Demand Response application
A survey with district heating professionals

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IEA EBC - Annex 84
Demand Management of Buildings in Thermal Networks

Background

1. The transition to smart and decarbonized energy systems calls for active involvement from all energy sectors.
2. The entire energy supply chain, encompassing production, distribution, and consumption, must contribute and collaborate.
3. In the recent energy crisis, resilience and Demand Response (DR) in the District Heating (DH) systems have gained international interest (54 applications submitted to HORIZON-CL5-2024-D4-01-02 Smart grid-ready buildings success chance <4%)
4. Numerous simulation studies, and few demonstrations in controlled real-life environments, have documented the potential benefits of DR, **BUT** there is still limited understanding of the approach DH professionals take toward DR.

Survey with DHC professionals

Aim: to measure DHC professionals' opinions and beliefs toward applying Demand Response concept in DHC systems.

Structure: 17 Likert Scale questions with a five-point agreement scale, 2 open text questions and 1 close-ended question

Language: ENG, DK, FR, DE, IT, SP

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A survey on the application of Demand Response among DH utilities

Take part in the IEA EBC Annex 84 survey on "Demand Side Management status in District Heating/Cooling systems"!

The well-known and applied concept of demand side management (DSM) in the electricity system is one of the solutions that adapted to the demand side can foster the decarbonisation process and future operation of the DHC systems. The development of DHC systems actively applying the DSM requires the involvement of decision-makers and stakeholders. Therefore, the stakeholder's perception and opinion on DSM is asked during this survey.

In this survey, DSM is understood as the modification of user demand in order to meet some requirements or reach specific goals in the DHC system. Demand Side Management and Demand Response are understood as similar concepts.

This questionnaire is anonymous, and your answers will only be used for research purposes. **The deadline to fill it in is 30 June 2023.**

Language of the survey	Link	QR Code
English	https://www.survey-sact.dk/LimeCollector/?key=8GYJUW4FUICP	

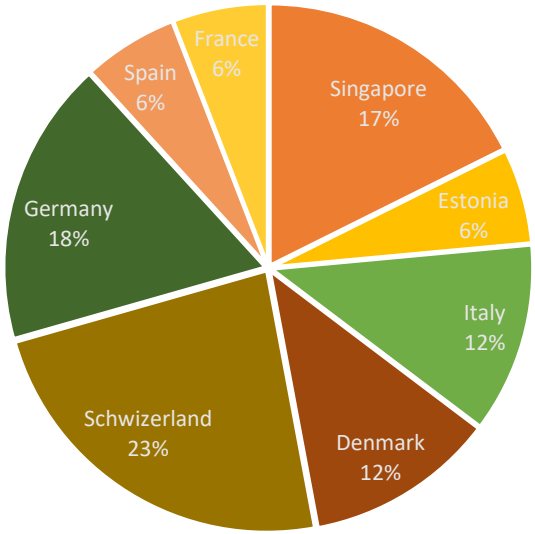
Questions categories

1. Load management: experience
2. Renewable energy sources: experience, use
3. Relevance of the electricity market
4. Status and experience with DR
5. Willingness for system upgrades and investment enabling DR
6. DR control limitations: data privacy, thermal comfort, legal responsibilities
7. Benefits and barriers from DR and their importance
8. Incentives for customers to enable DR
9. Relevance of DR to future developments
10. Business models
11. Importance of policy measures to enable DR

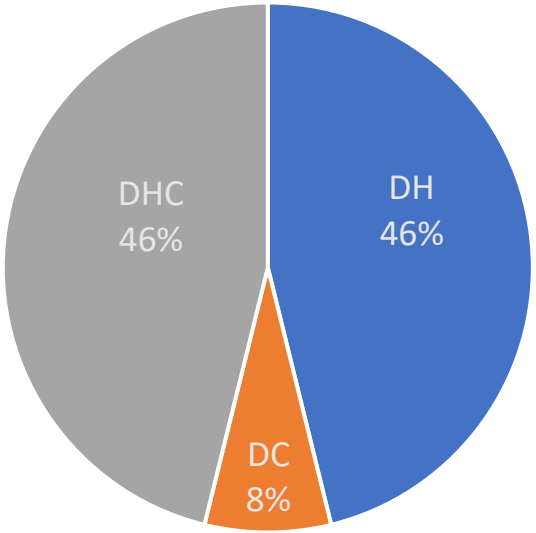
Results

45 respondents and their characteristics

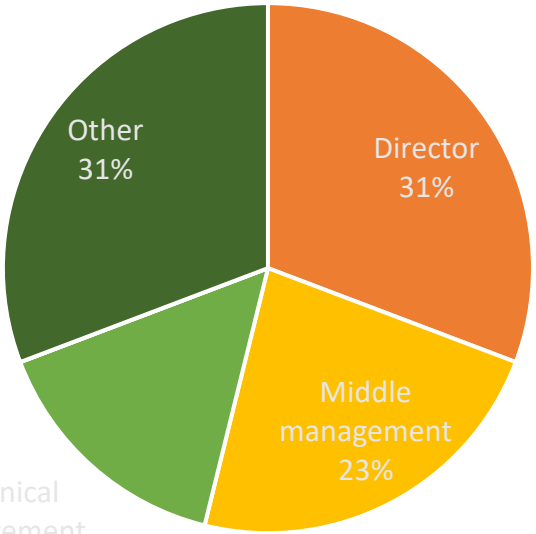
Country



Utility

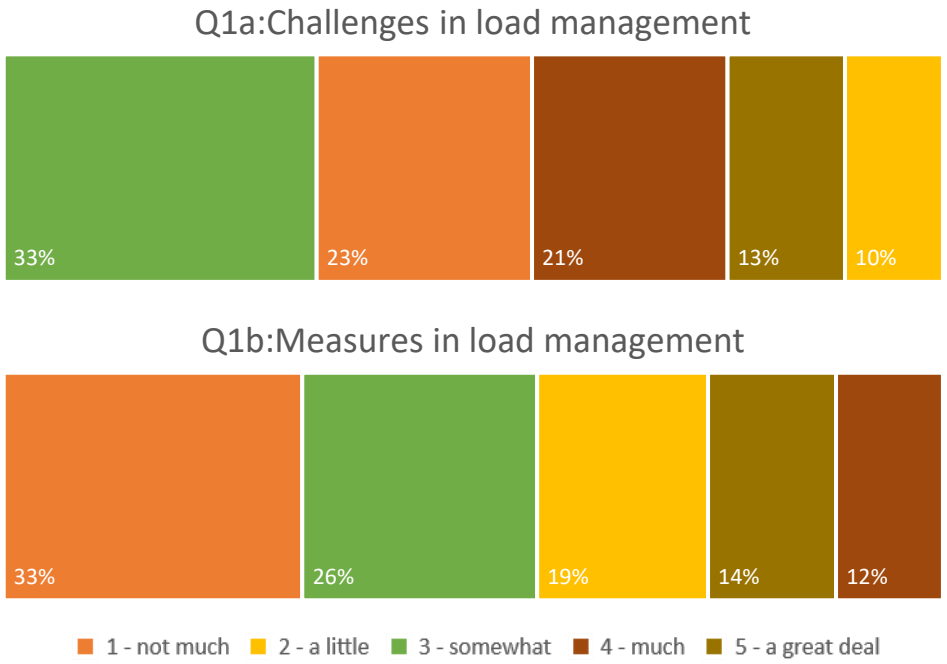


Occupation



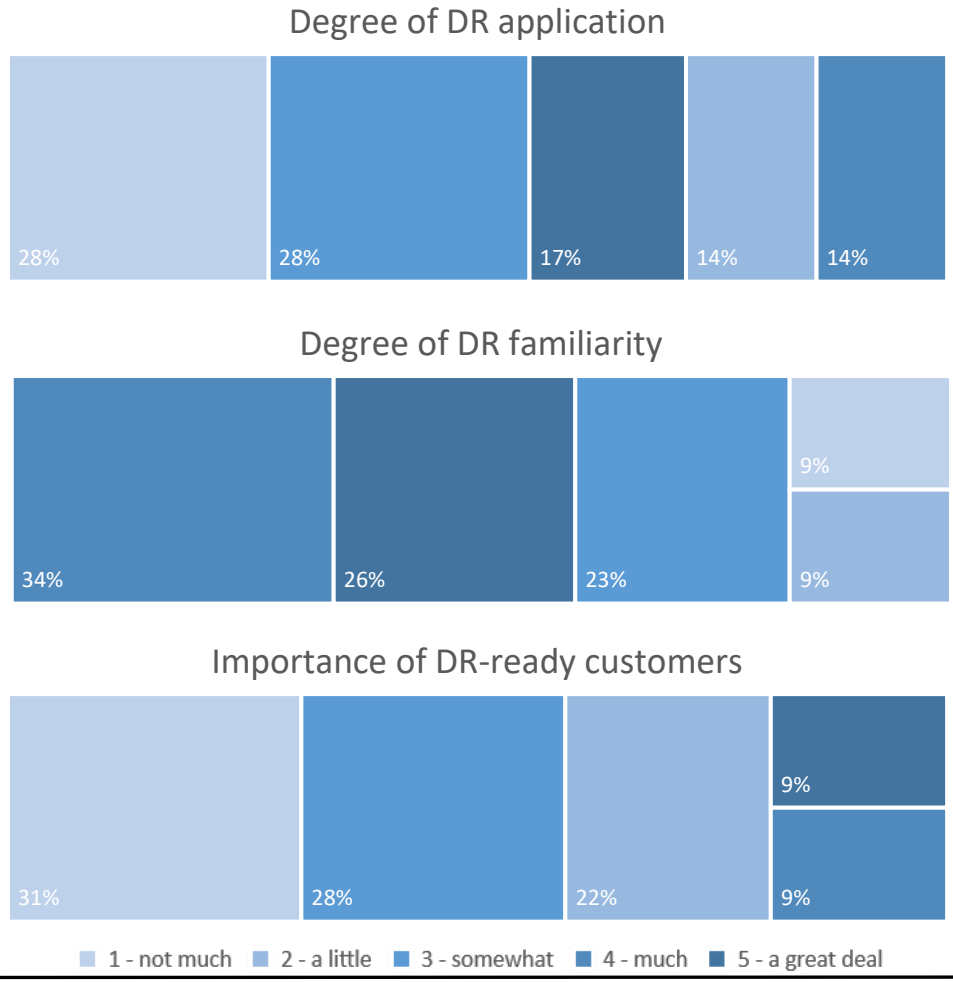
Results: Load management

- **60%** face major challenges in load management
- **75%** do not take significant measures to solve the load fluctuations
- For **50%** electricity price is important in daily control of DHC system



Results: Current DR status

- **30%** applies DR
- **90%** is familiar with the DR concept
- For **50%** DR customers are important



Results: Restrictions for DR

	Data privacy	Customers' thermal comfort	Legal resposibilities
absolutely not	38%	21%	25%
mostly not	17%	21%	13%
probably	33%	25%	38%
mostly yes	8%	21%	17%
absolutely yes	4%	13%	8%

Other:

- *"Mostly contractual obligations than legal" (SIN)*
- *"The electricity grid must have already put in place demand response mechanism"*
- *"Old structure and known and safe practices" (DK)*
- *"Split of cost customer / network operator" (DE)*
- *"The technical effort is too great" (DE)*
- *"Customer-facing marketing" (SP)*
- *"Tariffs" (SP)*

Results: Benefits of DR

	Not important	Of little importance	Moderately important	Important	Very important
CO2 savings	6	17	11	28	39
Cost savings: production	6	6	11	44	33
Cost savings: distribution	11	22	11	28	28
Peak load reduction	11	11	6	28	44
Increase of renewable sources	6	6	11	44	33
Fault detection	22	11	6	39	22
Prestige among DHC utilites	32	37	10	11	10

Results: Barriers for DR

	Not important	Of little importance	Moderately important	Important	Very important
High cost of technologies	13	7	27	40	13
High complexity level of control	13	7	33	20	27
Insufficient or unclear benefits	20	40	7	27	7
Lack of customers acceptance and trust	13	20	20	32	15
Lack of appropriate regulations	27	20	0	13	40
Lack of real-life experience	13	13	14	60	0
Lack of technical standardisation	7	20	20	33	20
Data privacy and protection problems	27	13	20	20	20
Reduced market potential	13	33	40	13	0

Results: Incentives for customers to engage in DR

	Not important	Of little importance	Moderately important	Important	Very important
Monetary savings	7	0	27	20	47
CO2 savings	7	7	33	47	0
Energy savings	7	0	40	27	20
High thermal comfort	14	20	33	20	7

Conclusions

1. Majority of DHC utilities do not take significant measures to solve the load fluctuations (**TODAY**)
2. Majority is familiar with the DR concept → **Great potential**
3. **Restrictions**: Data privacy is not an issue; Legal and contractual responsibilities is the issue
4. **Benefits**: Production cost savings are important; Peak load reduction; Increase in RES
5. **Barriers**: Lack of real-life examples; lack of appropriate regulations; Insufficient or unclear benefits is not a problem ☺
6. Incentives for DR ready customers: monetary, CO2, energy

Further Information

Thank you

https://annex84.iea-ebc.org/

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