Development of quarters
Market, planning steps, legal aspects
Status Quo 2020

- Market
  - sales > 20,000 heat pumps/year
  - One of the main markets in Europe

- Federal system
  - different regional requirements for planning, licensing and construction
  - significant tightening of permits under the federal water and mining law (time, requirements...)
  - noticeable differences among the authorities in the federal states (“jungle”)

- Geothermal energy in context of the energy and heating transition
  - politically not clearly anchored
  - complicated funding systems (funding, repayment grants, regional programs...)
  - allocations on the electricity price prevent fair market access
  - assigned enormous potential

- Wide discussion about legal aspects, certification, drilling quality, innovative materials, site-controlling, risk insurance...
Heat pump sales in Germany
Strompreisentwicklung und Zusammensetzung (in Cent/kWh)

Daten: BDEW 2017
Current fields & future development

- Single-family houses → the standard → influence to the neighbours
- Retrofitting → strongly need, huge market → financial support needed
- Commercial use → heat & cool → stabile market
- Development of Quarters → new → many new players
- Grids → Wärmenetze 4.0 → many pre-studies
Quartier Kaiserlei, Offenbach am Main
Status 2017
Retrofitting an New Buildings
Space availability for BHE
• Marketing strategy of the project developer

• Geothermal „Balance“
  ➢ Combination of heating & cooling
  ➢ Balanced temperatur level in the underground
  ➢ Energy profile in total
Heating and cooling (total demand)
Thermal balance

European Shallow Geothermal Days 2020
5 BHE for TRT
Test results
• Design according to the total energy demand
• Balanced temperature in the underground as an optimized approach and legal requirement
  ➢ No significant temperature distribution to the neighbours
Establishing the modell
Energy demand

2,000 MWh/a
1,250 MWh/a
Temperature over the time

2.000 MWh/a
1.150 MWh/a
0.1 K Isotherme
License
## Time scale

- **Quartier KAI Offenbach**
- **FourLiving Leipzig**

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- The timeline includes the following milestones:
  - Erstkontakt/Projektbeginn
  - Erstkontakt Behörde
  - Einreichung Antrag
  - Genehmigung Pilotbohrungen
  - Bohrungen/Testarbeiten
  - Erkundungsbericht

- The timeline spans from Monat 20 to Monat 20.

- The timeline is marked with arrows indicating the sequence of events.
Quartier Kaiserlei, Offenbach am Main
Horizontal connection vs. piles
Monitoring
Status 2020 - Sector G and F
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