

Service-based business models for heating and cooling as a way to save energy and contribute to a circular economy



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1. The broader context

Cooling is essential for life and contributes to numerous sustainable development goals such as **zero hunger (SDG2), good health and well-being (SDG3), or sustainable consumption and production (SDG12), to name only a few**. It is needed to ensure safe and fresh food, medicine and vaccines, and a healthy and productive indoor environment. Triggered by trends such as urbanisation, digitalisation and a warming climate, the demand for cooling is expected to grow in the coming decades. Whilst this could potentially lead to increasing emissions, sustainable solutions and technologies are readily available to counter such effect: According to a recent report by the UN Environment Programme (UNEP) and the International Energy Agency (IEA), the world can avoid 210-460 GtCO₂e over the next four decades through efficiency improvements and refrigerant transition. This is equivalent to roughly 4-8 years of global greenhouse gas emissions, based on 2018 levels.



Servitisation: the global megatrend of moving towards service-based business models.

Approaches to achieve this goal include the equipment itself, the way it is installed, maintained and controlled, but also new business models. **This is where the global megatrend of moving towards service-based models - also called "servitisation" - comes into play**. Such business models are increasingly successful in areas such as entertainment (music, films), transport (cars) or light, replacing traditional ownership-based models. This factsheet explores service-based models for heating and cooling and how they can contribute to saving energy and related emissions in this field.

2. The issue

To save energy at product level, so-called “minimum efficiency performance standards” (MEPS) for products and energy labels have already been in place for many years in several regions of the world. In Europe, MEPS are regulated under the Ecodesign Directive and complemented by the Energy Labelling Framework Regulation. MEPS are undoubtedly essential to set a minimum standard and energy labels help driving the market towards higher efficiency. However, these rules do neither address energy efficiency beyond the mere product level, nor do they help overcome the barriers that stand in the way of broadly deploying highly energy efficient solutions, beyond the minimum requirements. Such barriers include for example:



High upfront investment cost for highly energy efficient equipment and prioritisation of investment in core business;



Lack of awareness and trust in the benefits of highly efficient solutions where payback is related to the operation of the equipment;



Missing incentives to take an integrated approach based on synergies between heating and cooling, demand side management, etc;

Service-based business models can be a way to overcome these barriers, contributing therefore to saving energy and fostering an integrated approach.



3.

Heating and cooling as a service

There are different types of service-based business models that can be applied to heating and cooling. Typical models include the following:



SOLUTION:

Energy Service Companies (ESCOs) and Energy Saving Performance Contracts (ESPCs)

DESCRIPTION:

The ESPC is a contract between the ESCO and the customer where the ESCO guarantees a certain amount of energy savings to the customer. The ESCO implements the project and the customer pays the ESCO for the performance. Savings are guaranteed to be higher than the payment to the ESCO. Different types of ESPCs exist, depending on who bears the technical and financial risk.

PAYMENT:

Payments for the service provided are determined upfront and depend on guaranteed energy savings.

EVALUATION:

ESPCs are a powerful tool to raise awareness on the benefits of energy efficient equipment by directly monetizing these savings. However, they do not address the important barrier of higher upfront investment cost as the savings will only “appear” during the operation of the equipment. Other issues include for example the complexity of contracts, and the potential lack of trust in the promised savings.



SOLUTION:

Heat contracting combined with equipment rental

DESCRIPTION:

The customer rents the equipment including the payment for additional services such as maintenance and repair, combined with an energy supply contract based on EUR/kW heat consumed.

PAYMENT:

Payments for the equipment rental are determined upfront and depend on the equipment provided. Payments for the heat depend on the actual consumption.

EVALUATION:

This model is well-known from other sectors such as car leasing for example. It removes the necessity to pay a high upfront investment cost and the customer only pays for the heat consumed which is an incentive for the customer to save energy. However, there is no strong incentive for manufacturers to propose highly efficient equipment as consumers may shy away from related high rental rates, not recognising the benefits of operational savings.

3

SOLUTION:

Cooling and Heating as a Service (CaaS; HaaS)

DESCRIPTION:

CaaS and HaaS are fully service-based models where the customers only pay for the unit of cooling / heating consumed, whereas the technology provider pays for all other services including maintenance, electricity, etc., remaining the owner of the equipment.

PAYMENT:

Payments for the heat / cold provided are determined upfront based on the assumed usage. No other payments are required.

EVALUATION:

This model is new and directly addresses the higher upfront investment cost whilst providing a strong incentive to the customer to save energy since payments depend on anticipated energy usage. In the same vein, this model is an incentive for the equipment supplier to provide highly efficient equipment as the supplier pays for all related costs, removing the performance risk for the customer. However, the model is not very well known yet and more experience is needed to fully appreciate its way of working.



4.

Service-based business models as a contributor to the circular economy

As opposed to ownership-based business models, service-based models imply continued involvement of the technology provider who, in most of the cases, remains the owner of the equipment.

This can be an important driver in the context of the circular economy, promoting reparability, recycling and re-use of components and parts. It will impact the design of products and the related choice of materials, for example in the sense of a modular design and serial production, which simplifies repair or replacement if needed. In the same vein, recyclability will play an increasingly important role in the choice of materials, again contributing to a circular economy.



5.

Conclusion

Moving away from ownership-based models towards the servitisation of heating and cooling represents an important piece of the puzzle of how to achieve sustainable, energy efficient and climate friendly heating and cooling. It addresses key barriers such as the higher upfront investment cost for more energy-efficient equipment and provides direct incentives for consumers to select top of the range products rather than those that just comply with minimum levels of performance. For technology providers, service-based models can be a way to increase profitability by re-assessing the design and material choice of their equipment in view of simplifying maintenance, repair, recycling and re-use. Current service-based models are largely limited to single product groups (e.g. only providing cooling systems or only providing heating systems). However, as the trend towards servitisation is gaining momentum, they could also be deployed to integrated solutions based on the synergies between heating and cooling, and thus further increasing energy and emission savings.