

Project Concept for a new task shared Annex within the DHC TCP

Proposed Project Title	<u>Digitalisation of District Heating</u> : Optimised Operation (and Maintenance) of District Heating and Cooling Schemes via Digital Processes Management
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Date	23. September 2018
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Brief description of the proposed project, including the objectives and scope:

Problem and situation: District heating and cooling (DHC) networks are traditionally operated with a limited number of controls (as the control of the supply temperatures or the network pressure) to secure the required supply task and to optimize economics and ecologic performance. Detailed information of the supply and utilisation structures (e.g. heat plant characteristics, power demand or time profiles) is not provided in classical network operation. On the other hand an optimised heat generation and overall network operation is possible with more information on the demand and flexibility options (storages) and resulting in e.g. peak shaving and the reduction of expensive peak boiler use, as well as integration of fluctuation heat sources, such as solar thermal energy and power-to-heat applications operating on the electricity markets as shown by already realised projects. A wider implementation of information and communication technologies, as in many other industries, opens up for better network management based on real time measurement data.

The aim of the project: The proposed project aims at promoting the opportunities of the integration of digital processes into DHC schemes and to clarify the role of digitalisation for different parts within the operation (and maintenance) of the district heating and cooling system. Furthermore, the implementation of these technologies is going to be demonstrated. Digital technologies are believed to make the whole energy system smarter, more efficient, and reliable and to boost the efficiency and the integration of more renewables into the system. In the future, digital applications might enable district energy systems to fully optimise their plant and network operation while empowering the end consumer. On the other hand new challenges need to be tackled, such as data security and privacy as well as questions about data ownership.

The proposed project is aimed to offer insights on how digitalisation impacts the district heating industry, system suppliers, showcases the current state of the art, identifies barriers and presents objectives, targets and recommendations for each of the topics:

- Integration of Multiple Sources Production Level
- Distribution Level
- Building and Consumption Level
- Sector Coupling

The project takes the entire energy chain from production/generation via distribution to end use and consumer (secondary side systems) into account.

The principle goals of the task shared Annex “Digitalisation of District Heating” are to:

- Create awareness for the advantages of the implementation of digital processes to the various stakeholders and users
- Provide a state-of-the-art overview of the digitalisation of district heating schemes in terms of R&D projects, demonstrators and cast studies
- Evaluate non-technical barriers and enablers for digitalisation processes in district heating and cooling schemes such as business models, legal aspects and policy instruments

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Methodology: The proposed task shared annex “Digitalisation of District Heating” could be e.g. separated into following subtasks (draft, a more detailed description will be made during the definition phase):

- A. Digitalization concepts for district heating and cooling schemes
- B. Digital technology solution for district heating and cooling systems
- C. Case Studies (existing R&D projects, studies, demo plants ...)
- D. Existing and upcoming business models or opportunities, legal aspects, standards and policy instruments (Barriers and enablers for the digitalisation of district heating)
- E. Dissemination and Guidelines

intended target audience (receptor):

- Energy suppliers, utility companies and district heating network operators
- Component producers and engineering consultancies
- Branch organisations within the field of district heating
- Digitalization solution providers

Related ongoing and past projects (IEA DHC and other TCPs):

The project relates to and builds upon the following previous DHC projects, in particular:

- DHC Annex XI: Smart use as the missing link in district energy development: a user centred approach to system operation and management
- DHC Annex TS3: Hybrid Energy Networks
- EBC Annex 67: Energy Flexible Buildings
- EBC Annex 73: Towards Net Zero Energy Public Resilient Communities

Further on, cooperation to other TCPs such as EBC, DSM etc. will be investigated.

Time planning:

November 2018:	approval to start the definition phase (ExCo Meeting Nottingham)
January 2019:	start <u>definition</u> phase (international definition phase meeting/WS in Spring 2019)
May 2019:	approval to start preparation phase
July 2019:	start <u>preparation</u> phase
July 2020:	start <u>working</u> phase (final annex text available)
July 2023:	start <u>reporting</u> phase
May 2024:	end of the Annex

Preparation team:

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