Evaluating the potential impact of the introduction of an energy performance assessment (EPK) in the Dutch industry

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Abstract

Under the recent Dutch Agreement on Energy for Sustainable Growth it was agreed to introduce a new instrument to improve corporate compliance with existing energy savings obligations under the Dutch Environmental Management Act. The new instrument is an Energy Performance Assessment (we use the Dutch abbreviation EPK) carried out by certified commercial parties. The EPK should ensure increased compliance with the Environmental Management Act and thus reduce the need for governmental enforcement capacity.

The Dutch government initiated pilot studies in nine different sectors to investigate how an EPK should be designed to ensure efficient and effective compliance with the Environmental Management Act. Stakeholders, including commercial advisors, were invited to propose innovative concepts.

We evaluated the potential effectiveness of the nine pilots in intensifying energy savings. Considering the variety of pilots and targeted sectors, designing a well-structured evaluation was our key challenge. For this purpose we used the 'Boardroom model', which assumes that company decisions on energy-efficiency investments are influenced by five 'driving forces': knowledge on energy savings, financial situation, image and market position, commitment, and policy pressure.
The results of our evaluation show that most pilots focused on developing somewhat traditional monitoring and inventory tools that enhanced a company's knowledge on energy savings. Therefore most EPK approaches focused on a single driving force: knowledge. We concluded that in order to become effective, the EPK should be embedded in a broader mix of policy instruments that are able to affect all five driving forces. Our more qualitative observations from the pilots suggest that the pilot project design, that usually included all relevant stakeholders, facilitates support for future implementation of an EPK but may also hamper the development of more innovative ideas.

1. Context

In 2013 an Agreement on Energy for Sustainable Growth was signed by forty-seven Dutch organizations. These include central, regional and local governments, employers and unions, nature conservation and environmental organizations, financial institutions and other civil-society organizations[1]. The agreement includes a comprehensive policy package to accelerate energy savings in small and medium-sized companies (SMEs). Up to 2013, policy makers paid limited attention to achieving energy savings in SMEs, while several studies revealed that there is a large untapped potential for cost-effective energy saving in SMEs in the Netherlands (i.e. CE (2011*)* ECN (2014) - details on last page).
Key instrument within the policy package to incentivise energy savings in SMEs is the introduction of a new instrument to enhance corporate compliance with existing legal energy savings obligations. Since 1993 the Dutch Environmental Management Act has required companies to implement energy efficiency measures with a payback time up to 5 years. In practice, however, the law delivers limited incentives for companies to comply with the requirements. Several inventories have shown that local authorities don't rigorously enforce these requirements (VROM, 2010). The new instrument is an

1 SER Agreement on Energy for Sustainable Growth http://www.energieakkoordser.nl/doen/engels.aspx (date 6th of February 2016)

Energy Performance Assessment (EPK) carried out by certified commercial parties. The energy performance assessment should ensure increased compliance with the law and thus reduce the need for any increase of enforcement capacity at the level of local authorities.

2. Design of the EPK

But, how to design an EPK in such a way that it facilitates efficient and effective compliance, is transparent for local authorities, and takes into account the huge variety of companies and sectors covered by the Environmental Management Act? The government decided not to come up with a proposal for the design itself. Instead, it invited stakeholders, including commercial advisors, to propose innovative concepts that could be developed and tested in nine pilot projects. The consensus approach, a typical feature of Dutch industrial energy saving policies, was also reflected in the pilots – all relevant stakeholders in each project were invited to participate: a local authority, companies, sector representatives and/or commercial energy advisors. The nine pilot projects covered seven economic sectors: car spraying, printing industry, textile care, industrial bakeries, metal industry, supermarkets, and care and cure institutions. Furthermore, two pilots projects had a regional, multi-sector, approach. The tested EPK ideas ranged from full energy-scans executed by an energy advisor, including on-site visits, to online self-assessment tools.

3. Our evaluation challenge

Our central evaluation question was: how effective are the EPK proposals in accelerating energy savings in companies. In addition, we were also asked to evaluate the support for the full-scale implementation of the EPK proposals by key stakeholders (companies, authorities, commercial advisors). It should be noted that activities within the pilot projects were limited to designing and testing different EPK ideas. Actual implementation of the EPK and assessment of investments in energy saving measures resulting from the EPK was beyond the scope of the pilots. Therefore our evaluation focussed more on the potential effectiveness of the EPK ideas (Wesselink et al, 2015). The question of how to design an EPK was echoed in the design of the evaluation: how to evaluate such a diverse set of pilots, both in terms of design as well as the sectors under consideration? This called for a structured approach that we explain briefly in the next section.

4. Boardroom model

Five driving forces for investments in the boardroom

To cope with the variety of sectors and companies, we used a single ‘boardroom’ to represent the analytical framework that applies to any company deciding to make new investments. The corporate decision making process is simplified and represented by employing five driving forces as proxies in our model (IEA, 2011) (RIVM, 2003) (RIVM, 2001):

- Driving force #1: The *knowledge on energy savings* opportunities within the company. The higher the level of knowledge on energy efficiency within a company, the greater the support for investment in energy saving. The more knowledge on energy efficiency is institutionalized within the company, the less a measure is considered as complex (technical barriers to deployment or continuous operation of core business), which increases the likelihood that measures will be implemented.
- Driving force #2: The *financial situation* of the company: companies demonstrate a greater willingness to invest in energy conservation if: (i) the profitability of the company is sufficient to ensure continuity of the business in the long-term, (ii) the additional costs for investments in

energy efficiency can be recovered (almost fully) by increasing the selling price of products and/or services, (iii) the costs to raise capital for investments in energy savings are low, and (iv) the return on investments in energy saving measures is high (i.e. payback time for energy saving measures is short).

- Driving force #3: The demands made by the public and market to improve the company's environmental or energy performance (*image & market position*). The greater the pressure brought to bear by parties such as consumers, market, suppliers, competitors, NGOs and the media, the greater the likelihood that energy conservation measures will be implemented.
- Driving force #4: The *commitment* of the company to the environment and energy efficiency. The more positive a company's attitude towards sustainability issues in general, and energy efficiency in particular, the more likely it is that energy saving measures will be implemented.
- Driving force #5: The *policy pressure* (i.e. obligations) placed on the company to achieve environmental compliance. The higher the pressure exerted on businesses by government agencies, e.g. by setting and enforcing energy efficiency standards or targets, the more likely it is that businesses will invest in energy efficiency.

The stronger the driving forces, the more likely it is that a company will implement energy saving measures. The five driving forces are illustrated in figure 1.

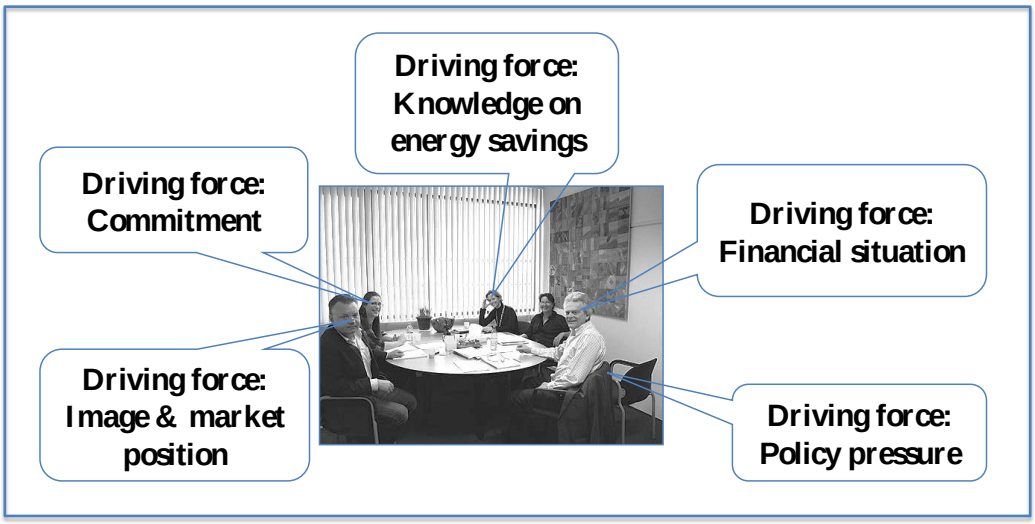


Figure 1. Five driving forces reflecting the boardroom's decision-making process concerning investments in energy efficiency. Note that in smaller companies the same driving forces will work through fewer persons.

Instruments affecting driving forces

In our boardroom model, the EPK policy instrument affects the driving forces. To support a structured analyses of how the different EPK designs affect the driving forces, we introduced a set of *instrument characteristics* and related these to the driving forces in a qualitative manner (see Table 1 and section Results and discussion).

Table 1: EPK instrument[2] characteristics and assumed influence on driving forces.

Instrument characteristic	**Assumed influence on driving forces**
Ambition level	(Affects the driving force policy pressure) If there is a huge gap between the required level of energy efficiency in order to comply with the Environmental Management Act and the current practice within a company, a significant behavioural change is required. In this case, the EPK must initiate behaviour that is not the norm, and the level of ambition is high. Where the EPK recognised existing behaviour within a company (i.e. in order to comply with the Environmental Management Act a company hardly needs to make any further investments in energy efficiency) the effect of this instrument on the company is limited.
Enforceability[3]	(Affects the driving force policy pressure) If achieved energy savings can be unambiguously measured and monitored the policy instrument can be enforced at minimum cost, resulting in an efficient instrument.
Flexibility concerning compliance	(Affects the driving force commitment) If a company has limited flexibility on how to comply with the standards set for energy efficiency under the EPK, support for the policy instrument will be lower compared to the situation in which a company has more flexibility on how to achieve the required energy savings. For example, technology-prescriptive policies provide little flexibility, whereas sectoral targets under a covenant provide somewhat more.
Confidentiality	(Affects the driving force commitment) Leading companies are often proactive in making their sustainability performance public. The majority of companies, however, are less willing to share this information with the public. Support for the policy instrument with these companies increases when it is not compulsory to make their sustainability performance public.
Scope	(Affects the driving force commitment) The EPK is focused on one theme, energy efficiency, but can be part of a broader management system including health, safety and/or Environmental Management. If the EPK is implemented as part of a broader existing system, the support for implementation of energy efficiency measures increases.
Resources	(Affects the driving forces knowledge and financial situation) If more 'resources' (knowledge and funds) are offered as part of the introduction of the EPK, the likelihood increases that companies will comply with the standard set for the instrument.

Applying the Boardroom model to evaluate the EPK pilots

We used the Boardroom model to map the *initial situation* of the five driving forces for companies participating in the EPK pilot project. Next we analysed how characteristics of the different EPK ideas could potentially contribute to *changes* in the five driving forces. It is important to note that the

2 The original Boardroom model distinguished 11 instrument characteristics. Not all characteristics are relevant for each individual policy instrument. For the evaluation of the EPK, only six characteristics were considered relevant to explain potential effectiveness of the EPK.

3 Note, that *the rigour of enforcement* (how meticulous do public bodies monitor a company's efforts to comply with policies? How strictly is compliance enforced and non-compliance punished?) is a crucial policy characteristic that affects the driving force 'policy pressure'. This aspect, however, was not part of the pilot studies.

pilot projects provided little information on actual investments in energy saving measures influenced by the EPK pilot project, because the lead-time for the pilots was too short.

5. Gathering relevant information

In the evaluation, we performed the following steps:

1. Map the status of the five driving forces within the companies that participated in the pilots and assess the potential impact of the EPK on these driving forces. Information was gathered though a structured survey, which was completed by 106 companies and organizations (i.e. 77% of the participating companies and organizations).
2. Assess to what extent the ideas for the EPK provide sufficient guarantees for local authorities that companies are complying with the Environmental Management Act. Information was gathered through an internet survey, which was completed by 7 civil servants, and by means of 6 semi-structured interviews with civil servants.
3. Make a detailed inventory of sector-specific characteristics and EPK design within the individual pilot projects. This information was collected through semi-structured interviews with the project leaders of the pilot projects and - on some occasions - with one or two other team members, including local authorities. Furthermore we analysed individual reports drafted by the nine pilot projects.

A broad market survey among companies that were not participating in the pilots was carried out in parallel with our evaluation, to gauge the attractiveness of an EPK for companies in general. A total of 157 companies covering 7 sectors participated in the survey (TNS NIPO, 2015).

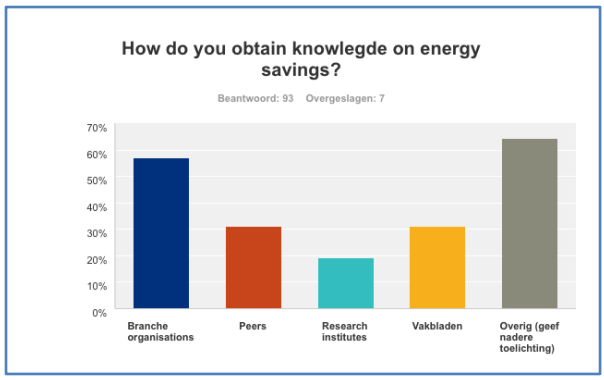
6. Results & discussion

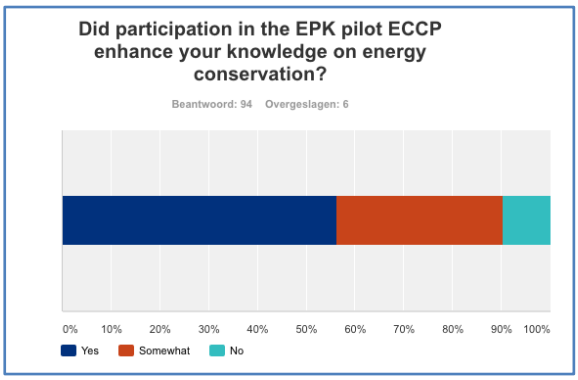
In this section, we discuss how the different EPK designs will potentially affect the boardroom's driving forces for energy savings investments. To support a structured analyses we discuss, where possible, how the EPK instrument characteristics affect the driving forces. The illustrations in this section show results from our company survey.

Characteristics of companies participating in the pilots

Most companies participating in the pilots are rather energy extensive, with energy costs totalling 1%-2% of their production or organization costs. Exceptions are the industrial bakeries, with a level of 2.5% and the textile services with 10-15% energy costs. More than 90% of the companies indicated that they had already implemented energy saving measures. More than 90% implemented these measure because of cost savings, whereas 56% indicated that corporate social responsibility (CSR) policies were an incentive to implement measures. The results signify that companies participating in the pilots are more active in the area of energy saving than their peers, as several studies have shown that there is a large untapped potential for cost-effective energy saving in the sectors involved (i.e. CE (2011*)* ECN (2014)).

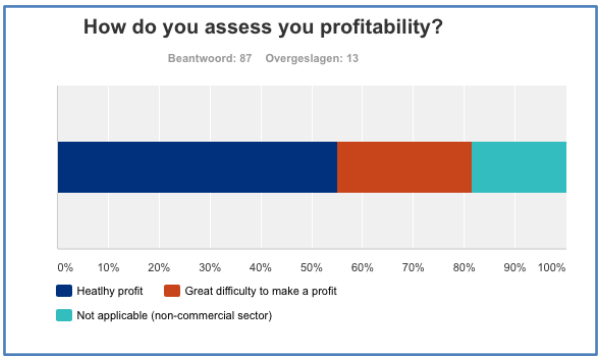
EPK impact on driving force <u>knowledge</u>

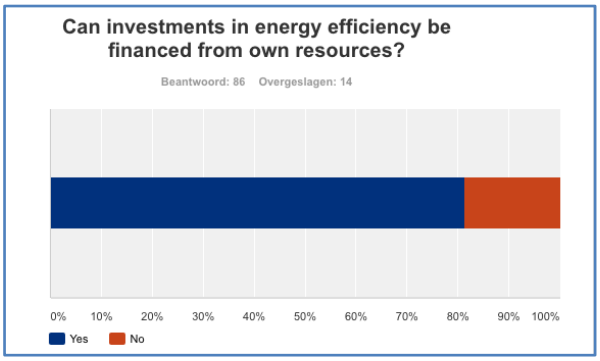




Initial situation: Participating companies indicate that knowledge about energy conservation is obtained through magazines, installers, consultants and trade associations. Their main sources of knowledge are installers and suppliers.
Impact of EPK ideas: In most pilot projects knowledge 'tools' were developed aimed at facilitating monitoring and inventory of energy saving measures, either online, in excel or on paper. Companies participating in the pilots signalled that this increased the knowledge on energy saving options in their company strongly (58%) or somewhat (33%). In most of these pilot projects an external (commercial) energy expert had a central role as the *resource* from which to translate and tailor energy savings knowledge to the company's specific situation.

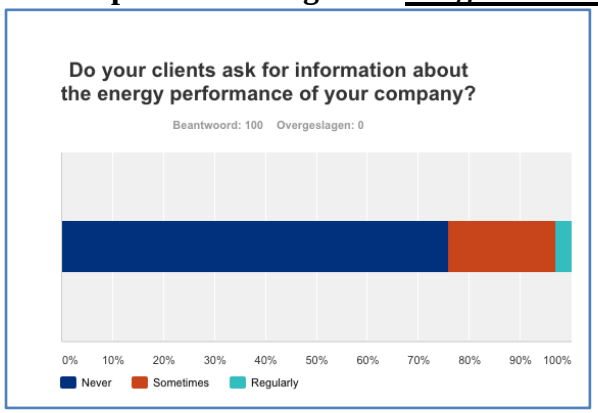
EPK impact on driving force financial situation

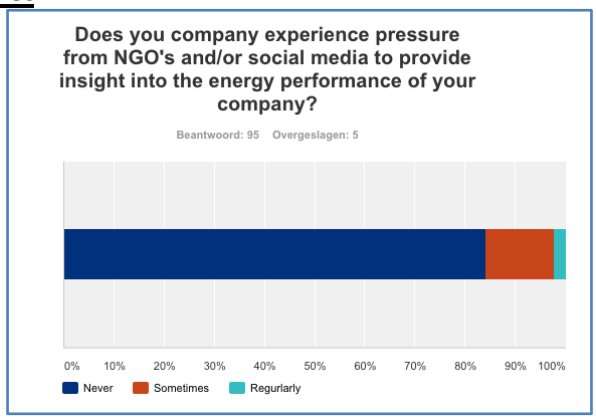




Initial situation: About half of the companies and organizations in the pilots judged their financial position as healthy and 80% indicated that investments in energy savings could be financed without attracting funding from a third party. For most companies it is not company policy to attract outside capital to finance energy saving measures. Almost 70% of the companies had made use of energy savings subsidies or fiscal support measures in the past.
Impact of EPK ideas: In most pilots, the energy scan, reporting and certification must be paid for by the company. In most pilots the costs are estimated to range from € 500 to € 1000 per EPK. However, costs can be higher where larger companies or more complex processes are involved for which a more extensive scan is required. In some pilots the participating companies indicated that they are willing to pay these costs, whereas in other pilots this was regarded as a barrier. No specific conclusions could be drawn about which type of sectors or companies are willing to pay and which are not. One of the pilots investigated a new financial arrangement whereby the costs of the energy scan will be shared between the company and the installers that will carry out energy saving measures. If and how this will operate in practice, is a topic for follow-up research.

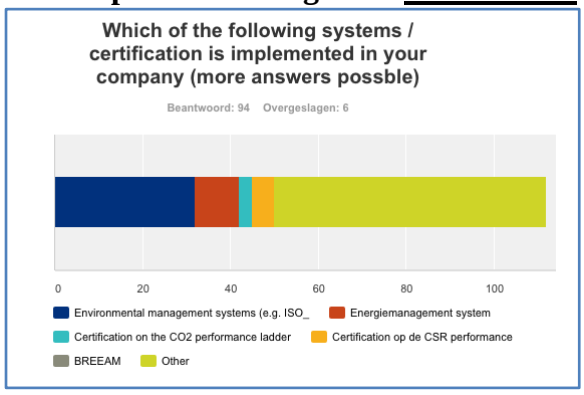
EPK impact on driving force <u>image and market</u>

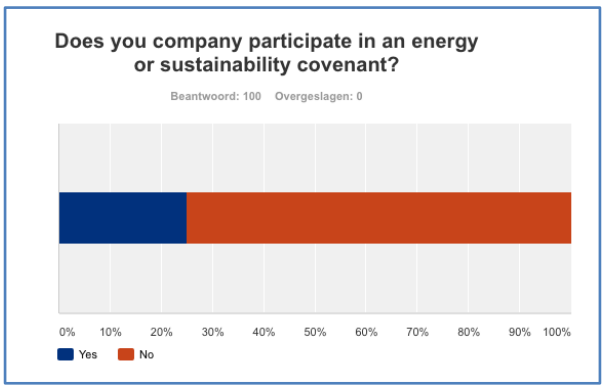




<u>Initial situation</u>: The majority of companies and organizations that participated in the pilots indicated that they experienced no (or hardly any) pressure from suppliers, clients, peers or NGOs to provide insight into their energy performance.
<u>Impact of EPK ideas</u>: Results from two regional pilots suggest that the introduction of an EPK 'quality mark' would be useful to strengthen the environmental image for leading companies. In a survey among companies that did not participate in the pilot projects, 40% of the respondents indicated that a 'quality mark' could improve the image of their company (TNS-NIPO, 2015).

EPK impact on driving force <u>commitment</u>





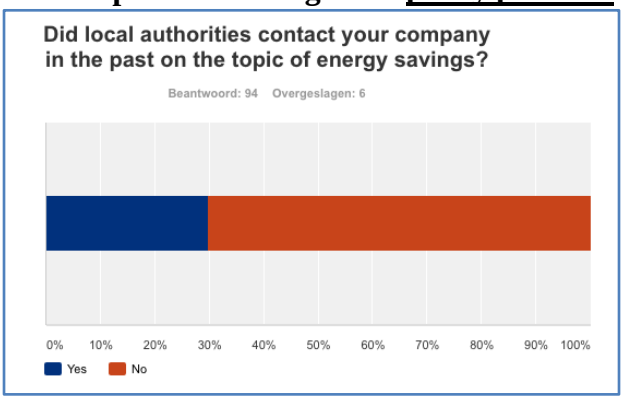
<u>Initial situation</u>: We estimated the initial energy and environment commitment of the pilot companies and organizations by asking them about: (i) the implementation of environment management systems (EMS) or the presence of certification, (ii) participation in covenants and (iii) publication of their environmental performance. 55% of the respondents say they have implemented some kind of EMS or other kind of certified system (e.g. BREEAM) and 24% of the companies participate in a regional or national energy covenant. Less than 25% of the companies disclose information on their environmental performance to the public.
<u>Impact of EPK ideas</u>: Two sectoral pilots integrated the EPK approach into existing certification schemes for their sector, thus making use of existing commitment to these schemes in the sectors concerned. Commitment in the boardroom is affected through the following instrument characteristics of the EPK ideas: flexibility with regard to compliance, confidentiality of monitoring data and scope.

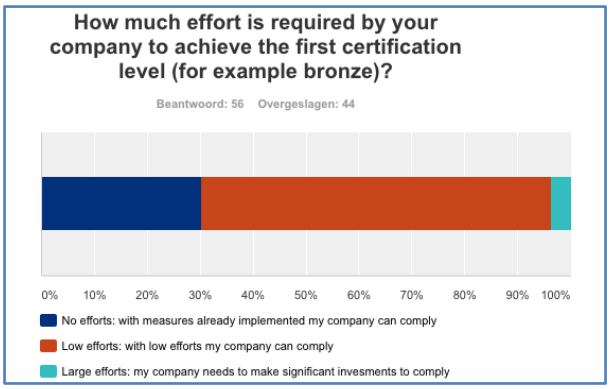
- The call for *<u>flexibility with regard to compliance</u>* was evident in several pilots, regarding for example: (i) planning of the implementation of measures and (ii) fulfilment of requirements (i.e. is there a prescriptive list of measures or are companies flexible as to which measures to implement to achieve a specific energy saving target). It was concluded that flexibility with regard to compliance increases potential commitment in the boardroom. On the other hand, it

increases complexity for the enforcement authorities resulting in a lower level of support for the EPK from their side.

- The question whether data gathered within the framework of an EPK should remain *confidential* or be open the public, triggered a range of responses among companies. On the one hand there was a group a companies that were willing to fully disclose their energy performance data, and at the other extreme there were companies that wanted to keep all information confidential, even from the enforcement authorities. In general it was concluded that freedom of choice with respect to public access to data could increase commitment in the boardroom.
- In several of the pilots, the *scope* of the EPK was extended beyond the legal energy savings requirements. Extension was sought in additional energy saving measures, renewable energy options or integration in environmental or occupational Health and Safety Management tools. An extended scope was often reflected in proposals for a 'bronze-silver-gold' or EPK+ approach. It was concluded that extension of the scope of the EPK could potentially increase commitment in the boardroom.

EPK Impact on driving force policy pressure





Initial situation: Policy pressure is primarily about the rigour of enforcement of the energy savings obligations under the Environmental Management Act: how meticulously do public bodies monitor a company's efforts to comply with policies? How strictly is compliance enforced and non-compliance punished? Approximately 30% of the companies and organizations in the pilot projects indicated that the local authority had contacted them in the past on the topic of energy savings. Earlier investigations show that the overall (national) level of enforcement and compliance is even lower (VROM, 2010).

Impact of EPK ideas: Potential policy pressure from the introduction of an EPK depends - among other things - on the rigour with which this is enforced. Increasing enforcement capacity, however, was not part of the scope of the pilot projects. Policy pressure is furthermore affected through the following two instrument characteristics of the EPK ideas: level of ambition included in the EPK and the enforceability of the EPK.

- Of the companies and organizations participating in the pilots, 32% indicated that they did not need to take any action to comply with the requirements of the Environmental Management Act, and another 65% said that compliance requires minor efforts. This would indicate that the *level of ambition* is not very high and thus would not result in increased policy pressure in the boardroom. The project, however, revealed that there is under-reporting, i.e. energy scans carried out during the pilots suggest that more measures are needed than companies may think. Nonetheless, we also have indications that the pilot populations consist of front-runners. This suggests that the EPK will not be an effective tool for this group of companies, but will only become effective if used by the 'pack' and the laggards.
- *Enforceability* is enhanced through the introduction of standardized and transparent reporting tools. Such tools were indeed developed and appreciated especially in those sectors that are

homogenous in terms of production processes, buildings and measures, e.g. the pilots of the industrial bakeries, the car paint shops, care institutions and the textile care sector. Here, stakeholders indicated that the developed reporting tools increase transparency and thus enforceability. In more heterogeneous sectors, however, these reporting tools received less support. In only one pilot were the developed tools were fully integrated into a certification scheme or some kind of central electronic register, accessible for the local authority.

7. Lessons

Our advice to the policy makers

In most of the pilots, the EPK design focused on developing rather traditional monitoring and inventory tools. The tools involved either self-assessment or required specialized support from a commercial energy expert. Thus, most EPK approaches focused on strengthening a single driving force, knowledge. In only one pilot was the tool embedded in a certification procedure, which improves and simplifies the enforceability of the Act and thus affects the driving force policy pressures. Because of the focus on one single driving force, we conclude that - to become effective - these EPK's should be embedded in a mix of instruments that affect all five driving forces.

On the design of pilots (consensus)

Our more qualitative observations from the pilots suggest that the pilot project design, that typically included all relevant stakeholders, facilitates support for future implementation of an EPK but may also reduce the degree of innovativeness.
In all but one pilot, the developed EPK approach was not secured in a transparent procedure or certification process. As a result, the majority of local authorities that participated in the project considered the EPKs to be not yet sufficiently ready for full introduction. For us as evaluators it remains unclear whether the overarching Energy Agreement, from which the EPK idea originated, is sufficiently strong and coordinated to initiate the required next step in the development and roll-out of an EPK approach.

On the boardroom model

The boardroom framework that we used provided a structured approach to a diverse suite of pilot projects. As such, it helped us to run an efficient and effective project. Also, in our interaction with stakeholders during the project, the boardroom model was generally recognized as a good, albeit simplified, representation of *real world* investment decisions. As a result, there was general support among the participants for the evaluation approach. However, finding good measures for the driving forces as well as the instrument characteristics remains a challenge.

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