

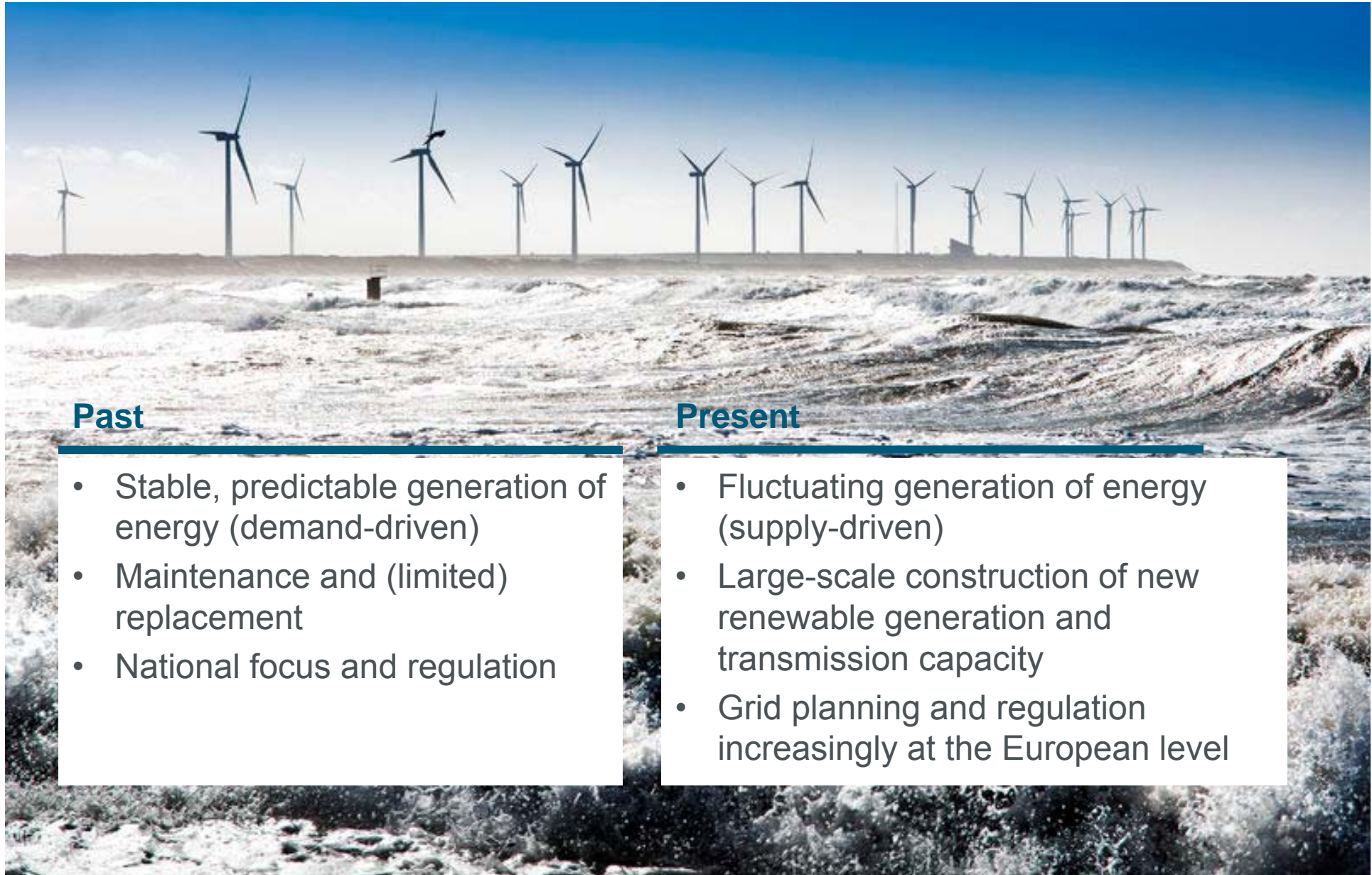
# The role of EV's in Ancillary Services



October-23-2017

Thies, Saskia

# The market is changing



## Past

- Stable, predictable generation of energy (demand-driven)
- Maintenance and (limited) replacement
- National focus and regulation

## Present

- Fluctuating generation of energy (supply-driven)
- Large-scale construction of new renewable generation and transmission capacity
- Grid planning and regulation increasingly at the European level

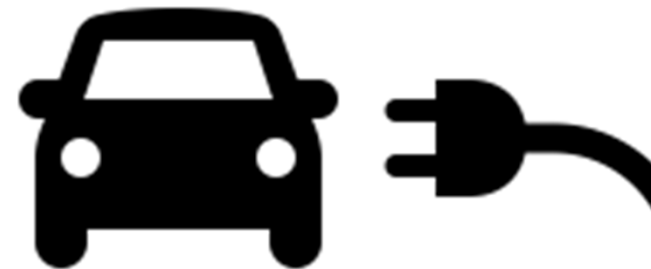


# EV's and the energy transition

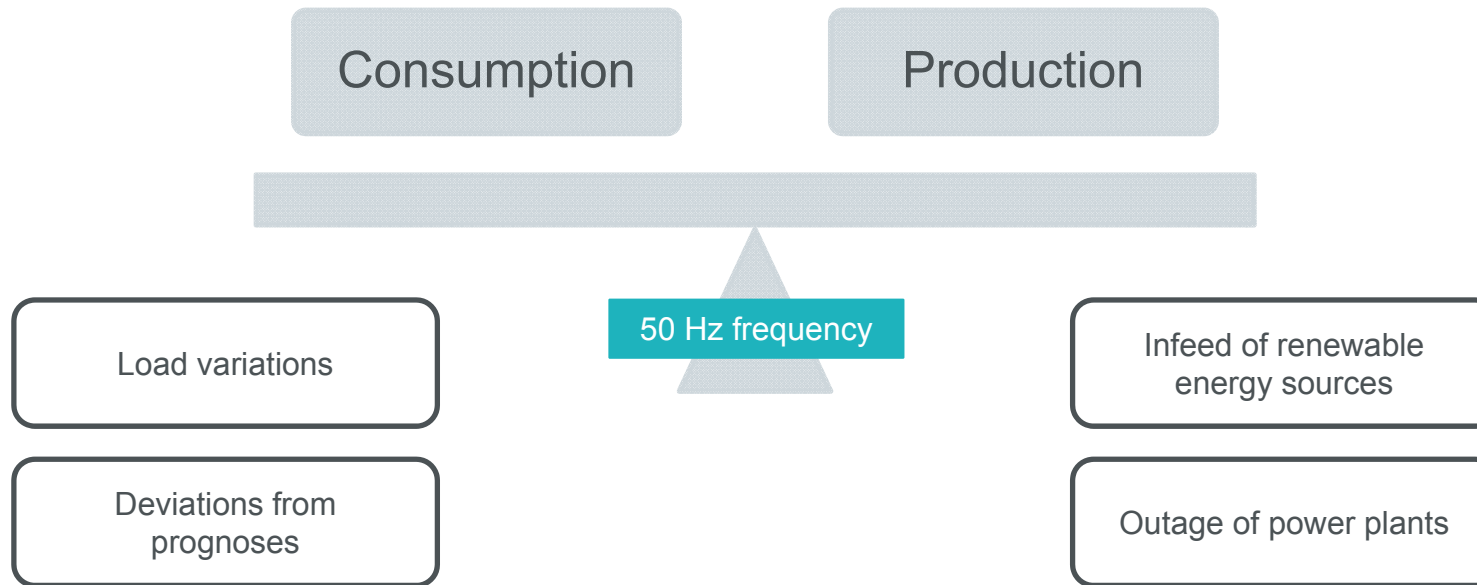
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- ...a car that does not only cost money but could also earn money
- ...a car that can serve as buffer for the increasingly fluctuating energy generation
- ...a car that can contribute to the stabilization of the electricity grid

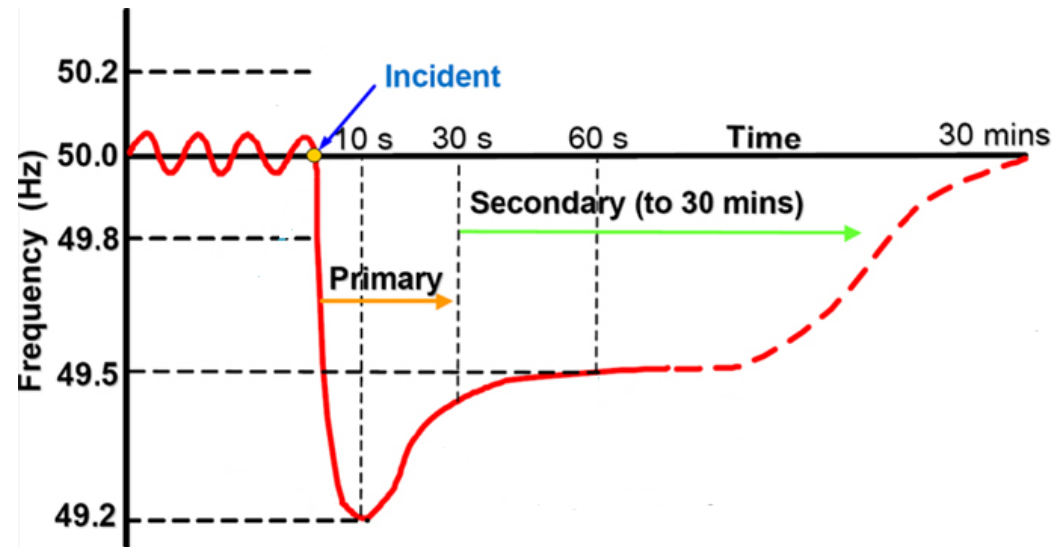


# Maintaining the balance



The amount of **electricity produced** must always match the amount of **electricity consumed**.

# Maintaining the balance



Frequency ↓ reserves “ramp up”, or provide power;  
Frequency ↑ reserves “ramp down”, or consume power.

In 2017, TenneT NL is obliged to contract:

- **107 MW** for **FCR** – weekly tender ([www.regelleistung.net](http://www.regelleistung.net));

# FCR pilot objective

Examining whether it is possible to provide frequency support with new technologies and/or (aggregation of) smaller assets.

To prepare for a future with less large scale and more small scale generation.



To provide a level playing field for different technologies.



Alternatives of supply might reduce costs of the FCR product.



# Product Specifications FCR



Product specifications	Market	FCR pilot
Availability	1 week	1 week
Accuracy frequency measurement	< 10 mHz	< 10 mHz
Insensitivity range of frequency control	< 10 mHz	< 10 mHz
Full activation time	30 s	30 s
Full activation frequency deviation	± 200 mHz	± 200 mHz
Real-time operating measurement of power	4-10 s <small>(with max delay 30 sec)</small>	4-10 s <small>(with max delay 30 sec)</small>
Minimum bid size (upward & downward)	1 MW	<b>100 kW</b>





# Pilot participants

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**Peeeks**



**ENGIE**



**Senfal**



**KPN**



**NewMotion**



# Challenges future FCR market



For TenneT

- 1 Prequalification (of all assets)**  
Complex and/or time consuming for large pools of assets.
- 2 Data communication**  
New ways of data communication have to be set up.
- 3 Frequency measurement**  
Considering local versus central frequency measurement with respect to system security.



# Challenges future FCR market



For market parties

- 1 Minimum bid size**  
The minimum bid size of 1 MW can be large for new concepts / technologies.
- 2 Availability / tender period**  
One week is long for technologies depending on weather conditions and/or demand side response.
- 3 Local frequency measurement**  
Might be complex and/or too costly for large pools of assets.







# European FCR market

European TSO's are actively working on harmonising the FCR market. Some of the points of discussion are listed here:

- 1 Minimum bid size**  
The minimum bid size of 1 MW remains.
- 2 Availability / tender period**  
Bid period could decrease to 4h – products within a daily auction frequency (probably D-2)
- 3 Frequency measurement**  
For now, central metering in the NL is allowed (pending discussion on European level)





# What impact does this have on the EV market?



- EV's can have a significant impact in the energy transition (storage capacity and support of the grid frequency)
- EV's could potentially deliver FCR (income source)
- The European FCR market changes in a way that is favourable for EV's



# Disclaimer

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