

TECHHOUSE Guideline for Innovation Challenge Definition

1. Describe the challenge you are addressing in one sentence.

Digitalization, monitoring and metering of existing heating centers/systems in multi-storey housing

2. Describe the general environment of the challenge, the challenge itself in more detail and why finding a solution is important

Heating centers in the cellars of multi-story commercial buildings are the physical environment of the challenge. In such centers, different heating systems (e.g. wood pellets..), heat- and electricity meters, heating valves as well as circular heating pumps are located. At present, these heating centers are hardly digitized. Therefore, we don't have adequate digital information about fill level of pellets, meter values etc. Currently, the monitoring works mainly "manually" by our employees.

3. What is the potential impact of a solution to the problem you are facing?

With adequate digital information, operation-disturbances in the heating centers/systems can be quickly identified. Quick and proactive reacting to decreasing fill levels of wood pellets (predictive maintenance). Meter values can be recorded digitally via remote monitoring.

4. What are the essential functionalities/capabilities that the solution has to meet?

Combination of hardware (senores, camera, transmission...) and Software (visualization and analyzation). Hardware should be able to measure fill levels of wood pellets- reservoirs, heating circuit temperatures as well as to monitor heat-, gas- and electricity meter values. The main purpose of the Software (Dashboard) is to visualize the measured and monitored data. Moreover, it would be great if the software is able to identify disturbances in the heating system (eg. Valve or pump defects). Since the heat systems are located in cellars under the surface of a building, connectivity issues have to be considered in the solution.

5. Will there be a detailed technical briefing of the environment the solution has to operate in?

Yes, our internal experts can explain all the relevant aspects of the heating centers/systems

6. What resources (data sets, detailed current approach, unsuccessful preexisting approaches) can be made available to the participants?

Historical data (gas meter, heat flow meter, electricity meter, Solar heat flows) can be made available

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7. What disciplines/background/capabilities are likely to be required to solve the challenge (this could also be an interdisciplinary combination of individuals)?

- *Basic Knowledge of HVAC-Systems (heating, cooling, ventilation) in the building sector*
- *Knowledge and experience in data collection/evaluation/transmission (connectivity) as well as in the development and implementation of metering and monitoring hardware (sensors, cameras..).*
- *Existing references form other (successful implemented) projects would be welcomed*

8. Would you like to promote potential approaches (technologies/devices), or is the chosen approach secondary to finding a solution to the problem?

The chosen approach is secondary. Main focus: Solving the problem in a practicable (low cost) way