CITY-zen

New urban energy

THE SOLAR AND ELECTRICAL MOBILITY REVOLUTION CONFERENCE

ARNO VAN ZWAM – 2015/03/31

Co-funded by the European Union's Seventh Programme for research, technological development and demonstration

MASTERVOLT

RESIDENTIAL PV STORAGE - IN BRIEF

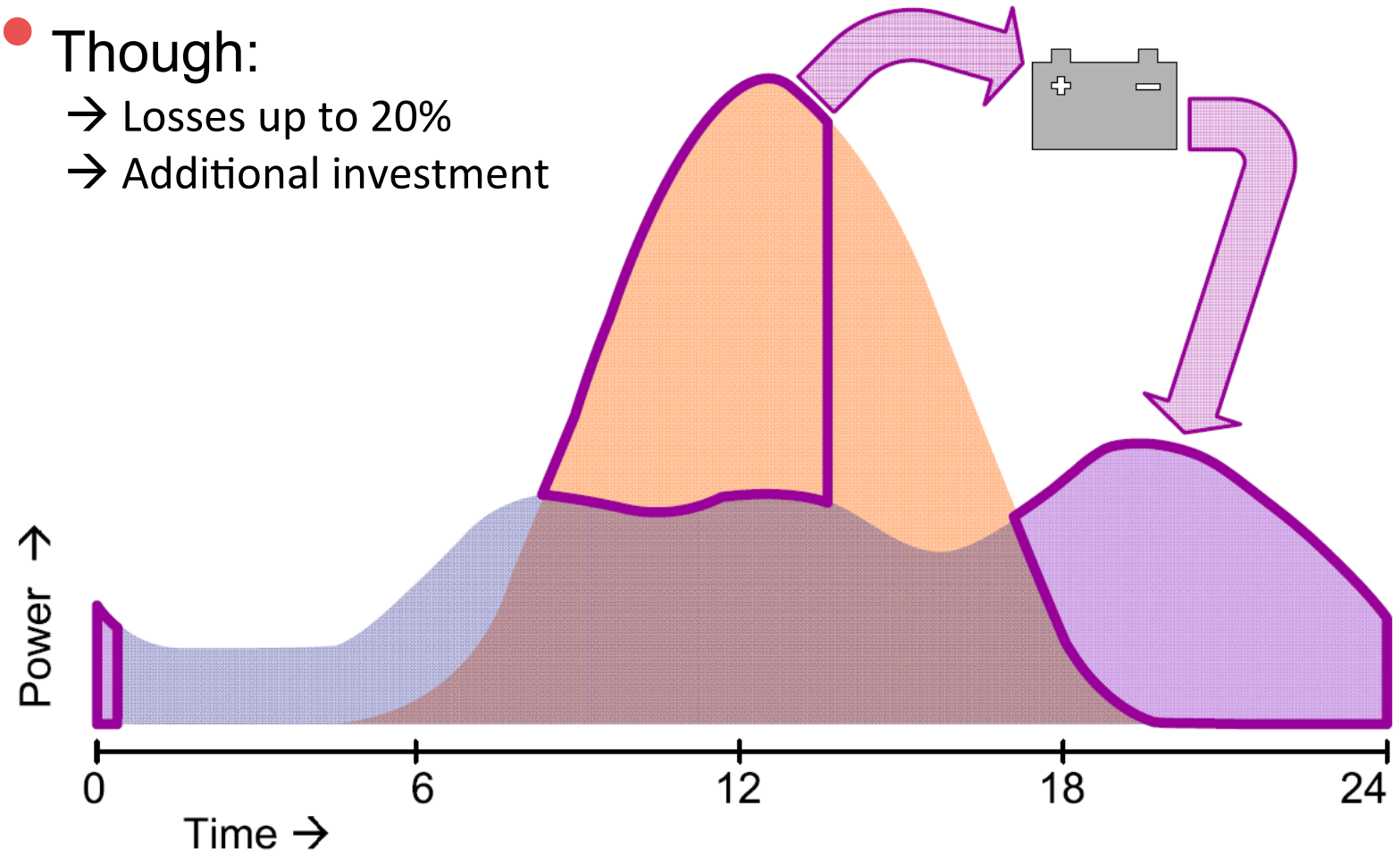
- Use your own generated PV energy yourself at a later time
- Add-on to existing rooftop PV systems
- Li-ion battery storage technology is the enabler

- Economic viability : ‘today’ only in Germany → subsidised
- Smart Grids research: aggregation to neighbour(hood) level could increase viability
- In foreseeable time: automotive/ EV development will contribute to price decrease of storage → Residential Storage will appear in every household

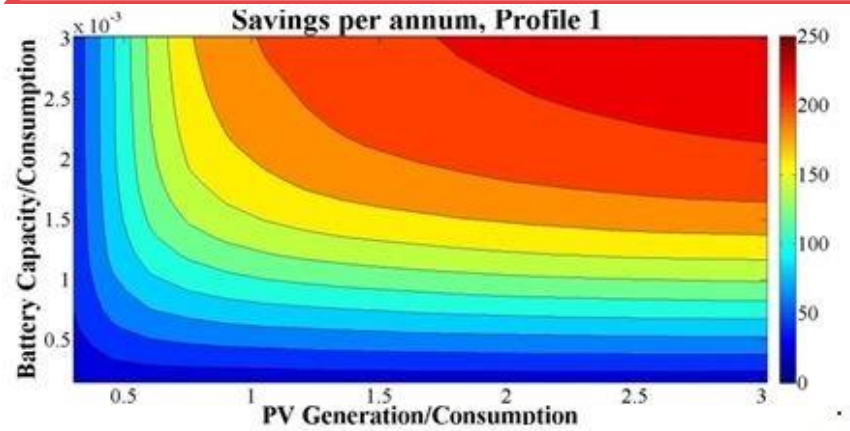
SURPLUS GENERATION IS STORED FOR AFTER DAWN

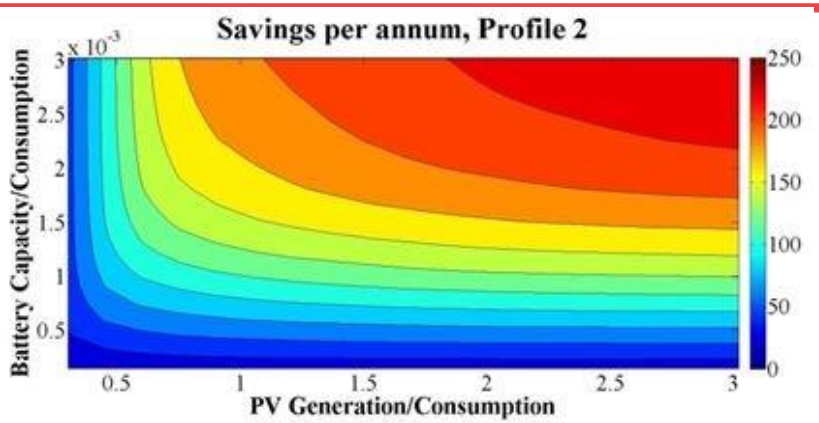
- Refrain from earning 7 ct
- Prevent buying for 20 ct

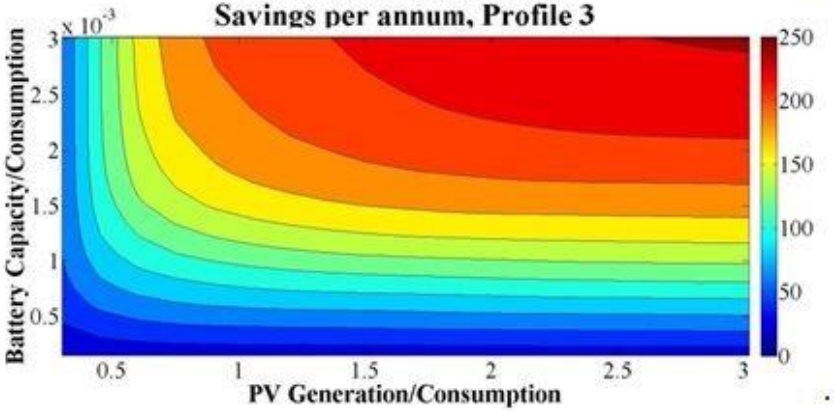
- Though:
  - → Losses up to 20%
  - → Additional investment

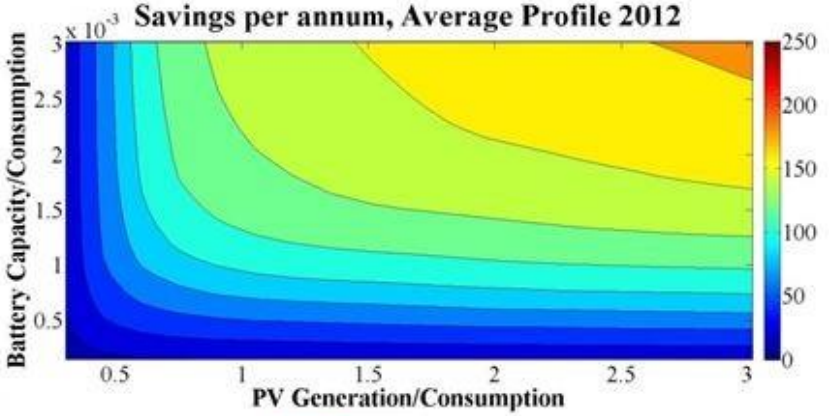


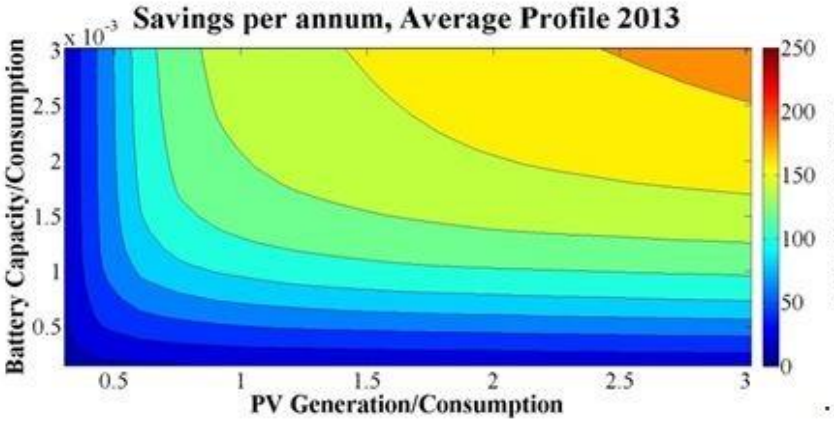
ANNUAL SAVINGS [€]

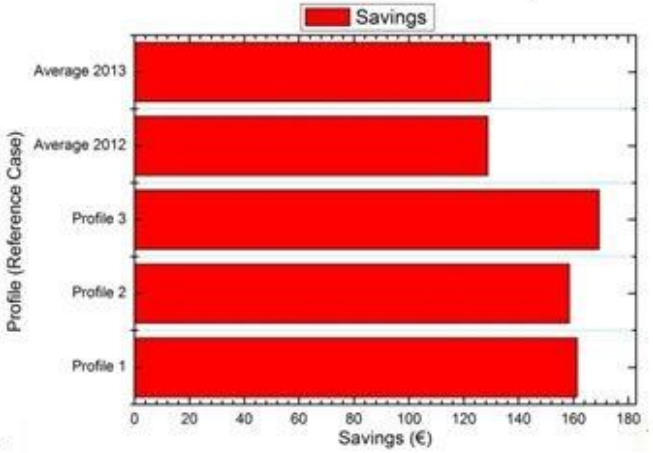




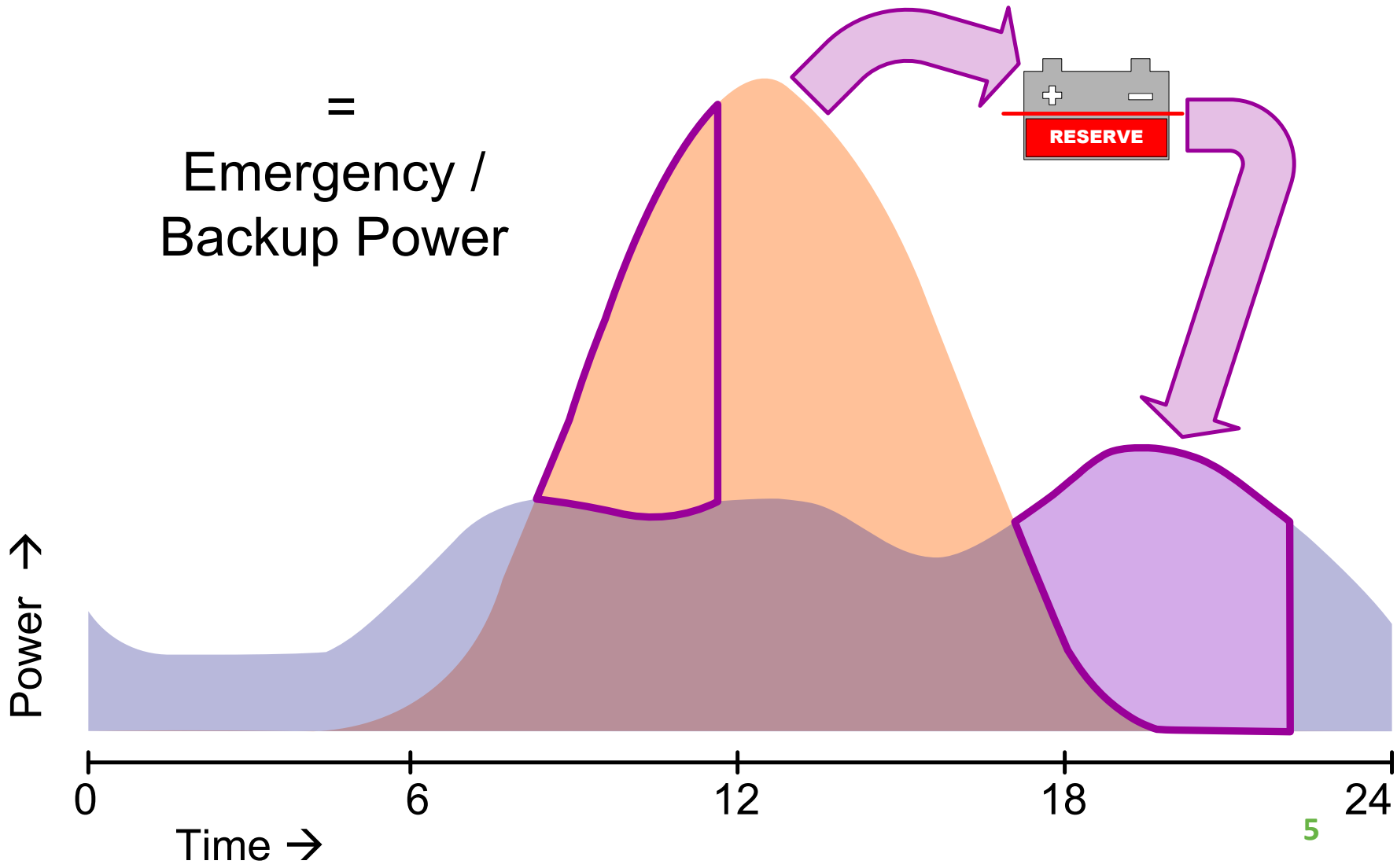






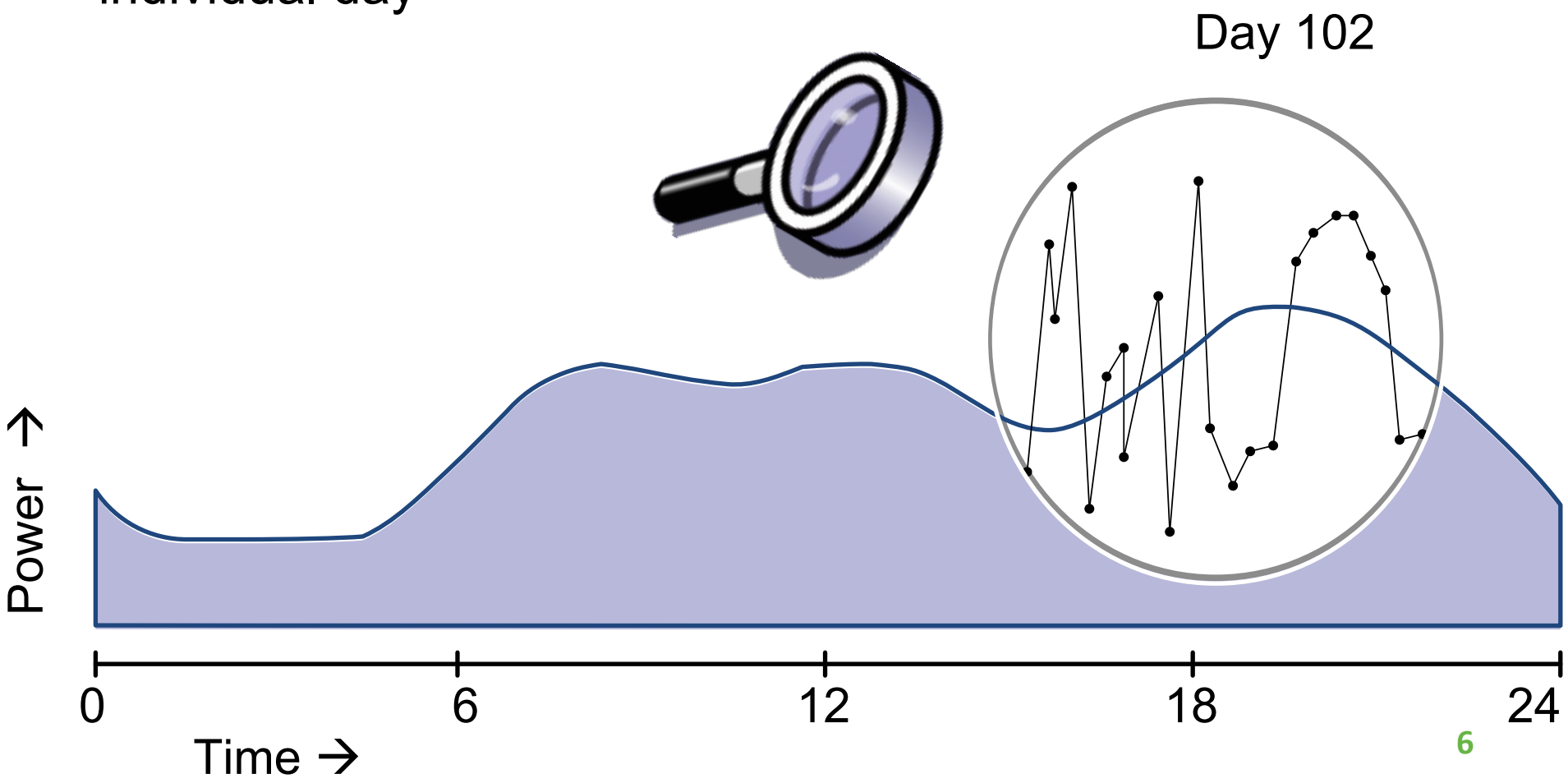


INCLUDE UNINTERRUPTABLE POWER SUPPLY FUNCTION



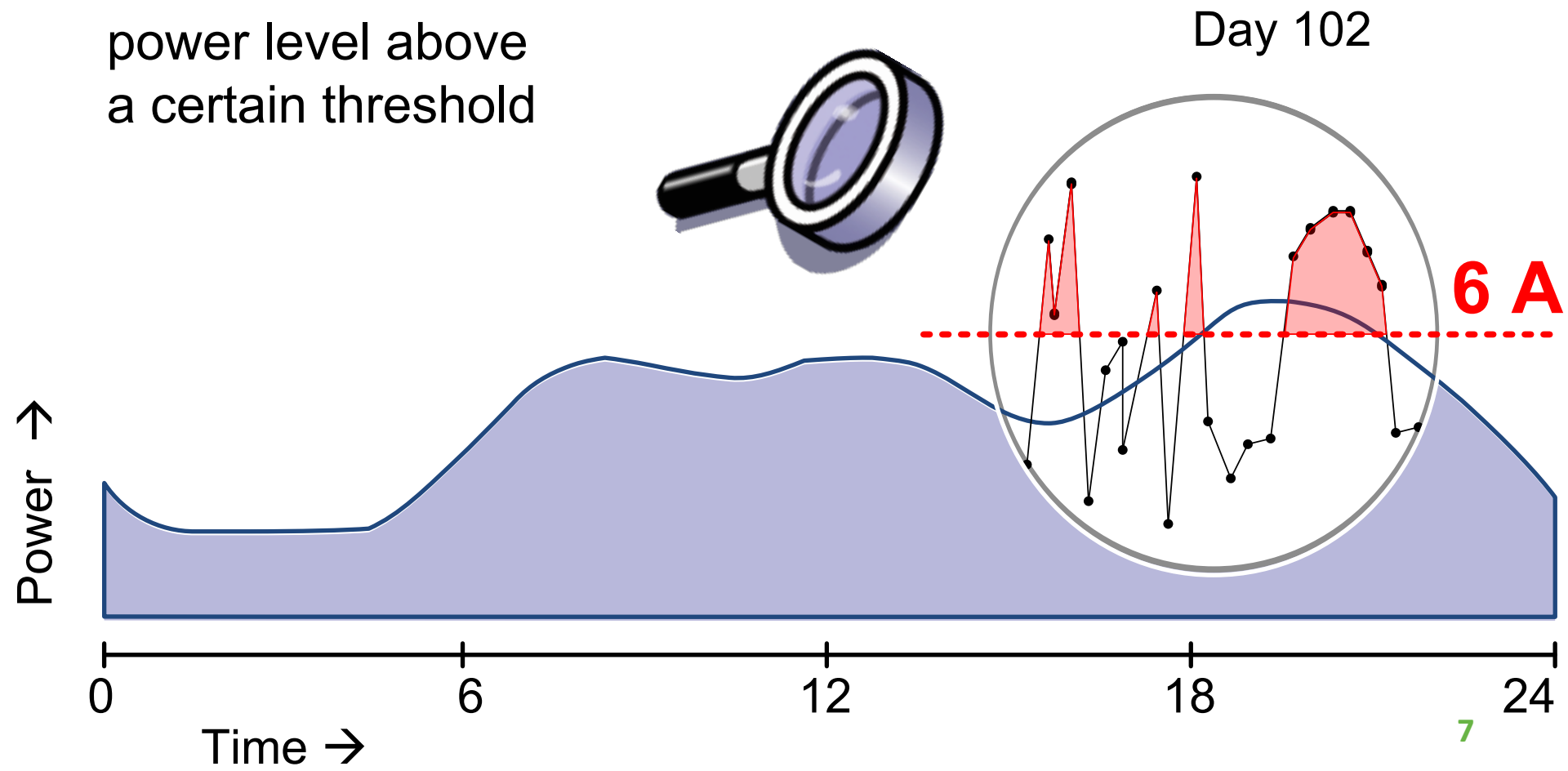
REDUCE UTILITY CONNECTION RATING

- Zoom in on an individual day

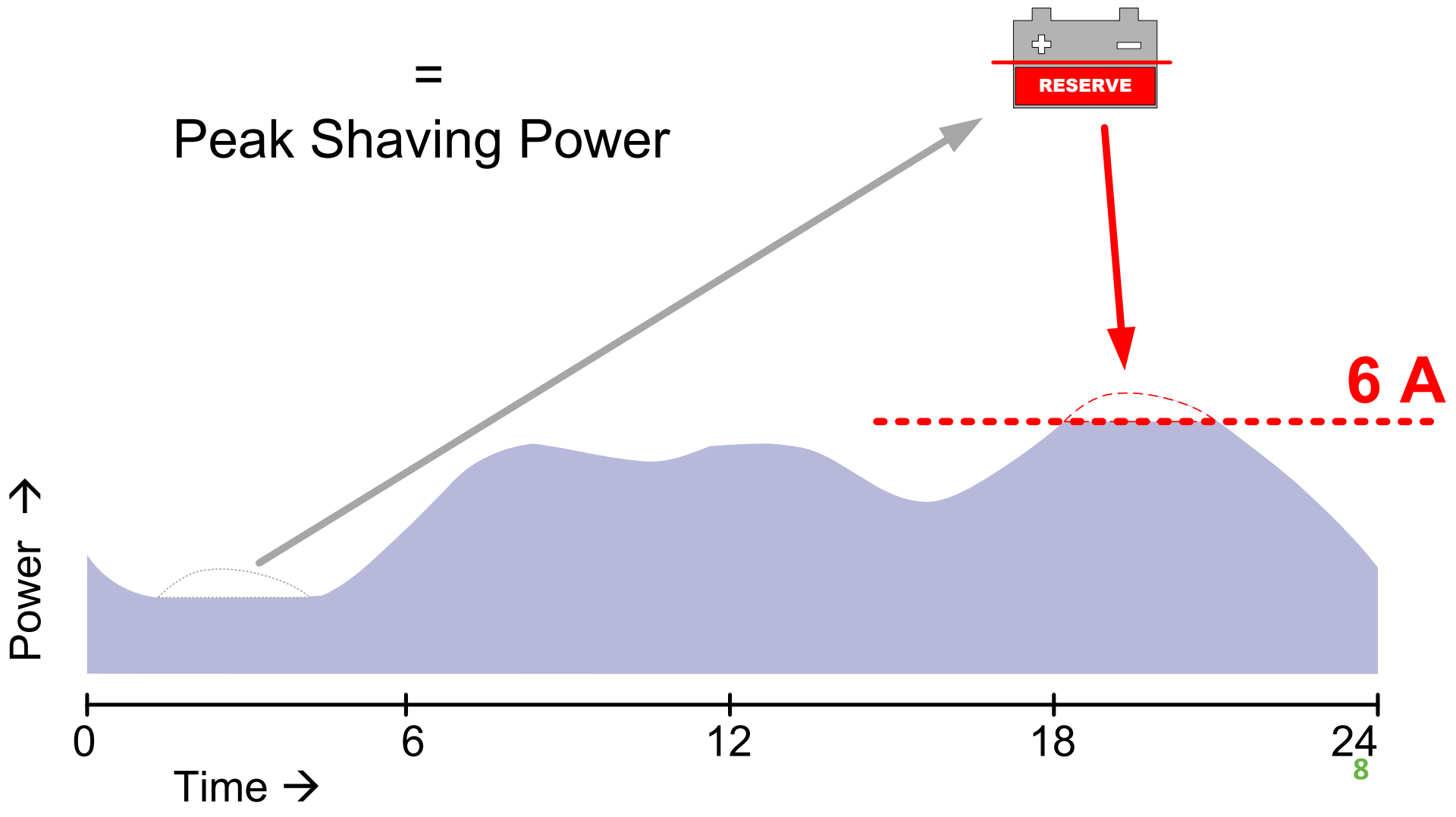


REDUCE UTILITY CONNECTION RATING

- Act on an instantaneous power level above a certain threshold



REDUCE UTILITY CONNECTION RATING



RESIDENTIAL PV STORAGE - IN BRIEF

- Use your own generated PV energy yourself at a later time
- Add-on to existing rooftop PV systems
- Li-ion battery storage technology is the enabler

- Economic viability : 'today' only in Germany → subsidised
- Smart Grids research: aggregation to neighbour(hood) level could increase viability
- In foreseeable time: automotive/ EV development will contribute to price decrease of storage → Residential Storage will appear in every household

AMSTERDAM SMART CITY : LIVING LAB

GREENSPREAD

amsterdam smart city

tki switch 2 smartgrids

alliander

REX REALTIME ENERGY EXCHANGE

SEVENTH FRAMEWORK PROGRAMME

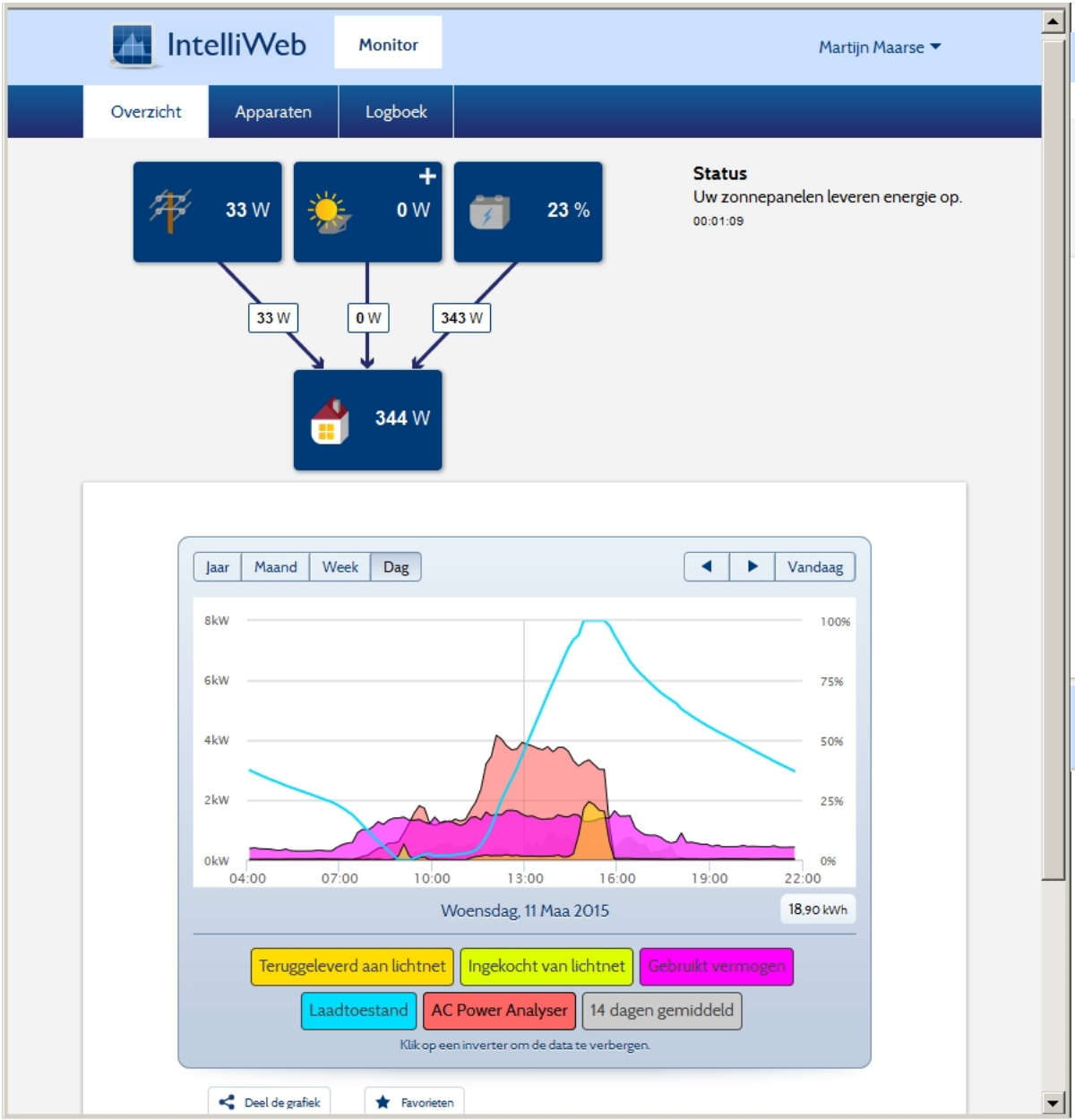
Agentschap NL
Ministerie van Economische Zaken

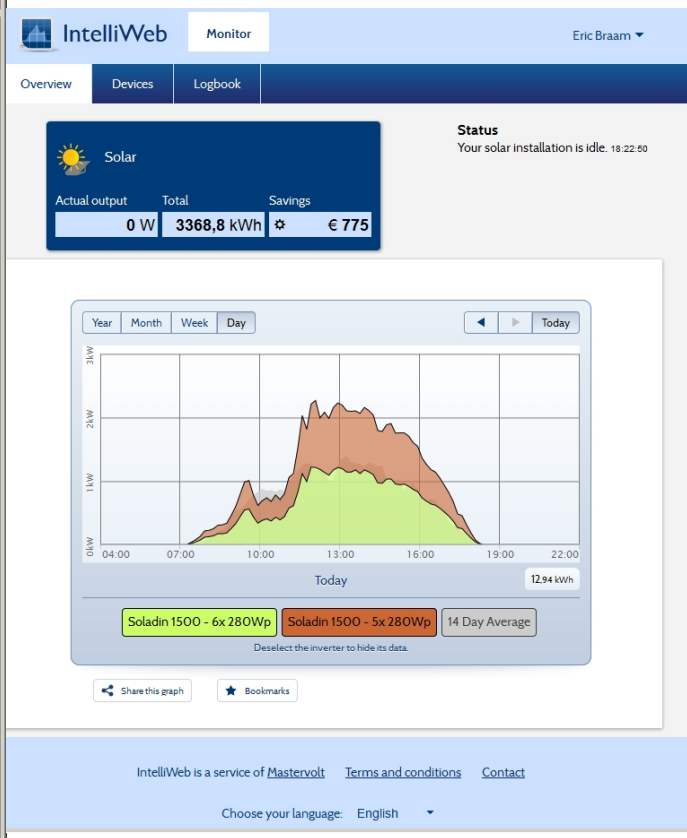
TU/e

EXE ENERGY EXCHANGE ENABLERS

MASTERVOLT

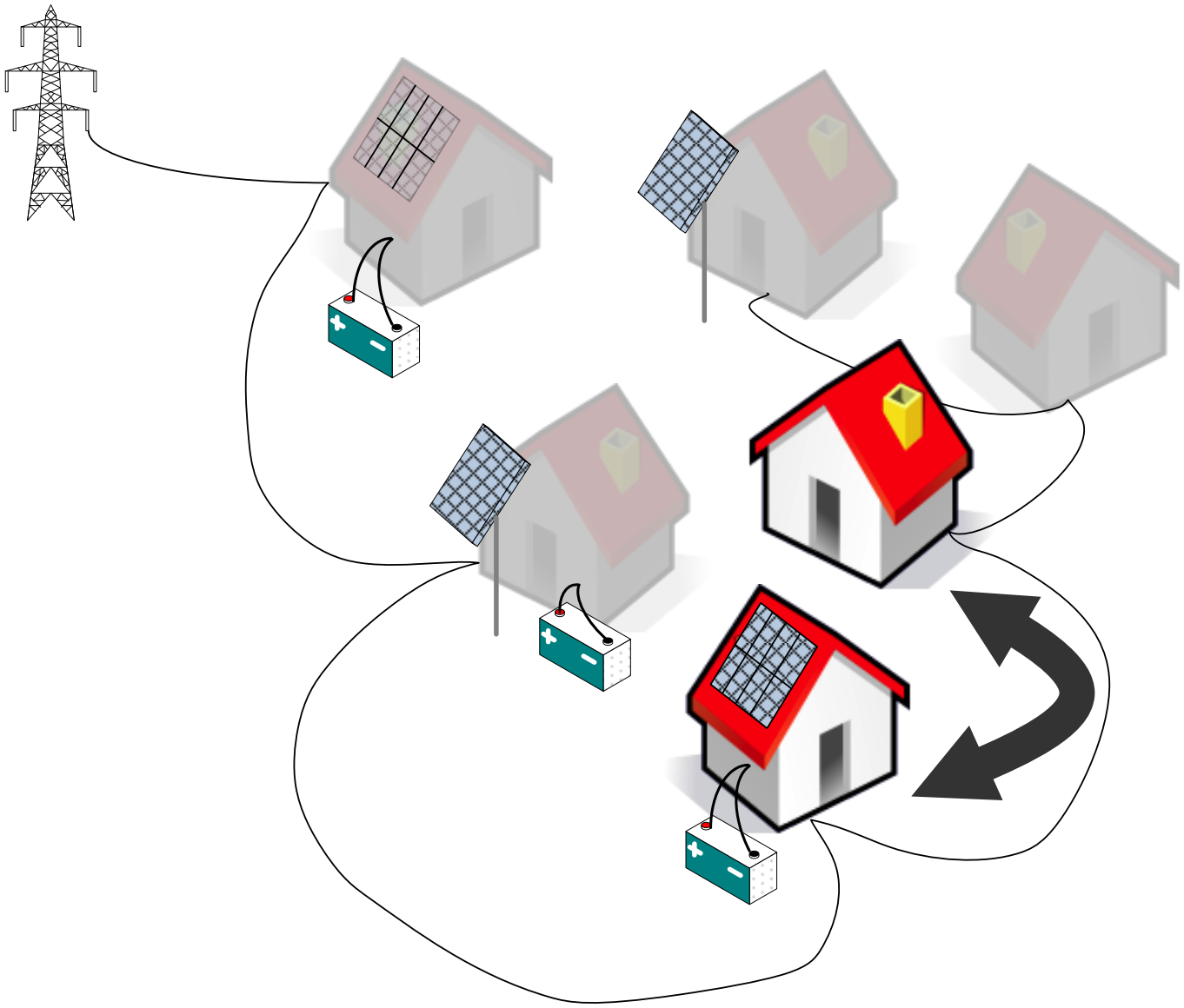
PV-STORAGE & PV MONITORING





http://intelliweb.mastervolt.com

PV-SIMS PROJECT: PEER-TO-PEER TRADE



Agentschap NL
Ministerie van Economische Zaken

alliander

amsterdam smart city

GREENSPREAD

MASTERVOLT

tki switch 2 smartgrids

TU/e Technische Universiteit Eindhoven University of Technology

CITY-ZEN PROJECT

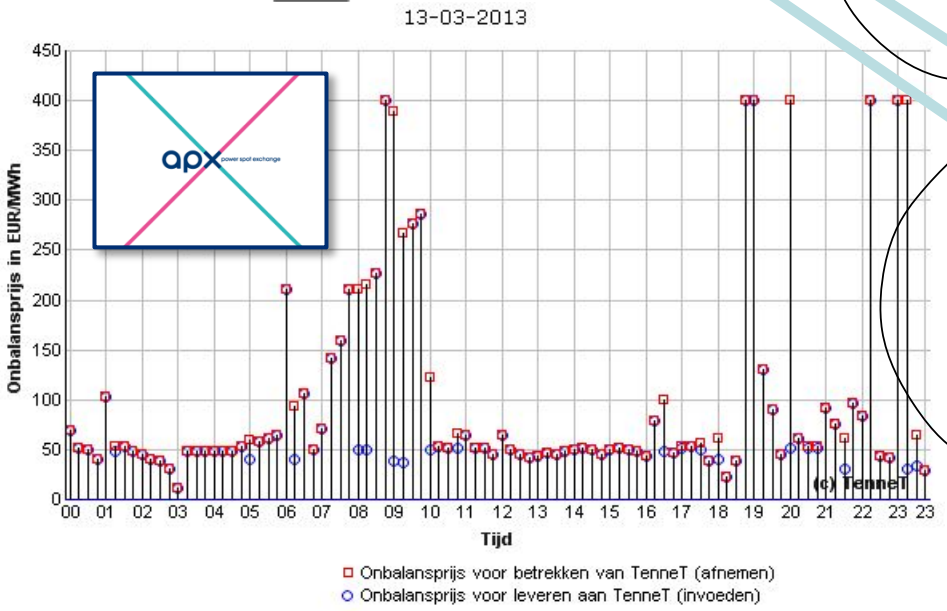
Theme: Smartification on Building Level

- Aggregate the flexibility of a demonstrator of 80 residential PV-Storage systems
- Use flexibility to trade on the Dutch energy markets
- Refund earnings to participant via their energy contracts
- Improve economic viability of PV-Storage via tapping into a second earnings model (next to maximising self consumption)

➔ *Unleash small utility connection flexibility as previously reserved for large capacity telemetry connections*

www.cityzen-smartcity.eu

CITY-ZEN: AGGREGATE FOR SPOT MARKET TRADE



CITY-zen
New urban energy

POTENTIAL OF MARKETS

3600 kWh household with 6 kWh battery

Market	Value of market	2012 for single household
Day ahead	25-150 Euro per MWh.	80 Euro
Intraday	25 -150 Euro per MWh	60-100 Euro
Offer power to Tennet	-200 - +500 Euro per MWh	30-600 Euro
Imbalance price Tennet	-200 en +500 Euro per MWh	5-10 euro
Follow prognosis	10% improvement reduces 2% of cost.	5 Euro
Imbalance price supplier	BlowTennet pricing	<2 Euro
Red. peak load connection	Fixed price (<3x25A)	
Reduce peak load grid	35 Euro/kWpiek	3,5 Euro
Use for own balancing	No value (Regulated)	
OTC / ENDEX	25-60 Euro per MWh	40-60 Euro

Source : ENERGY EXCHANGE ENABLERS

Questions & Answers