



Albert van den Noort – 23 juni 2011

Full Concept Smart Grid Solution

Intermittent Renewable Energy Sources



Smart Appliances for Demand Response



Smart Hybrid Heat Pumps



mCHP for Flexible Power

Smart Charged Electric Vehicles

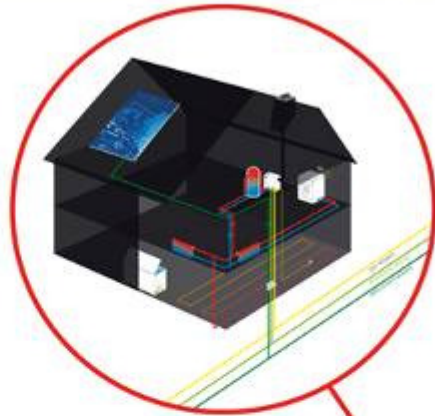


Doelstelling PowerMatching City

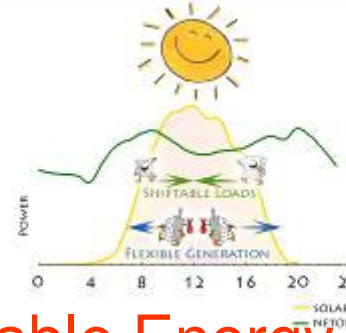
An illustration at the top of the slide shows a city skyline with several houses, a car on a road, and three wind turbines. A yellow line representing a power grid runs across the scene, with two warning signs (yellow triangles with exclamation marks) placed on it.

- Ontwerpen, bouwen en **demonstreren van de haalbaarheid** van een **Slim Energie Systeem**
- **Optimalisatie** gebaseerd op lokale **energie markten**
 - **Commodity**
 - **Capaciteit**
- Ontwikkelen van een **toepassing onafhankelijke** oplossing
- **Integreren** lokale **opwekking** en **demand response**

Multi Goal Optimization



1. Cost Effective Use of Energy
(In home optimization)



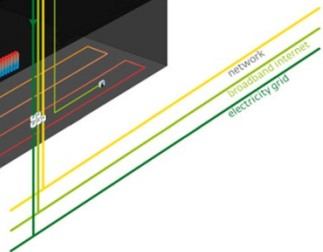
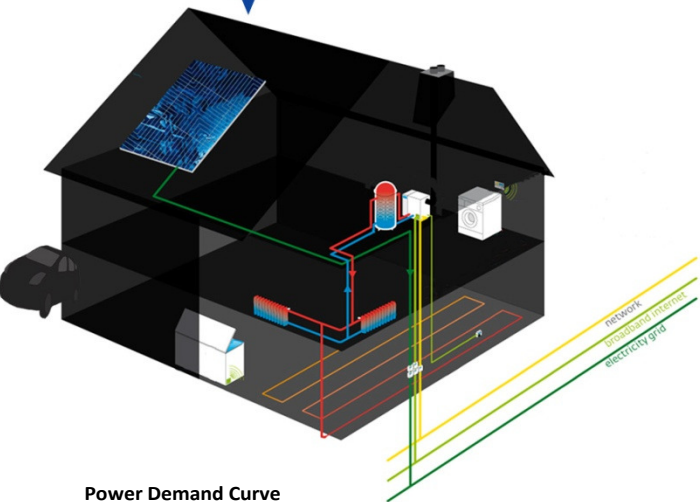
4. Integration of Renewable Energy
(Valorisation and Imbalance Reduction)

2. Capacity Management
(reduce peak loads)

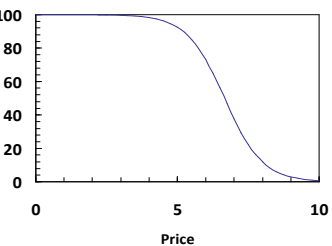
3. Commercial Optimization
(Virtual Power Plant)



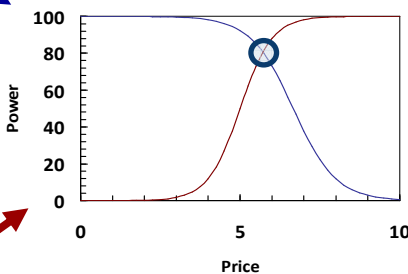
Je eigen lokale energiemarkt in huis



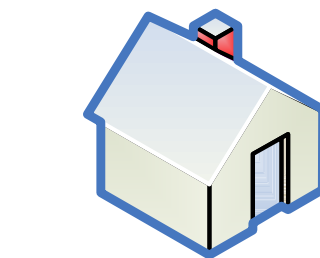
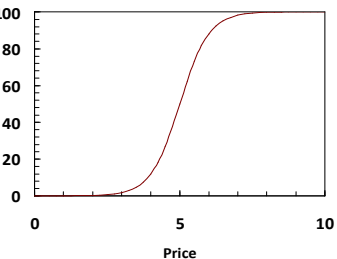
Power Demand Curve



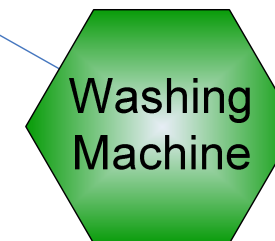
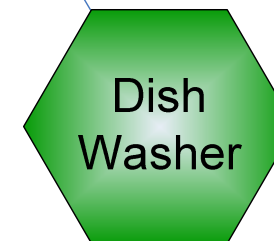
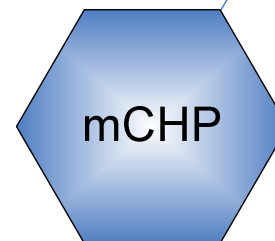
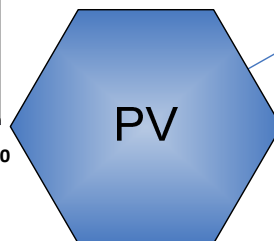
Price Equilibrium



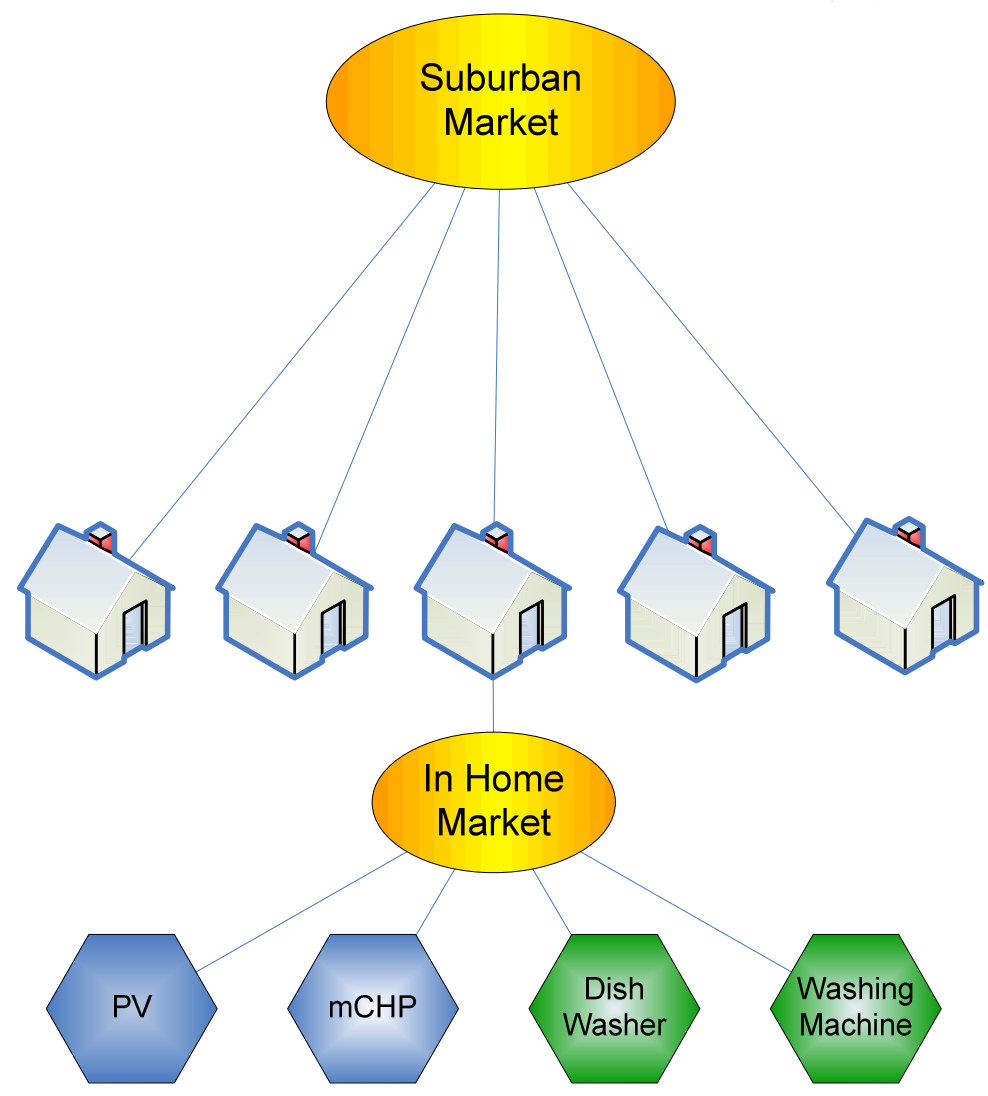
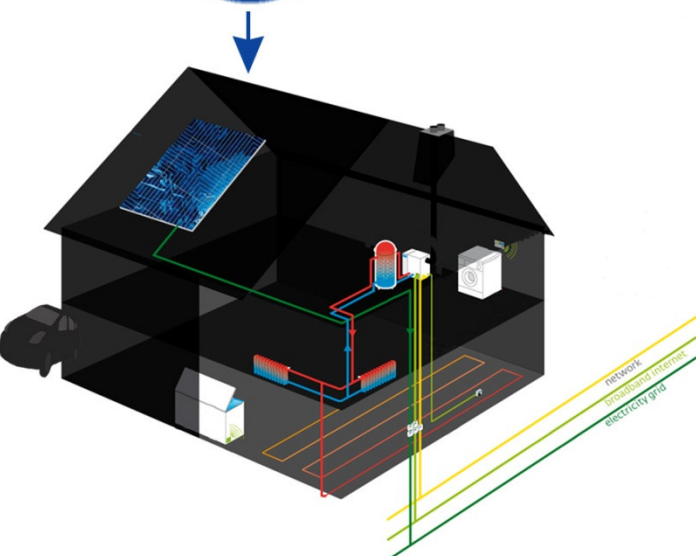
Power Supply Curve



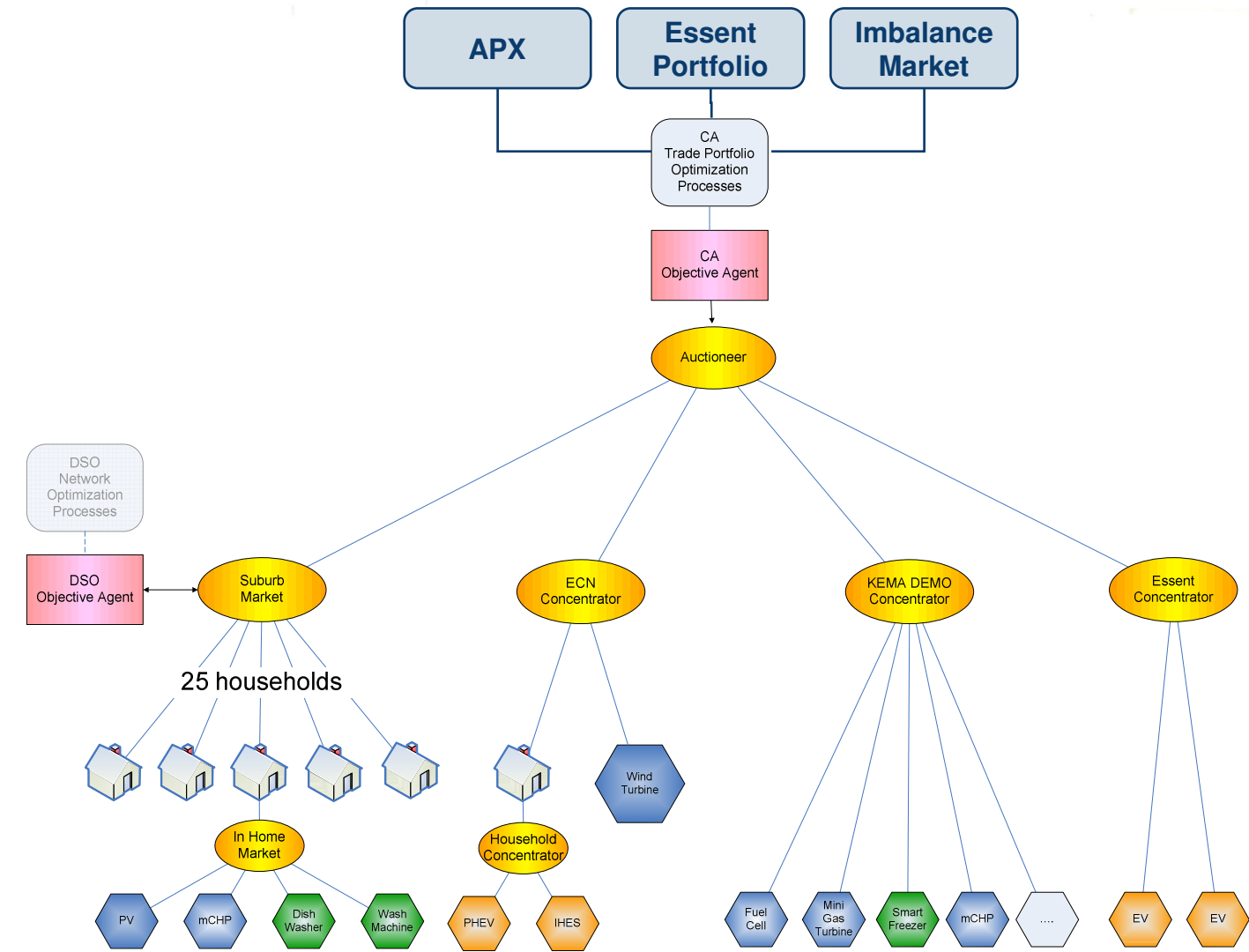
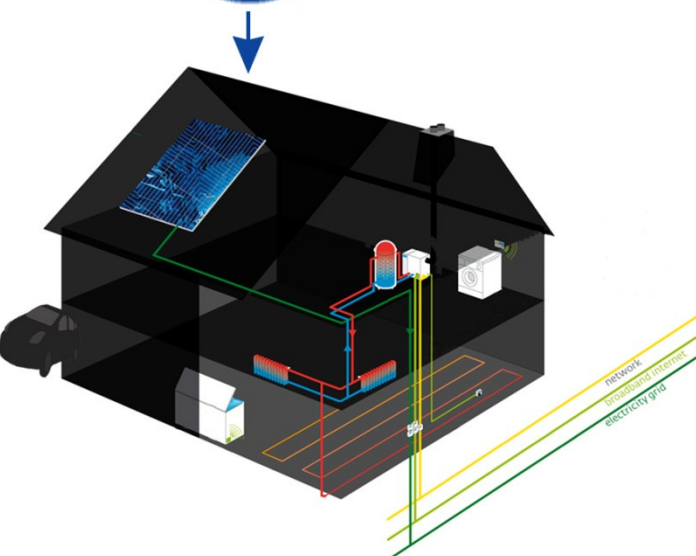
In Home Market

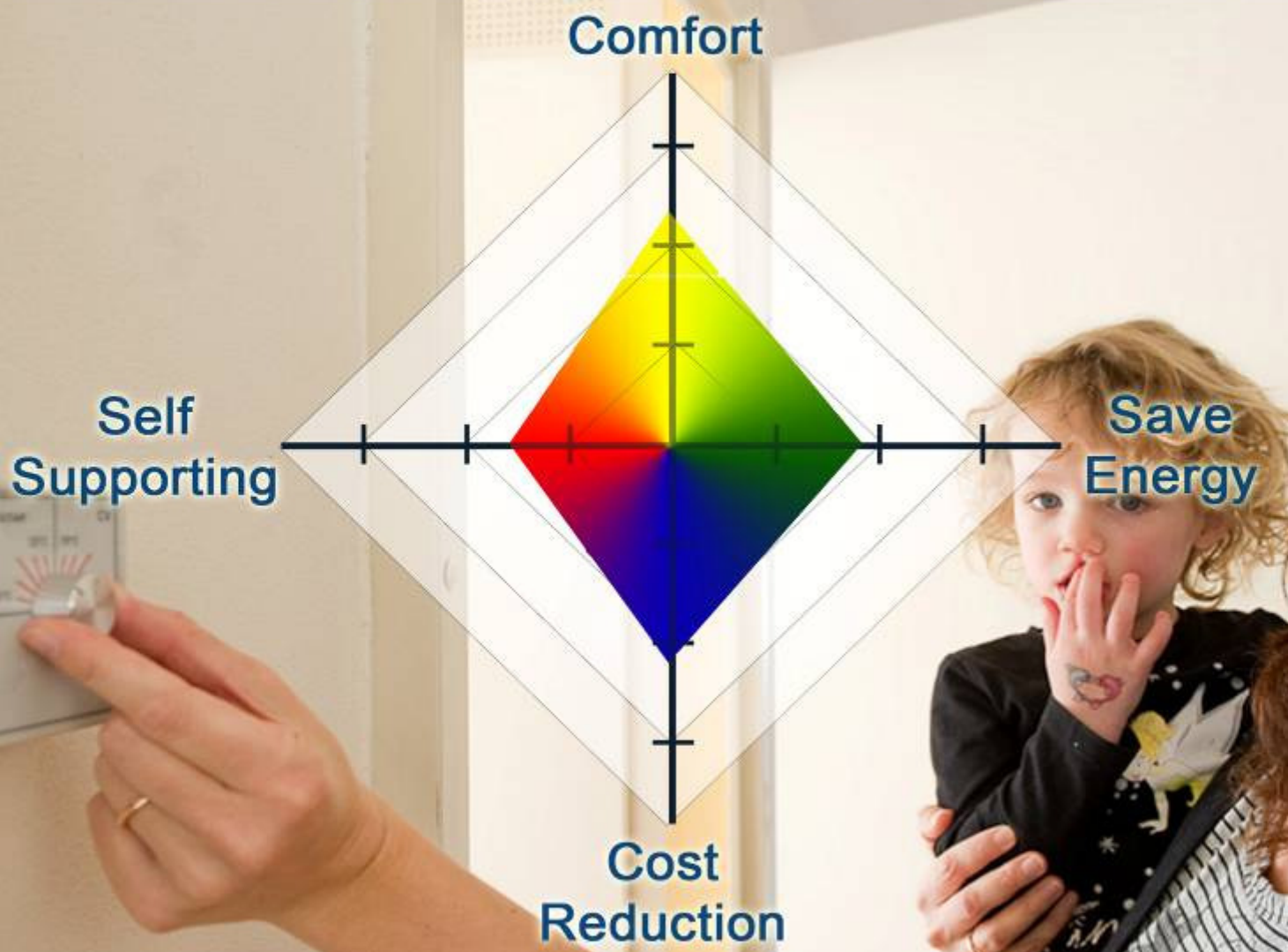


Buurvrouw mag ik een kopje stroom lenen?

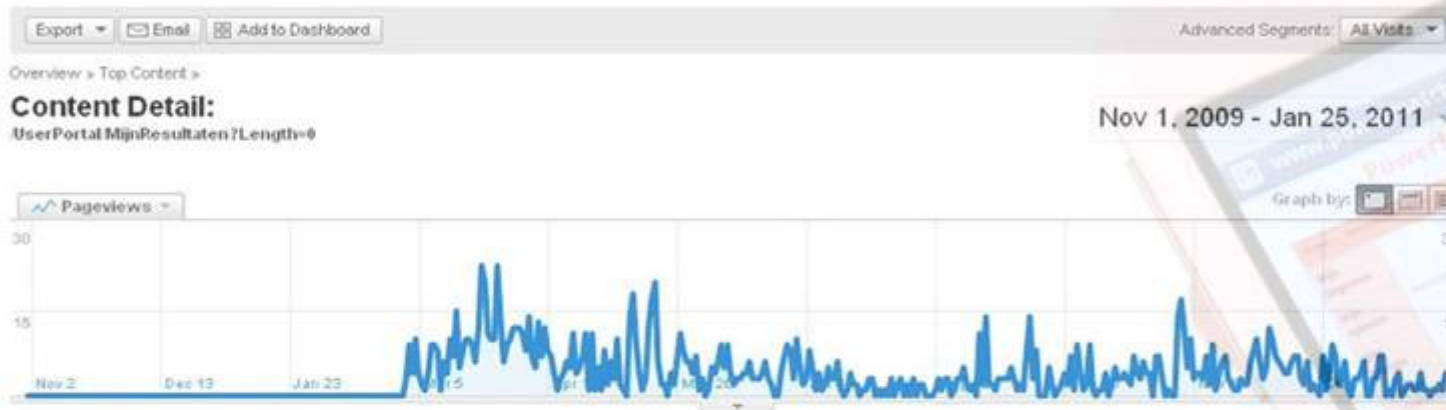


Lokale energiemarkten in een slim netwerk





Inzicht in eigen Energie Verbruik en Productie



This page was viewed 1,513 times

Visit this page | Analyze: Content Detail | Content: UserPortal MijnResultaten?L | None

- 1,513 Pageviews
- 1,220 Unique Views
- 00:03:22 Time on Page
- 65.49% Bounce Rate
- 38.33% % Exit
- \$0.00 \$ Index

Navigation Analysis

- Navigation Summary
How visitors found your content
- Entrance Paths
Paths visitors used to get to your content

Landing Page Optimization

- Entrance Sources
Top sources per page
- Entrance Keywords
Top keywords per page

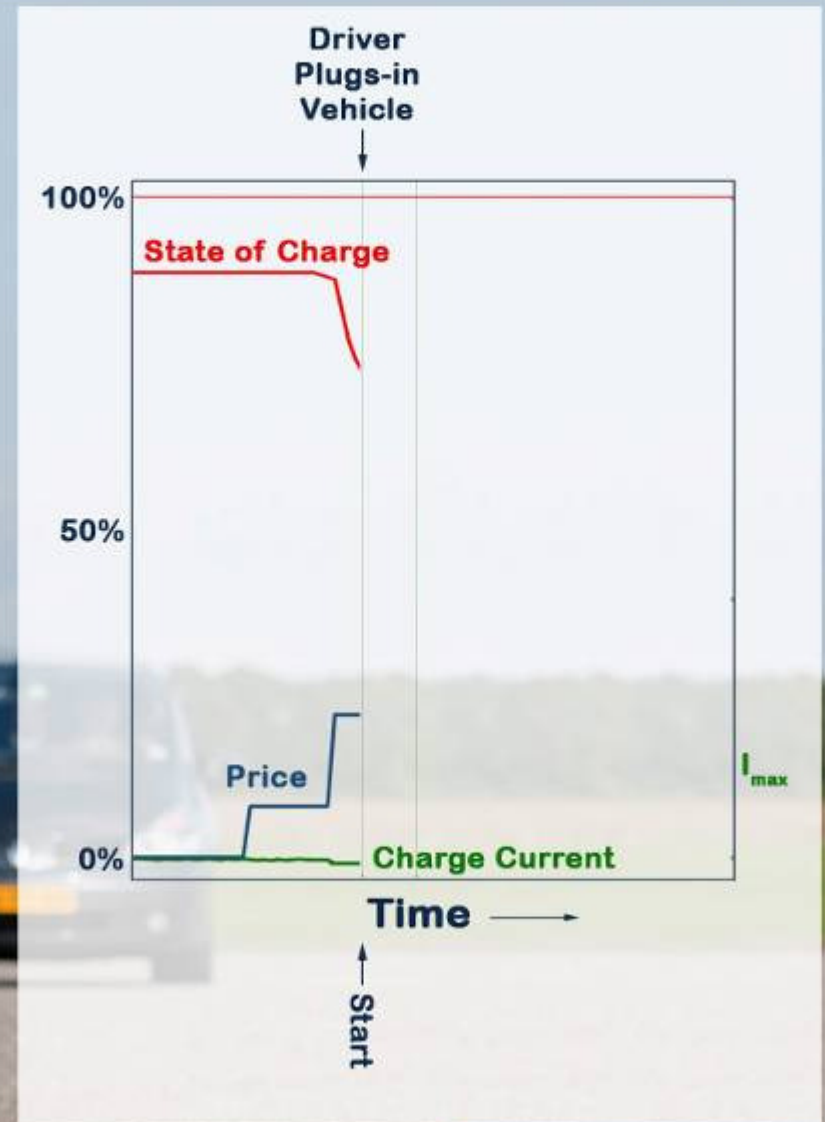
Click Patterns

- In-Page Analytics **Beta**
Click data on top of your website

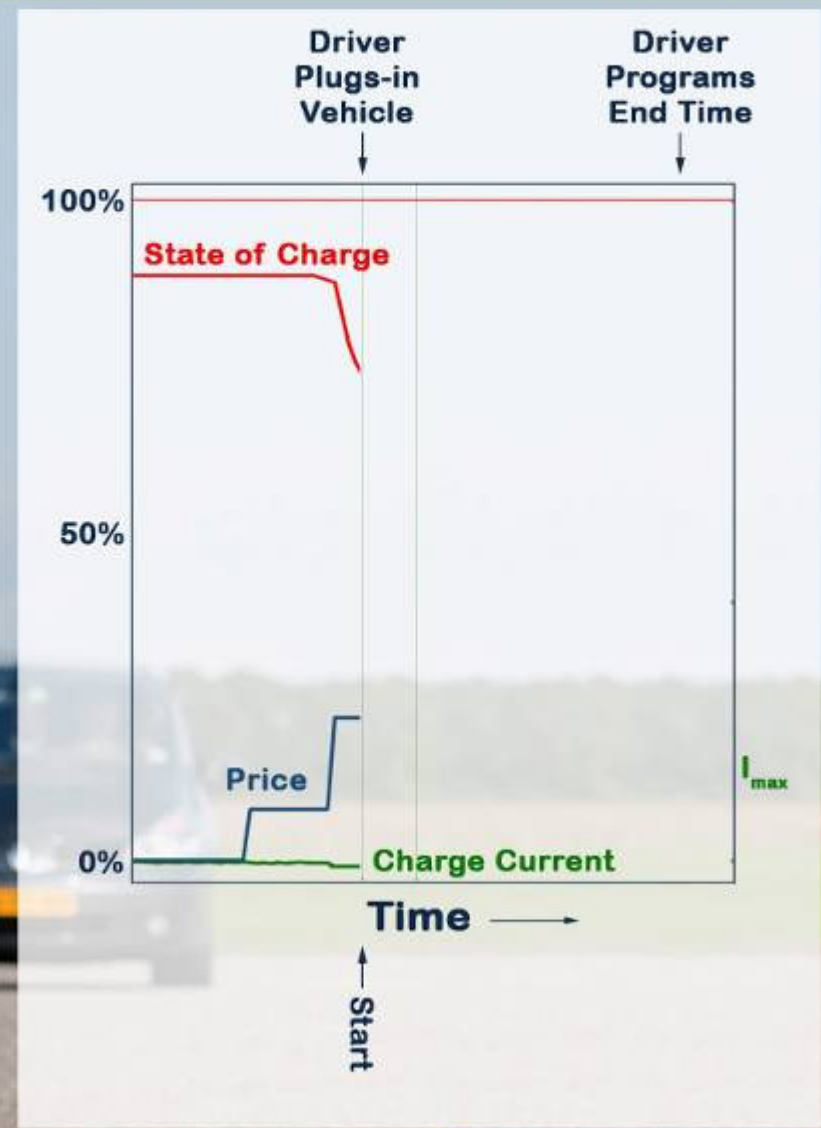
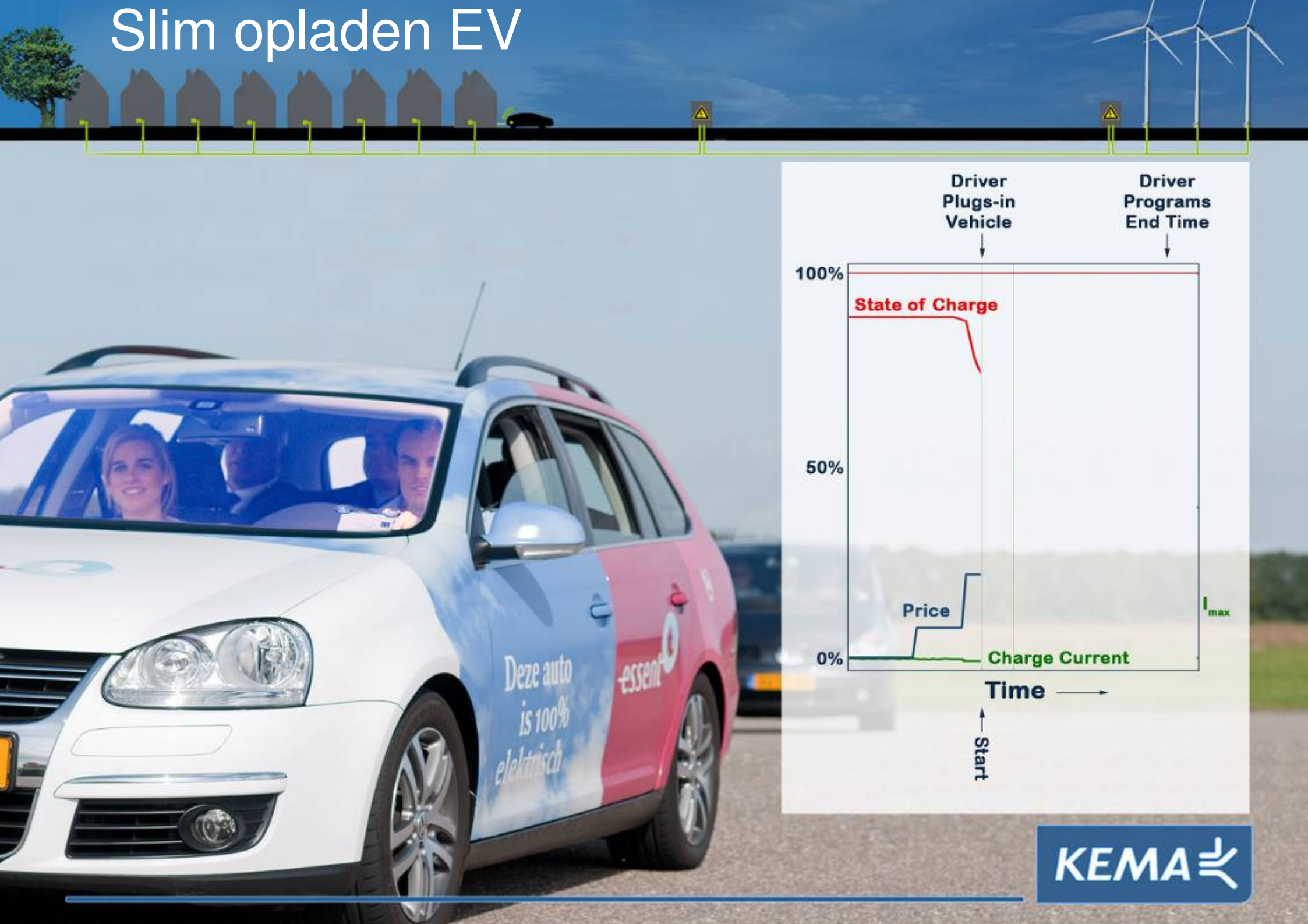
Try Website Optimizer
Increase conversions by testing different content.



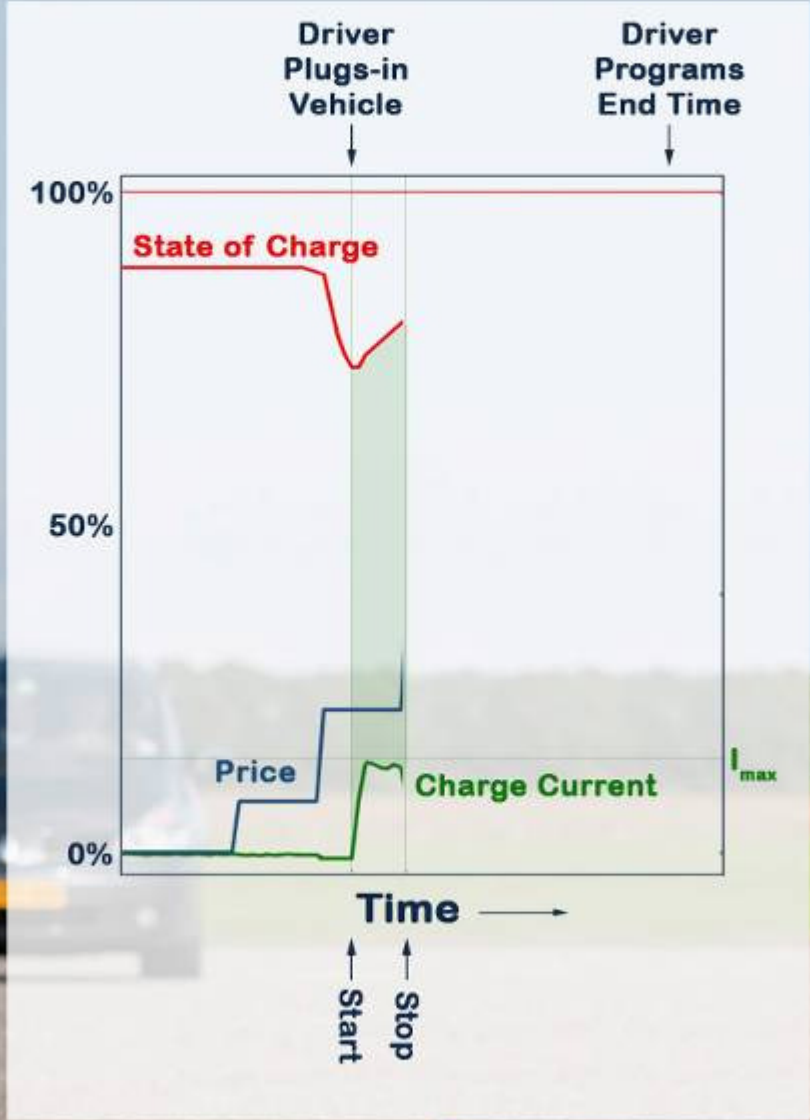
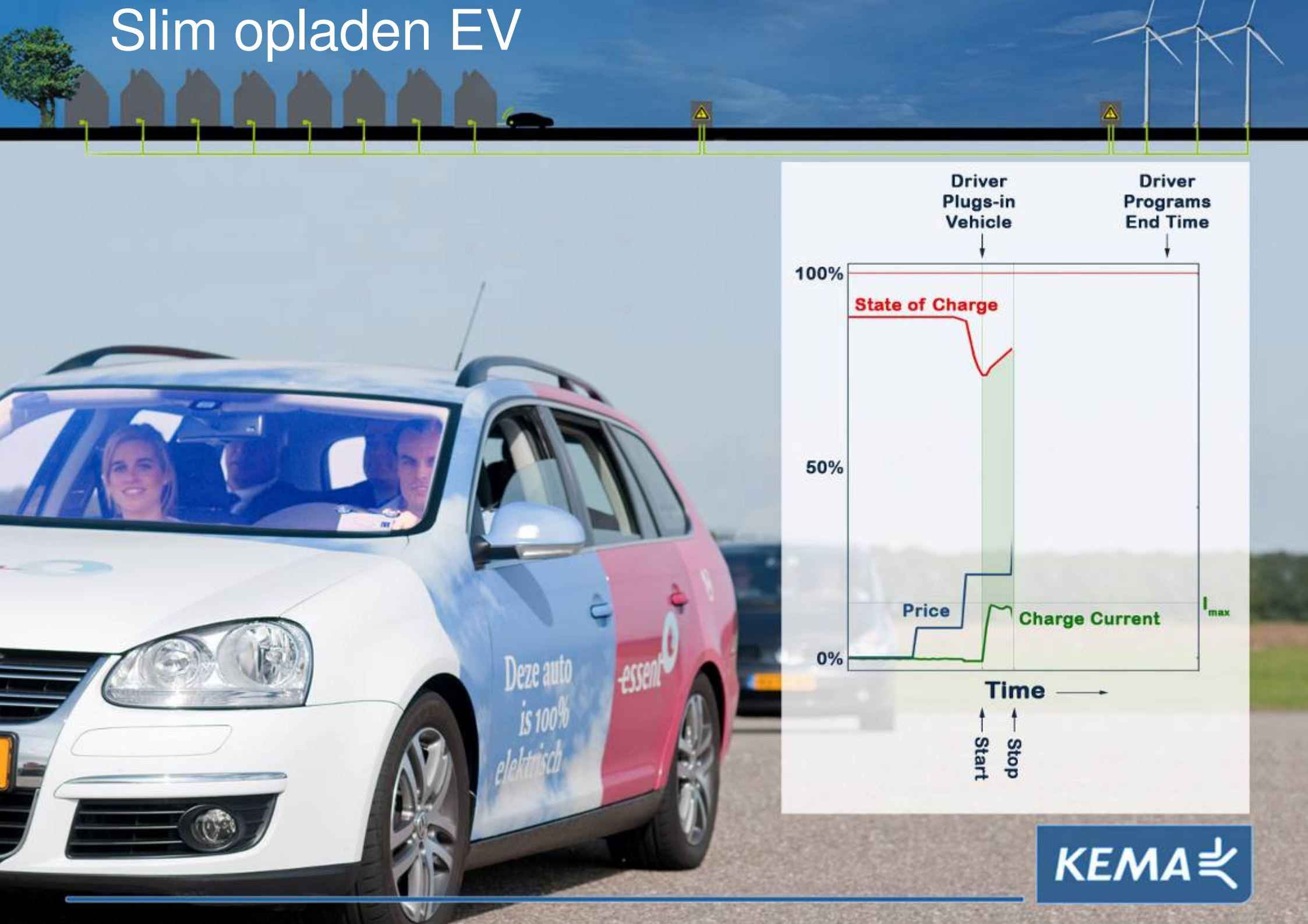
Slim opladen EV



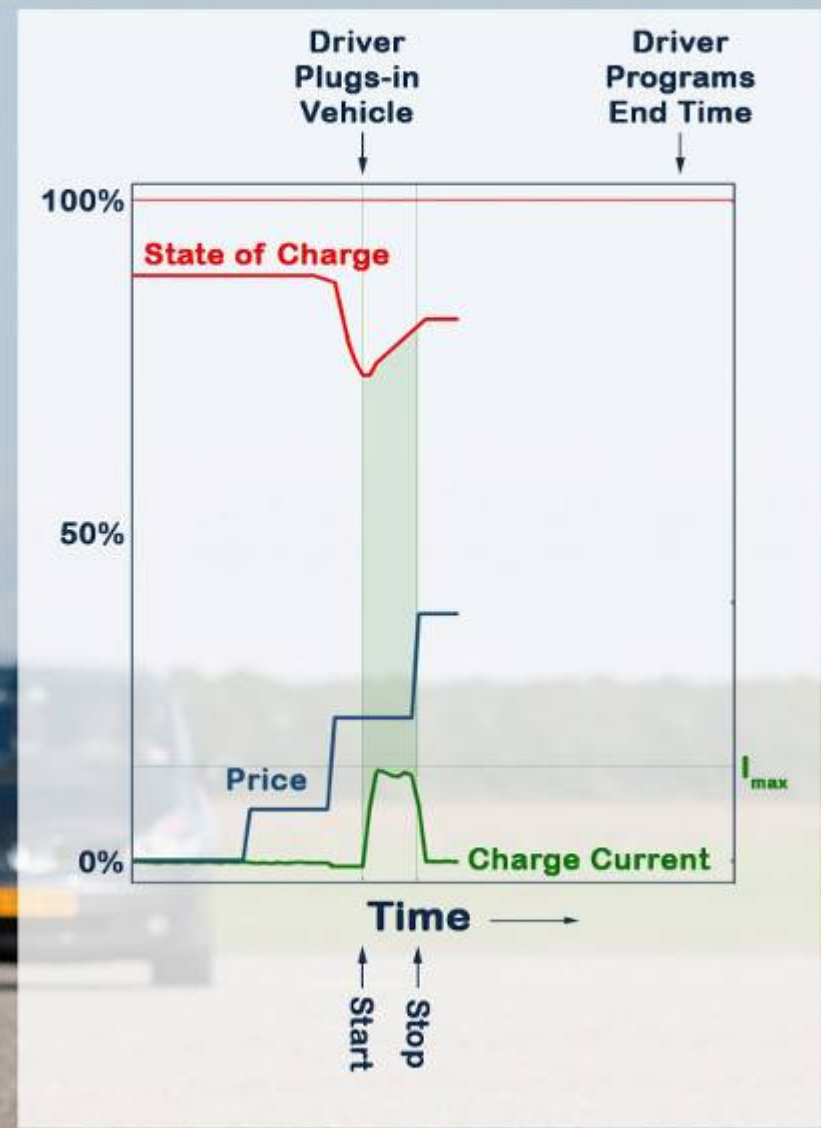
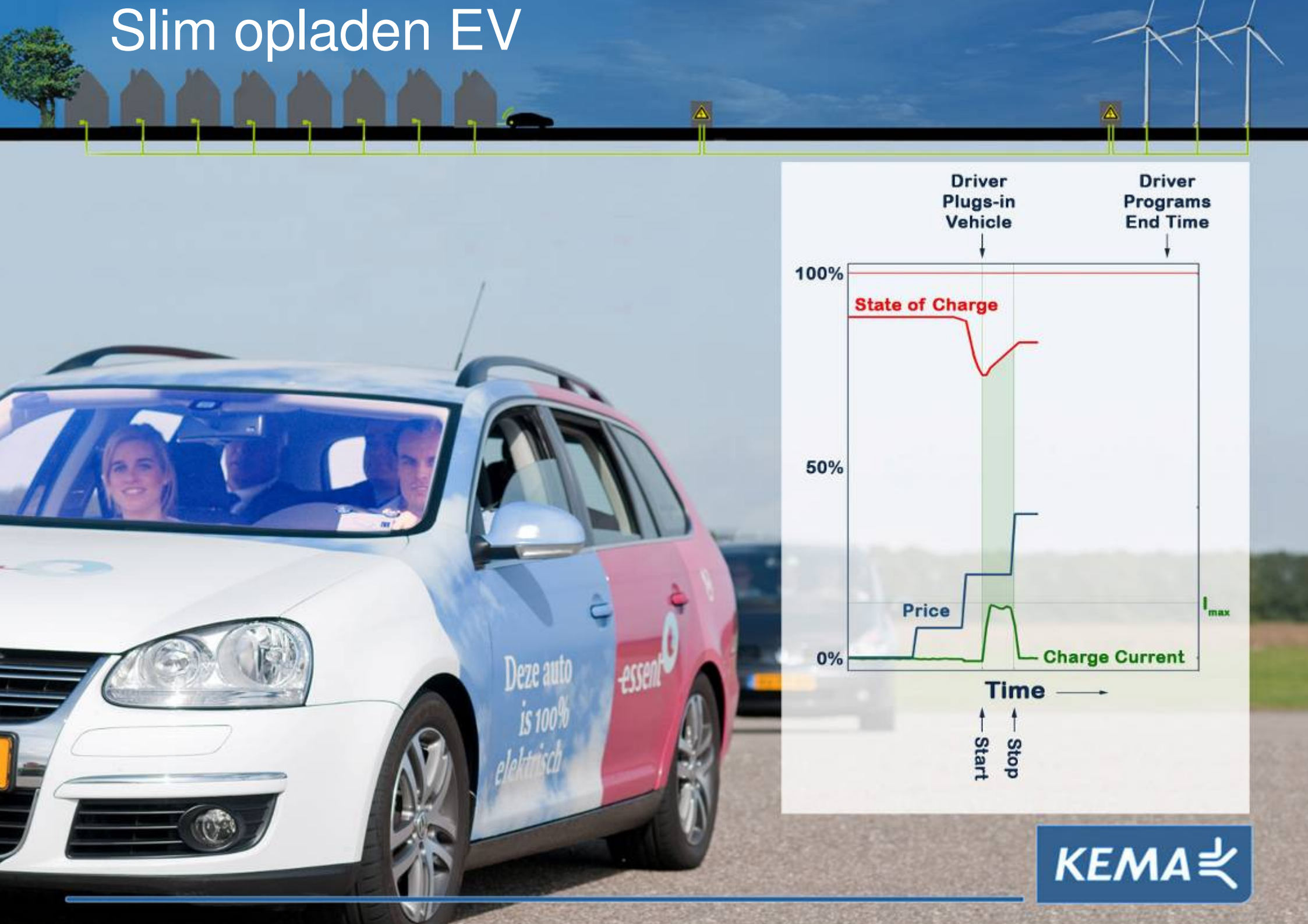
Slim opladen EV



Slim opladen EV



Slim opladen EV



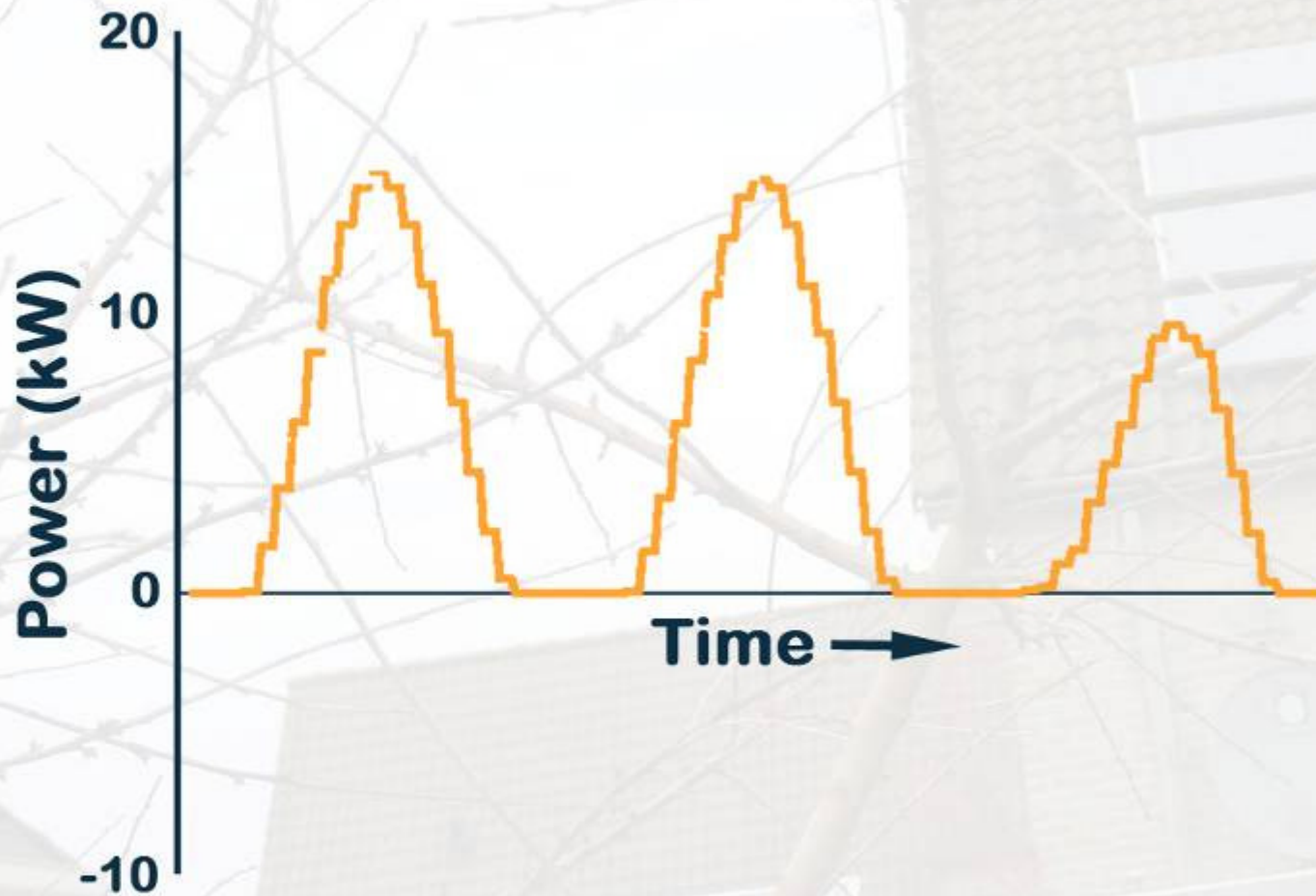
Slim opladen EV



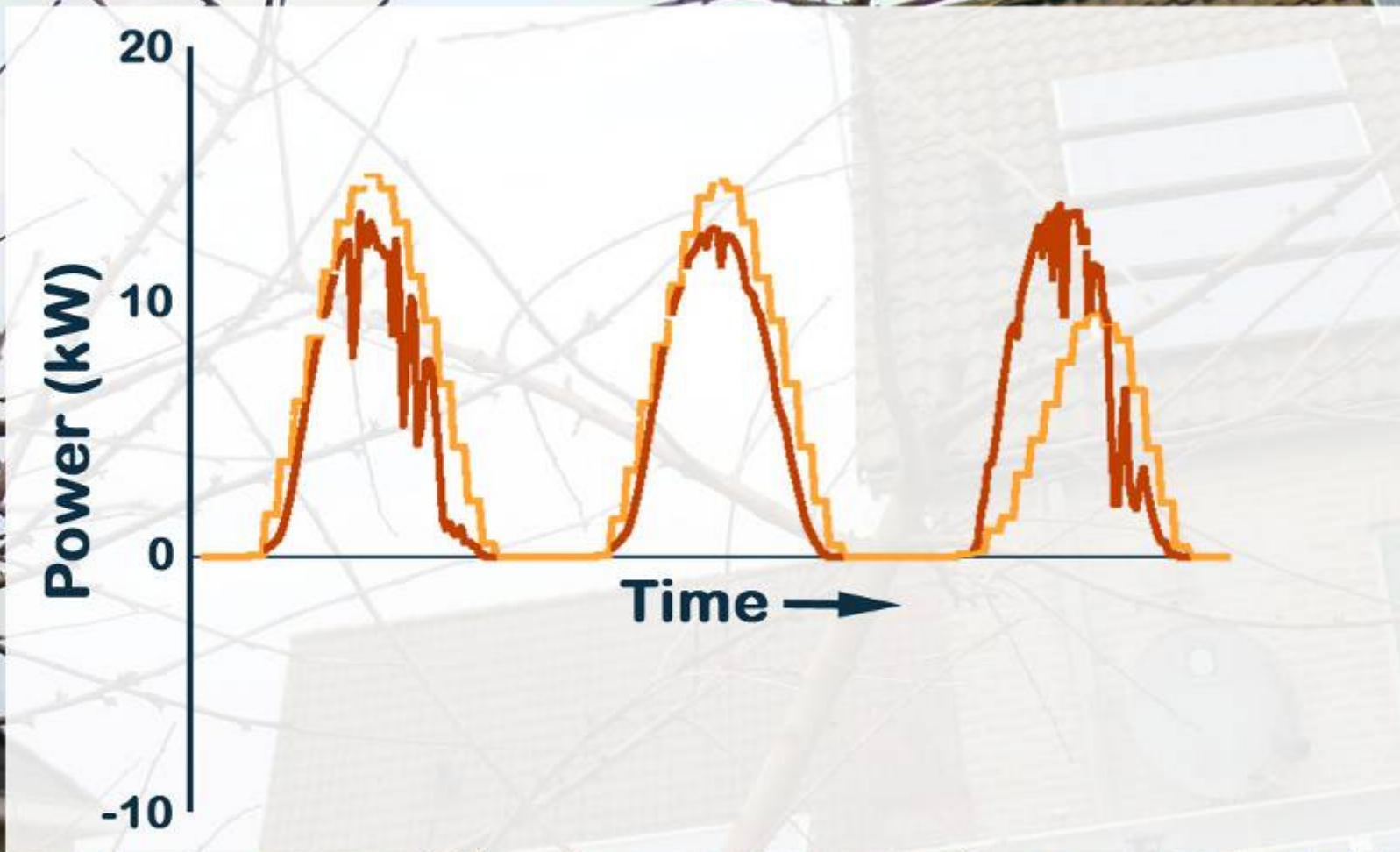
Slim opladen EV



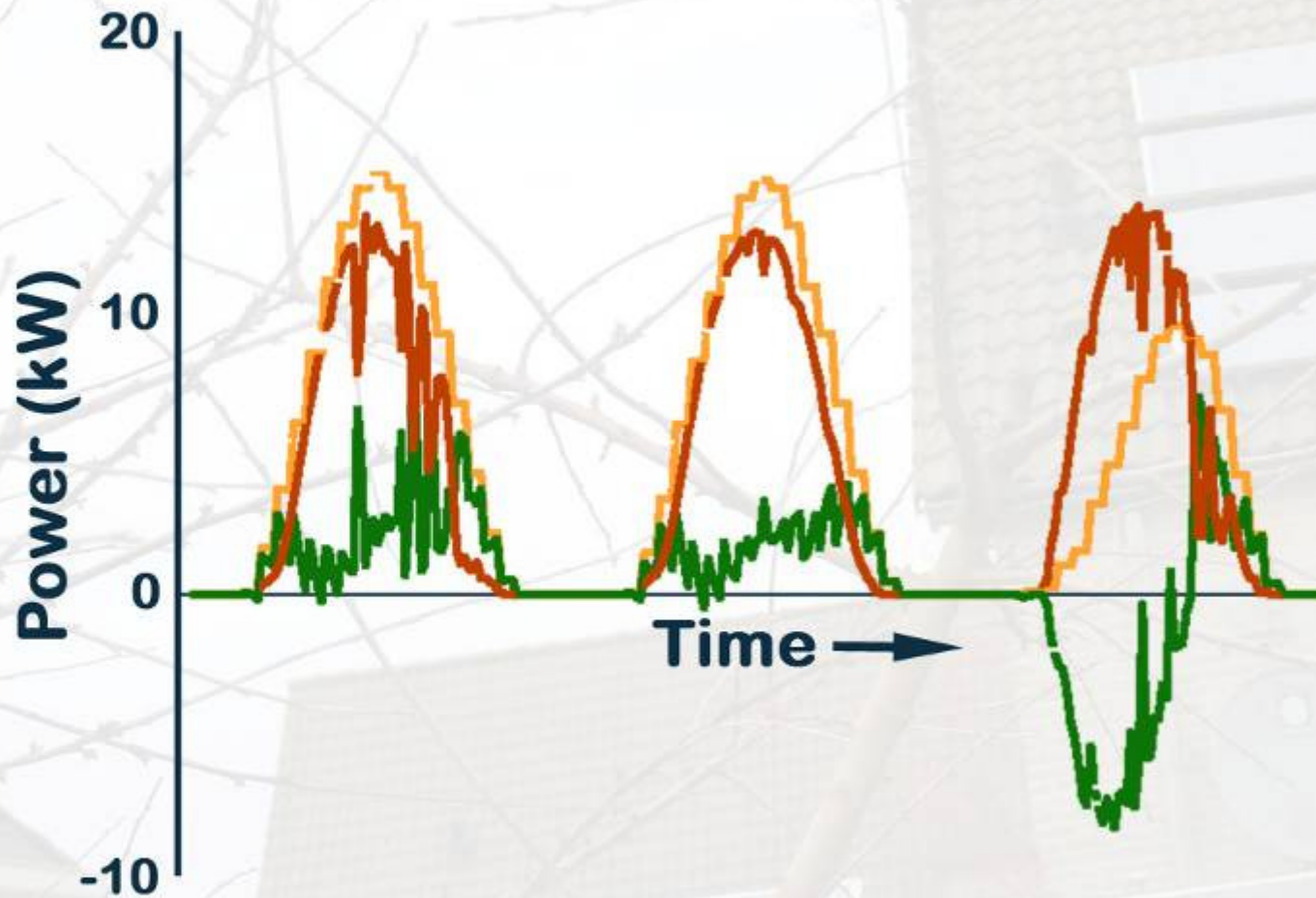
Wegregelen van onbalans door PV



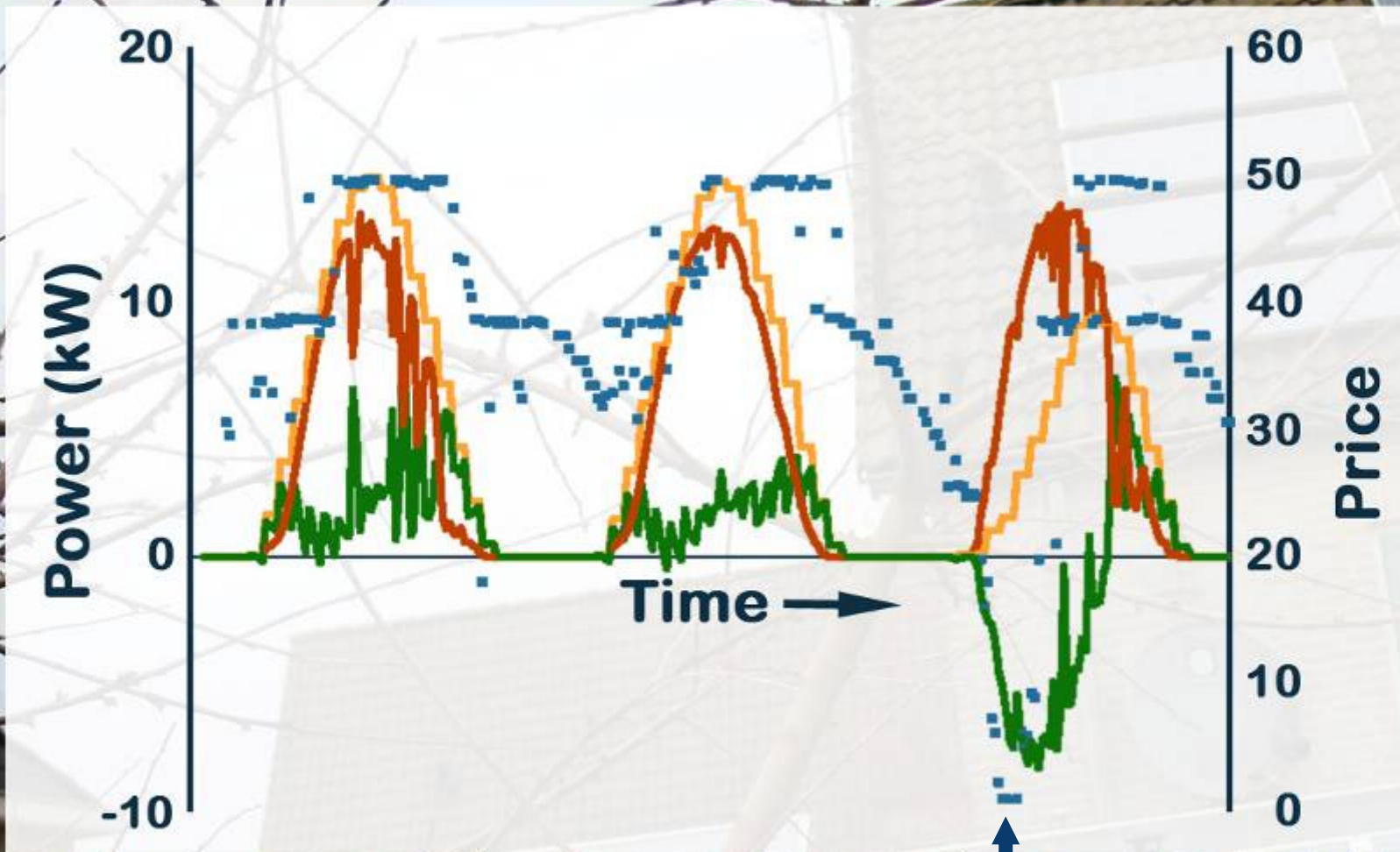
Wegregelen van onbalans door PV



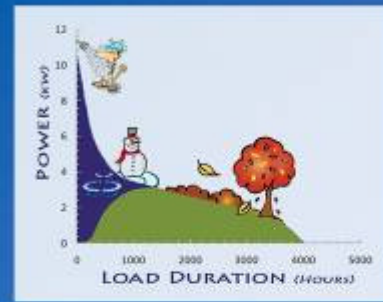
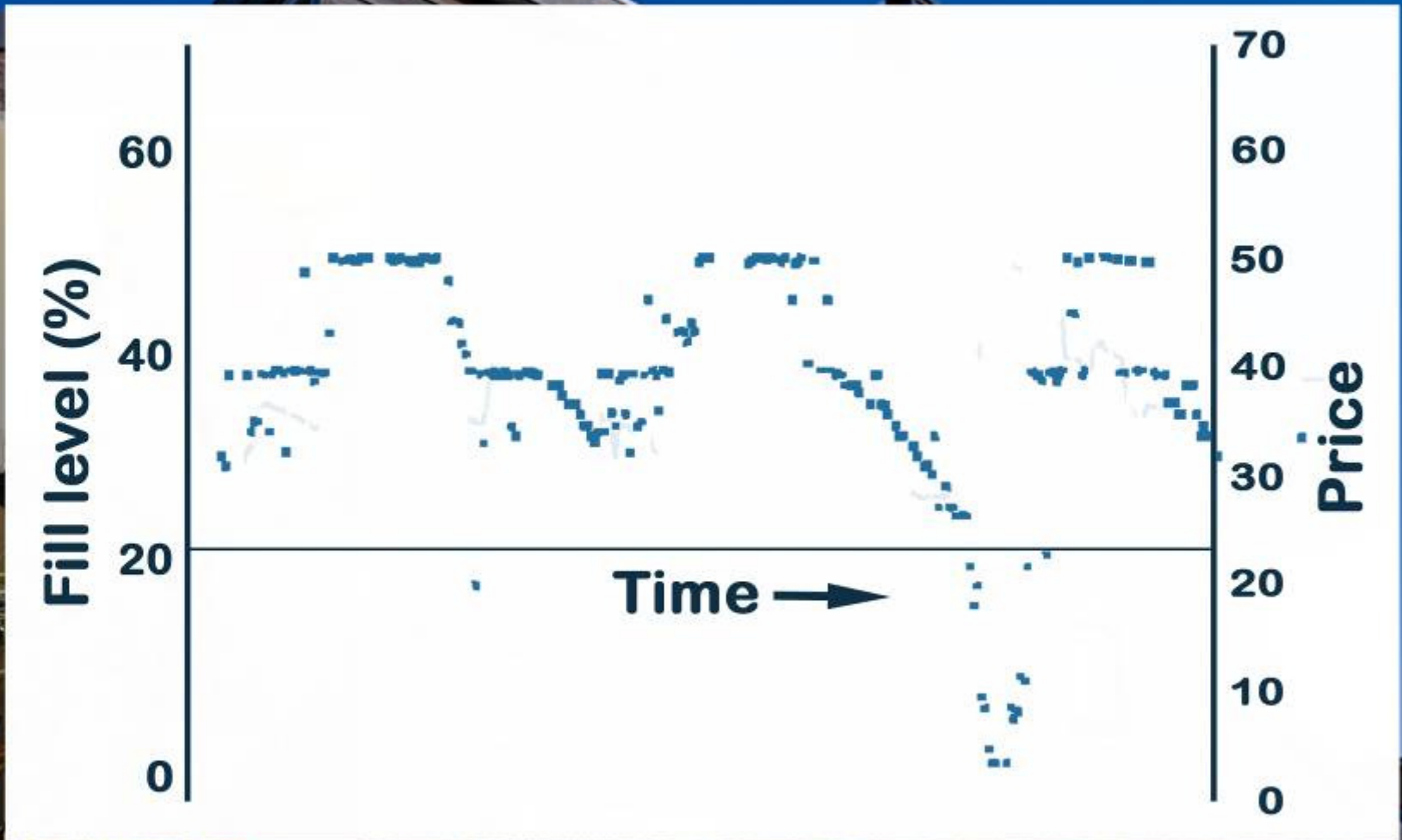
Wegregelen van onbalans door PV



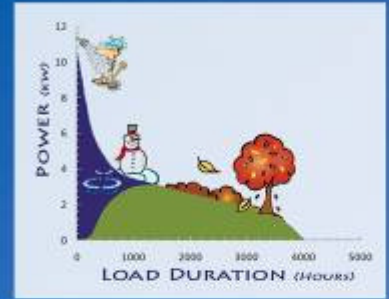
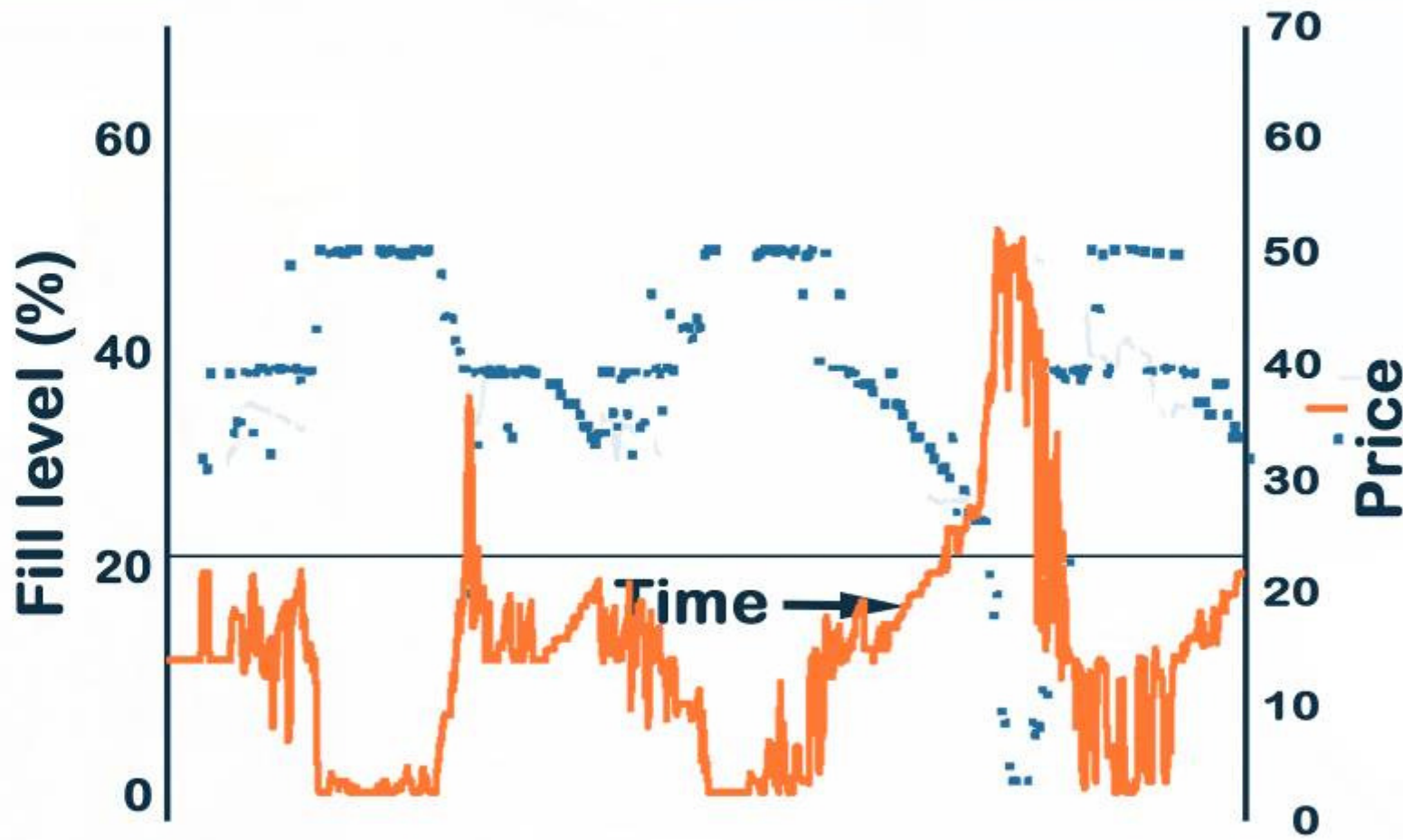
Wegregelen van onbalans door PV



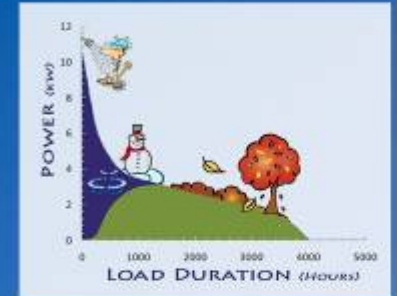
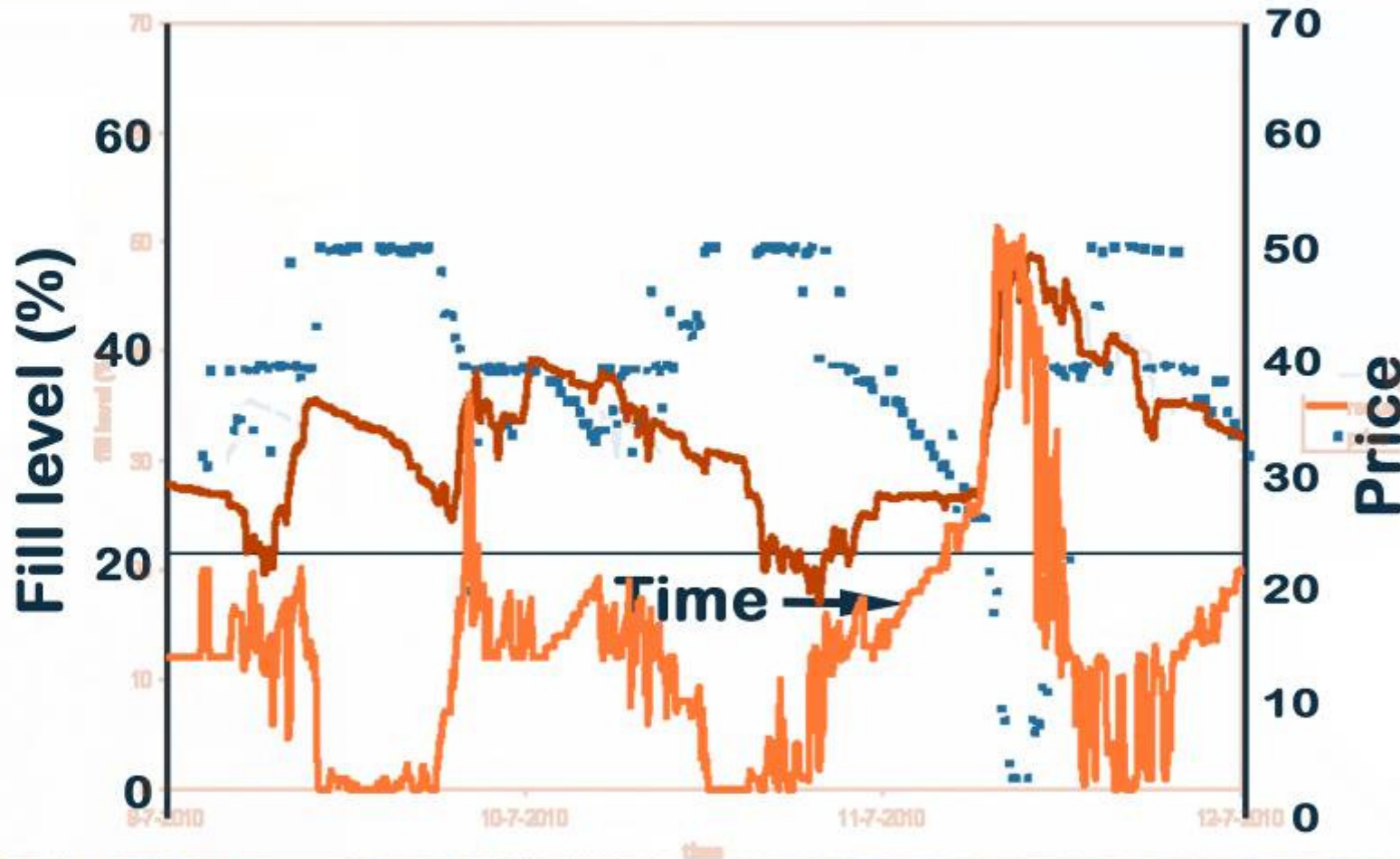
Reactie hybridewarmtepompen



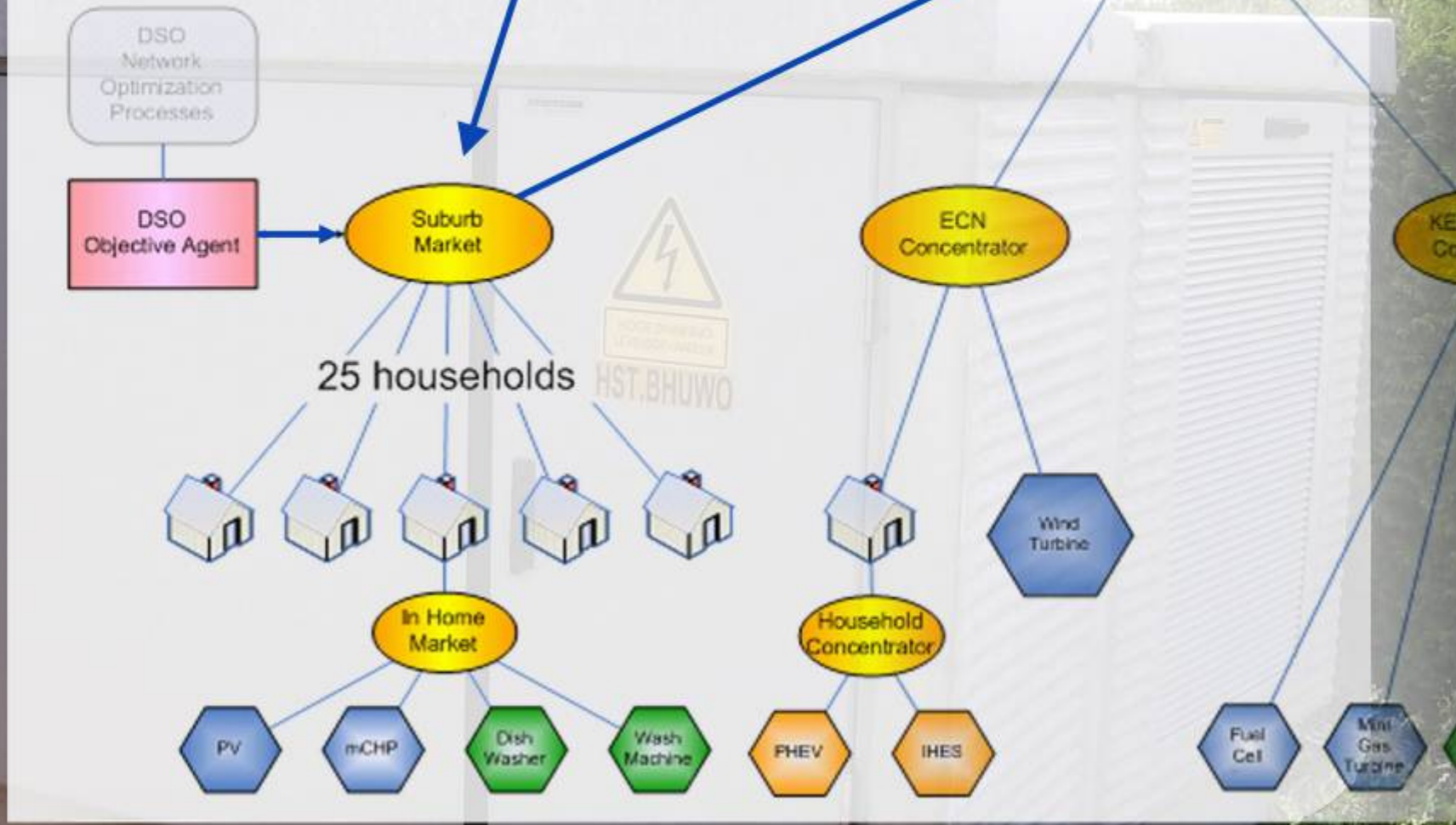
Reactie hybridewarmtepompen



Reactie hybridewarmtepompen



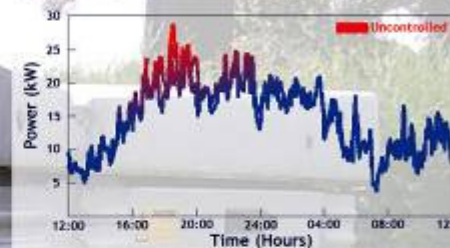
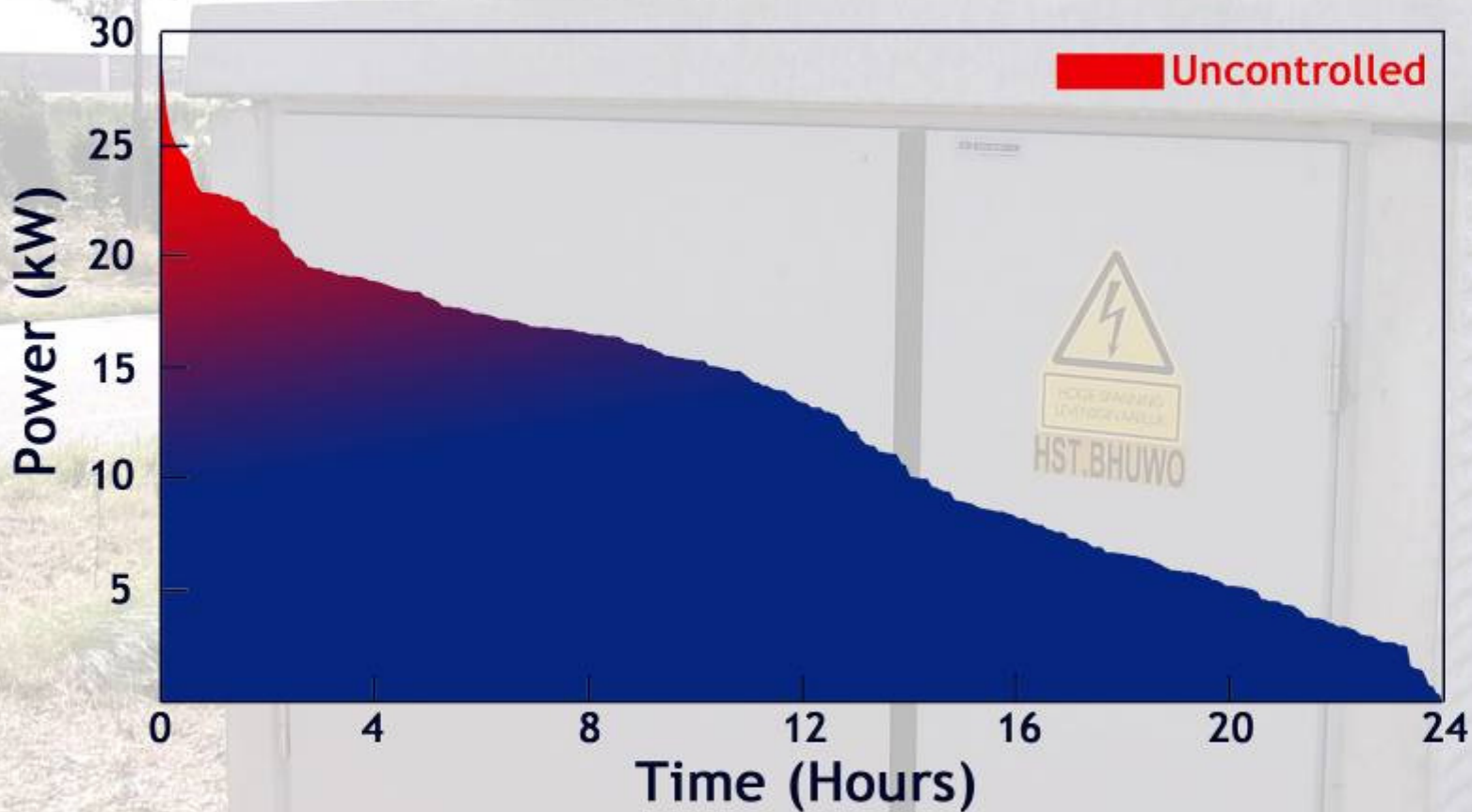
Capaciteitsmanagement in een distributiestation



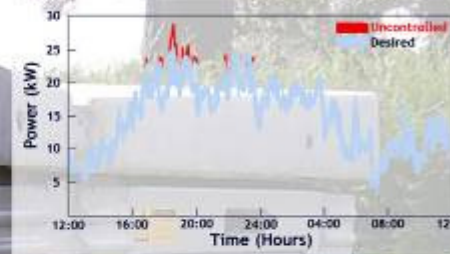
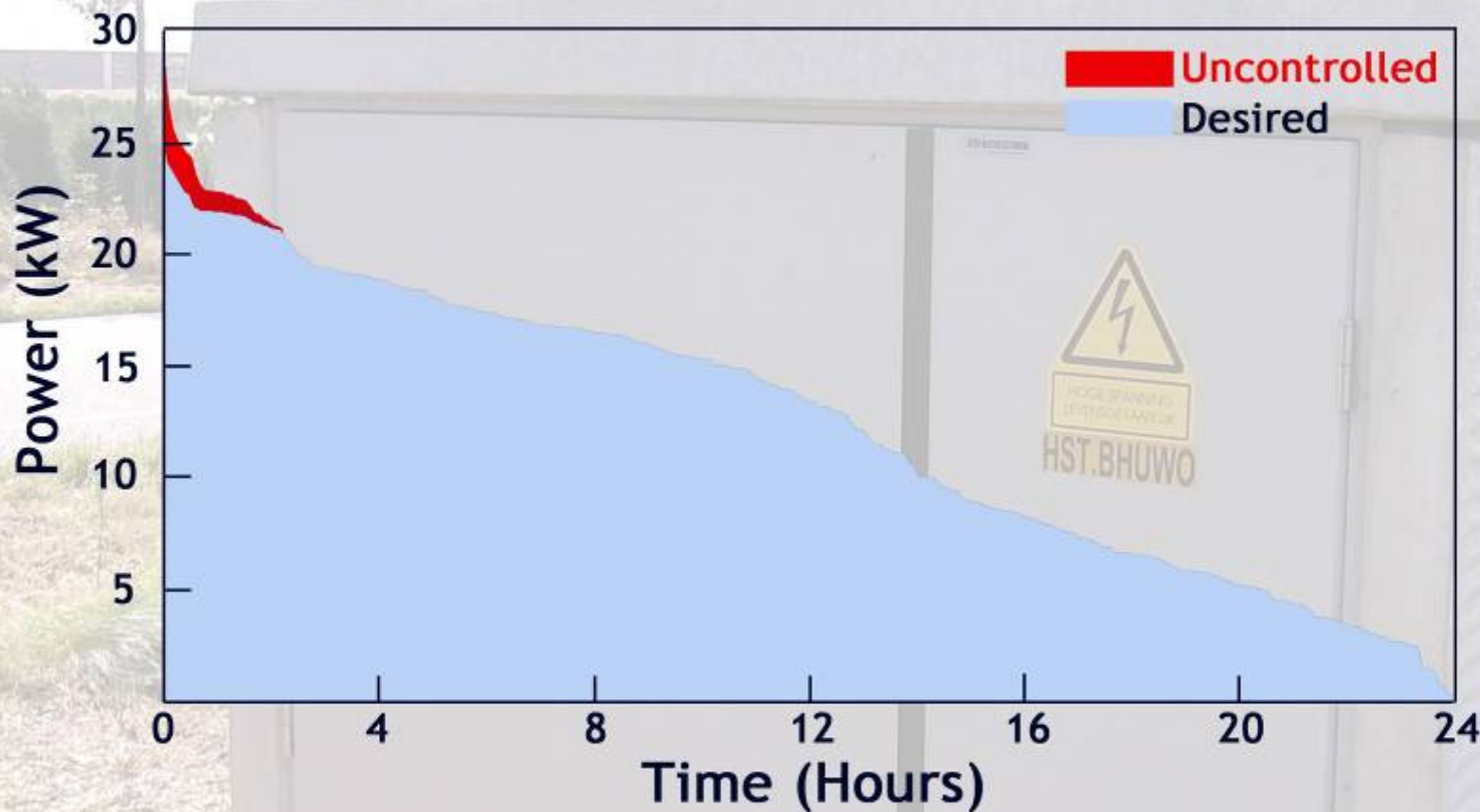
Centrale marktprijs



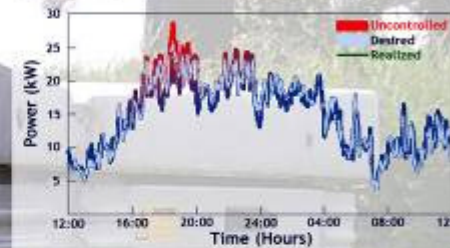
Ongecontroleerde belasting op het distributiestation



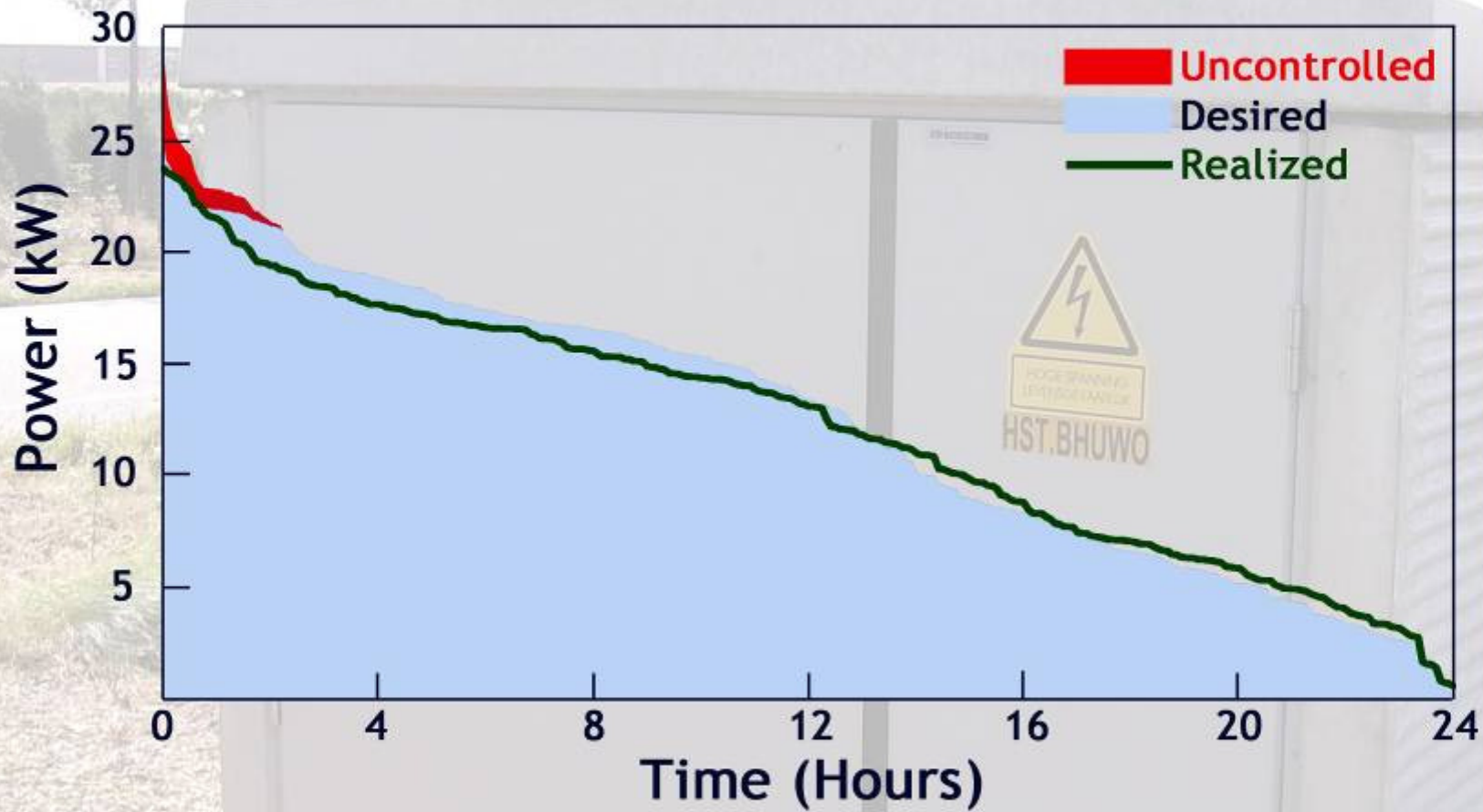
Gewenste belasting op het distributiestation



Centrale and lokale marktprijzen



Gerealiseerde belasting op het distributiestation



Conclusie

- In PowerMatching City hebben we een smart grid gebouwd
 - Flexibele opwekking en gebruik van elektriciteit
 - Slim gebruik maken van gas (microWKK/hybride warmtepomp)
 - Inpassen van zonne- en windstroom
 - Slim opladen van EV
 - Een generiek concept waardoor uitbreiding eenvoudig mogelijk is
- Resultaten laten zien dat het marktsysteem werkt zoals voorzien
 - *Eindgebruikers*: kopen en verkopen elektriciteit op het optimale moment zonder verlies van comfort.
 - *Leveranciers*: kunnen het cluster gebruiken als een virtual power plant, om daarmee bijvoorbeeld onbalans weg te regelen
 - *Netbeheerders*: kunnen pieken van het net weggelen



Smart Grid for the Real World



**Thank you for
your attention**

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