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.....acknowledging the valuable input of all REScoop data experts and partners!

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REVISION HISTORY AND STATEMENT OF ORIGINALITY

Revision History

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	20-8	Rie	EBO	Revision BP's
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Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Introduction

The REScoopPlus project aims to make REScoops in Europe go beyond their activities of producing and supplying energy and take up energy savings for their members as a new pillar in their organisations. This report is a description of the best practices that partners undertake to encourage and promote energy savings among their members that were selected in the REScoopPlus project.

Goal of this report

This report validates the selection of best practices based on the criteria that were formulated in the best practice criteria report. It demonstrates the state of the art of involving members/consumers in energy saving, that are worthwhile to disseminate and share with REScoops, to ease the uptake of these best practises in other European countries.

Process of validation

In the project REScoopPlus we first have made an overall inventory of all activities on energy savings of our partners. This research was done by the Technical University of Twente based on questionnaires and short interviews with the partners. Next to that the Technical University of Crete did a data analysis on those activities that could give substantial data and could be measured. The inventory combined with the data analysis gave us the information we needed to select best practice activities in the field of energy savings.

In the inventory there was a list of 17 practices. Based on the established criteria we made a selection of 8 best practises. Once selected there was a second interview with experts on each of the best practices to get a better understanding of the actions involved, the way of implementation and the costs involved. During the interviews we went through the criteria with the experts in order to obtain additional information, and a more detailed explanation of the scoring on each criteria. Thus for most of the criteria the scoring is a qualitative score based on the interviews with the experts. The Technical University of Crete contributed with data analysis on a quantitative scoring of the impact of the best practices, in case sufficient data were available.

Criteria

For the selection of best practices we developed a concrete set of selection criteria, assuring the selected practices included a balanced set of characteristics, and taking into account different types of concerns that will influence their dissemination and implementation. These criteria are described extensively in the best practice criteria report.

The selection criteria are:

- 1) Effectiveness:
 1. Outreach efficiency
 2. Cost efficiency
 3. Time Efficiency
 4. Long term efficiency
- 2) Pre-investments and share of costs

- 3) Implementation
 1. Administrative burdens
 2. Training of employees or volunteers
 3. Integration into existing systems
 4. Adjustment of practices
- 4) Market uptake:
 1. Regulatory context
 2. Organisational context
- 5) Ethical performance:
 1. Degree of control by end-user
 2. Transparency
 3. Data management

General observations

For the readers of this best practice report it is important to understand that energy saving activities come in many ways and for different reasons. There are technical reasons. For example, energy savings makes district-heating systems more efficient. There are financial reasons. For example, there is money to be made for the energy supplier when district-heating systems run more efficient. Or when national regulations are in place that create a market for energy savings in households. Or for financial reasons from the viewpoint of the consumers, who wish to reduce their energy bills. Marketing is also a reason. For REScoops it is a way to activate members and consumers and to create commitment and loyalty to the cooperative. Finally a reason is that energy savings are considered part of the goals of the REScoop and actively promoted and supported as a service to its members.

Experts

The experts working on the best practices were interviewed. A brief description of each expert is included in this report, to make it easier for REScoops around Europe to contact these experts for dissemination of the best practices. In the following phases of this REScoopPLUS project, these experts will play a role to assist partner REScoops throughout Europe to implement the best practices.

Dissemination of best practices throughout Europe

The main goal of the REScoopPlus project is to disseminate the knowledge on the best practices throughout Europe in order to get REScoops in Europe started with energy savings. The best practices will be taken up in a REScoopPlus Toolkit. This is an online tool to easily learn about these best practices. Next to that we will organise together with National federations of REScoops national workshops where the experts can go deeper into the details of the best practices and answer questions of interested REScoops face to face. Those REScoops interested in implementing the measures will get in-house trainings of these experts so that these energy saving best practices can be implemented into their organisation and day to day routine.

Best Practice description

REScoop: Hvidovre Fjernvarme, FDHvidovre, and Avedøre

Country: Denmark

Name of Measure: the “package” approach

Third party involved: EBO Consult

Description of measure

EBO Consult manages administrative and technical tasks of several local district heating non-profit companies, called Hvidovre Fjernvarme, FDHvidovre, and Avedøre. Each company is a cooperative owned and directed by citizens and consumers. One of the administrative and technical tasks that EBO Consult manages for Hvidovre Fjernvarme is to expand district heating in Hvidovre, which is a suburb in Copenhagen. The expansion of district heating is accomplished by separating the expansion area into projects.

In order to realize and begin a project, 30 % of the heat demand (i.e. home owners) in each project has to accept a conversion into district heating from natural gas, electricity or oil. Therefore, each project starts with a marketing period. A measure that is used to achieve the 30 % is the package approach, which is a conversion package for the homeowner.

Description of actions

First there is a marketing period where a specific area is targeted. Which area is next, is determined in advance in a district heating expansion plan. In order to begin, a project proposal must be prepared and sent to the municipality for approval. It must include socio-economic, user-economic, environmental analyses etc. of different heating sources (district heating, oil or gas). The city council is obliged to approve the heating source that has the largest socio-economic benefits.

Consequently a period of 2-4 months the cooperative goes into the area, starting off with newspaper articles and information nights. People can sign up to participate on the website of the cooperative. The marketing in this campaign has three main arguments: comfort, price and sustainability.

When 30% of the district households sign up, the project goes ahead. There is a specific deadline for people to sign up. When the customer agrees on the details, he signs a contract with the cooperative.

Everybody that signs up gets a visit of the account manager of the cooperative. This person explains all the details on how, when and where the installations will be installed. This account manager communicates with the cooperative and the builders and construction workers, the customer only needs to be home when they start the installation.

Customers only have to do two actions. Sign the contract and open their house for the installation. All the rest is taken care of by the cooperative. Customers can become a member of the cooperative (non-profit organisation in Denmark).

After the installation members get information on saving energy. The more efficiently they use the heat the better the business case of the project. Since all profits are returned by lower heating prices, it is in their interest to save heat since it benefits everybody.

Cost of implementation:

The package solution has a fixed price of +/- €6000,- . People who cannot afford this amount can choose to repay it through their energy bill. They can decide in how many terms they want to pay it.

Criteria	the "Pakkeløsningen" approach	Score	Explanation of Score
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	++++	The transition from gas to sustainable heat (50%) has a large impact on energy savings. The transition from gas, oil and electricity is considered an energy saving in Denmark. A conversion from oil to district heating = over 70 % decrease in CO2 emission pr. consumer. A conversion from gas to district heating = over 60 % decrease in CO2 emission pr. Consumer.
	<i>Outreach efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	+++	Reaches at least 30% percent per district and has significant impact. 386 households changed their energy source in last projects.
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	+++	6-12 months of implementation to first transition and significant energy saving. After that the communication continues.
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		++	Thanks to the cooperative model, the consumers benefit. Members share the costs. The cooperative shares pre-investments, but also gets the benefits. Returns get back through energy bill. For consumers the price of installation is €6000. They save €700 a year. Less then 10 year ROI is about the average.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.			
	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	+	It requires extensive specialised organisation, but is legitimized by the high impact.

	<p><i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.</p>	+	Cannot do this with volunteers, but you need trained skilled workers to implement. It is not a quick win. But once the organisation stands you can expand and have significant impact.
	<p><i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.</p>	++	When one takes the technical aspect out of consideration but focus on the package deal approach and the process can be implemented as a measure everywhere. It can for example also be used for retrofitting houses.
<p><i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.</p>			
	<p><i>Regulatory context:</i> Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.</p>	++++	No regulations needed for the package approach. District heating depends on national regulations.
	<p><i>Organisational context:</i> Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.</p>	+++	No specific legal entity or structure needed. The fact that it is a cooperative is an extra benefit to the project but not essential.
<p><i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.</p>	<p><i>Degree of control by end-user:</i> In what terms can end users exercise control of the measures or organisation that implement the measures.</p>	+++	The district heating is owned by the cooperative. Members have direct control in the organisation.
	<p><i>Transparency:</i> Is it clear how governance structures or cash flows are organised</p>	++	Due to the cooperative control of the members this is clear
	<p><i>Data management:</i> How is data of the tools managed. Is there for example a privacy policy in place?</p>	+	National privacy regulations for the cooperative are in place.

Expert involved:



Holds a bachelor degree in Social Science from the University of Roskilde and a master degree in Cross-Cultural Studies from the University of Copenhagen, and she has followed business courses from Copenhagen Business School. She has mainly worked with issues in Social Science, international trust-building, diversity management, cultural, and behavioral differences and change. Rie wrote her thesis for an international company, called Grundfos, where she analyzed the behavior of employees working in different cultural contexts in order to help the leading management team to change the business culture. She has also followed courses in behavioral economics, psychology, and 'nudging'. Rie has a lot of hands-on experiences working with qualitative and quantitative methods.

When studying, Rie worked in EBO Consult, where she has got a lot of knowledge about energy issues. She has worked 6 months in Spain, where she made a feasibility study of the Spanish biomass market, and she has been involved in the package solution model and the free technical service from the beginning. Today, she works as a fulltime employee in EBO Consult, where she combines her knowledge about human behavior and energy issues. She works with communication, marketing and evaluation of district heating projects, and motivating consumers to become cooperative members, make sustainable and energy saving choices such as the package solution model or the free technical service. Rie has also arranged an energy community gathering where over 200 consumers – children and adults - voluntarily showed up.

Rie can help REScoops with the communication and marketing of large energy projects concerning the changing op heat sources.

Best Practice description

REScoop: Hvidovre Fjernvarme, FDHvidovre, and Avedøre

Country: Denmark

Name of Measure: Technical support to members “FJR-ordning”

Third party involved: EBO Consult

Description of measure

The FJR-ordning is a check of the consumers heating installations every second year:

The first check is a check of their district heating unit and a thorough energy analysis of their houses, i.e. how the consumer can save energy in their house. After the check, the consumer receives an energy report of their house. In the report, the consumer is informed on whether their heating consumption is below or above the average consumption and it entails guidelines for what the consumer can do to optimize the energy efficiency of their house. This type of check is repeated every sixth year.

Two years after the first check, a maintenance check of the district heating unit is performed in order to adjust the unit in the most energy efficient and energy saving way. This type of check happens every second year.

Description of actions

The different checks of the heating installations are performed by authorized service engineers, found through quotations from local authorized plumbers. In Denmark, each utility company has to realize energy savings at the end users. Every year, the government sets an energy saving target, which each utility company has to obtain. In order to fulfil the energy saving target, the utility companies can implement measures themselves (FJR-ordningen) or buy energy savings at a liberal market, where different actors sell their energy savings at a fixed price.

The consumer cannot individually sell the energy savings at the liberal energy market when the consumer accepts the FJR-ordning. Instead, they obtain higher energy efficiency and an improved cooling of their district heating water. When multiple consumers accept the FJR-ordning it follows that the cooling in the whole district heating system improves, which ultimately benefits the consumers. It is due to the fact that Hvidovre Fjernvarme buys heat at a transmission company. The transmission company needs cold water to cool the electricity turbines in a CHP plant. Therefore, the transmission company has implemented a cooling tariff on the return water from the district heating system. One heating degree costs 26.889 euros. It follows that the cooler the return water is, the less Hvidovre Fjernvarme has to pay in cooling tariff. If the cooling in the whole district heating system is improved, it, therefore, reduces the production costs in Hvidovre Fjernvarme, which ultimately decrease the consumer’s heating bill.

Cost of implementation:

Hvidovre Fjernvarme pays the service engineers to perform the checks at the consumers. The consumer does not have to pay anything for the checks. It is partly enabled by an energy saving agreement between the Danish government and the utility companies.

In 2015, the price for one kWh was 0.07 euros and the energy saving target for the district heating company was: 6.888.430,107 kWh. The target increases every year, and it is punishable, if the utility company cannot fulfil their individual energy saving target. Therefore, Hvidovre Fjernvarme is interested in achieving energy savings at the end users. Therefore Hvidovre Fjernvarme offers the FJR-

ording for free, and in return Hvidovre Fjernvarme gets the energy savings that the consumer achieves.

Criteria	Technical service to members	Score	Explanation of Score
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	++++	There is a clear impact on energy savings. Statistical analysis shows 20% monthly kWh/(HDD) and kWh/(HDD*m2) consumption reduction for a typical consumer that has received technical support, with a p-value of less than 0.05.
	<i>Outreach efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	+++	Almost all households accept the service. The fact that the service is free contributes to the high impact
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	++	First visit is up to 1,5 to 3 hours per household including making up the report. Considering the impact this gets a positive score.
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		++++	The service is free for the members. If they implement the energy savings the customer benefits from lower energy costs. If the cooperative does not achieve energy savings it needs to pay the government this is why the service is free. The technical service makes sure it has a better cooling. Which creates a better business case in the heating district because of the cooling prices. When costs are lower, it follows that members pay less for their heating bill. Efficiency in cost is shared among the members.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.			

	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	++	Technical service engineers fill in the report in a tool that gives an automated report. Administrative burdens are therefore almost non-existent.
	<i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.	-/+	Technical service engineers are trained employees. Service engineers giving this service get a course on the district heating unit and how to install in an energy efficient way.
	<i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.	+++	Especially in existing district heating it is an extra service to members. It is easy to implement.
<i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.			
	Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.	--	The regulatory context is important. The energy saving target system makes it that the service can be given to members for free. There is a direct incentive for the cooperative to work on energy savings. However when the energy saving target system is not in place, the service could still be offered, but then the customer would have to pay for the service or the costs need to be included in the overall cost of the sale of energy.
	Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.	--	The business case of the district heating improves when the system is more efficient and has a lower cooling return flow. The cooperative needs to pay when the return water is too warm. This is a specific aspect for this district heating system. However it's not a determinant factor for the practice. It only adds as a financial argument to give the service for free to the members.
<i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.	Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.	++++	It is not an obligation, customers are in full control. Also they are free to take up the advice given or not.
	Transparency: Is it clear how governance structures or cash flows are organised	++++	Information about the governance structure is open to all customers especially in the cooperative. Information is given when asked.
	Data management: How is data of the tools managed. Is there for example a privacy policy in place?	+++	Customer and service company can access the reports online. If data is used for other purposes it is aggregated and anonymous data.

Expert involved



Erik Christiansen

Holds a master degree in Law. Erik has been employed in the Ministry of Interior (municipalities and health), in a Mayor's office in a municipality (leader of department) and in a housing association (judicial director). For 21 years Erik has been CEO of EBO Consult (www.ebo.dk).

Erik can consult cooperatives generally on helping their members from a transition to district heating. And specifically on the best practice "Package Approach". The package solution is a cooperative business model which is based on the idea of making it possible for all, i.e. poor and rich, to join the district heating system as member and consumer. The package solution is supplemented by the technical service which is free for all and therefore benefits all, independently of the individual consumer's income and social status.

Erik can help starting REScoops to implement the package approach in new REScoops and talk more on the regulatory situation in Denmark.

Best Practice description

REScoop: Ecopower

Country: Belgium

Name of Measure: One Tariff structure

Third party involved: -

Description of measure

Ecopower cvba is a cooperative that sells electricity to its members. Ecopower has a different cost structure as other energy suppliers in Belgium. They have a “one price per kWh-policy”.

There are no fixed costs. All taxes, grid fees and VAT are included in the price per kWh. And that price is always the same no matter when you consume (during the day or during the night). This makes the invoice very clear for the customers: 1 kWh is the same as approximately 25 cent.

This tariff structure supports the growth of photovoltaic installations on customers’ homes and supports energy savings. Due to the variable costs it is very beneficial for small energy users. When you have fixed cost and you consume a small amount of energy, fixed costs are relatively high.

Description of actions

Members of Ecopower get a yearly invoice of the cooperative. The tariffs are set every year by the cooperative depending on tax, transportation costs and energy prices.

On terms of communication, understanding and explanation of the bill and rational energy-use, many cooperative members like to keep the simple and clear bill.

Cost of implementation:

In Flanders there are several grid operators (with a natural monopoly) with different tariffs. Ecopower calculates an average of all grid operator costs and uses that average to compose the price. The cost of the implementation in the systems in Ecopower is unknown. For Ecopower it was the way the company was set up and structured from the beginning. Because the system is simple, the cost will be low. There is a payback, because it reduces costs for explaining how it works or explaining bills.

This original price-system came under pressure. Until a few years the spreading over the different grid operators was more or less equal. Unfortunately there was one grid operator who became significant more expensive than the others. The difference was so big that a disparity had developed. The inflow of new members from the expensive grid area became too big. Actions needed to be taken to rebalance this disparity.

Ecopower therefore had to make a choice: raise the price (for everyone) or implement a separate price for that one area. The first choice will have the consequence of members leaving. The second one would mean a change of tariff structure (internally – for the customer it stays one price per kWh).

Since januari the 1st of 2017 Ecopower uses a one price per kWh-policy depending on the grid area where you live. Prices variate from 0,22 euro per kWh in the cheapest grid area till 0,29 euro per kWh in the most expensive grid area.

Criteria	Ecopower: One Tariff	Score	Explanation of Score
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	++++	The impact of the one tariff structure is very high. It is clear to consumers what they save if they save energy. After becoming a member there was an energy reduction of 22.85%. The structure is also beneficial for prosumers it let to more people producing energy themselves and thus an energy reduction of average 45.84%.
	<i>Outreach efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	+++	The invoice reaches all members of Ecopower.
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.		
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		-/+	To cost of the implement a tariff structure is unknown at Ecopower since it was part of setting up the whole company. When the structure needs to be implemented in a new organisation this will also be part of the overall cost of setting up the energy supplying company. When an existing company needs to restructure it tariff structure this can be a costly endeavour since it may involve IT adjustments and it needs a lot of communication. Due to all these uncertainties we could not score this criteria.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.			
	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	++	Having a one tariff structure makes administration immensely easy.

	<p><i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.</p>	++++	Not only makes this system the energy bill transparent for the customer, also it makes it easy for employees to understand the energy bill. More important it is easier for the customer service to explain the energy bill to their customers.
	<p><i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.</p>	---	This is scored - because to implement a tariff structure one needs to be able to supply energy to your members. This by itself can take a lot of time to set up. On the other hand, once the legal hurdles of getting a permit to supply are taken the tariff structure can be implemented. When a supplying permit is already acquired, and a cooperative moves to a different tariff structure, it needs to be calculated what financial implications are for the organisation. This might include IT investments.
<p><i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.</p>			
	<p>Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.</p>	----	Tariff structures are heavily regulated. It depends on national regulations if this tariff structure is possible.
	<p>Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.</p>	--	To use this measure one needs to be an energy supplier that controls the structure of the tariffs and the invoicing to the members.
<p><i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.</p>	<p>Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.</p>	+++	The members control Ecopower and in the end they determine the tariff structures. It thus depends on its governance structure.
	<p>Transparency: Is it clear how governance structures or cash flows are organised</p>	++	In case of Ecopower the governance structure and cash flows are very transparent. All is explained in their financial yearly statements.
	<p>Data management: How is data of the tools managed. Is there for example a privacy policy in place?</p>	0/-	National data privacy regulations are in place.

Expert involved:

Jim Williame is chairman of the board of Ecopower since 1999. He is an industrial engineer for elektromechanica and has a special MBA certificate. He has been responsible for the tariff structure of Ecopower and the structuring of the invoice IT system of Ecopower. Jim can help starting REScoops to implement a one tariff structure into their company and share knowledge of setting up the internal invoice systems. He can also explain the details of the regulatory system in Belgium to give a better context for your organisation.



Best Practice description

REScoop: Ecopower cvba

Country: Belgium

Name of Measure: EnergieID

Third party involved: EnergieID cvba

Description of measure

EnergieID cvba was founded in 2014 as a cooperative under Belgian law. The organisation is active in Belgium and the Netherlands and recently Portugal and has one main goal: contribute to the transition to an environmentally sustainable, socially just and economically stable society by setting up services in the field of information technology. Cooperatives can become a member of EnergieID. It pays EnergieID to use the tool for their customers.

As a first service, EnergieID has set up a SaaS-platform (software as a service) to help families and organisations to manage their energy and water consumption as well as their transport kilometres and renewable energy production. For example, it can be used as a platform for an energy saving competition between schools. Users can create an account for free, compare their consumption with similar user profiles and can share their data with the service providers of their choice. Meter readings can be entered manually or automatically by compatible smart energy devices (e.g. Flukso.net, Smappee.com, Arcus-EDS KNX IP gateway,...) or smart meters (DSMR P1 Smart Meters)

EnergieID shares costs with its co-operative members and provide a shared and secure database to help as much users with their energy management. By sharing the platform, EnergieID can gather relevant data more quickly to compare and analyse. As of beginning of August 2017, almost 18.000 users are active on the platform.

Description of actions

EnergieID is a platform for active customers of a cooperative. It is expected from those customers who want to participate to fill in their own data and for the cooperative to be the first line of support. Customers sign up with an account on EnergieID and on a monthly basis they fill in their energy use. Data-integrations are provided for some systems to automate data entry. Then together with the help desk service of Ecopower the invoice and consumption is analysed and discussed. This can be done by phone or email.

Questions by the help desk asked are for example:

- Are the meter readings real or estimated (correct or incorrect)?
- Does the meter function right? What to do when your meter appears to be defect?
- If there is a PV installation: do they function correct? Has the convertor broken down?
- Did you buy new devices last year? Were you home more? Did your family situation change?
- Did you use electric heating, airco, electric boiler, Jacuzzi, heat pump,
- Maybe there's an energy loss on some (old) devices, ...

The customers fill in the data. EnergieID follows up on the consumption of customers using EnergieID and compare it with similar households.

Cost of implementation:

In countries where EnergieID is already implemented the licence costs for cooperatives are around €2000,- to track 500 sites. It is expected that the service and first line of support is carried out by the

local cooperative and not by EnergieID. For starting cooperatives, this amount can be lower and can grow along with the growth of the cooperative.

In countries where it is not implemented its cost are around € 3000,- to implement it in that country. This cost can be shared with multiple cooperatives. It is expected that the local cooperative do the translations themselves. This will take a couple of days work and translation support with new developments.

The costs of EnergieID can also be shared with local governments that want to promote energy efficiency among certain groups in their community, f.i. when the community joins The Covenant of Mayors. EnergieID is good tool to measure and compare either the effectiveness of energy savings program or as an incentive to start energy efficiency in schools, or local companies.

Criteria	Energie ID	Score	Explanation of Scale
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	+++	There is a clear impact on energy savings. Statistical analysis shows 11.42% yearly kWh consumption reduction for a typical consumer that has registered in EnergieID, with a p-value of less than 0.05.
	<i>Goal efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	++	When adopted by a cooperative it is very easy to reach a large group of customers. However, the incentive of the customer needs to be there.
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	+++	Energie ID is a developed platform. Participating is very easy for consumers and cooperatives.
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		+++	Cooperatives pay a fee depending on usage for using EnergieID. Ecopower considers this a service to the members and includes this in the overall cost. For members the use of the platform is free. First development of the platform is paid by early adaptors like Ecopower. Now fees of the cooperatives cover the exploitation of EnergieID and new developments.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.			
	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	++++	The system is mostly automated and relies on input of customers. There is almost no administration needed, apart from when one wants to use the data to improve service to members. EnergieID has three employees to keep the system working and bug free.

	<i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.	++	The system is fairly simple to use and to understand. Small explanation of customer service is helpful to answer questions of customers using the system.
	<i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.	++++	The system is a stand-alone system. It can be implemented in every country and every group of citizens. The system accounts for smart meters but also manual input. For energy suppliers input and production and sending of reports to customers can be automated.
<i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.		+++	Implementation is possible in different countries. It needs extra development of the platform that comes with cost. Also the customer service of the system will need to be organised locally. EnergielD proved in Portugal that this is possible.
	Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.	++	It is a web based platform and a tool. National privacy regulations apply.
	Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.	++++	Any group can use the system, like schools or school classes or even football teams. Being an energy supplier makes it easier because data can be uploaded automatically.
<i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.	Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.	++++	All users can access and modify their own data. EnergielD is a cooperative of different cooperatives and companies that use the system. This gives the groups that use the system control over the software company. Individual users can give permission to the admin to use its data or not.
	Transparency: Is it clear how governance structures or cash flows are organised	+++	The business model is mentioned on the website and transparent for users.
	Data management: How is data of the tools managed. Is there for example a privacy policy in place?	+++	Private data can only be used in the system and cannot be sold to third parties for commercial purposes. Data for research is sometimes used on an aggregated basis. This is stated in the internal regulations of the cooperative EnergielD.

Expert involved

Vincent Dierickx (°1978) works full-time on accelerating the energy transition. After studying civil engineering with major in mechatronics (KUL 2001), a malfunctioning torch at BASF Antwerp sowed the seed for his passion for energy efficiency. This resulted, after a stopover for artstudies (Jazzdrums) at the Lemmensinstitute in Leuven, in further specialization in energy monitoring and management. He worked in those years for diverse clients such as the Flemish Government, DSO Infracore, KBC, Medialaan, Brussels Environment, Intervest, Nike and Veolia.

His belief in cooperative entrepreneurship led him recently to co-found the cooperative EnergielD cvba-so (° 2014), provider and developer of the social energy monitoring platform energieid.be, and the engineering company Efika Engineering (°2015).



Best Practice description

REScoop: Enercoop

Country: France

Name of Measure: Dr. Watt

Third party involved: -

Description of measure

Dr Watt is an online tool including an offline training course to help consumers make a self-diagnosis of their specific electricity consumption. It is a tool for consumers to understand their consumption. With Dr. Watt you measure everything what has a plug. The diagnostics are made visual online. The report gives consumers the opportunity to look at every appliance separately instead of only general advice. This makes the advice very effective.

The service is offered to members and non-members of the REScoop. The aim is to help individual consumers reduce their energy consumption:

- By giving them the tools to measure their consumption and understand it.
- By reducing their consumption while maintaining the same comfort level with personal advises from Dr Watt.

Description of actions

First there will be a training with an energy expert. A meeting with a group and an energy expert is organised where the expert presents the importance of the energy saving and the expert explains how to do to the self-diagnosis by using a wattmeter (provided by the expert) and the online service.

Second, participants start with the self-diagnosis for six weeks. The participant will measure the consumption of every electrical device with the wattmeter and put the data on the online service. It does not register heating. Water electrical consumption and electrical heating of food are estimated by ratios. This data and the program will give the potential energy savings that can be achieved by the consumer and compare it to the other participant's results and personal made advices.

Finally there is a feedback meeting. In this meeting the expert will analyse the results of each participant, and answer their questions. It is also the opportunity for participants to share their experience and ask for advices within the group. Participants are also given access to different sharing tools in the platform to give them the possibility to exchange experiences online.

Cost of implementation:

The initial costs of the implementation and organisation of Dr. Watt is hard to measure. All time of the IT department and people working in Enercoop was not registered because it was seen as an extra service to the members of Enercoop. Also it included a lot of voluntary work of members. It is estimated that the initial investment was 90.000 euro's : 60.000 in R&D and 35.000 in IT. It is considered as an investment in the service for the members and there is no big ambition to have the money back, it was simply taken up on the overall cost of the organisation and seen as a marketing investment.

There are costs involved for the training of the experts. These costs are covered with the payments for individuals participating. One day training in total is enough where experts are trained in general knowledge of energy and energy savings and how to use the Dr. Watt platform.

The price to participate with Dr. Watt is €39 for individuals, this includes the use of the online tools and the offline trainings. Dr Watt is available to groups as well: collectives, associations, businesses can buy a group training session for their employees for example. Group price is €500 (up to 20 participants).

Criteria	Dr. Watt	Score	Explanation of Scale
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	0/+	Statistical analysis was performed on only a small sample, since 6-monthly aggregations of measurements was required. Preliminary results show a 7.68% increase in 6-monthly kWh customer's consumption, but a 60.31% decrease in 6-monthly kWh/DD consumption. Both p-values are higher than 0.05, indicating insignificance of the results.
	<i>Goal efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach. Important to note is that a measurement can have a specific goal in the energy saving process, for example visiting a website. We therefore look at the impact of reaching its goal.		
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	+++	There are two trainings. How to use the Wattmeter, and what is energy. After six weeks there is another training and sharing of knowledge. Consequently with the tool it is easy to support people in their energy savings advice.
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		++++	The initial investment to set up the online system was a big investment 90.000 but was considered by Enercoop as marketing cost. For customers it's a low investment to participate €39.-Also new cooperatives in the Enercoop network can use Dr.Watt for free.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.		++	Experts need to be trained on how to use the platform. This training can be done in one day.

	<p><i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.</p>	++++	<p>Once the system is set up the administration is very easy and reports on energy savings are made automatically. The personal reports are made automatically, but the group report/analysis is made by the expert trainer (it needs a half hour of work).</p>
	<p><i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.</p>	++	<p>Trained volunteers and employees as an energy expert is needed. This is not a high level education.</p>
	<p><i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.</p>	++++	<p>The measure is not dependent on any regulations or internal administration. It is a stand-alone solution that can be integrated everywhere. Well, it needs translations of course and also a contract of use between Enercoop and other cooperatives.</p>
<p><i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.</p>			
	<p>Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.</p>	++	<p>Regular national privacy regulations apply. Customers need to agree to general conditions proposed by Enercoop.</p>
	<p>Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.</p>	++++	<p>The measure is a stand-alone measure. Any cooperative or energy group in Europe can use it.</p>
<p><i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.</p>	<p>Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.</p>	+++	<p>Customers have a private login platform within Dr. Watt. They can change all information. Also they can erase all data on themselves by email the cooperative.</p>
	<p>Transparency: Is it clear how governance structures or cash flows are organised</p>	++	<p>The small cash flow is used for the payment of the trainings. Which is clear to the customer + cooperative governance of the Enercoop network</p>
	<p>Data management: How is data of the tools managed. Is there for example a privacy policy in place?</p>	+++	<p>There are general conditions set up by the cooperatives that customers have to agree to. Here the cooperative declares that they does not share or sell the data to third parties.</p>

Expert involved

Mohamed Sifaoui has a MSc in Energy and advanced materials, renewable energy section at the Université de Cergy-Pontoise, Cergy-Pontoise, 2013 and a MSc - Management and sustainable development at ISEADD, Marne-la-Vallée, 2014

He is the project officer on energy saving issues for the Enercoop network of cooperatives. Making easy for all cooperatives and all functions to integrate energy savings services (Wiki, Dr Watt, Accompagnement des professionnels, etc).

Mohammed can help other REScoops to

- Understanding how the Dr Watt website/supercalculator works
- Understanding how the Dr Watt training can be sold in the local areas for residential clients and also for organizations
- Understanding the arguments of Dr Watt effectiveness and simplicity
- Understanding how the Dr Watt physical (group) trainings are working
- Understanding the costs and the benefits of Dr Watt

Understanding the whole scheme of a Dr Watt training (communication, selling, client relationship, 1st physical training, wattmeter lending, questions/answers during the 6 weeks auto-diagnostic, 2nd physical training, accounting, etc).



Best Practice description

REScoop: Som Energia

Country: Spain

Name of Measure: InfoEnergia

Third party involved: Beedata

Description of measure

InfoEnergia is a service for all the customers of an energy supplying cooperatives or companies. It is a personalized energy awareness service. It provides information to consumers through two channels:

- Monthly report with benchmarking against yourself and similar customers and has useful tips. Customers receive this report once a month as e-mail attached PDF.
- Customer portal where the monthly reports and extended information is available (i.e. smart metering measurements).

Description of actions

Som Energia started with InfoEnergia as an extra service for their members. Instead of just sending invoices Som Energia also sends reports on the energy use of their customers. In this report customers are compared with similar household benchmarks, with previous periods. They also get personalized energy saving tips.

The service desk of Som Energia is trained to know how the system works and how the reports are created. This way they can handle any questions from customers concerning the report.

The cooperative does not handle the data and the system themselves. They buy this service from a third party Beedata. BeeData is the Building Energy and Environment Group. Which is an autonomous department of the International Center for Numerical Methods in Engineering (CIMNE) involving over 20 researchers. The system was built in a European project called Empowering. The cost of development was 1.5 M€. They implemented it in six countries with twelve partners on four pilot sites. In the project they serviced 344.000 users.

Cost of implementation:

The tool is developed in a European research project therefore most of the development cost are socialized. New cooperatives or energy suppliers only pay in the implementation costs of the tool. These include their own cost of IT employees for implementing the system in their invoice system. And a yearly service cost for BeeData. This amounts for Som Energia (45.000 customers) to roughly €1,- per customer but is reduced when more customers are introduced. Different REScoops can join in the same system and add more customers and in this way can share the discount.

Criteria	Som Energia :Infoenergia	Score	Explanation of Score
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.	++	Based on the results from the statistical analysis, this particular measure has no significant impacts in energy savings in general, for all customer groups. However when tested on a small sample of a specific contract type (Contract B), significant reductions (almost 50%) have been demonstrated.
	<i>Outreach efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	+++	Once the program is installed it is easy to reach a lot of people. Som Energia started with 1000 customers in the testing phase and reached 40.000 half year later.
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	-/+	Implementation depends on the strength of your IT personnel. However once it is installed customers receive the information directly and are urged to take action. Also once installed there is some effort and time needed by the cooperative itself. Advice is automated, but questions from customers and talking about their actions and help them takes some time. (About 10 questions a week)
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		+++	The development of the service was developed by the EU project Empowering. Now the data service is done by a (University) start-up company using the technology developed. SomEnergia pays Bee Data for the service. It is free for the customer.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.			
	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	-	The implementation takes time in your organisation. Especially for the IT personnel to implement it. However once it is installed into your system the reach can be big (all customers) and reports are automated. A service desk is needed to help people with questions and their proposed actions in the reports.

	<p><i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.</p>	-	Depending on your service organisation. In the case of Som Energia, all service employees are suppose to be able to answer all questions in order to give a direct and good service. So employees that deal with these questions need to be trained in the program and understand its reports.
	<p><i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.</p>	+	You need to be a supplier and have the data of your members. Data received from smart meters give better results but is not entirely necessary. Taking the implementation issue into account, the system works on all kinds of data systems and can be adapted by BeeData
<p><i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.</p>			
	<p>Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.</p>	++	Suppliers have to comply to personal data protection regulation set for all companies dealing with this kind of data.
	<p>Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.</p>	+	The system works for every energy supplying company.
<p><i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.</p>	<p>Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.</p>	+++	The cooperative has control on how the report looks like and what information is sent. Also the customer has its own customer portal where it can access its data.
	<p>Transparency: Is it clear how governance structures or cash flows are organised</p>	++	Roles between Beedata and the cooperative are clear. Beedata is service provider to the cooperative.
	<p>Data management: How is data of the tools managed. Is there for example a privacy policy in place?</p>	+++	Data is owned by the cooperative. There is an agreement with Beedata that this data is only used for InfoEnergia system. Customers themselves can choose not to have these analysis done by their own customer portal

Expert involved



Marc has been involved in the creation of the cooperative since its inception Som Energia (2010).

Degree in technical industrial engineering completed in Escola Tècnica d'Enginyeria Industrial (EUETIB-UPC).

Master degree in Management and Design of Renewable Energies at Technological Catalan Institute (ICT-UB).

Expertise on the development of rural electrification projects with photovoltaic and mini-hydro (2006-2007) and in the design of photovoltaic solar installations in Spain (2007-2008).

He is the energy efficiency consultant at Som Energia as a member of InfoEnergia's team. He can help other REScoops to implement InfoEnergia.

Best Practice description

REScoop: Südtiroler Energy Verband (SEV)

Country: Italy

Name of Measure: Return Flow Temperature Optimization

Third party involved: SYNECO ltd

Description of measure

SEV uses the measure of return flow temperature optimization to optimize their district heating system and save energy. This is a tariff incentive for consumers to give financial incentives in order to encourage consumers to use energy outside the peaks. District heating plants work most efficiently if run at a constant baseline. Biomass plants take a couple of days to work within their design boundaries. Outside these boundaries they quickly become inefficient, that means they do not use the whole amount of energy that resides within the woodchips. The efficiency factor can easily drop from 85% to 40%. To avoid this, a biomass district heating plant should have a well-balanced demand situation. However, demand of consumers varies a lot throughout the day and throughout the year.

One crucial factor for energy efficiency for a district heating plant is the return flow temperature. High return flow temperatures are an indicator for not optimal configured secondary circuits on the client side. Therefore, incentives for the final customer may be a chance to foster energy efficiency in a very transparent way.

Lower return flow temperatures have the following effects for the district heating plant:

- A reduction of the return flow temperature by 10 K reduces the demand for pumping by 20-30% (cutting the flow rate by half reduces energy demand by factor 8);
- Lower return flow increases the efficiency factor for flue gas condensation;
- Demand shifting (start heating earlier / later) is very effective for peak shaving;

Description of actions

In order to give consumers an incentive to use their heat on different times in order to create a better baseline SEV proposed a new tariff model. For transparency and exact calculations of a new tariff model the cooperative first needed to collect data from each customer. The following data is needed:

Parameter	Unit	Data granularity
Flow temperature	°C	Continuous
Return flow temperature	°C	Continuous
Consumption	kWh	Hourly
Capacity / Load	kW	Hourly

With this data SEV creates a new tariff model. This model is as follow:

$$Tariff\ NEW = Base\ Tariff + T_{Building} + T_{ReturnFlow} + T_{EfficiencyBonus}$$

- **Base Tariff:** All Customers pay a certain base tariff to cover expenses for piping, heat exchanger and other fixed costs;

- **Building Component:** Depending in which house the customer lives, there is a certain component to take also the basic structure of the building into account. It is easier to save energy with a brand new building than with a 50 year old house;
- **Return Flow:** The most important part; a temperature level below 40°C is considered as very efficient, levels from 40°C to 50°C efficient and temperatures above 50°C are penalized as not efficient;
- **Efficiency Bonus:** The efficiency bonus is granted if the customer is shifting peaks as well; the efficiency bonus is a simple correctional factor. If the customer can reduce its standard deviation an additional bonus of 5% is granted. If the deviation is high a penalty of 5% is applied to the whole tariff.

Customers then get a proposition for new a tariff that gives them an incentive to change their energy use. In order to convince customers to move from the basic tariff system to the new system the basic tariff system is increased a bit to create a better incentive to move. Then the new tariff system is promoted through information nights, leaflets and online communication.

Cost of implementation:

The cost of implementation depends highly on the size and complexity of the district heating system. First a technical analysis needs to be done in order to find out how to optimise the energy use in the system. Then the new tariff system needs to be implemented in the organisation. Finally the new tariff system needs to be communicated to members in order to convince them to take on the new tariff system (which is optional).

On average it is estimated that an implementation costs around €20.000 euro's. €10.000 for the technical analysis in order to know how to establish a better equilibrium of energy production and energy use. And €10.000 for the marketing and communication to customers. Depending on the size of the district heating system, this investment has a return within a year thanks to energy saving in the system.

Criteria	Dr. Watt	Score	Explanation of Score
<i>Effectiveness:</i> The effectiveness of energy saving measures exists of different parts			
	<i>Impact:</i> Is there a clear impact on the energy savings of households where the measures were targeted or implemented. The researchers aim to find meaningful correlations between the measures and the variables that determine energy saving in households.		Not available yet
	<i>Goal efficiency:</i> This criterion looks at the reach in relation to impact. How easy is it to reach a large group of consumers and have an impact on energy saving in that group. Or the other way around, when the measure was implemented in a small group did it had a substantial impact to justify this reach.	+	Once implemented the new tariff is proposed to all consumers of the district heating system.
	<i>Time Efficiency:</i> This criterion looks at how much time does it takes to implement the measure and the duration between implementation and first results. An example of a best practice would be a short time span (months rather than years) between the implementation of a measure and the first measurable results.	++	Implementation of the measure will take around half a year, but results can be measured within the next half-year.
<i>Pre-investments and share of costs:</i> Who bears the pre-investments of implementing the measures and who benefits? How long does it take to cover the pre-investments?		+++	The investments are done by the district heating company to implement the new tariffs. Members can benefit from the new tariffs and the district company from the energy savings in the system. In cooperative district heating companies this reflects in the overall price again.
<i>Implementation:</i> This criterion looks at the complexity of implementing the measure. This includes the above criteria of cost, but also administrative burdens, training of employees or volunteers and integration into existing systems.		-	
	<i>Administrative burdens:</i> Here we will look at the administrative burden that is created with the implementation of the measures, and if it is possible to reduce them with automatization, for example with a basic administrative system. This criterion will always be applied in relation to the impact and reach.	-	The new tariff structure integration in the organisation should not be taken lightly. Once it is implemented administration will function as regular.
	<i>Training of employees or volunteers:</i> Here we will look at how much time it costs to train volunteers or employees that help with implementing the measures. Also, the level of education is considered.	-	It requires specific technical knowledge to implement the new tariff structure.
	<i>Integration into existing systems:</i> Here we will look at the ease by which the implementation of a measure can be transferred to another cooperative somewhere else. When adoption of a measure implies the adoption of a complex support system, this is likely to form a barrier for transfer of this practice to other cooperatives.	++	Integrating a new tariff structure is difficult. However with the right support it is possible. The financial returns are worth it.

<p><i>Market up take:</i> This criterion evaluates the possibility of replication with workable alterations in different cooperatives.</p>			
	<p>Regulatory context: Important here is to look whether the measures can only be used when certain regulatory measures are in place or that they can be implemented in any regulatory context.</p>	-/+	<p>Whether it is possible to implement it is dependent on tariff regulations on a national level.</p>
	<p>Organisational context: Another important aspect is to analyse whether the measures are linked to any specific organisational structures of the cooperative. For example, when a measure only works when the cooperative is the owner of the electrical grid it will get a low score on the market up take criteria.</p>	++	<p>No organisational limitations. This tariff structure is independent from what legal structure the company is.</p>
<p><i>Ethical performance:</i> This criterion looks at whether there are ethical procedures in place concerning control of end-user, transparency and data management.</p>	<p>Degree of control by end-user: In what terms can end users exercise control of the measures or organisation that implement the measures.</p>	++	<p>This depends on the legal structure. The company owns the data. When the company is a cooperative owned by the consumers they could exercise control.</p>
	<p>Transparency: Is it clear how governance structures or cash flows are organised</p>	+++	<p>Cash flows and governance structures are clearly explained in the communication about the new tariff structure.</p>
	<p>Data management: How is data of the tools managed. Is there for example a privacy policy in place?</p>	+	<p>Managed according to national privacy regulations.</p>

Expert involved: Christopher Larch

Christoph Larch is partner of SYNECO Ltd, an engineering and consultancy company focusing on energy efficiency and renewable energy. He is specializing in the public service sector with over 15 years' experience.

After finishing his studies of business economics in Innsbruck, Florence and London he worked for several utilities and professional service firms before starting his own business in 2000. Larch is author of various papers in digitalization, machine learning and big data.

In his professional focus now he is supporting multi-utilities through the digital transformation. The key issues are developing new business models, delivering digital securely and the move towards the 'internet of things' which is a remarkable playground for utilities.

Christoph can help district heating cooperatives to implement other tariff models in order to make their system more efficient and save money and energy.

