

A network initiative to promote energy efficiency in SMEs

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Keywords

industrial SME, energy-saving programme, policy measures, industrial energy saving

Abstract

SME's are usually a tough target group to involve when implementing energy efficiency programs. Despite the significant energy savings potential, lack of resources, competences and commitment to implement a systematic energy saving initiative are major barriers for improving energy efficiency.

In 2010 and 2011, Go' Energi (GE) (Literally in English "Good Energy", and also known as the Danish Energy Saving Trust) investigated how to approach the SME segment. As a result of positive feedback from the industries surveyed, a network initiative has been developed to promote energy efficiency to SMEs. After the first year of operation, the network initiative appears to be successful.

Firstly, the initiative is anchored by the establishment of local networks that address commercial and industrial energy efficiency. These networks are to be established in each of the approximately 100 Danish municipalities. The networks are hosted by either local climate initiatives or by local business councils – in both cases with GE as coach and program manager.

Secondly, a comprehensive set of "checklists" for energy efficiency in the most important areas have been developed, for example for ventilation, cooling systems, boilers and heating systems, server rooms, lighting, etc. These checklists are based on best practice principles for energy efficiency (the "onion" diagram) carefully developed over the past 20 years of energy efficiency activities in Danish industry.

Finally, a consultant scheme has been developed that is aimed at promoting the use of professionally-qualified technical specialists to go through each of the checklists at a fairly low, fixed price for the industries participating in the network activities.

So far, more than 100 companies have joined the program and the principles are widely recognised among industries and partners of the program. Significant energy savings have been achieved by the first wave of companies involved in "checking" selected areas.

Introduction

Since the early 1990s Danish energy policy has been strongly focused on improving energy efficiency in industry. A comprehensive CO₂ agreement scheme was developed early in the process with the introduction of compulsory energy audits in large, energy intensive industries. In the late 1990s, the first energy management scheme (based on the Danish standard DS2403) was introduced in order to involve and encourage senior management in companies to implement systematic initiatives to improve energy efficiency in all areas. Comprehensive materials, guidelines and methodologies have been developed during this period. In addition, a comprehensive subsidy scheme was operated until 2001 that provided investment support for energy saving projects of up to 30 %.

More recently (since 2006), the Danish utility companies have been involved in new and reinforced initiatives to improve energy efficiency in all sectors. A type of a "white certificate" scheme has also been developed that allows the utility companies to use significant budgets to purchase/provide investment

support for “kWhs saved” in all sectors – but especially from the commercial and industrial sector.

An overall priority during over the years has been to operate cost-effective schemes and therefore large and energy-intensive industries have been, and remain the focus of the programs. Large energy efficiency projects are usually considered to be much more cost-effective to both identify and implement than small projects.

Even though evaluation of the programs has concluded that they are successful, historically the main focus has only been on large companies consuming 70–80 % of the industrial energy consumption in Denmark. A very high number (>50,000) of SMEs within the manufacturing and commercial sectors have been more or less out of focus despite the fact that the potential savings in these sectors are estimated to be relatively higher than in large industries (/6/).

In 2010, as an independent public organisation in Denmark, Go’ Energi was given the task by the Danish government to develop a strategy for stimulating energy efficiency in the SME sector in a cost-effective way.

Opportunities to support SMEs in their efforts for increased energy efficiency

According to the EU definition (/1/), the SME sector comprises all private sector companies with less than 250 employees and a turnover of less than 50 million Euros per year. The definition splits the SME sector into 3 sub-categories:

1. Medium-sized SMEs – companies with more than 50 employees and a turnover of more than 10 million Euros
2. Small SMEs – companies with 10–50 employees and a turnover in the range 2–10 million Euros
3. Micro SMEs – companies with less than 10 employees and a turnover of less than 2 million Euros

From an energy efficiency perspective, the following characteristics can be associated with each of these groups:

1. A certain proportion of the medium-sized SMEs have a sufficiently large energy bill high enough to justify involving internal staff as well as commercial consultants and utility companies in energy audits, etc. This group typically comprises dairies, pharmaceutical companies, large office buildings, the plastic industry and a wide variety of industries with an energy bill of between 0.5–3 million Euros per year.

When it comes to Danish industries, approximately half of this group is involved in energy efficiency projects today, but many are still not convinced that energy audits and consultants will bring added value to their companies. Furthermore, the companies do not themselves look for information about energy efficiency and do not make use of the “do-it-yourself” tools due to lack of internal resources and competences.

There are therefore still major barriers for improving energy efficiency in medium-sized SMEs.

2. The “small” SMEs generally lack resources and competences to do anything other than the most urgent and possibly mandatory activities in relation to energy efficiency (for example, the annual boiler efficiency inspection). This group

typically comprises large supermarkets, small industries and office buildings with less than 50 employees, etc.

A major barrier in this sector is lack of experiences and resources when it comes to using external consultants. Concepts such as “free energy audits” as well as the use of consultancy on a commercial basis have therefore failed and a new concept must be introduced to promote energy efficiency in this sub-category. As for the medium-sized companies, the companies do not themselves seek information about energy efficiency and do not make use of the “do-it-yourself” tools.

3. The “micro” SMEs are short of everything when it comes to energy efficiency: knowledge, resources and money for investments. This typically comprises smaller shops and small private sector offices with less than 10 employees.

Some attempts have been made to involve these companies via “free” energy audits and various sector initiatives, but experiences are poor and the sub-category are to a large extent considered as “impossible” or at least very expensive to involve.

On the basis of the above, GE has identified the first 2 of these sub-categories as target groups for developing an initiative towards SMEs. It is estimated (/6/) that the 2 sub-categories represent 20 % of industrial energy consumption in Denmark.

Early 2010, at the same time as GE’s focus on SMEs was initiated, GE was invited to participate at meetings of a climate network for private sector enterprises hosted by the municipality of Gladsaxe near to Copenhagen (/2/).

This network involves approximately 40 private sector companies such as large offices, small industrial enterprises from various sectors and commercial buildings of various types. The network has been running for a number of years with meetings every 2–3 months that deal with various aspects of energy efficiency – for example, LED lighting, optimisation of HVAC systems and the use of renewable energy sources.

Discussions at the meetings identified a significant potential for supporting the companies in their activities for improving energy efficiency via frequent network meetings:

- The companies lack easy-to-use materials (checklists) on how to approach energy efficiency in the most important areas. The materials currently available (guidelines for energy audits, etc.) although comprehensive, are too technical and difficult to use for in-house investigations of energy saving opportunities. The companies are not interested in general energy audit schemes, instead they require specialist investigations. This is because while the most low-hanging fruits have already been picked as part of the standard focus on reduced operating costs, the new savings will require in-depth expertise in selected areas.
- The companies have a significant general interest in implementing “new technology” in all areas. An important element in network meetings has therefore been to involve manufactures of new technologies in the network meetings to present new solutions and ideas, for example, about LED lighting, heat pumps, etc. Another important element of the meetings has been to arrange the meetings on the premises of local companies so that energy saving projects

Focus Groups

Based on the initial findings described above GE established a number of focus groups involving private sector enterprises to discuss its future assistance to SMEs (/3/). The focus groups unveiled 4 basic types of SMEs as outlined in Figures 1–4.

The experience from these focus groups is more or less in line with findings reported earlier in the paper – but basically it has been confirmed that a significant part of the SMEs would be interested to join networks.



Figure 1. The “poor” types of SME.

Company: Privately owned company with a recent history of being taken over or merged. Energy savings are secondary and have very low status – the management argument is that the company cannot prioritise energy savings when it is struggling to survive.

Person responsible for energy: Typically this person has another primary working area, e.g. technical head or facility manager focusing on operation and maintenance. He/she is knowledgeable about energy savings although not an expert.

Attitude: The energy costs of the company are not considered high enough to warrant this being an important area. Financing energy savings is perceived as problematic.

Information: In case of improvements/maintenance local craftsmen are contacted and often at budget prices. Network (craftsmen, suppliers, etc.) is used as a way of testing knowledge. Consultants are not an option for financial reasons.

Cases: What the company “can afford” is very limited. Alternatively, the company itself improves energy efficiency and adopts the most beneficial measures, or makes use of no-cost energy savings, e.g. “switch off of equipment when you go home”.

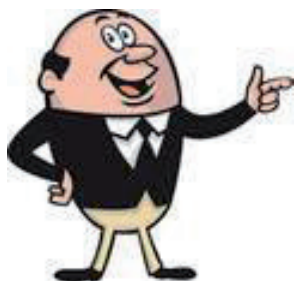


Figure 2. The “convenience” types of SME.

Company: Often smaller privately owned company (retail, office, smaller production company) in rented premises. Owner/partners take decisions about investments – major focus on the bottom line. The company is not considered to be particularly energy intensive, with primary expenses being salaries and rent. Energy expenses have roughly same status as insurance, telephone and internet costs, etc.

Person responsible for energy: Typically this person is the managing director, financial director or marketing director. Is responsible for energy because of position. More in name than in fact (several have masters degrees). Has comparatively little knowledge about energy savings – is uncertain about own knowledge.

Attitude: Only a little (too little) can be saved on energy costs and primarily on lighting and heating/ventilation, or by changing employee behaviour – switch off the lights, etc. Some have earlier tried to find out whether or not energy savings were relevant, but investigations stalled and no further action was taken. Some have experienced problems when introducing new energy efficient technology – for example, problems with energy efficient lighting. Environmental concerns are not raised by customers – no green marketing and hence not relevant to use money on that.

Information: Search for information is random and characterised by immediately-available information. Others trust manufactures and suppliers.

Cases: Depend mostly on luck.



Figure 3. The “proactive” types of SME.

Company: Typically a medium-sized production company with production in Denmark and possibly also abroad. Has carried out energy savings over the past years and intends to continue working to make the company more energy efficient. Typically owns its premises.

Person responsible for energy: Holds the position as plant manager, manufacturing director or facility manager – several have engineering degrees. Is focused on energy and has energy as one of the areas of responsibility. Knows quite a lot about energy savings and is curious and interested in getting to know more – is actively seeking information.

Attitude: Has an open and positive attitude towards the fact that it pays to prioritise energy in financial terms, marketing value and (for some) also internally among employees. When planning new buildings, facilities and machines energy efficiency is factored into the equation – good business case for improved energy efficiency even though investment cost may rise.

Information: Seeks information in a broad sense. Has a good internal network at the company but also uses suppliers as “impartial” sources of information and may also have a good external network. Are often closely anchored to their trade, e.g. engineers subscribe to technical magazines and often participate in relevant conferences. Uses utility companies, consultants and suppliers as dialogue partners and has several audit reports regarding energy efficiency.

Cases: Has typically invested in larger energy saving measures, for example, within ventilation/HVAC, alternative heat sources (district heating, solar panels), switched to LED bulbs, changed compressor operations, etc.



Figure 4. The “expert” types of SMEs.

Company: Medium-sized company with a significant focus on energy either as core parameter in cost-effective production, or as an important marketing parameter. Energy savings are a part of the mission and vision of the company. Owns its own premises and hence considers it reasonable to make them more energy efficient.

Person responsible for energy: The person has energy savings as their main or partial working area. Title in company is often sustainability engineer, energy manager or managing director with great focus on energy (some have a technical education and have undertaken additional training). Has considerable experience with different energy saving projects and knows a lot.

Attitude: Takes a holistic approach to energy management. Focus is on the company’s total energy balance: electricity, heat, insulation, transport (e.g. replacement of cars with employee bicycles where possible), etc.

Information: Actively searches for information using a broad range of channels. Can have internal energy competences in the form of own service departments. Uses external consultants in areas where competences lacking. A few participate in network activities on a political level to lobby for better conditions for the business.

Cases: Implements relatively comprehensive energy saving measures – involving both production machinery and buildings.

can be demonstrated, but also to see new technical solutions in other areas during the visit – for example, a new magnetic conveyor system (not an energy efficiency measure).

- The companies lack qualified consultants and specialists to assist them in complicated technical areas – many manufacturers of equipment as well as utility companies and service and maintenance companies offer various services but most often such assistance is on a general and not very qualified level when it comes to energy efficiency in a specific technical area. The companies have a positive attitude towards involving the right specialists and even pay for their assistance given that they are experienced and qualified in specific areas.
- The companies lack regular and unbiased information on energy efficient solutions and technologies. For a long period (since 2001) no government body in Denmark has systematically provided information about energy efficiency to the commercial and industrial sectors. In particular companies ask for sector-specific case studies.

Based on the above findings, GE decided to base its assistance to SMEs on the following cornerstones:

1. Development of a checklist scheme and brief materials about energy efficiency in the most important areas
2. Establishment of local networks for enterprises in cooperation with municipalities and local business councils
3. Dissemination of information to industries regarding energy efficiency including case studies
4. Development of a consultant scheme for SMEs based on professionally-qualified specialists in important areas

Overall, GE found that it was crucial that the initiative should be easy to join, leave and use, and be cost-effective for the companies. Crudely put, SMEs “do not read”, “do not want to spend money”, “do not take the initiative themselves” and “do not want to give commitments” in an area that has low strategic priority.

Checklist scheme and materials

A central discussion in the dialogue with companies in the networks has been how to ensure the delivery of high-quality energy efficiency consultancy services. Naturally, the companies ask for, and require technical assistance by experienced specialists capable of identifying both the appropriate focus areas and the activities to implement.

From these discussions it has been decided to base the development of checklists and materials on the “Onion” diagram originally introduced in process integration studies for the energy efficiency area (/4/), and later developed further in the 1990s under the Danish CO₂ Agreement Scheme for large industries (/5/), see Figure 5.

The idea of the “Onion” diagram is for each individual end-user of energy to target all aspects of energy efficiency “inside-out” from “energy service” to “good housekeeping” (operator behaviour) – divided into logical steps in order to establish a structured way of dealing with energy efficiency.

Examples of “energy services” to investigate are:

- HVAC (ventilation): Does the required air change rate or room temperature correspond to present usage of the ventilated area? Or can the basic parameters that significantly influence energy consumption be challenged and eventually changed?
- Cooling systems: Is cooling with brine and glycol necessary for all purposes or can individual processes be optimised and changed with a view to either reducing the cooling demand or circulating cooling water at a higher temperature (ambient air/natural cooling)?
- Drying process: Is the targeted amount of dried material after the drying process necessary, or can the drying parameters be adjusted to reduce the heating demand?

Such approaches might appear academic and complex to use for SMEs, but experience shows that most of the structure in the “Onion” diagram is very well suited for these companies also. It is important that everyone understands that minimising energy needs (minimising “energy services” reduces the need for energy supplied by utility systems) is an important first step before utility systems can be optimized.

A slightly modified structure of the onion diagram comprising the following sections has been used for the checklists:

- Purpose of system (“energy service”)
- System efficiency
- Control strategy
- Maintenance
- Energy meters
- Relevant links and literature

Each checklist comprises four A4 pages (a front page, 2 pages with items to check, and a back page for brief report of findings and recommended improvements. Table 1 shows items to check in the section “Check purpose of system” in the Ventilation checklist. Table 2 shows some of the items to check in the section “System efficiency”.

Such technical checklists have been developed to cover the most important energy consuming areas in SMEs:

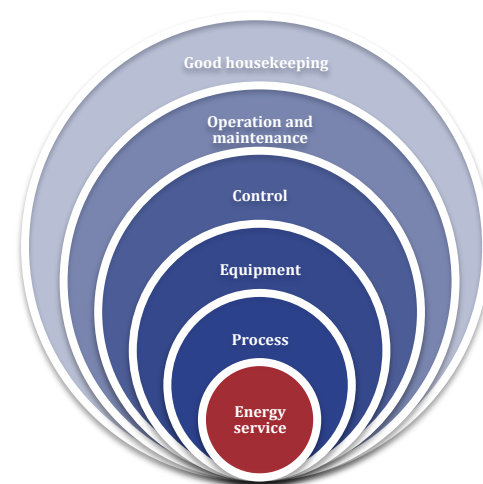


Figure 5. The “Onion” diagram (/4/).

Table 1. Ventilation checklist – “Check purpose of system” section.

What to check	How to do it
Ventilation needs	
Check purpose of system	Ventilation needs are determined by your indoor climate requirements and by factors that impact on it.
	Check original and current indoor climate requirements. These are a mix of working environment requirements, and your requirements in relation to comfort, processes and machines.
	Check or map out original and current factors that impact on the indoor climate. Impacts are typically a mix of heat generated by human activity, IT equipment, lighting, machinery, etc. Finally, you should also take account of heat loss in the building envelope, solar energy ingress, as well as dust, gasses and odours from work processes and human activities.
	Check whether the requirements or the impacts have changed since the system was built, and whether you can retrofit the system and its control system so that it meets your actual needs.
Check if requirements vary	Check if requirements vary, and whether the control system manages the system in the most energy efficient way, 24-hours a day, all week, and all year. Evaluate the need for variable airflow, timer control and variable thresholds for temperature, moisture and air quality.
Settings	Check if airflow, room pressure, temperature and humidity are set with a suitable interval between high and low thresholds, and that it is possible to change these parameters to achieve even lower energy consumption.
Avoid wasting heating	It's better to heat with radiators than by using ventilation. Heating with ventilation may be a good idea if you use a lot of recirculation.

Table 2. Ventilation checklist – part of “System efficiency” section.

System efficiency	
SFP (Specific Fan Power)	Measure the total supply airflow and the total power of all motors. Calculate the specific consumption. The result should be less than 2.1 kW/(m³/sec) for the whole system.
Ventilator efficiency	Check if energy saving components are fitted such as energy efficient fans, motors, belts and fan housings. Consider replacing them with more efficient ones if not.
	Check that the size matches the requirements. Adjust the motor size and fit a variable speed drive for controlling the motors. Possibly change to a more efficient low resistance motor type (e.g. PM Motor).
Heat recovery	Check if you use heat recovery, and whether this is functioning optimally. Pressure loss should preferably be less than 150 Pa.
	If the efficiency is less than 60–70%, you should investigate the viability of replacing or optimising your heat recovery process.
Recirculation	Investigate whether you can increase the level of recirculation without compromising the indoor climate requirements.
	Check that the damper control system is configured so that it is always set to the lowest pressure loss.
	Check the pressure level in the mixing chamber when it is open for partial recirculation. Overpressure is a sign of too little fresh air – check the fresh air intake.
Filters	Measure the pressure loss across the filters in the ventilation system. The pressure should always be less than 200 Pa for a normal filter, and less than 80 Pa for a coarse filter. Make sure the filter is one of the recommended types, that it is clean, dry, has no holes, and that the edges are properly sealed.
	Check if the filters cover the complete unit cross-section, and consider the feasibility of having a larger filter area with lower pressure loss.
Cooling and heating coils	Measure the pressure loss across all heating and cooling coils. Clean as necessary and repair damaged fins. Pressure loss should be less than 25 Pa for heating coils and under 130 Pa for cooling coils.
	Check if the coils utilise the complete unit cross-section, and consider the feasibility of having larger coils with lower pressure loss.
Cooling coils	Pressure loss in the coolant circuit should not exceed 15 Pa in standard (not dehumidifying) cooling coils with a capacity under 30 kW/(m³/sec). Pressure loss should not exceed 25 Pa in coils with a capacity over 30 kW/(m³/sec) if these are also used as dehumidifiers.
	Cooling fluid temperature should preferably be 3–5 °C less than the required supply air temperature on the output side of the cooling coil. The cooling system is less efficient if you use unnecessarily cold fluid. This is because the compressor operates worse, and because the number of fresh air cooling hours will be less.
	Either you or the Building Monitoring System (BMS) should be able to vary the temperature of the water passing into the cooling coil between 6 and 13 °C.

- Ventilation systems
- Heating systems
- Cooling systems
- IT, servers and office equipment
- Building envelope
- Lighting
- Compressed air and vacuum systems

Through comprehensive mapping of energy consumption in Danish industry (/5/) it can be argued that the energy consumption for these 7 areas accounts for approximately 80 % of the consumption in SMEs.

In addition to these technical areas, checklists have also been prepared for more general and system-oriented checks:

- Overview checklist (basically for mapping of energy consumption by end use)
- Automatic control checklist (for checking and implementing control parameters for most ventilation, lighting, heating, and idle load situations in general)
- Waste heat checklist (for identifying opportunities to use waste heat to heat buildings and water)

These 3 checklists overlap to a certain extent with the 7 more technical checklists, but discussions in focus groups with SMEs have identified the need to promote checks in different ways based on how the companies themselves see the opportunities. It has been very important for GE to use the wording and initiatives proposed by the SMEs themselves rather than promoting a completely developed scheme by GE.

Also a number of methodology tools have been elaborated:

- Guidance on energy management “light” (in Danish) – based on most important elements in ISO 50001
- Good housekeeping and operator influence – campaign materials for “small” SMEs.

The good housekeeping campaign materials are expected to be a particularly good “seller” as the management in many of the participating companies would like to kick off their energy campaigns by making them visible to all employees as a first low-cost measure.

Finally an important area raised by GE’s focus groups in the commercial sector is how to obtain maximum energy efficiency when purchasing new equipment – for example, new HVAC systems, cooling systems and machinery.

Several companies report that most manufactures can deliver equipment with good component efficiency, but that control systems often are often delivered with faults that result in inefficient operation once the equipment is put into service. Similarly, maintenance instructions are not delivered so building owners never have a real understanding of how to maintain their systems in good working condition in energy efficiency terms.

To address this issue, GE has also produced technical specifications as appendices to procurement materials for the following technical areas:

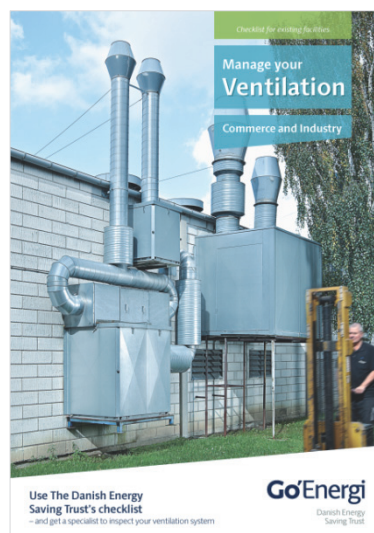


Figure 6. Ventilation checklist.



Figure 7. A fitness centre in the Copenhagen area carried out a ventilation check on a 2-year-old HVAC system. A specialist identified that the heat recovery system had been defective for 2 years with 40,000 Euros per year in additional costs.

- Ventilation
- Cooling system (air conditioning)
- Display cabinets
- Heating systems
- Production machinery
- Lighting
- Building envelope

Apart from the technical specifications, the specifications also state that manufactures must deliver properly configured equipment and systems in full working order in energy efficiency terms. In addition they must provide a maintenance plan that specifies which aspects must be kept in focus to maintain energy efficiency at a high level.



Figure 8. An 8-page introduction to basic energy management activities (in Danish).



Figure 9. A colourful template for good housekeeping campaigns (in Danish).

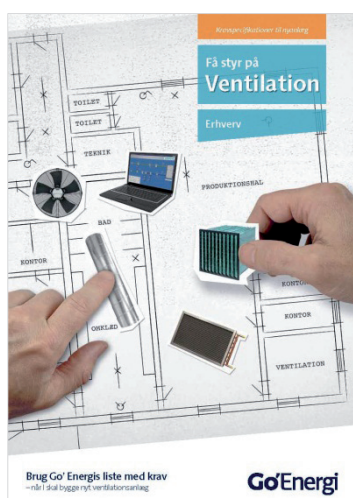


Figure 10. Procurement guideline for ventilation.

Concept for local networks at municipalities

At the planning stage of the network concept for SMEs GE has been in dialogue with several municipalities and as a result it was able to identify a significant interest in establishing local “sustainability networks” for SMEs. This among other reasons is explained by the fact that quite few Danish municipalities are engaged in national and international climate initiatives (17/–19/).

However a number of barriers have been raised by the municipalities:

- Municipalities are short of resources and, apart from establishing contact with local companies, cannot allocate any resources to operate a scheme.
- No staff at the municipalities have the technical capabilities to promote energy efficiency to local industries or even guide them in their first steps to improve energy efficiency.
- The budgets are tight and do not allow funding of energy audit activities. Furthermore, under Danish law the municipalities are not allowed to pay for such work in support of local SMEs.

To overcome these barriers, a network concept was developed by GE based on the following principles:

- A local municipality or local business network hosts the network for private sector industries
- GE delivers agendas and plans for network meetings covering a 2-year period and further runs the meetings.
- The municipality and/or local business council is responsible for sending invitations to every event
- Events take place at different local companies – not at the municipality’s premises
- GE delivers technical materials and promotes checklists to the members
- GE supplies a list of qualified technical specialists to carry out checks
- Companies pay for checks at normal rates (fixed price per check similar to 1½ day of consultancy work)
- Technical specialists present checklists and case studies at network meetings

A cornerstone in the concept is that network meetings must be case-oriented and take place at local companies. Some efforts are therefore required to convince local companies to have a check carried out in a relevant technical area, and to host the next network meeting so that participants can see how things have been investigated, and which actions have been implemented following use of the checklist.

For example, a network meeting about “ventilation systems” should take place at a company that has had a check of its ventilation system carried out before the network meeting. The local municipality needs to encourage the sequence of activities necessary in keeping with this approach.

Information and web

In order to track which companies join the municipality networks and to ensure a flow of relevant information to the participants, a web community “Kurveknækker Erhverv” (“Industry Curvebreakers”, i.e. companies aiming to ‘break’ the upward increase in energy consumption) has been established, see (/10/) (in Danish).

The membership do only register company name, business license number (to identify sector) and key person involved in network meetings. There is an opportunity to specify absolute goals to reduce energy consumption, but most companies prefer just to join the network meetings without setting goals.

Kurveknækker Erhverv members receive regular e-mails (in Danish) such as:

- Newsletters about network activities
- Case studies
- Alerts when new relevant materials are launched on GE’s homepage
- Other relevant information

The homepage of GE (/10/) provides information to the public about which networks have been established and which companies have joined the web community.

Consultant scheme

In order to steer companies in the direction of the appropriate specialists, GE directs the companies towards the Danish scheme for officially registered energy consultants.

This scheme was developed for use by large energy intensive industries in the 1990s and today hosts approximately 40 consultants with more than 5,000 documented hours of experience in industrial energy efficiency.

To qualify for the Danish scheme consultants need to attend a 1-day training course for each of the technical areas covered by the checklists:

- Ventilation systems
- Heating systems
- Cooling systems
- IT, servers and office equipment
- Building envelope
- Lighting
- Compressed air and vacuum systems

Following their attendance in these training courses the names of the consultants are listed on GE’s homepage (/10/) and GE promotes these consultants at all network meetings. In addition, the consultants have the opportunity to market themselves at network meetings, which are also the forums at which checklist results are presented.

Status and experiences

By early June 2012, the status concerning the development and implementation of the network concept for SMEs is positive and promising:

- 1/3 of the municipalities have agreed to establish a network for local companies
- 1/3 of the municipalities are committed to a further dialogue about establishing a network
- 1/3 have indicated that pressure on resources presently prevents such an initiative.

By late May, 120 companies have signed up to “Kurveknækker Erhverv” and it is expected that this number will pass 400 by late 2012. Nonetheless, many of the planned networks are still in the start-up phase, where local companies have not yet attended any network meetings.

The network concept is also facing some challenges:

- It takes time to move from “interested in network” to “network in operation”. GE began promoting the concept in September 2011, and by late April 2012 only 5 networks are fully operational.
- It is difficult to convince companies to pay for a check-up. Consequently, even though they recognise that specialist assistance is worthwhile paying for, it is necessary to “flush them out” during network meetings.
- Some of the municipalities have identified alternative funding opportunities to encourage the positive development of network activities.
- It takes quite some effort to arrange successful network meetings. E-mail notifications about future meetings are only replied to by very few companies and it has been found necessary to follow up with a personal call to the person responsible for energy in the companies in order to receive a confirmation of their attendance at the next meeting.
- Agenda planning for network meetings has to be very dynamic. New political initiatives influencing energy efficiency are of great interest to participating companies. New technologies are also “hot topics”. For these reasons, the maximum planning horizon is 3–6 months, and an up-to-date insight into energy efficiency in industry and buildings is necessary to plan the right meetings.

Among the first 10 companies carrying out a check, 4 have implemented energy savings equivalent to 10–15% of their total energy consumption. A further 3 are in the process of deciding which additional steps to take. The general conclusion is that from a technical angle the relative energy saving potential is not only significantly higher than in large industries, but also that payback times are relatively longer due to the less energy-intensive character of the companies concerned. In total, 10 staff members from GE have been involved in developing the network concept and related materials. Once fully operational it is expected that a staff of 6–8 people can run the program. If the development described above continues, the network concept will be a cost-effective way to approach

the SME sector when comparing man-hours used to run the networks to number of companies deciding to carry out investigations in energy efficiency.

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