Climate agreement in Gothenburg

The overall aim of this demonstrator is to offer the customers a non-conventional energy contract by providing a set indoor temperature (e.g. 21 °C) at a fixed cost, instead of a certain quantity of energy (kWh).

Asset

Idea and Layout

Göteborg Energi was early to offer energy service agreements. We link the entire chain, from energy production to consumption, under the slogan ”the right energy in the right amount on the right occasion”. With the most developed ”climate contract” service, customers work towards their climate goals at fixed prices per square metre, while Göteborg Energi has the incentive to take energy-saving measures. In this way, we’ve made energy-efficiency measures profitable. We are ahead of the energy and environmental policy of introducing instruments of control in the area of energy efficiency via the EU’s energy service directive (e.g., white certificates). Our customers’ response has been very positive. We’ve become closer and have more personal contact. Operation and maintenance agreements, on-call property services, and energy declaration for buildings (including proposals for measures and profitability assessments) are among the energy services our customers can choose from our wide assortment. We now have energy service agreements covering an area of 3.6 million square metres, and energy consumption has been reduced by 20% through our climate agreements. We also offer our customers a developed energy report (E-report). Several of Gothenburg’s largest housing com¬panies have already chosen this option. The E-report enables the customer to easily follow-up, monitor and forecast the consumption of district heating, electricity and water. This is done automatically, without the customer having to do readings. Customers can log in to their Göteborg Energi account to see actual consumption, environmental impact and costs – all in the same system. The E-report is greatly appreciated.

Impact

Linné Housing Association

If you look at the environment then using customers reduced the environmental impact of CO2 by about 30% against that clients were assisted by Göteborg Energi. This is a total savings for those buildings that have a contract with Göteborg Energi. This is since the start of this kind of agreement. We have for a number of years has increased the numbers of contracts to around 150 today. If we base our calculations, what would have happened if these customers would have a contract with us. Customers would have continued high temperatures into the property and then the CO2 etc. have continued high values. The figures below are taken from our systems.

Without the agreement:

- CO2 15400 ton
- S 780 kg
- NOX 8300 kg
- Dust 55 kg

The Agreement:

- CO2 10200 ton
- S 580 kg
- NOX 6400 kg
- Dust 39 kg

The overall demonstrator's performance is summarized in the following table according to 5 evaluation criterions. It can be noticed that the assignment of all the scores is directly linked to the values calculated for the Key Performance Indicators, except for socio-economic benefits where a qualitative assessment is carried out based on this cluster's indicators and on separate interviews.

Overall Impact	**Fair/Medium**				
Size [MWh/y]	1-100	100-1000	1000-5000	5000-10000	>10000
Primary Energy Savings	0-10%	10-20%	20-40%	40-60%	>60%
GHG Emissions Reduction	0-10%	10-30%	30-60%	60-90%	>90%
Pollutant Emissions Reduction	0-10%	10-30%	30-60%	60-90%	>90%
Socio-Economic Benefits	Low	Fair	Medium	High	Extrem

Replicability

Replication Potential

Replicability	**Low**	**Medium**	**High**

Authorizative easiness			X
Adaptability to different climate conditions			X
Technology easy-to-implement (No needs of specific technical requirements)		X	
Easy-to-implement (No needs of specific technical requirements)			X
Easy-to-operate (No needs of specific technical requirements)		X	
Opportunity of integrating waste energy sources			X
CAPEX needed for the deployment of the solution	X		

Technical Requirements

For the right temperature (21 degrees indoors) should be maintained, there must be installed a number of indoor sensor. This cost can the customer take or the energy company. Where the substation is located a computer for control of the substation and supervised by staff at the energy company.

Read more about end user involvement and service agreements in the Technical Toolbox.

Stakeholders

Stakeholders	Organization Name	Organization Type	Organization Domain	Benefits from demo
District heating network operator	Goteborg Energi AB	Publicly owned	Utility	Peak shaving for thermal energy production
Customer	N/A	N/A	N/A	Peak shaving for thermal energy production

The proposed agreement is offered either for a five or three years duration and by now has been undersigned by customers within different areas for a total extension of 3.6 million square meters. The energy company Goteborg Energi takes responsibility of the building energy system and by the agreement gets incentives to save energy as well as continuously maintain the system, providing also information to customers about their energy consumptions.

Gothenburg Energy sellers meet customer and go through the building's technical installations. The agreement also includes service on such ventilation systems, etc. Once the inventory of the customer's property is completed, a single fixed price forward for heating, hot water, and service

in the technical installations. For the customer to get the right price as compared consumption and costs 3 years, and 10 years after correction consumption. Customer all the information is entered into a program in which debit and all reports are available. Customers signing the agreement has a fixed price of district heating, regardless of the temperature outside. In this Agreement, Gothenburg Energy deliver a temperature of 21 degrees Celsius inside. The savings for the customer is around 19%. The customer also know how much the cost is per month and can add their budget accordingly.

Read more about service agreements and end user relations in the Socio-Economic Toolbox.

Finance

The main requirements for replicating the demonstrator technology are listed below: • Since the demonstrator aims at cutting production peak in the district heating production system (i.e. benefit for the energy company) proper business models should be developed for customers (e.g., tenants, house owners, etc.) to obtain benefits and advantages in making their real estate available for “short term storage technology” installations; • Building components’ (e.g., walls, ceilings, floors) materials with high energy storage capacity, thus enabling to “load” the building with thermal energy during the low consumptions hours and to unload it during the peak hours for maintaining the indoor temperature keeping the heat production at a lower level; • Availability of a large number of buildings to be connected for guaranteeing demonstrator’s technology impact on production peaks’ cut. Another option is to select a smaller number of buildings that are known to greatly affect production peaks; • An extended period of significantly cold weather conditions.

The use of buildings as short-term heat storage is often possible under the technical point of view, especially in the northern and central part of the EU. Specific constraints may exist and be different depending on the state and region. In fact, every energy company has to take into consideration the laws and regulations of the specific location.

Lessons learnt

Demonstrator development

Our customers are sometimes pleased to receive services in their technical facilities and see cost reduction as a bonus. It is important to stay at the right cost to the customer and not leave the wrong or excessive costs. It is also important to the customer that there is a fixed monthly charge for which the customer can add a budget for their association

CELSIUS Talk

Heres is a recoded discussion between Patrik Arvsell from Göteborg energi and representatives from Hofor, Chopenhagen regarding climate agreements.

CELSIUS contacts

CELSIUS partners contributing to this article: Göteborg Energi, D'Appolonia

For further engagement on this subject you are welcome to turn to your CELSIUS city contact person or use the contact form for guidance to relevant workshops, site visits or the expert team.