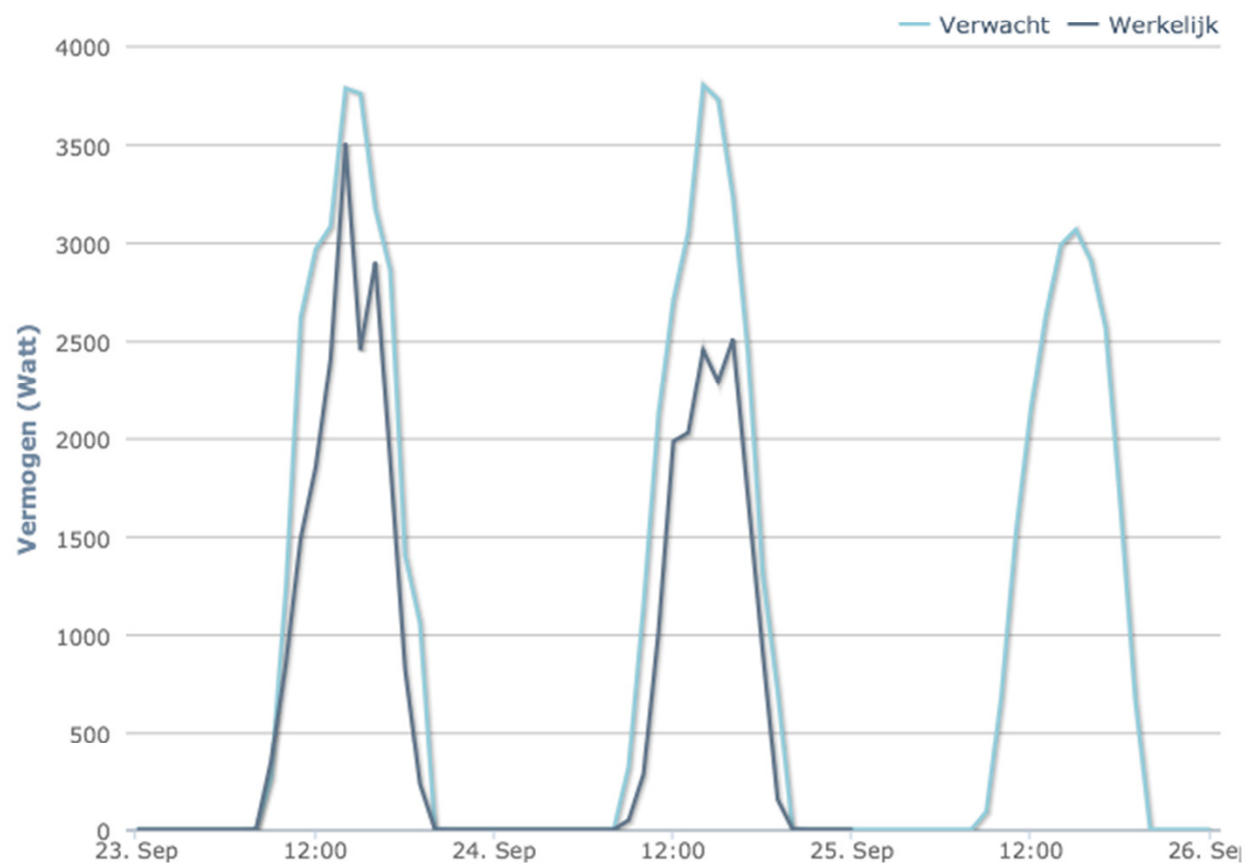
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Totaal	2698 km / 399 kg



ZONNE-ENERGIE

WINDENERGIE

Klimaatbureau



Vandaag

	Zonne-energie	15 kWh
	Windenergie	70 kWh
	Elektrische vervoer	21 kWh

Voertuigen

	Opgeladen	9
	Opladen	4
	Rijdend	3

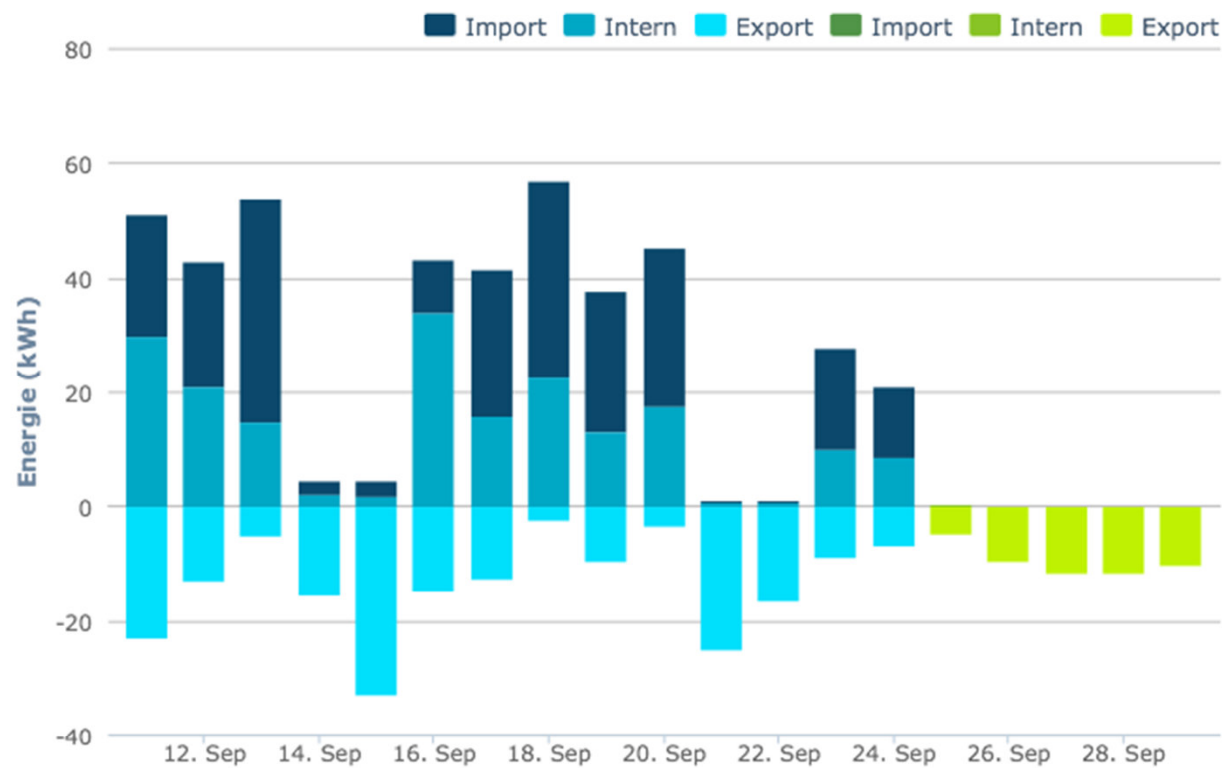
Weer in Zaandam

Zwaar bewolkt
13.5 °

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	Totaal	2698 km / 399 kg

ENERGIE OVERZICHT



Handel vandaag

	kWh	Prijs per kWh	Totaal
Vraag	20,77		€ 1,11
Ingekocht	12,22	0,0537	€ 0,66
Eigen productie	8,55	0,0536	0,46
Totaal	20,77		€ 1,11

Vandaag

Zonne-energie	15 kWh
Windenergie	70 kWh
Elektrische vervoer	21 kWh

Voertuigen

Opgeladen	9
Opladen	4
Rijgend	3

Weer in Zaandam

Zwaar bewolkt
13.5 °

Electrisch gereden km / kg CO₂

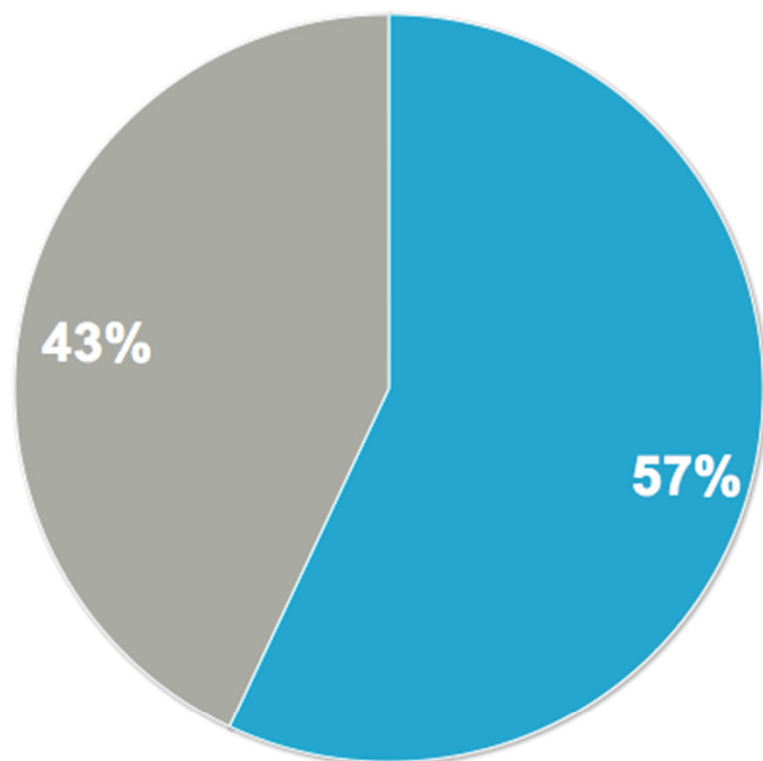
Door u	85 km / 13 kg
Totaal	2698 km / 399 kg

Actueel (Watt)

Zonnepanelen	0
Windturbine	1200

RESULTATEN

Aandeel zelf opgewekte duurzame energie bij eigen elektrische auto's



Project manager

Vandaag

	Zonne-energie	15 kWh
	Windenergie	70 kWh
	Elektrische vervoer	21 kWh

Voertuigen

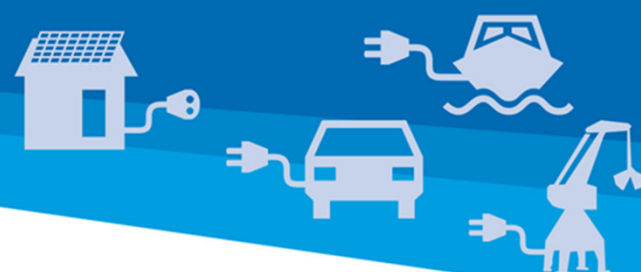
	Opgeladen	9
	Opladen	4
	Rijdend	3

Weer in Zaandam

Zwaar bewolkt
13.5 °

Electrisch gereden km / kg CO₂

	Door u	85 km / 13 kg
	Totaal	2698 km / 399 kg



Smarter Charging:

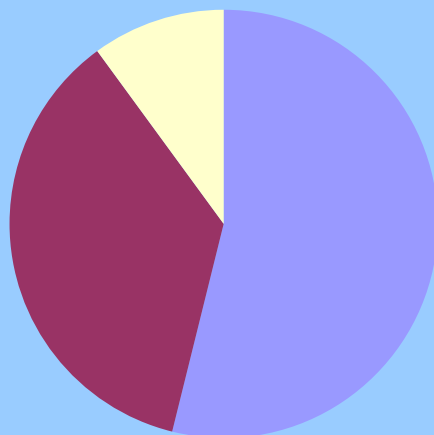
- 11% costs Feed In
- 25% costs Day / Night
- 30% APX

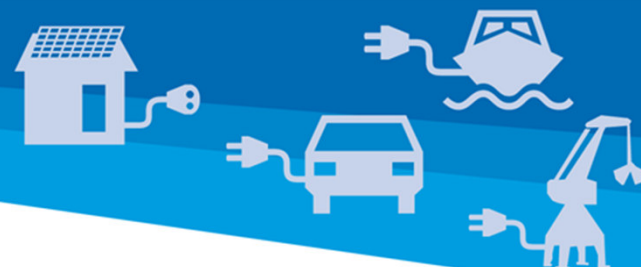
:smart PV

10%+

**regular
PV: 36%**

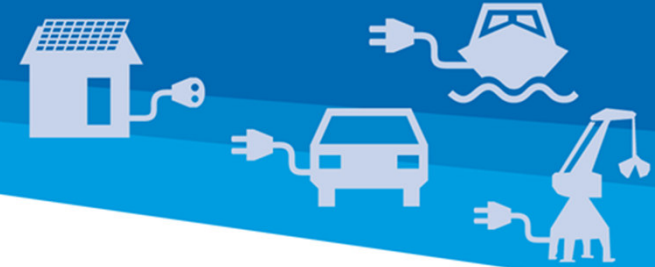
other





Next steps:

- Larger contracts: more cars / processes
- Added value to your work:
 - Easier access of RE
 - Cleaner air
 - Business case stretched with energy component



Contact

- e-harbours www.eharbours.eu
- Zaanstad www.zaanstad.nl
- EnergyGo www.energygo.nl
- Final event 12/13 feb 2014