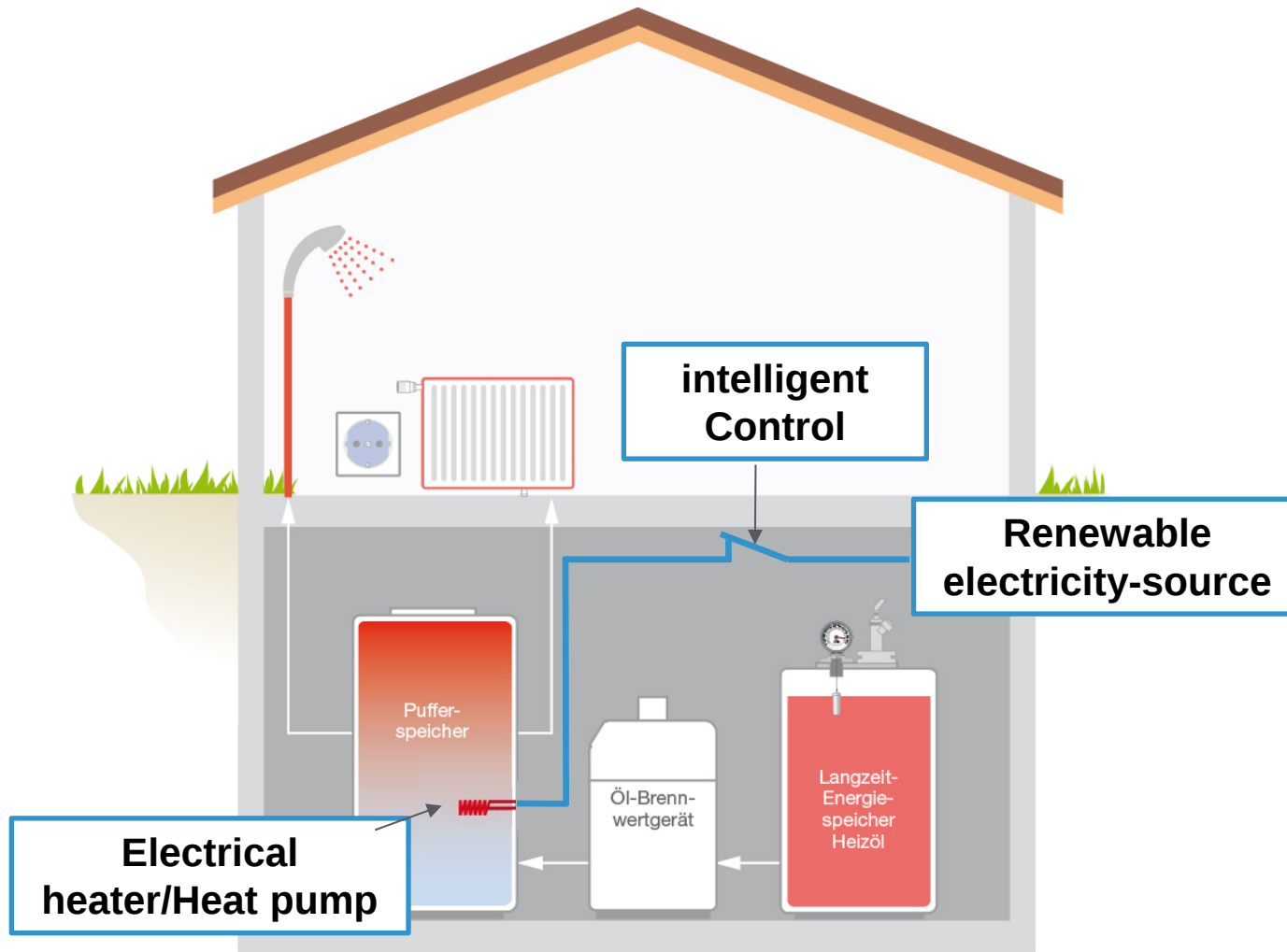


Technology Update from Europe

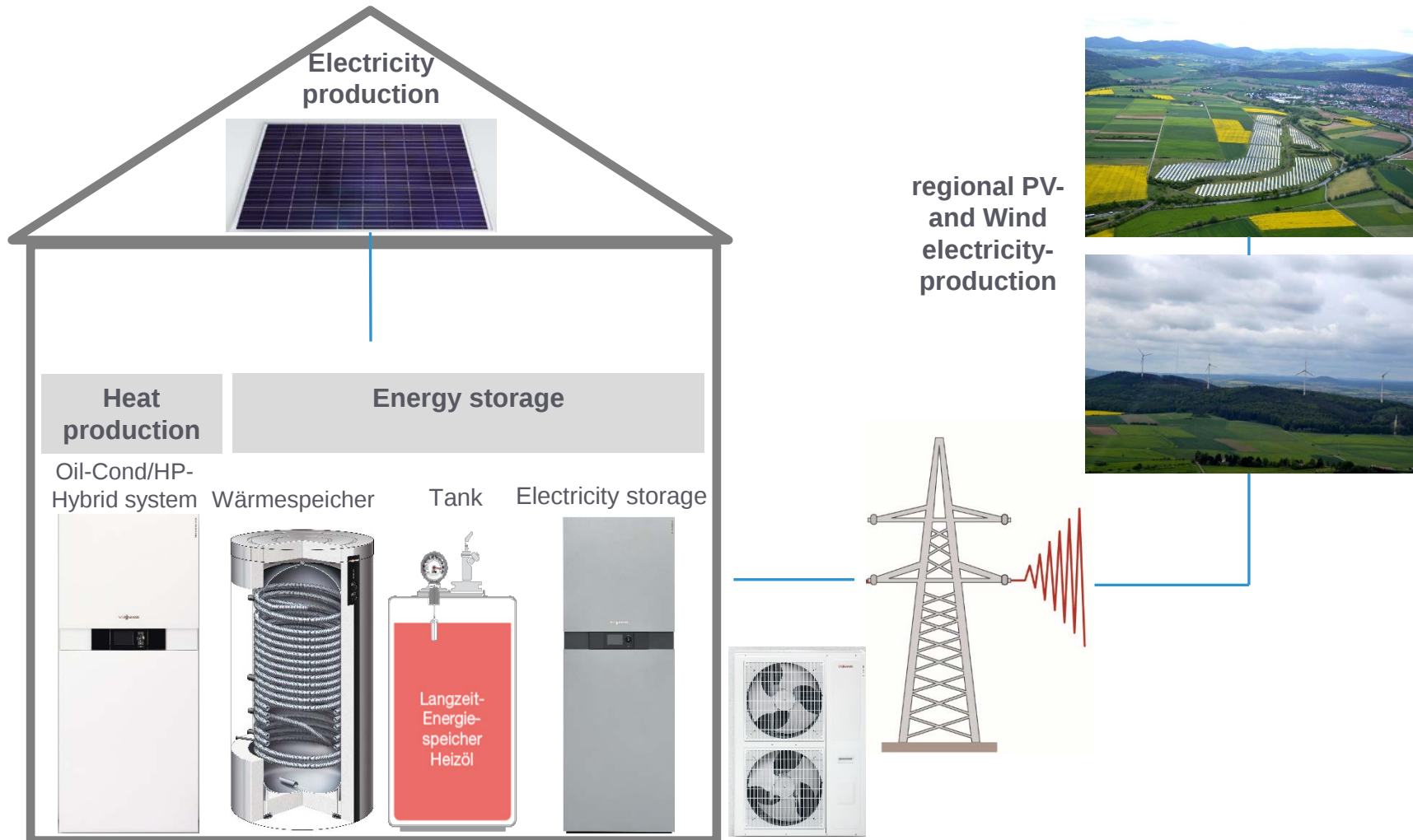
24.09.2018, Nora Meeting Newport

Dr. Klaus Lucka
T4F TEC4FUELS GmbH

Usage of renewable electricity in hybrid heating



Innovation house Wolfhagen: Flexible Usage of renewable electricity



Three energy storages: Heat – Electricity – Fuel



The „new“ Hybrid heating system:



Hybrid system unites Oil condensing boiler & electric heat pump



Modern oil condensing boilers Buderus - State of the art

Modulating Poweroutput

- Modulation range 1:3
- Lowest Power output of 4,8 kW
- Energy efficiency η_s of 93%



High comfort

- Low noise emissions
- No oil smell , RLU



As less as necessary - take the benefits from automotive technology



Burner injection system

- Long life
- Automotive approved

Lambda sensor

- Self calibrating
- No burner adjustment necessary
- Optimal oil dosage and emissions

Customer value

- Prolonged inspection period for the chimney sweeper (KÜO)
- Optimal adjusted Power output



System technology out of the field

- Modulating oil condensing boiler 5-15 kW
- 500 Liter for hot sanitary water production
- 9 kW electric heater
- PV system

- Efficient use of heating oil
- Usage of access energy of own PV System as well as of negative balancing energy out of the grid as heat



Test house in Berlin

What is in favor for hybrid heating?

- **High flexibility for electricity delivery**
- **High load management potential**
 - Higher than in White goods
 - Available without change of habits or comfort at consumer level
- **Permanent load abandonment is possible**
 - Oil condensing module enables uninterrupted heat supply
 - ➔ This enables only to use electricity for heating, if wind- and PV-electricity is reasonable available
 - ➔ cost intensive provision of standby power stations become obsolete
- **Increase of own solar electricity consumption**

Looking forward to discussion...

contact:

Dr.-Ing. Klaus Lucka

TEC4FUELS GmbH

Kaiserstrasse 100, 52134 Herzogenrath

+49 2407/55830-11

Klaus.lucka@tec4fuels.com

www.tec4fuels.com