

tiko – Experience with VPP in Switzerland and Germany

tiko Energy Solutions AG
3. July 2019, Lucern



Agenda

1

Introduction tiko

2

Experience with Virtual Power Plant (VPP)

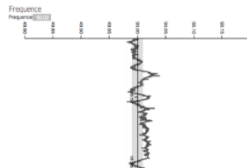
Background –tiko Energy Solutions

- Founded in 2012
- Located in Olten, close to Zürich
- Business in Switzerland, Germany, France and Austria
- Trustworthy shareholders: Engie New Business, Swisscom AG , Repower AG management and employees
- In Switzerland: technology provider and aggregator
- International: only technology provider

**>100 MW connected,
operations since 2013**



**First aggregator for FCR in CH,
FR with heating loads**



2018 FCR with Battery-pool in DE



Delivering value for the customer, value for the grid and the community

Customer



Monitoring and Alarming



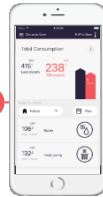
Increase efficiency



Financial cash-back



Self-consumption



HOME



Grid/ Utility

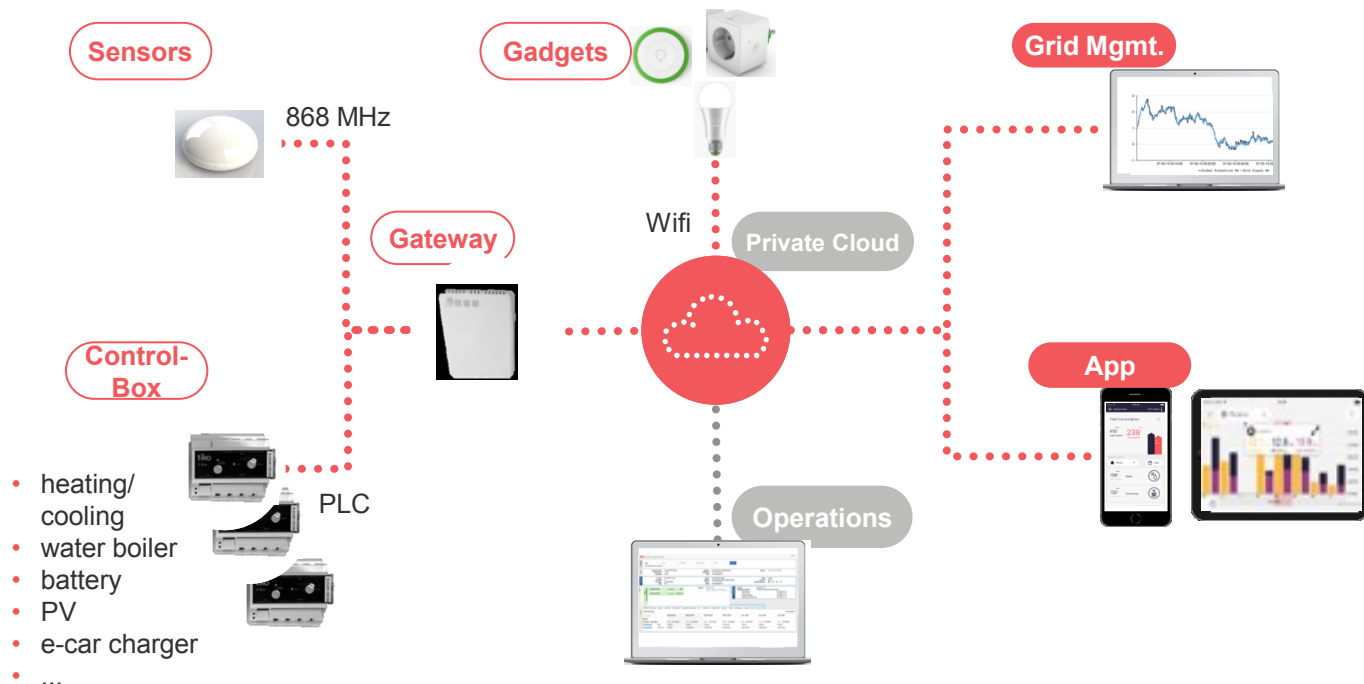
Frequency Control

Demand Response

Intra-day, Day-ahead

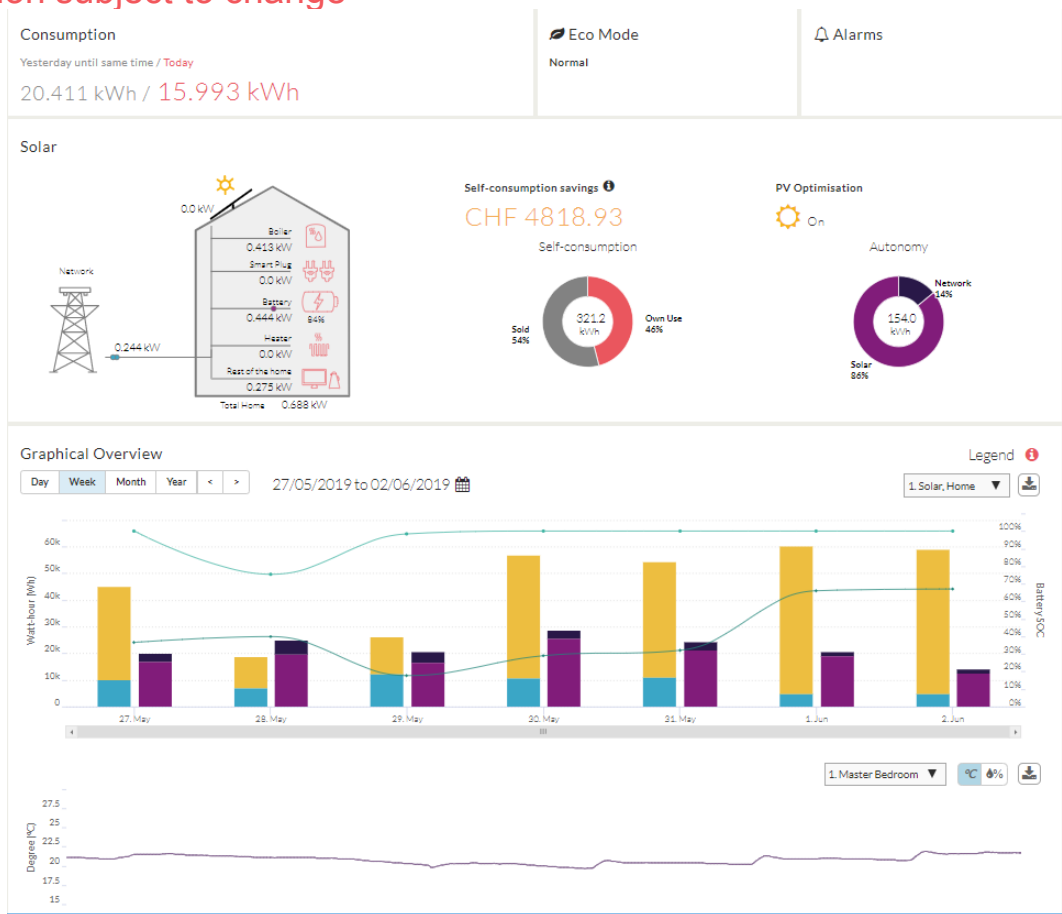
Customer Engagement/
Preventive Maintenance

Architecture build for highest cyber-security and metrology requirements and efficient installation



End Customer Web Area:

Illustration subject to change



VPP functionality

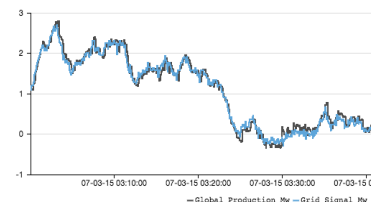
Intended for

1 TSO

Functionality

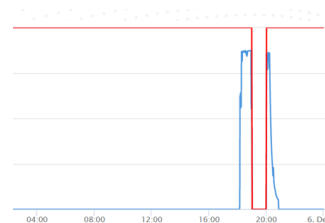
- FCR (Primary)
- aFRR (Secondary)
- mFRR (Tertiary)

Illustration



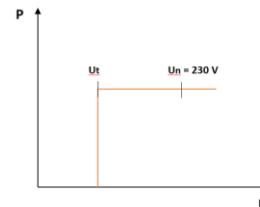
2 BRP

- Day-Ahead
- Intra-Day
- Balance Group optimization

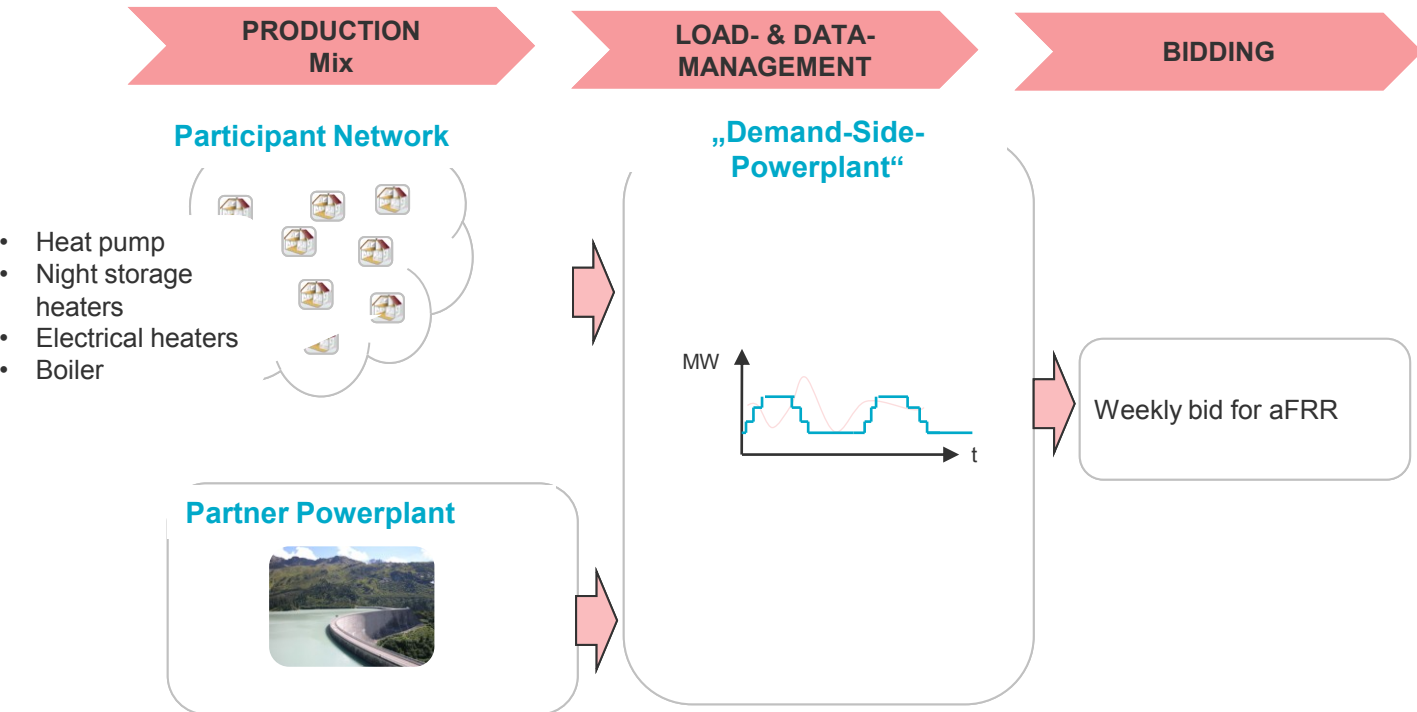


3 DSO

- Voltage control
- Local flexibility



TSO functionality: aFRR with heating loads (1/2)



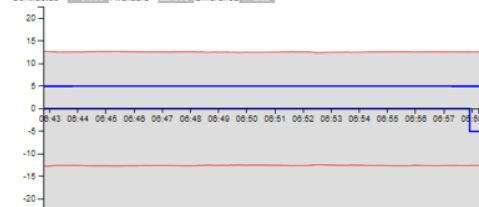
TSO functionality: aFRR with heating loads (2/2)

Activation

CAPACITY (Values in MW)

Overview

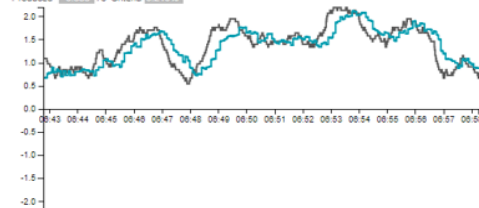
Contracted + 5.000 Available + 12.567 Difference + 7.567
Contracted - 5.000 Available - 22.238 Difference - 17.238



PRODUCTION (Values in MW and MWh)

Overview

Requested 0.786 Deviation + 1.882% Deviation + 1.882%
Produced 0.888 79 Criteria 0.210%

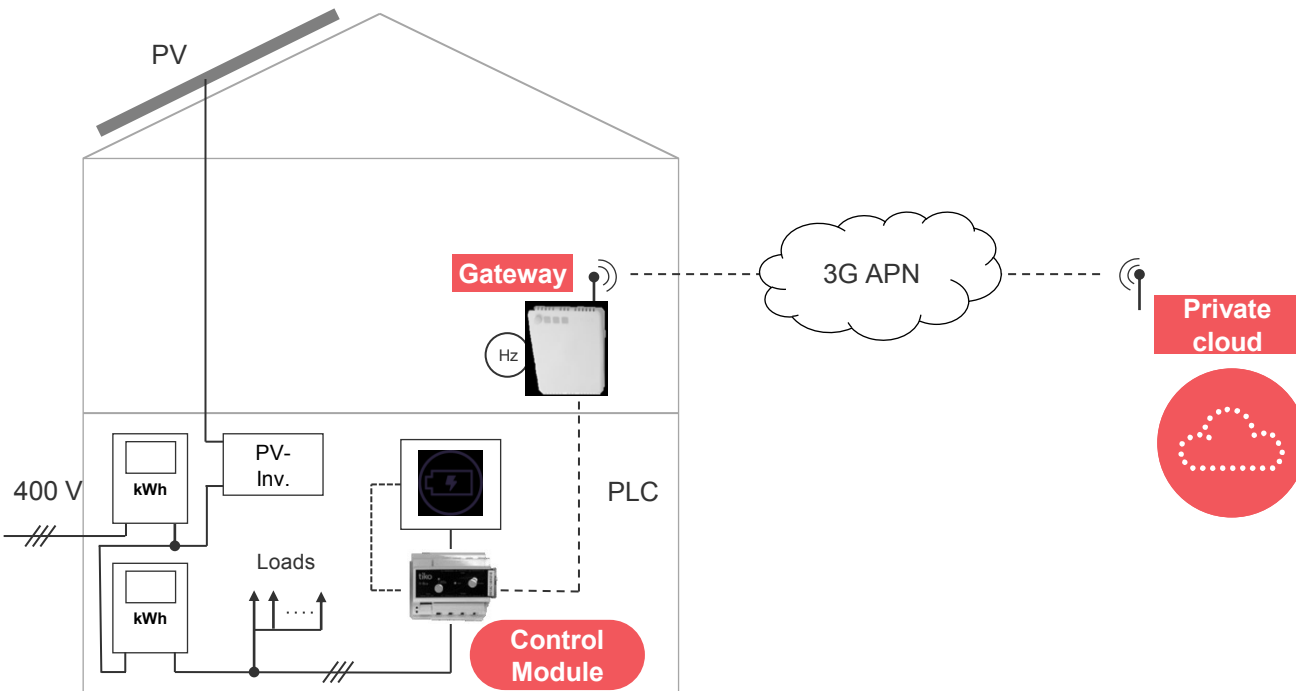


tiko production

Post-Scheduling

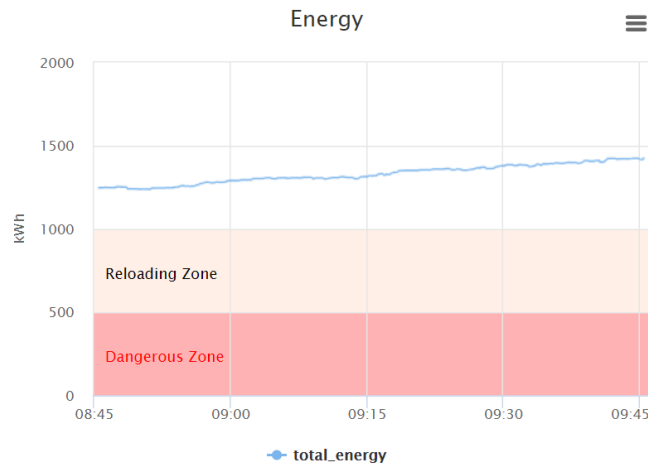
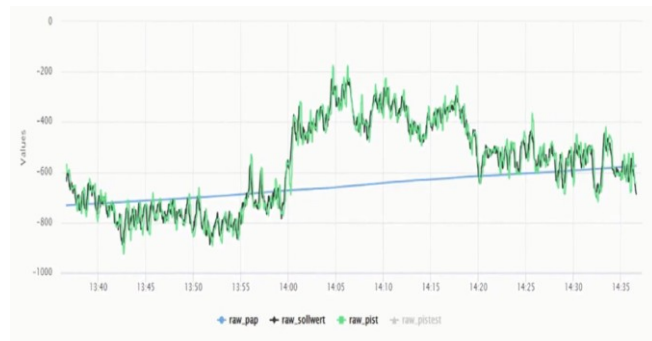
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Receiver: 10YCH-SWISSGRID2				
Altmarkt				
	Wert für TS1	Wert für TS2	Wert für TS3	Wert für TS4
time series id	1234	1235	1236	1237
version	1	1	1	1
Business Type	A10	A10	A14	A14
Product	8716867000016	8716867000016		
Object	A01	A01	A01	A01
aggregation				
unit	MW	MW	MW	MW
In area Coding scheme	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"
Out area Coding scheme	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"	10YCH-SWISSGRID2" codingScheme="A01"
In party Coding scheme	12X-0000001861-Q	12XBGV-HANDEL-X	12X-0000001861-Q	12XSVPool-Standard
Out party Coding scheme	12XBGV-HANDEL-X	12X-0000001861-Q	12XBGV-HANDEL-X	12X-0000001861-Q
Period	2013-04-17T22:00Z/2013-04-18T22:00Z	2013-04-17T22:00Z/2013-04-18T22:00Z	2013-04-17T22:00Z/2013-04-18T22:00Z	2013-04-17T22:00Z/2013-04-18T22:00Z
Resolution	PT15M	PT15M	PT15M	PT15M
18.04.2013 08:00 - 08:15	5	0	4	4
18.04.2013 08:15 - 08:30	5	0	4	4

TSO functionality: FCR with decentral Batteries (1/2)

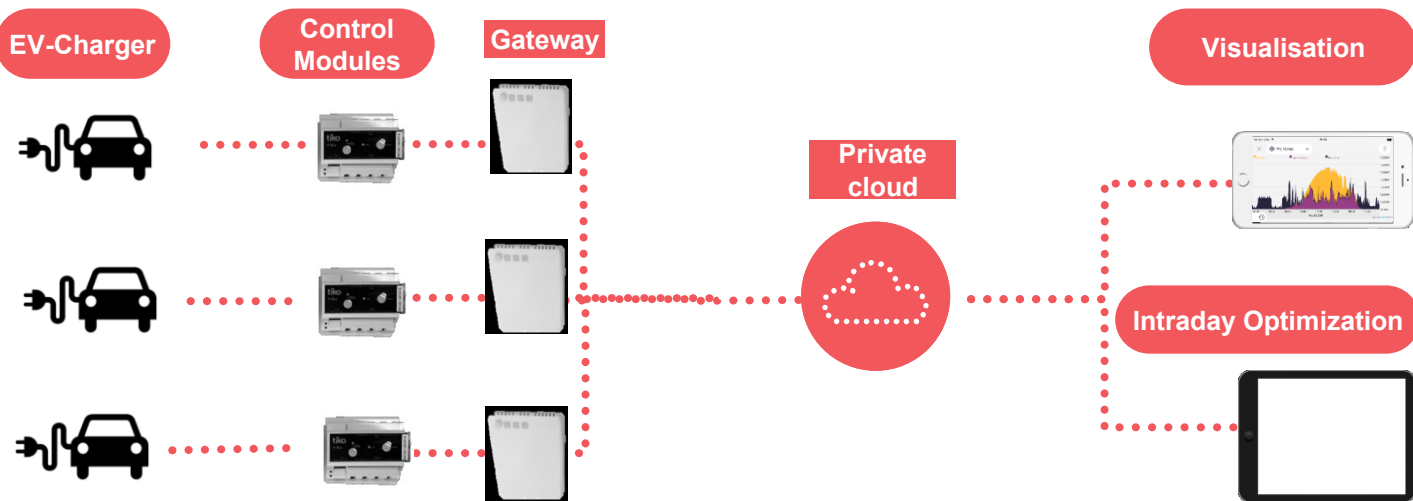


TSO functionality: FCR with decentral Batteries (2/2)

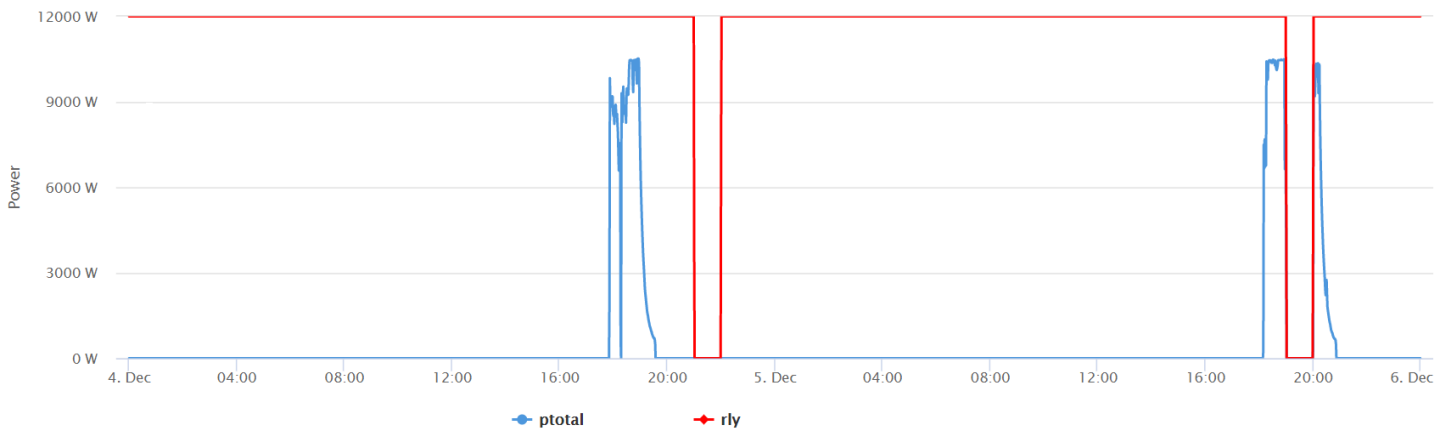
- FCR with Household Batteries
- The pool concept makes Self-Consumption optimization and FCR activation possible with the batteries



BRP functionality: Intraday optimization (1/2)



BRP functionality: Intraday optimization (2/2)



VPP: Opportunities and Challenges

Opportunities

- Flexibility of Household-loads and batteries can be marketed
- Additional assets for grid stabilization
- Makes new Business models possible
- Additional benefit for End Customers

Challenges

- Closed Markets
- Discriminating Market rules
- Low prices for ancillary services

