Technology Update from Europe

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Usage of renewable electricity in hybrid heating
Innovation house Wolfhagen: Flexible Usage of renewable electricity

Electricity production

Heat production
- Oil-Cond/HP-Hybrid system
- Wärmespeicher

Energy storage
- Tank
- Electricity storage

Regional PV- and Wind electricity-production
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 $\eta_s$ 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...

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