Solar Heat supported thermal Networks in Switzerland

The SolCAD project
1st June 2022
Context

- Adapted heat demand
- Saving ressources
Context – Switzerland

TVP installation in Geneva on the SIG network 1000 m²
The SolCAD project

With the support of

Technical Potential
- criteria
- archetypes
- decision tree

Case studies
- detailed analysis
- hourly simulations of the production & network
- economical aspects

Framework conditions
- business models
- Environmental impact

Interest of stakeholders
- survey
- stakeholder group

With the support of

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE
Office fédéral de l’énergie OFEN
Technical potential

Données Swisstopo, OFEN
Technical potential

- Known installed power: 4024 MW
- Type of production: 1819 MW
- Sufficient summer needs: 1807 MW
- Available solar resources: 1807 MW
- Available areas (land or roof): 1550 MW
- Available roof areas: 1356 MW

Criteria
0.5 – 1 TWh solar heat + strong increase due to development of TN
Case studies

Aerial view of the areas selected for the case study at Marais-Rouges (source: map.geo.admin.ch)

Solar production and heat consumption for the scenario « shutting down the boiomasse boilers in summer »
Case studies

Specific investment costs

Specific investment costs

Specific investment costs

Feedback stakeholders

- Solution already known and studied
  - 14 operators (>50%) have already realized a study about adding solar thermal on an existing thermal network
- But the application rate is still very low
  - Only one project realized

- Main barriers to realization
  - High investment without subsidies
  - Too complex / lack of knowledge
  - Managing an intermittent resource / storage
  - Lack of available areas near to the DH network
  - Concurrency with PV
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>High temperatures, complexity, intermittent</td>
<td>Aggregation of heat demand</td>
<td>Develop training, encourage pilot projects, promote tools</td>
</tr>
<tr>
<td>High investments</td>
<td>New business models, step-wise installation, scale effects</td>
<td>National incentives, promote adapted BM</td>
</tr>
<tr>
<td>Low costs of heat</td>
<td>... for the moment</td>
<td>Taxes</td>
</tr>
<tr>
<td>Need for close areas</td>
<td>High energy density, double-use, renting</td>
<td>Improve legislation</td>
</tr>
</tbody>
</table>
Conclusion

- Potential of 0.5 – 1 TWh in 2050 and 1-2 TWh in 2050

- Mean LCOH estimated to 15cts. CHF/kWh, sometimes as low as 10cts. CHF/kWh (without subsidies), similar to biomass

- Detailed hourly simulations have shown the opportunity to shut down the biomass boiler in summer

- Save resources for decarbonation in other sectors

- Not economically feasible in the three case studies → subventions 35-50% needed

- Need for clear and fair subsidies system and better sharing of knowledge within the DH industry on this topic

- Project report soon available
Increasing the share of renewable energies in DH networks

1. **Market development** in cooperation with 6 EU countries

2. **Planned activities**
   - Exemplary feasibility studies
   - Training activities
   - Methodical guidelines
   - Guide for temporary solutions

3. **Information webinars & events:**
   - [YouTube](#) channel
   - [Website (EU)](#) / [Website (CH)](#)
   - [Newsletter](#)