Energy Transformation

Best Practice From the Base

Ing. Peter Ott

Disclaimer

- I am a private person
- No academic background
- Acting as volunteer
- I am NOT living in a +Energy building

The complete picture

- 0 kWh/a/m^2, but 20 t/a CO_2-footprint?
- Lifestyle
- Shares and investments
- Contributions

The Basics

- Reduce energy demands to < 30%
- Increase energy efficiency to 300%
- Substitute the remaining by 100% RE
- Within the next 10 (20) years
- This is obvious since 20 years

$E=mc^2$

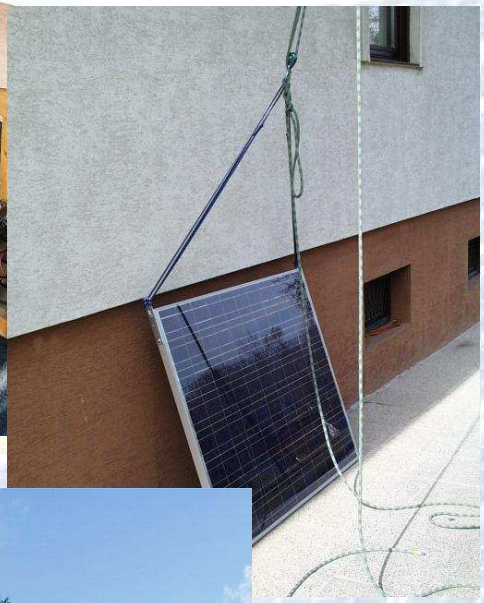
- Everything is energy!
- Common understanding of energy:
  - just electricity
  - water / wind / PV
- Electricity and heat is obvious, but:
  - Food = energy for our bodies
  - Mobility = energy to move from A to B
  - Everything around us contains energy

1990

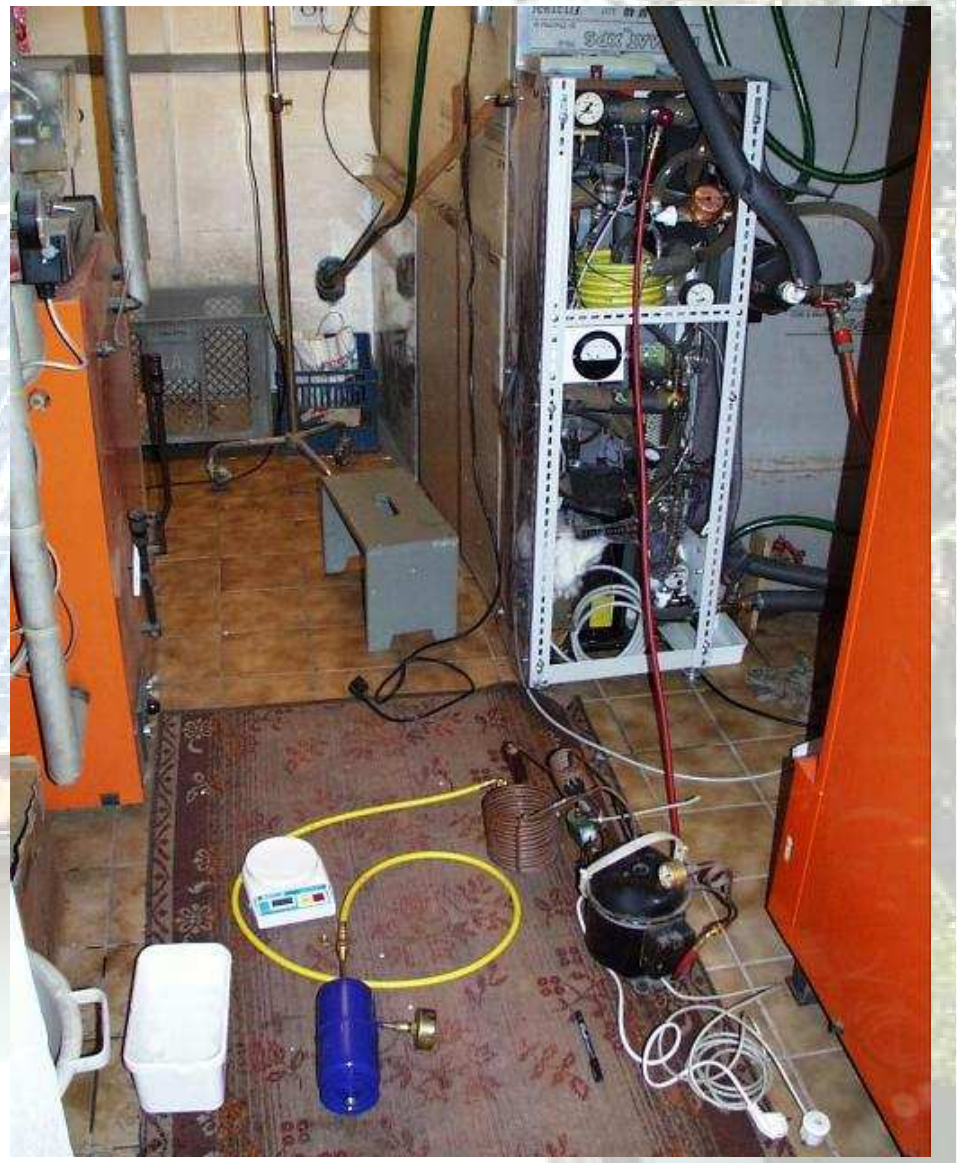

2000

2005

2006

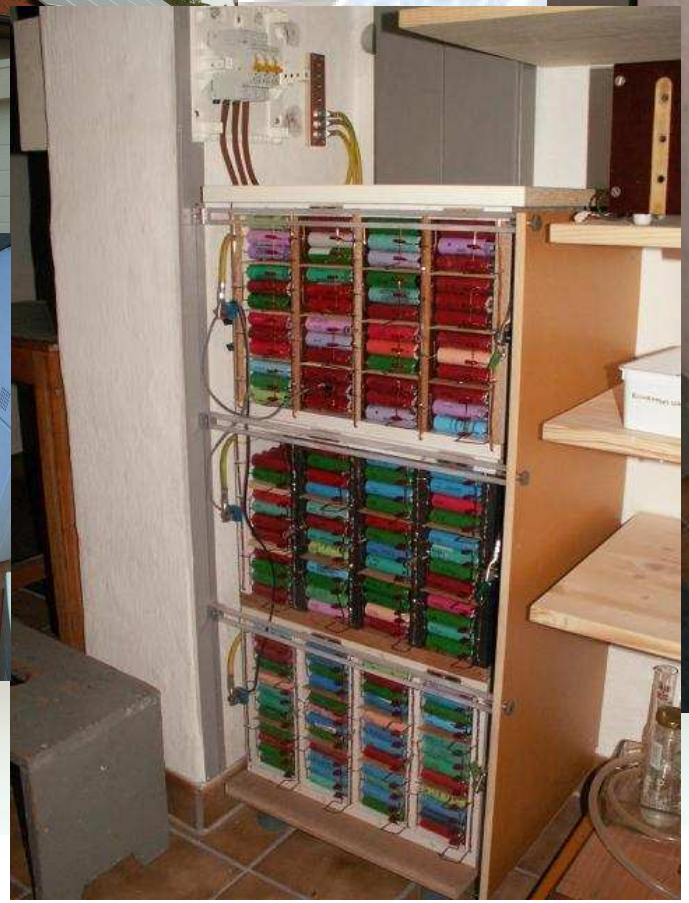


2007



2013

2014



2017

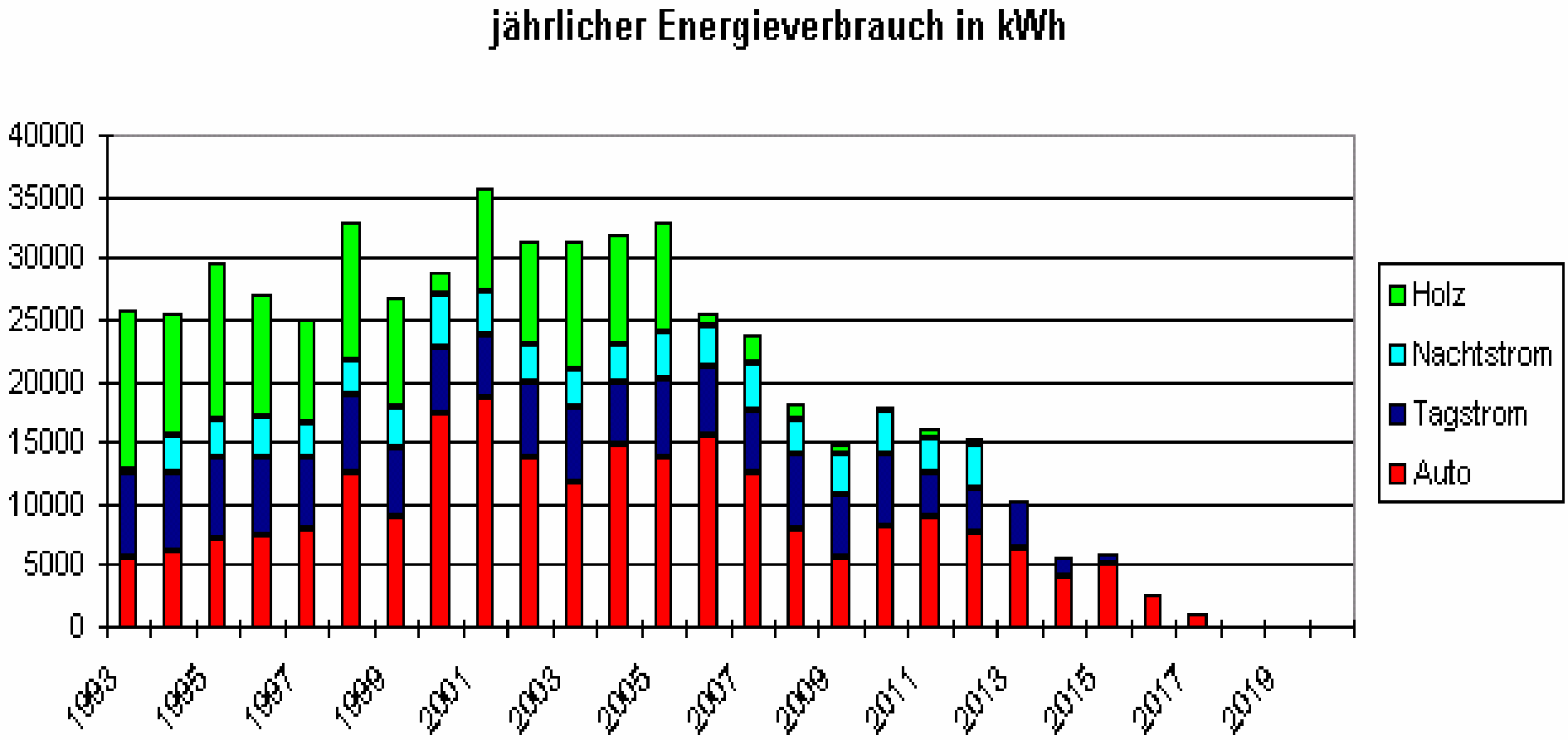

2019

2020

2020


Tel. 07412 54588 0
Pellets
www.rz-pellets.at
Pellets GmbH
Energie aus der Natur
Riegler & Zechmeister

My Energy Transformation



Summary

- 12 kWp PV
- 50 kWh Lithium battery
- P2H (hot water boiler, heating, tiled stove)
- IT controlled Wallbox
- Electric car
- Pellet heating
- Overall energy management
- Participation in local energy community

Energy Balance

- 50 kWh/a/m^2 -> 10 MWh/a
- PV: 10 MWh/a
- Windpark share: 30 MWh/a
- Other shares: 20 MWh/a
- E-Car: 2 MWh/a
- Electric grid

Virtual balance:
+50 MWh

year	togrid	frgrid	tocomm	frcomm	tosupp	frsupp	tocomm%
2019	2,242.07	552.53	1,303.57	52.84	947.77	504.96	58
2020	3,555.13	340.70	2,755.65	106.92	799.48	233.78	78

Set Theory

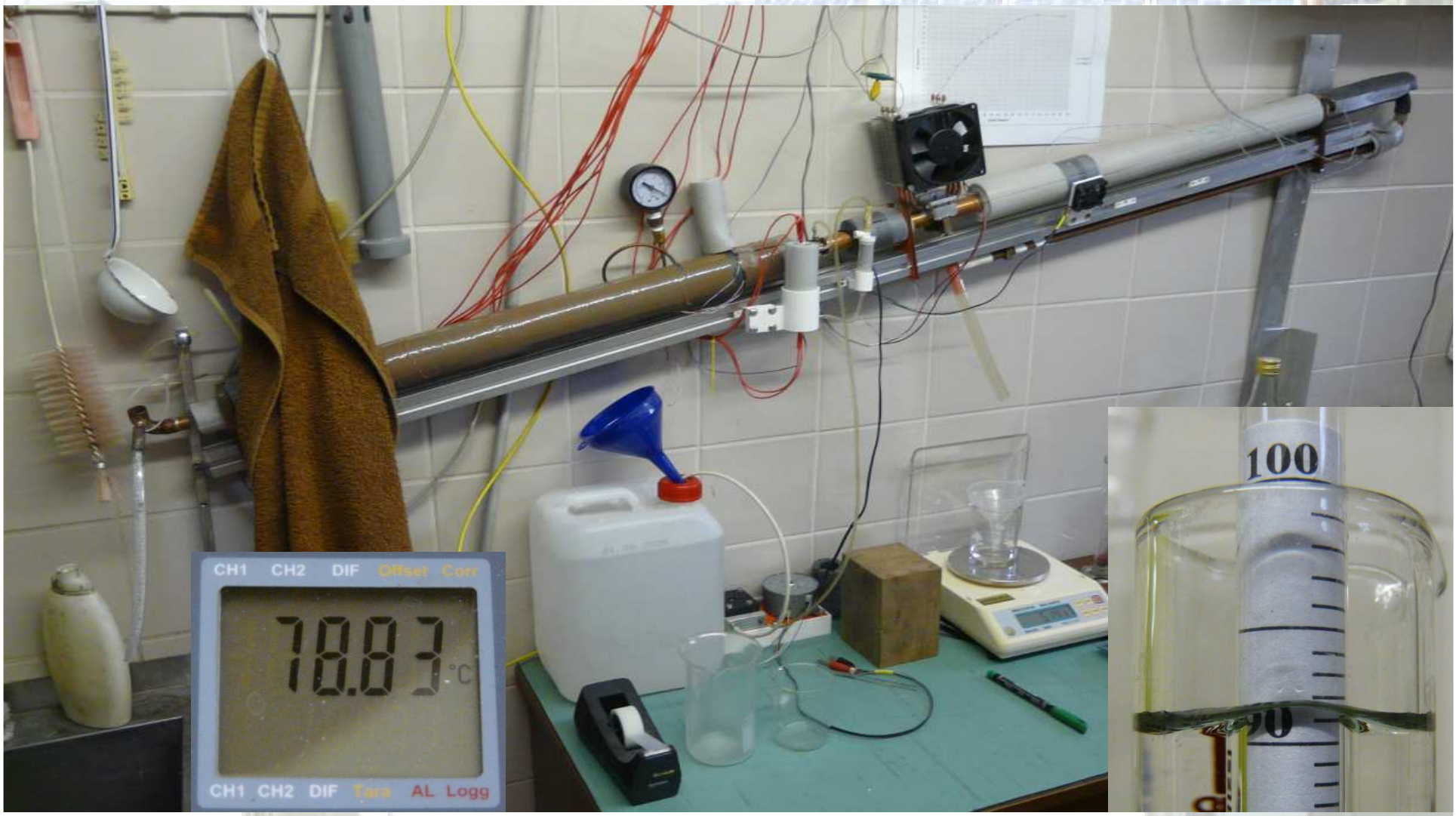
- Virtual balance vs. realtime balance
- Feed-in at noon, car charging at night?
- What‘s the price for strawberries in winter?
- Imbalance energy costs us 200 Mio EUR/a

- The two local energy community approaches
  - Virtual balance only
  - Realtime peer-to-peer trading

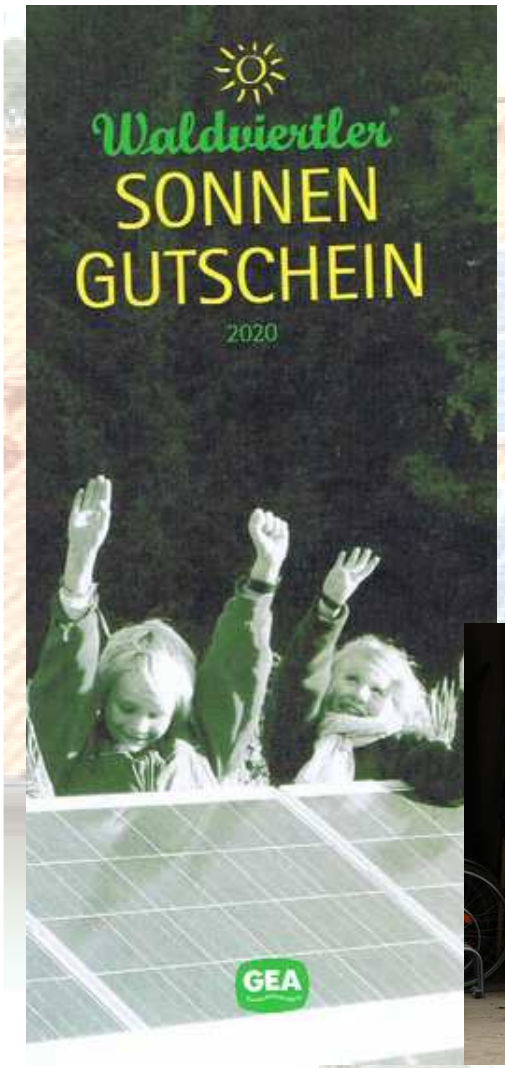
Fruits and Vegetables

Rain Water

92% Ethanol



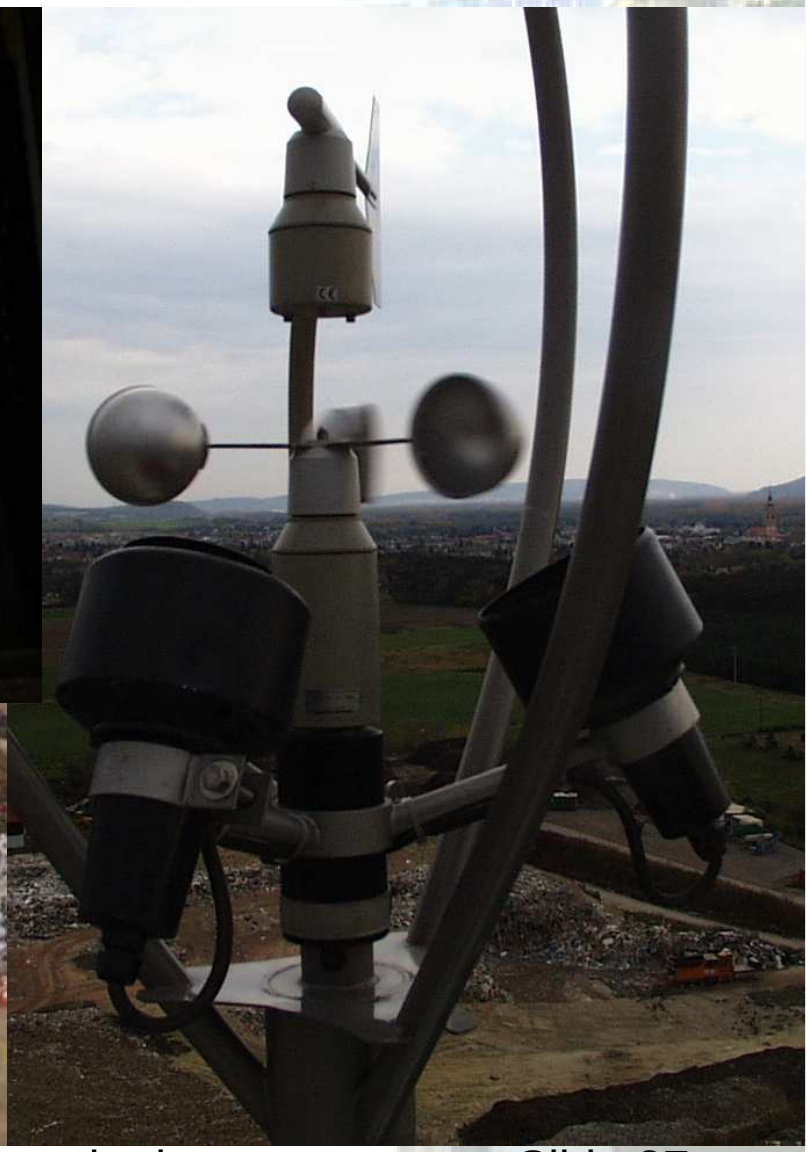
Green investments



Green mobility

Social life

Wind Energy Events



E-Mobility Events

ElektroMobilitätsClub Österreich

FFF demos

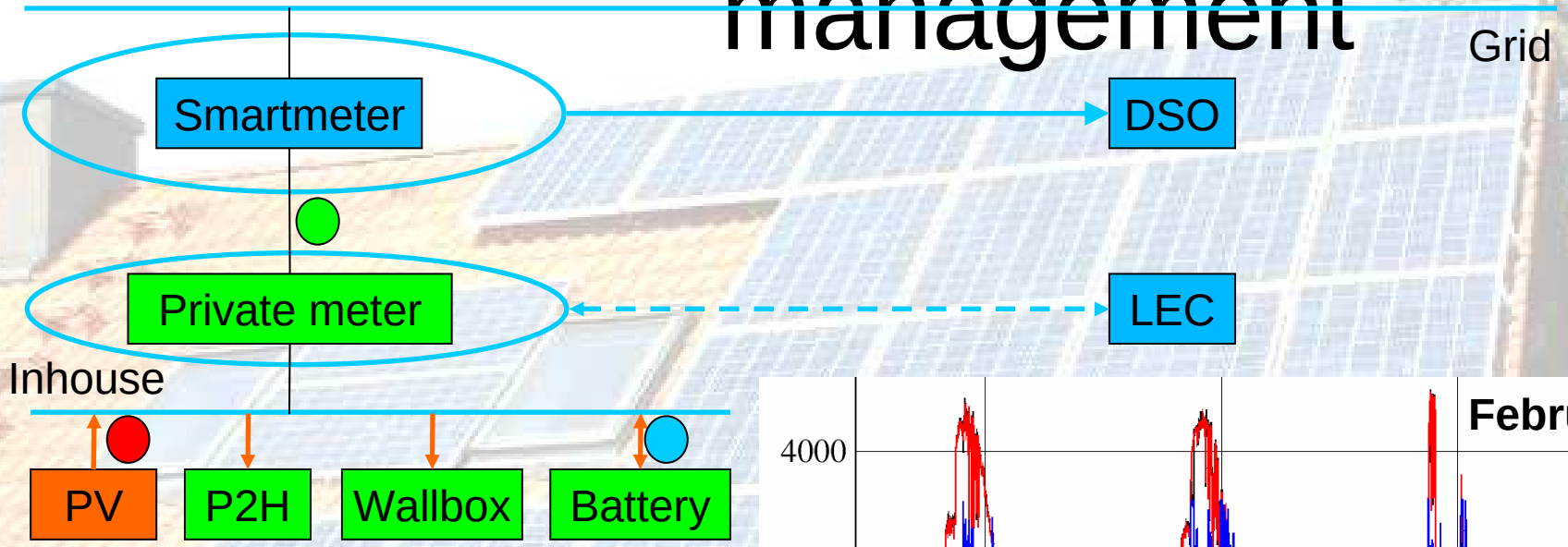
Tesla batteries for FFF

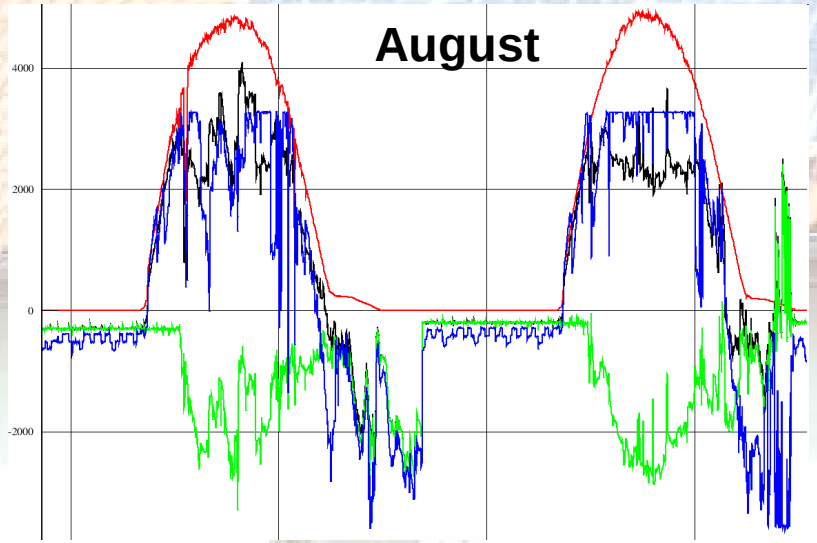
Support your friends

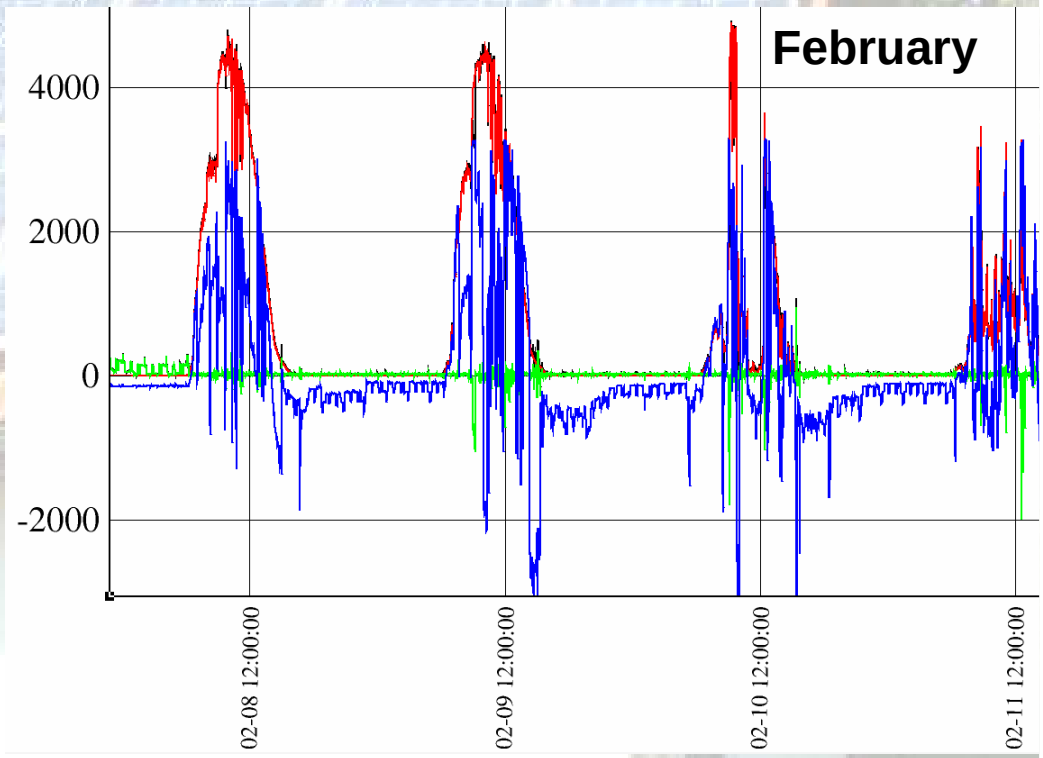
Some special issues

- 50kWh second-life Lithium-Battery
- LEC (ElWOG 16a / 16b)
- Smartmeter
- Co-generation of power and heat
- Seasonal energy storage

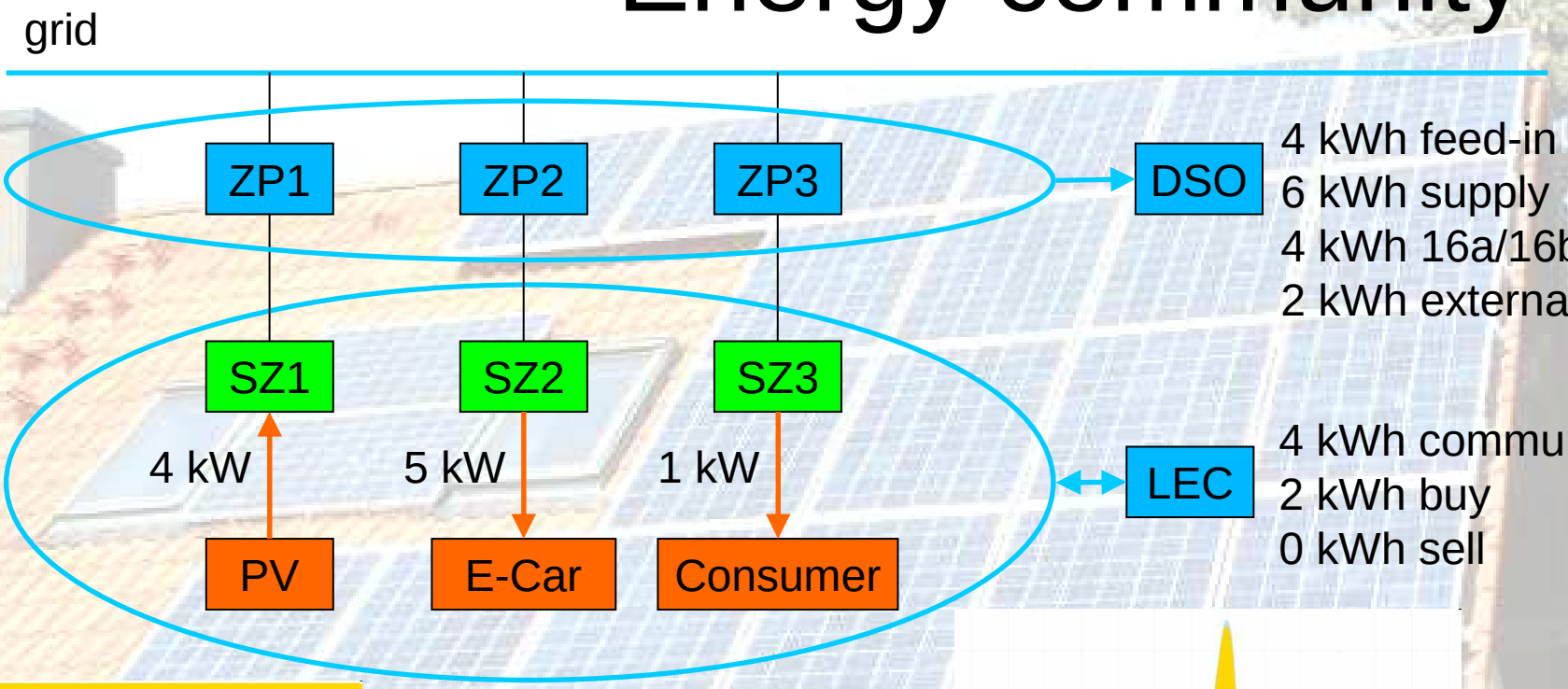
Internal energy management

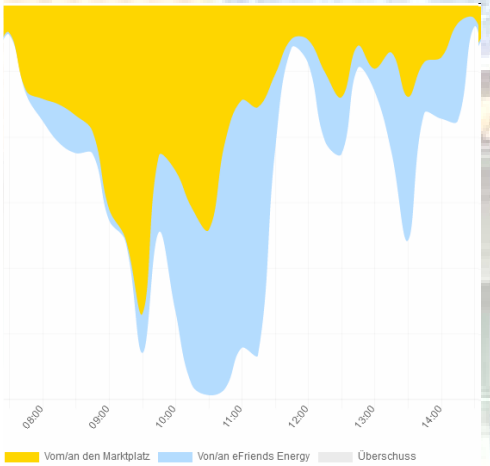


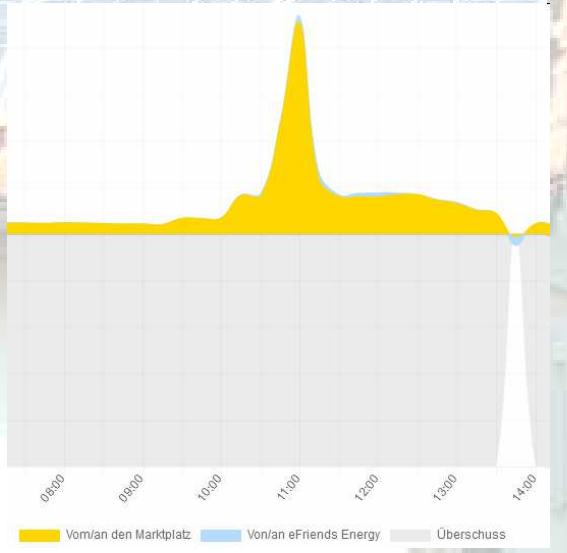




Energy community



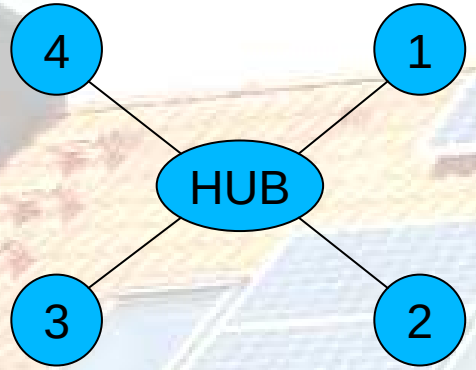




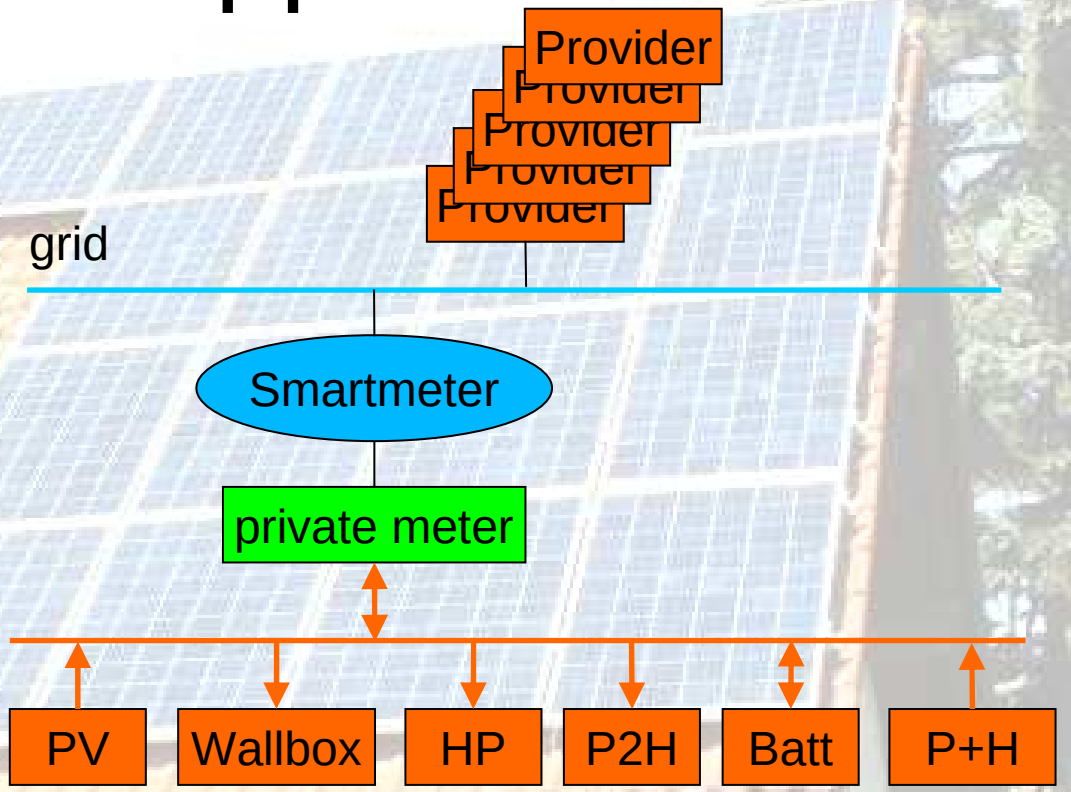
LEC motivation

- Integrate renewable energy
- Make transport distances shorter
- Stay within grid level 7
- Relieve the grid
- Provide new features
  - Managed E-car charging
  - Managed energy storage
  - …

The HUB approach

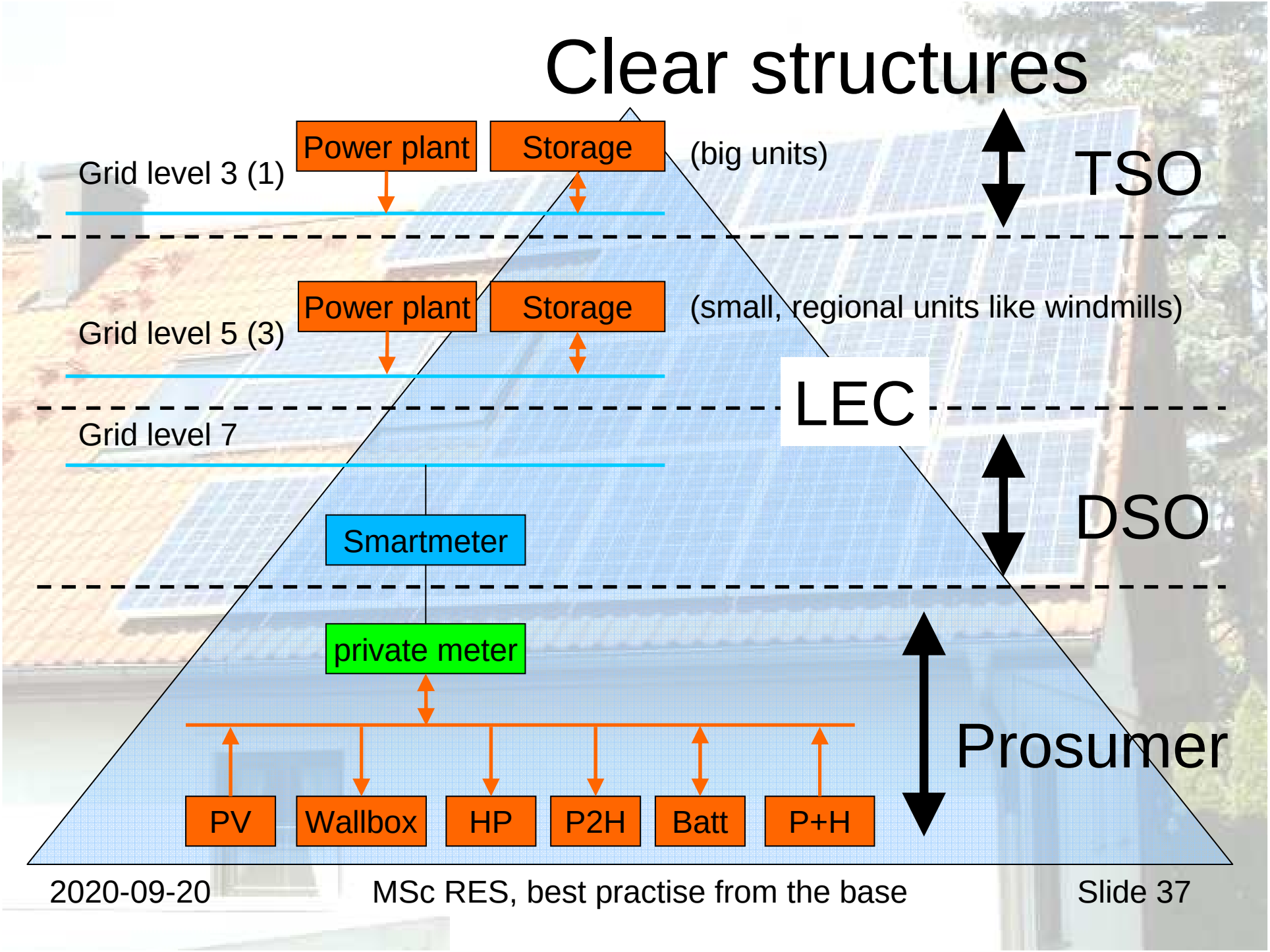


#	peer-to-peer	hub
2	1 link	2 links
3	3 links	3 links
4	6 links	4 links
5	10 links	5 links
6	15 links	6 links



- 1:1 relation between Smartmeter and provider
- Internal energy flow based on private meter
- Smartmeter plays no active role
- DSO has NOTHING TO DO with energy flow

Clear structures



Hands on…