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Success and failure in the promotion of an increased energy efficiency in industry

- A comparative evaluation of the implementation of policy instruments in five EU countries

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Policy instruments, evaluation, implementation, industry, energy efficiency

Abstract

The objective of this paper is to make a comparative analysis of the implementation of five public policy instruments directed to the industry sector, which have in common the aim to promote an increased energy efficiency. The empirical material for the paper comes from ex-post evaluations of the policy instruments carried out within the EU-project AID-EE (Active Implementation of the European Directive on Energy Efficiency). All five instruments were implemented in countries from the north of Europe (Finland, Norway, Denmark, Germany and the Netherlands), which facilitates a comparison since administrative cultures and market conditions are fairly similar. The focus of the paper is to discuss and compare some key factors that contributed to success or failure in the implementation of the five policy instruments. It is argued that there are some important explanatory factors that all, or most, of the policy instruments have in common. Three such factors are analysed: stakeholder involvement in design and implementation, flexibility in the implementation phase, and the integration of policy instruments.

Introduction

Increasing energy efficiency in the industry sector is today an important policy goal for many governments. Within the EU, many different types of policy instruments are being applied, and there is an increasing interest to use policy instruments to promote energy efficiency. This process will be further advanced by the Directive on Energy End-Use Efficiency and Energy Services that was adopted by the Council of the European Union in 2006, which puts ambitious energy efficiency targets on Member States. In order to improve policies on energy efficiency for industry and facilitate the implementation of new policy instruments, there is a need to learn from the experience of policy instruments that have already been put into practice. Evaluations of energy efficiency policy instruments have focused on net impact, target achievement and cost-effectiveness, which are important factors in order to assess the effects of policy instruments. However, an equally important aspect is to assess the *reasons* why the implementation of policy instruments succeed or fail.

The aim of this paper is to make a comparative evaluation of the implementation of five policy instruments for energy efficiency in the industry. The evaluation will discuss some common factors that have had an important effect on the implementation of the policy instruments, and which can be expected to be of general relevance.

The empirical material for the paper is taken from ex-post evaluations of five policy instruments that were made within the research project AID-EE (Active Implementation of the Directive on Energy Efficiency) in 2005-2006. The policy instruments are:

- Energy concepts for trade and industry sectors in North Rhine-Westphalia (Germany)
- Energy investment deduction scheme (the Netherlands)
- Voluntary agreements on energy efficiency in trade and industry (Denmark)
- Energy audit programme and voluntary agreements (Finland)
- Industrial energy efficiency network (Norway).

All evaluations used the same evaluation method called theory-based policy evaluation. In the evaluations, the complete implementation process of the policy instrument was reconstructed. An analysis was then made of each step in the implementation process, which included the assessment of indicators in order to determine whether the step has been successful or not, and the analysis of success and failure factors in order to explain the reasons behind success or failure. The evaluations were based on interviews and document studies.

An introduction to the five policy instruments

The five policy instruments that are evaluated in this paper have both similarities and differences that have to be explained before analysing the factors that affect their implementation (for a short introduction to the policy instruments see Box 1). The first thing to note is that they are all fairly soft policy instruments, in so far that they do not pose any mandatory obligations on companies to carry out certain measures, they are thus not administrative policy instruments. This is not a coincidence. Within energy policy, economic, voluntary and informative instruments are common in relation to the industry sector, since a fundamental policy goal of most governments is to protect the competitiveness of industry, which is partly done by maintaining a stable and affordable energy supply for industry. The five cases in this study show a mix of economic, voluntary and informative instruments (see Table 2). The Energy Concepts for Trade and Industry Sectors (ECTIS) in North-Rhine Westphalia in Germany is a purely informative instrument where the aim is to develop energy concepts and energy efficiency guidelines for different industry and service sectors. The Energy Audit Programme (EAP) in Finland and the Industrial Energy Efficiency Network (IEEN) in Norway are examples of instruments that are mainly informative (provision of energy audits) but which also contain subsidies to companies for carrying out audits and energy saving investments. The Energy Investment Deduction Scheme (EIA) in the Netherlands and the Voluntary Agreements on Energy Efficiency in Trade and Industry (VA) in Denmark differ somewhat since they include a strong fiscal measure. In the EIA, companies get a tax rebate on part of their investments in energy efficient technology and in the VA scheme companies get a rebate on the CO₂ tax if they sign a voluntary agreement on energy efficiency with the government. To complicate matters further, two of the instruments include voluntary agreements: the VA scheme in Denmark and the EAP in Finland which is closely linked to a voluntary agreement scheme. Voluntary agreements mean that the companies that join oblige themselves to identify energy saving potentials and (in the Danish case) to implement profitable energy saving measures.

Table 1. Comparison of the five policy instruments.

| Name of instrument | Starting year | Target groups | Total energy use of target groups | Target | Net impact | Government costs (MEUR) |
|--|---------------------|-----------------------------------|-----------------------------------|---|--|---------------------------------------|
| Energy Concepts for Trade and Industry Sectors (North-Rhine Westphalia, Germany) | 1996 (still active) | Industry and service sectors | N.a. | Increase awareness of EE. Concerted development of sectors specific EE measures. Inform on innovative technologies. (No quantified targets) | Unknown | 1.5 (1996-2003) (0.2/year) |
| Energy Investment Deduction Scheme (The Netherlands) | 1997 (still active) | Light industry and service sector | 700 PJ | Save energy and accelerate market development of EE technologies. (No quantified targets) | 11.5 PJ (1.4 PJ/year) High uncertainty | 160 (1997-2004) (17.8/year) |
| Voluntary Agreements on Energy Efficiency in Trade and Industry (Denmark) | 1996 (still active) | Trade and industry sectors | 150 PJ/year | 1.1 Mton CO ₂ reduction in the period 1996-2005 (about 0.8 Mton was achieved in 1996-2003) | 9.6 PJ (1.2 PJ/year) High uncertainty | 250 (including tax rebate, 1996-2005) |

| | | | | | | |
|---|---------------------|--------------------------------------|--------|--|--|--------------------------------|
| | | | | | | (25/year) |
| Energy Audit Programme and Voluntary Agreements (Finland) | 1992 (still active) | Industry, service and energy sectors | N.a. | Energy audits in 80% of building volume in private service sector and 80 % of energy use in industry sector by 2005. 80% of building volume in public service sector by 2010. (Private services 25%, industry 70% and public service sector 50% by 2004) | 24-29 PJ (2 PJ/year) High uncertainty | 36 (1992-2004) (2.8/year) |
| Industrial Energy Efficiency Network (Norway) | 1996 (still active) | Industry sector | 300 PJ | Raise awareness for saving energy. (No quantified targets) | 6 PJ (0.6 PJ/year) High uncertainty | 13.5 (1996-2004) (1.5/year) |

Table 2. Key features of the five policy instruments.

| Name of instrument | Type of instrument | Key characteristics of instrument | Level of pressure on firms to carry out energy saving measures |
|--|--|--|---|
| Energy Concepts for Trade and Industry Sectors (North-Rhine Westphalia, Germany) | Informative | Development of energy concepts in different sectors to help firms find ways to improve energy efficiency. | Low. No pressure to carry out measures. Dialogue between firms and authority encourages saving measures. |
| Energy Investment Deduction Scheme (The Netherlands) | Fiscal and informative | Tax relief to firms that invest in energy efficient and renewable energy technologies. Establishment of list of technologies that are approved. | Medium. No compulsory measures. Tax relief is a strong incentive though. |
| Voluntary Agreements on Energy Efficiency in Trade and Industry (Denmark) | Fiscal, voluntary agreement, informative and subsidies | Tax relief for firms that sign agreement to implement energy efficiency measures. Energy audit and energy management system of firms. Subsidies for investments in energy saving measures. | Medium. No compulsory measures. Tax relief is a strong incentive though. Firms that sign VA are obliged to implement profitable measures. |
| Energy Audit Programme and Voluntary Agreements (Finland) | Informative, voluntary agreement and subsidies | Voluntary agreements to implement energy efficiency measures. Subsidies for firms to carry out energy audits. Subsidies for investments in energy saving measures. | Low. No pressure to join VA. Firms that join VA are obliged to carry out energy audits but not energy saving measures. |
| Industrial Energy Efficiency Network (Norway) | Informative and subsidies | Subsidies for firms to carry out energy management and energy audits.. | Low. Energy audits are subsidised. No pressure to carry out energy saving measures. |

Box 1. Summary of the five policy instruments.

Energy concepts for trade and industry sectors in North Rhine-Westphalia (Germany)

The Energy Concepts for Trade and Industry Sectors (ECTIS) were introduced in 1996 by the Ministry of Transport in North Rhine-Westphalia. By 2003, energy concepts had been developed in five industry sectors (metal and metal processing; nutrition; textile; synthetic processing; wood and wood processing) and in two other sectors (hospitals and horticulture). The aim of the energy concepts are to provide detailed and differentiated sectoral analyses of production processes and energy uses, localise typical weak points in production processes and cross-sectoral technologies, show examples of good practice, and provide recommendations for typical measures at the company level. The procedure of creating an energy concept for a specific sector is a combination of a top-down and bottom-up process. First, capacity building is carried out on the sectoral level, with the formation of a working groups that includes the ministry, the project-executing organisation, sectoral associations, regional chambers of commerce and energy consultants. Sectoral economic and energy-relevant data on is also collected in the first phase. In the next phase, individual firms are approached both to gain information about investments in energy efficient technologies and to give consultation on energy efficiency. The data is then used to write a sectoral guideline including typical energetic weak points and advice on energy efficiency measures.

Energy investment deduction scheme in the Netherlands

In 1997, the Energy Investment Deduction Scheme (EIA) was introduced in the Netherlands. The policy objective of the EIA is to stimulate investments in energy saving equipment (based on best available technologies) and renewable energy. Another goal is to improve the profitability of such technologies. The scheme offers Dutch companies tax relief on investments in energy efficient technologies and renewable energy technologies. Up to 44% of the investment costs may be offset against taxable profits, provided that the equipment appears on the so called Energy List or meets specific energy savings criteria (e.g. in euro/GJ saved). The Energy-list includes descriptions of concrete technologies, which are divided into five fields of application: buildings, processes, heat and power co-generation, transport and renewable energy sources.

Voluntary agreements on energy efficiency in trade and industry in Denmark

The Danish scheme on voluntary agreements (VA) on energy efficiency in industry was launched in 1996 as part of the Green Tax Package. The main objective of the Package was to reduce the carbon dioxide (CO₂) and sulphur dioxide (SO₂) emissions from trade and industry. The Package consists of three policy instruments that are closely linked: green taxes, subsidies and voluntary agreements. The objective of the VA scheme is twofold; firstly to encourage energy efficiency in industry in order to reduce CO₂ emissions and secondly to ensure that the competitiveness of Danish industry is not weakened by the increased green taxes. The agreement scheme mainly targets energy-intensive industries (according to Danish standards) that are given the possibility to enter VAs with the Danish Energy Authority (DEA). The participating companies belong mainly to the food and brewery sector and the greenhouse industry. The VAs obligate the companies to undertake a number of tasks promoting energy efficiency, such as the implementation of an energy management system, energy audits (later replaced by energy flow screening), special investigations of complicated processes and the implementation of energy saving measures. In return the companies obtain a CO₂ tax rebate. Companies are obliged to implement all profitable energy saving measures.

Energy audit programme and voluntary agreements in Finland

The Energy Audit Programme (EAP) in Finland was introduced in 1992. The central part of the programme is subsidies (40-50 %) to companies and organisations who decide to carry out energy audits of their buildings or processes. From the energy audits, saving potentials and saving measures are identified. The companies and organisations then decide whether to carry out saving measures or not. The EAP also includes many other elements to support the carrying out of energy audits: development of energy audit models, development of auditor's tools, training and authorisation of auditors, monitoring and quality control. The EAP is closely connected to the Voluntary Agreement (VA) scheme which started in 1997. The companies who join the VA scheme commit themselves to carry out energy audits. Within the VA scheme companies can also receive subsidies for making investments in energy saving measures. The EAP and the VA scheme have a broad scope regarding the target groups which include non-process and process industry, the private service sector, municipalities and the energy sector.

Industrial Energy Efficiency Network in Norway

The Industrial Energy Efficiency Network (IEEN) in Norway was introduced in 1989 but started to play a more important role for identifying and realising the industrial energy savings potential from around 1996. About 900 companies are members of the network today. The main component of the IEEN is that members of the network receive financial and technical support in order to identify energy saving potentials. In a first step the focus is on energy management activities (energy policy, training, monitoring) and in a second step the focus is on in-depth analysis of possible and profitable investments for energy efficiency. Companies receive subsidies to carry out energy management and energy analysis. The IEEN also includes a benchmarking system allowing members to extract information about their own energy performance in relation to other plants within the same industry sector.

Note: The summaries of the policy instruments are taken directly from the five evaluation reports (Schüle 2006, de Visser 2006, Ericsson 2006, Khan 2006, Modig 2006). Minor changes have been made on some of the texts.

The differences between the instruments are important to consider when comparing both the effects of the instruments and the challenges when implementing them. For example, the costs for the government for the different instruments vary considerably (see Table 1). The ECTIS is rather cheap since it only includes information. The EAP and the IEEN have somewhat higher costs since they include subsidies to companies. Finally, the EIA and the Danish VA are considerably more expensive for government since they include tax rebates to companies. When comparing costs with net impact (in PJ of energy saved) of the instruments it does not appear that the fiscal instruments are more effective and they thus seem to have a comparatively low cost-efficiency. However, it is rather precarious to draw such a conclusion. First, great care has to be taken when comparing net impact of different instruments depending on a number of factors such as (i) high uncertainties in the calculations of net impact (depending on measurement methods, quality of monitoring data, extent of free riders etc.), (ii) different potentials of energy savings depending on what has been done before, (iii) different coverage of target groups, (iv) uncertainties regarding what would happen if the instrument would not have been implemented and (v) country specific circumstances (climate, sectoral structure, age of technology). For example, the high net impact in Finland could partly be explained by the fact that the industry sector is energy intensive and that little attention had been paid on energy efficiency before. Second, the goals of the policy instruments can differ which affects both net impact and costs. For example, in the Danish case an important goal was to make sure that the competitiveness of Danish industry was not harmed, which was the reason why companies got a tax rebate on the CO₂ tax if they decided to join the VA scheme.

What can be said then about the successfulness of the different instruments? First it should be noted that for three of the instruments (ECTIS, EIA and IEEN), no quantified targets exist (Table 1). The goals are instead formulated in quite vague terms such as increase awareness of energy saving potentials, accelerate market development of energy efficient technologies and increase energy saving. This makes it difficult to assess whether the goals are reached or not. For the other two instruments quantified targets exist in the form of volume of energy audits (EAP) and amount of CO₂ emission reduction (Danish VA). For these two instruments target achievement is satisfactory. If it is not possible to reach a quantified assessment of the success or failure of the instruments, what can be said in more general terms? According to the evaluations that this paper is based on, most of the five instruments have been considered as generally successful. Especially the EAP and the Danish VA are brought forward as good examples of how to carry out energy audits and voluntary agreements. For the EIA there were some doubts regarding to what extent the Energy List actually contributed to the effectiveness of the policy instrument. The ECTIS is maybe the most problematic of the five policy instruments. Some of the sectors that were covered could be regarded as success cases since sectoral actors were active and many individual companies were consulted. Other sectors were less successful, with passive sectoral stakeholders and low interest from individual companies.

Factors affecting the implementation of the policy instruments

In the following sections, three general factors that affect the implementation of policy instruments will be analysed, they are: stakeholder involvement, flexibility in the implementation phase and integration of policy instruments. Before embarking on this discussion it should be noted that there are other factors, of a more context-specific or instrument-specific nature, that affect the implementation of policy instruments that are not covered in this paper. Examples from the five case studies include: the design of the Energy List in the EIA in the Netherlands, the design of the training for auditors and energy audit models in the EAP in Finland, the design and dissemination of the sectoral guidelines in the ECTIS in Germany and the problem of asymmetric information in the VA scheme in Denmark. Thus, each policy instrument has its unique challenges and there are no universal rules for how to best implement a policy instrument. The aim of the following discussion is, however, to put the focus on factors of common importance that all policy makers should consider when designing and implementing energy efficiency policy instruments aimed for the industry sector.

Stakeholder involvement

Stakeholder involvement in the design and implementation of policy instruments can have an important effect on how well the instrument works. There are two main ways in which stakeholder involvement can enhance the implementation of policy instruments. First, it can increase the usefulness of a policy instrument and make it better adapted to the needs and preferences of stakeholders by letting them have an influence on design and implementation. Second, it can improve the acceptance of the instrument since stakeholders will have better knowledge of the purpose and functioning of the instrument and since they have had the possibility to influence. In the five cases that have been studied, both these effects of stakeholder involvement could be observed to varying degrees. Before the discussion on the effects of stakeholder involvement, it is appropriate to specify what is meant here by the term stakeholder, since it is quite a vague term that can have many different meanings. The stakeholders

in the five cases studies are mainly companies that use energy in their activities, but also other actors such as energy consultants and branch organisations. Individuals, public organisations or NGOs are, however, not included in the discussion in this paper.

Two types of stakeholder involvement could be observed in the cases studies: (i) involvement in the design and/or development of important components of the policy instrument and (ii) dialogue with stakeholders about their involvement in the policy instrument. In the Energy Audit Programme (EAP) in Finland, energy audit models, which are used to guide the work of auditors, are developed in close co-operation with energy auditors (Khan 2006). Experienced auditors are contracted to make a first version of the model, which is reviewed by other auditors. The draft version of the model is then used in a few pilot projects, where companies have the possibility to give their comments, before it is finally officially published. This process of developing an energy audit model guarantees that it is relevant in practice to the stakeholders who will actually use the model (ibid). Also other parts of the policy instrument involve stakeholders actively, such as the training of auditors. The Energy Concepts for Trade and Industry Sectors (ECTIS) is an essentially participatory instrument, since the energy concepts are developed in close co-operation with relevant stakeholders (Schüle 2006). At the sectoral level, branch associations, regional chambers of commerce and energy consultants are engaged in working groups to study the general energy situation of the sector and to develop a guideline to companies about how to improve energy efficiency (ibid). The positive effects of involving sectoral stakeholders are both that the guidelines become more relevant and that it becomes easier to reach individual firms. The experience of the involvement of stakeholders was very positive in some sectors, while the sectoral stakeholders were rather passive in other cases (ibid). At the company level, individual firms were contacted in order to collect information about recent investments in energy efficient technologies and to offer consultancy to firms. Though participation of individual companies was a main aim of the policy instrument, the engagement of companies in most sectors was fairly low depending a number of reasons, such as low energy costs, economic recession in some sectors, limited capacities to carry out energy analyses, high use of renewable energy, little demand for energy advice. Individual companies were most active in those sectors where the sectoral associations had taken an active part in the development of the energy concepts and supported the participation of companies. One of the main components of the Energy Investment Deduction Scheme (EIA) in the Netherlands was an Energy List with energy efficiency technologies investments that were approved to give tax relief for companies (de Visser et al 2006). An important feature of this list was that it was continuously updated and that companies and technology suppliers had the possibility to suggest new technologies that should be added to the list. This kind of stakeholder involvement contributed to making technology suppliers motivated to take an active part in the policy instrument and made the energy list more relevant to companies (ibid). In the other two cases, involvement of stakeholders in the design and development of the policy instrument was not a prominent feature.

Particularly in the three Scandinavian cases, an active dialogue with companies and other stakeholders was an important aspect in the implementation of the policy instruments. Trust is a key word in order to understand the significance of the dialogue between authorities and companies. On the one hand, the possibilities for a constructive dialogue existed since there is a general level of trust and co-operation in the relations between government and business in the countries. On the other hand, one of the most important effects of the dialogue was that it further strengthened the atmosphere of trust between the actors and thus contributed to making the companies take an active part in the policy instrument. Through the dialogue it was possible for authorities to learn about the special needs or problems of a company and for companies to get close access to decision makers. For the two instruments in Denmark and Finland (VA and EAP) the dialogue had a further significance. In these instruments companies had a voluntary choice whether or not to join the agreement scheme, and if they did this included binding obligations to carry out auditing (VA and EAP) and energy savings (VA) (Ericsson 2006, Khan 2006). This meant that a control system was established to make sure that companies fulfilled their obligations. The existence of an open dialogue, however, made it possible to minimise the use of sanctions. Instead, the authorities sat down in discussions with the company and tried reach a common solution to the reasons for failure to comply (ibid.). This kind of soft pressure proved effective in most cases.

Flexibility in the implementation phase

Performance in the implementation phase of a programme is a key component in an evaluation of its success. The mandate and actions of the implementing agency, therefore, needs to be studied. From the five evaluations included in this overview, two main perspectives can be extracted. On the one hand it is stated as beneficial (*i.e.* it is a success factor) that the implementing agency is independent *vis à vis* the regulator (Khan 2006, Modig 2006). This allows for (although it doesn't guarantee) flexibility in the implementation of a policy instrument, and such flexibility can be seen as a prerequisite for the survival of an instrument. On the other hand, it is essential that the sectors addressed by the instrument feel that the scheme is durable, trustworthy and stable. Therefore, sometimes, it is better to stick with suboptimal implementation conditions than to rock the boat with the successive introduction of (even minor) improvements to a policy instrument (Khan 2006). Thus, for achieving and maintaining a successful

policy instrument, the implementing agency needs to not be “over-flexible”. There ought somehow to be a trade-off between these two alleged success factors (flexibility and stability), and a need to carefully strike a balance.

The Norwegian example shows how important the mandate of the implementing agency can be. From its inception in 1996 until 2001, the Energy Efficiency Network Programme was implemented by the Norwegian Water Resources and Energy Directorate (NVE), which has potentially conflicting tasks as the energy market regulator. As of 2002, the responsibility for the Energy Efficiency Network was transferred instead to Enova, a state-funded yet much freer body than the NVE (Modig 2006). This had a positive effect on the programme. The case of the Finnish Energy Audit Programme, also exemplifies a successful programme implementation by an independent state agency, Motiva.

The implementing agencies of the Voluntary Agreement Programme in Denmark (Danish Energy Agency) and the Dutch Energy Investment Deduction Scheme (SenterNovem) are not independent from the regulator. Still, the programmes were not rigid and inflexible; both were adjusted during the implementation phase.

Integration of policy instruments

Policy instruments never operate in a vacuum free from the effects of other factors in the environment. Their success or failure often depends on factors beyond the control of policy makers such as market trends, economic cycles and prices on energy and other products. The interaction with other policy instruments, either within the energy sector or in other sectors, can also be of crucial importance, and one of the key challenges for policy makers is to co-ordinate policy instruments so that they, at the best, support each other or, at least not, obstruct each other. In the case studies we could identify several good examples of the integration of policy instruments into policy packages.

The clearest example of policy integration was in Denmark. From the outset the VA scheme was part of the wider Green Tax Package, which also included green taxes (on CO₂ and SO₂) and subsidies to investments in energy efficient technologies (Ericsson 2006). Energy intensive companies who signed voluntary agreements got a rebate on the CO₂ tax (ibid.). The aim of this integration was to reach two similarly important policy goals: firstly to encourage energy efficiency in industry in order to reduce CO₂ emissions and secondly to ensure that the competitiveness of Danish industry was not weakened by the increased green taxes (ibid.). The aim of the subsidies was to further support the implementation of energy savings that were identified in the VA scheme (ibid.). The evaluations of the Green Tax Package show that this type of policy integration was quite successful (ibid.).

In Finland, policy integration was also an important factor, however, in this case it was introduced step by step instead of being planned from the start of the programme. In 1992, the Energy Audit Programme was introduced. During the first years it became widely known among companies and other target groups and the main components of the policy instrument (training scheme, auditor’s tools, audit models, monitoring) were being developed (Khan 2006). However, the volume of energy audits did not increase sufficiently and the effectiveness of the policy instrument could be questioned. In 1997, the VA scheme was introduced which blew new life into the EAP (ibid.). One of the preconditions of the voluntary agreements was that the engaged companies had to carry out energy audits, which meant that the volume of audits increased dramatically. Likewise, the fact that the EAP already existed was important in order to be able to implement the VA scheme smoothly. With time the two policy instruments have become so intertwined that they are in fact a tight policy package (ibid.). A further example of step by step policy integration, was the introduction of the Energy Service Company (ESCO) programme in 2000. An ESCO is a company that takes responsibility for financing energy efficiency measures for other companies. The investment for the ESCO is paid back by the savings that are made from the energy efficiency measures. The reason to create an ESCO programme was that the authorities were not satisfied with the level of implementation of energy saving measures with a medium pay-back time (appr. 2-5 years) (ibid.). ESCOs were identified as an actor that was well suited to take care of these type of investments. The ESCO programme consisted of measures to facilitate the development of an ESCO market (e.g. through standard contract model and subsidies to ESCO projects). The ESCO market is starting to grow but has not yet been so successful as policy makers had expected (ibid.).

In the Netherlands, policy integration has taken place in a more general sense and there has not been an explicit linkage between different policy instruments. The Energy Investment Deduction Scheme (EIA) is one of several instruments that are used in the Netherlands to support energy efficiency in industry and services (de Visser et al 2006). The two main tools of the EIA are (i) the possibilities for companies to get a tax relief on energy efficiency investments, which promotes increased investments, and (ii) the Energy List which makes it easier for companies to find energy efficiency investments that suit their situation (ibid.). Other policy instruments (e.g. long term agreements and investment subsidies) give further incentives to companies to invest in energy efficiency, which increases the effectiveness of the EIA (ibid.). There has, however, also been some overlap of instruments, which has meant that companies might receive too generous conditions for investments creating an increased risk for the existence of free riders (ibid.).

In the German case, there was an example of lack of integration of policy instruments, which inhibited the success of the policy instrument. As a part of the Energy Concepts for Trade and Industry Sectors (ECTIS,) the state of North-Rhine Westphalia offers advisory services on energy efficiency to individual companies (Schüle 2006). However, the Federal Government also offers similar services to companies, and the two advise schemes have not been sufficiently co-ordinated, resulting in decreased efficiency and possible confusion among companies (ibid.). An alternative would be a stronger integration of the instruments, with e.g. a commonly developed project for one sector, in which both institutions co-operate to offer a joint sectoral concept, initial advisory services and the co-funding of individual energy concepts (ibid.). This would require common planning and management of activities, co-ordinated activities in advertising, networking and PR-conduction, and a commonly developed project management. The result would, however, be a concentration of limited financial resources and staff (ibid.).

Discussion and conclusions

The aim of this paper is to highlight the importance of common factors that affect the implementation of energy efficiency policy instruments directed to industry. Three such factors have been analysed in the paper: stakeholder involvement, flexibility in design and implementation and integration of policy instruments.

It has been shown that in the five cases stakeholder involvement has contributed to the successful implementation of the instruments, making them more acceptable to stakeholders and better adapted to their needs. It can be argued that stakeholder involvement in many ways is easier for policy instruments that are directed to industry than those that are aimed at households and the service sector. First, industry as a stakeholder is a smaller and relatively homogenous group which makes it easier for authorities to create a dialogue. This could be noted in the EAP in Finland where dialogue with the industry sector, where a small number of companies account for the majority of energy use, was much easier than with the service sector, which consists of a large number of small companies. Second, the companies in the industry sector are competent and well organised and have a good knowledge about energy use in their activities. This means that the dialogue between authorities and industry is between two actors on the same level. As mentioned earlier, government has little interest in forcing industry to carry out measures and most policy instruments, as those covered in this paper, are rather soft. This reduces the reasons for conflict and tension and makes stakeholder involvement easier. Finally, there often exist ties between industry and authorities, since the same people work alternatively in the different sectors, since the people often share the same professional background and since they meet frequently in their daily work. Such ties naturally facilitates the dialogue. However, it still be noted that stakeholder involvement is not without problems and it has its drawbacks. To start with it makes planning and implementation more complicated and often more time-consuming. Second, it can often be quite difficult to engage stakeholders in the planning and implementation phases. This could be observed in the ECTIS in Germany, which to a large extent depended on the active participation of stakeholders at the sectoral and company level. In those sectors where stakeholders did not engage the policy instrument worked rather inefficiently. Consequently, one of the lessons learned from the evaluation was that energy concepts should only be developed in those sectors where there already exists a genuine interest among the stakeholders to join in the project. Third, there is a risk that some stakeholders are not involved which could hurt the effectiveness of the policy instruments at a later stage (Schüle 2006). Fourth, there is no guarantee that stakeholder involvement actually creates increased acceptance for the policy instrument. In cases where there exist real conflicts between government and industry, stakeholder involvement will at best highlight these conflicts and at worst impede the planning and implementation of the instrument.

From the cases studies it appears that flexibility in the implementation of the policy instrument is important in order to have a smooth implementation and increase the performance of the policy instrument. An important conclusion of the discussion is, however, that there has to be a balance between flexibility and stability. On the one hand, flexibility is important to allow for necessary changes in the policy instrument. On the other hand, stakeholders highly appreciate stable policy instruments and are wary of too many changes. A hypothesis that is worthy of further investigation is whether flexibility is connected to the independence of the implementing agency from the regulator. The case studies in this paper do not offer a basis for a conclusive argument to be made. In two of the cases, the implementing agency was relatively independent and in two other they were identical with the regulator. In all four cases it was, however, possible to observe a sufficient flexibility in the implementation phase.

Integration of policy instruments is a key issue in order to improve their effectiveness. From the cases in Denmark and Finland, it could be concluded that the integration of policy instruments can be either a strategy from the start, introducing several policy instruments at the same time in a defined policy package (Danish VA), or something that is developed step by step as the needs for supporting policy instruments are identified (EAP in Finland). In the first case it is important to carefully consider all the interactions between the policy instruments and to allow for flexibility in the implementation phase if it is discovered that they work suboptimally. In the second case, it can be complicated to integrate policy instruments that have been developed separately without consideration to the fact

that they will be integrated. This means that modifications of the instruments are probably needed. The case of the EIA in the Netherlands shows both the advantages and drawbacks of a more loose integration of policy instruments. On the one hand, having several instruments working in parallel can create a strong accumulative effect, while it is at the same time possible to separate the planning and implementation of the instruments. On the other hand, there will always be interactions and as in this case, possible overlaps, between the instruments which have to be dealt with in a conscious way. If these overlaps are considered from the beginning the instruments would work more efficiently and time and resources do not have to be spent on making changes.

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