Anergy2Plus

Demonstration and expansion of an anergy network as part of a holistic energy concept and plus-energy district

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Motivation – Community

▪ „Garten der Generationen“
  – Building project in Herzogenburg (Lower Austria)
  – Several consecutive building phases
  – Core concept of the association is to think in „circles“ and in „cycles“
    ▪ Financial, energetic, biological, …

▪ Vision
  – Sustainable heating, cooling and electricity based on local resources

▪ „Heart piece“
  – Anergy grid in combination with heat pumps & long-term thermal storage

▪ Long-term Goal
  – Further innovative expansion towards a PlusEnergy quarter
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<th>Buildings</th>
<th>HVAC System</th>
<th>Ultralow Temperature DHC Grid</th>
<th>Electricity Grid</th>
<th>Possible Extensions</th>
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| **Building phase 1**
Q4 2021 – Q4 2022 | Short term storage
Heat pump
Heat supply | Heat pump
Free Cooling | Solar Thermal | BTES |
| **Building phase 2**
2023 | Short term storage
Heat pump
Heat supply | Heat pump
Free Cooling | PV | E-Storage/Mobility |
| **Building phase 3**
2024 | Short term storage
Heat pump
Heat supply | Heat pump
Free Cooling | Bio Reactor | MicroGrid “Energy community” |
| **Building phase 4**
2026 | Short term storage
Heat pump
Heat supply | Heat pump
Free Cooling | Integrated Energy System | |
Building Phase 1: Numbers and Facts

- First Building Phase:
  - 3 Buildings:
    - 2 Residential buildings with mixed use
    - 1 Community house/kitchen
  - Around 10,000 m² gross floor area
    - 19 residential units
    - 4 assisted living flat-sharing rooms
    - 1 coworking space & 1 guest room

- Technical elements
  - Anergy grid system
  - Decentralized heat pumps for SH and DHW
  - Boreholes and foundation storage for seasonal heat storage
  - Solar thermal collectors 100 m²
Building Phase 1
Energy System Building Phase 1

- Object 1: Solarthermal, Anergy grid, Foundation storage, Swimming pond
- Object 3: SH, DHW, Storage tanks, Heat pumps
- Object 4: SH, DHW, Geothermal
- Object x: Compost heater

Building phase 1 - finished with 08/2022

Building phase 2
Outlook Further Construction Phases

- Planned system extensions:
  - Additional buildings
    - Solarthermal expansion
    - Tank storages
    - Heat Pumps
    - Grid connection
  - 30kWp PV System with electrical storage
    - Electricity for heat pumps and appliances
  - E-Mobility concept (EV-charging station installed)
  - Compost heater
    - Batch-wise heating supply
User Integration and Monitoring

- **System-wide monitoring installed**
  - Monitoring and optimization of the system during operation
  - Balancing of energy in system
  - Gathering experience for further expansions

- **User integration**
  - Processing of results for residents via Info screen (recommendations for action)
    - Accompanying dialog and workshop series
    - Construction progress
    - Supply and monitoring concept
    - Operational management strategies for the entire neighborhood
Thank you!