

Summary

Energy efficiency in
industry - effects of central
government action (RiR
2013:8)



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The Swedish National Audit Office has audited central government action on improving energy efficiency in industry, with a special focus on the voluntary programme for improving energy efficiency in energy intensive industries (PFE). Has the programme contributed to outcomes in the form of better energy efficiency or reduced emissions? The programme is to promote energy efficiency in energy intensive industry and according to the Government it will also strengthen competitiveness. Action to improve energy efficiency is an important part of the Government's climate policy. According to the Government there are good opportunities for synergies between the PFE and for example the EU Emission Trading System. However, the Government did not stipulate reductions in emissions as a requirement for PFE participation. The audit also addresses whether reporting by agencies and the Government of energy efficiency measures geared to industry is coordinated and clear. At a more general level the Swedish National Audit Office also examined whether policy instruments for energy efficiency in industry, including the PFE, contribute to reducing emissions in the short and long term, nationally and at EU level.

The overall conclusion of the Swedish National Audit Office is:

It is doubtful whether the energy efficiency programme has contributed to significant energy efficiency improvement. Efficiency improvements resulting from the programme are probably not as great as the Government and the Swedish Energy Agency have reported. Nor will energy efficiency policy instruments such as the PFE contribute to emissions reductions by 2020 for companies that are part of the EU Emissions Trading System. However, the programme may have benefited competitiveness. Apart from exemption from electricity tax, many companies also benefit from other policy instruments and exemptions, such as free allocation of allowances in the emissions trading system and exemption from quota obligations for electricity certificates.

Audit background

Motive: Measures to achieve energy efficiency are an important part of climate policy. A more efficient use of energy helps to reduce the burden on the climate and the environment and makes for a more secure energy supply. Industry accounts for a large proportion of Swedish greenhouse gas emissions and for more than a third of final energy consumption in Sweden. An important policy instrument for energy efficiency in industry is the Swedish voluntary programme for improving energy efficiency in energy intensive industries, the PFE. Increasing the share of renewable energy is another important part of the Swedish climate and energy policy.



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The electricity certificate system is an important policy instrument for this. Both the PFE and the electricity certificate system affect the price of allowances in the EU Emissions Trading System.

Aim: The aim is to assess whether central government action for energy efficiency in industry, with special focus on the voluntary programme for improving energy efficiency in energy intensive industries (PFE), has led to increased energy efficiency and to reduced emissions. The aim is also to audit whether reporting of energy efficiency measures geared towards industry is coordinated and clear. To assess whether energy efficiency in industry contributes to reduced emissions nationally and at EU level, a further aim is to examine the interaction between various measures. This applies to energy efficiency measures in industry and to renewable energy in relation to the Emissions Trading System in the short term (the period 2008–2012 and to 2020) and in the long term (to 2050).

What our audit covered: The audit covers central government measures for energy efficiency improvement in industry, in particular the voluntary programme for improving energy efficiency (PFE). The audit also deals with whether energy efficiency in industry contributes to emissions reduction, in the long and short term, nationally and at EU level. The electricity certificate system is also touched on in these contexts.

Results of the audit

The audit resulted in the following findings and conclusions:

Unclear how much energy efficiency the PFE has contributed to

Energy efficiency improvements as a result of the PFE are difficult to distinguish from improvements deriving from such things as increased electricity prices. The price of electricity and other policy instruments that impact the price of electricity, such as the electricity certificate system, may also influence whether companies take measures that lead to energy efficiency improvement. Both the objective and effects of the PFE are unclear. When the PFE was introduced the Government stated that the aim was to ensure continued international competitiveness for companies and to promote energy efficiency, though without any explicit priority between these aims. At the same time the Government refrained from formulating clear quantified objectives for the programme. The unclear objectives give a poor basis for follow-up and reporting of effects.

Energy consumption in PFE companies has not decreased more than in other companies. Energy consumption in the group of PFE companies has decreased, but no more than for the group of energy intensive sectors outside the PFE. At a more detailed level the Swedish National Audit Office's comparison shows that the workplaces within PFE with highest energy intensity in 2004 had marginally higher energy intensity than those with highest energy intensity in 2010. The difference between years was considerably greater for the companies outside the PFE that had highest energy intensity. Comparisons between the groups must be interpreted with some caution,

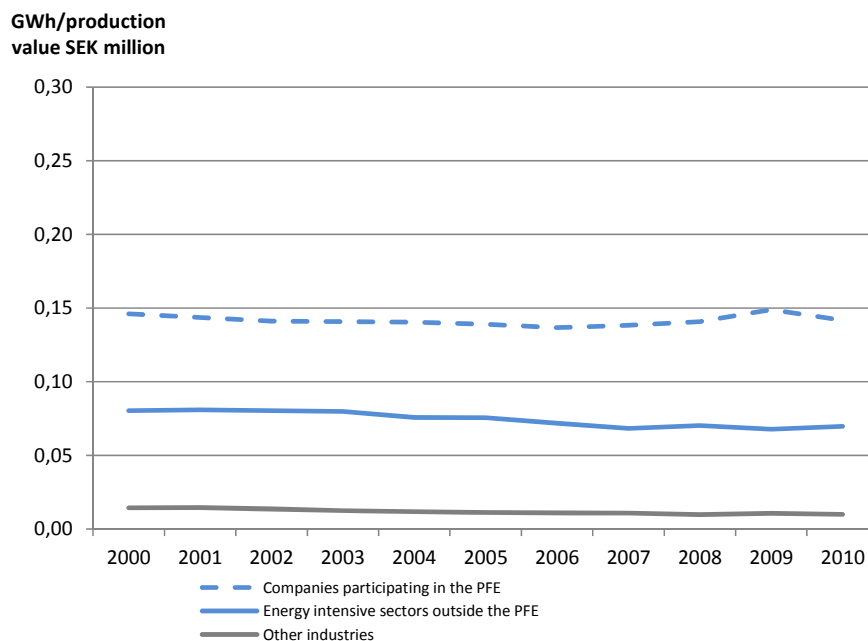


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but the Swedish National Audit Office's calculations nevertheless provide a base for assessing energy consumption in PFE companies compared with other groups in a way not shown previously.

Electricity consumption by production value in the PFE group of companies has been by and large unchanged since the start of the programme in 2005, see the figure below:

ELECTRICITY CONSUMPTION BY PRODUCTION VALUE IN FIXED PRICES IN 2005 IN INDUSTRY, 2000–2010



The Swedish Energy Agency has not reported the effects of the PFE clearly. The Swedish National Audit Office assesses that the result reported by the Swedish Energy Agency for the PFE is probably an overestimation of the effects of the programme. The result is based on the companies' own estimates. In addition the Agency has only to minor extent discounted measures that companies would have taken even without the PFE. Improvements in energy efficiency were relatively common before the PFE and in companies outside the PFE.

The PFE companies' investments in electricity efficiency are approximately the same as the tax relief. The annual tax relief from participation in the PFE amounts to SEK 150 million, a total of about SEK 750 million for the first programme period. The companies' costs mainly consist of introducing and running energy management systems and investing in energy efficiency measures, a total of SEK 708 million for the first period of the programme.



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Effects of measures for energy efficiency have not been reported in a coordinated and clear way

There are no coordinated analyses of the effects of policy instruments. The Government and agencies have not made a coordinated analysis of the effects of various energy and climate policy instruments or how they affect each other.

The Swedish Energy Agency's unclear reporting of the effects of the PFE means that the Government's reporting to the Riksdag (Swedish Parliament) is unclear. Since the Swedish Energy Agency's reporting of the effects of the PFE is unclear, the Government's reporting to the Riksdag is also unclear. One reason for this is that the Government has not formulated quantitative targets for the PFE or any requirements that the electricity efficiency measures should be additional; in other words would not have been carried out without participation in the programme.

Weaknesses in the Swedish Energy Agency's control of the PFE companies. It is not clear if the Swedish Energy Agency considers that a company reporting far too little energy efficiency improvement in its final report is a sufficient ground for exclusion from the programme. The Agency's supervision of the PFE is mainly supportive and promotive. Its purpose is to ensure that companies meet the programme requirements. There are deficiencies in the Swedish Energy Agency's controls of whether the electricity efficiency reported by the companies themselves has really been achieved.



Energy efficiency will not reduce emissions in the EU Emissions Trading System by 2020

Extra policy instruments for energy efficiency geared to companies in the trading system will not contribute to reduced emissions by 2020. Emissions within the trading system are determined by the cap on the number of emission allowances and are thus not affected by other policy instruments for energy efficiency. On the other hand, extra policy instruments in Sweden (such as the PFE) and other member states contribute to dampening the price of emission allowances in the trading system. The price is dampened since demand for allowances falls. That reduces the trading system's incentives to companies to invest in cleaner technology, which can reduce emissions in the long term. However, if emissions from companies outside the emissions trading system decrease as a result of policy instruments such as PFE, emissions will also decrease at EU level by 2020.

Policy instruments for renewable energy have a similar impact on emissions as additional policy instruments for energy efficiency. Policy instruments to increase the percentage of renewable energy targeting companies in the EU Emissions Trading System affect emissions and the price of emission allowances in a similar way to additional policy instruments for energy efficiency.

Exemption from the quota obligation for electricity certificates reduces the incentive for energy efficiency. Exemption from the quota obligation for electricity certificates neutralises the incentive for those companies to improve energy efficiency, since their electricity price is lower.

Unclear prioritisation between different objectives and unclear formulation of the energy efficiency objective. Neither the EU nor the Government has clarified the priorities that apply between the various climate and energy policy objectives. The Government has formulated an unclear objective for energy efficiency. This means that important conditions for follow-up and reporting are lacking.

A higher proportion of nuclear power in Sweden in itself has a negative effect on the energy efficiency objective but a positive effect on the climate objective. It makes it more difficult to achieve the energy efficiency objective, since nuclear power has major conversion losses.

Many energy intensive companies derive economic benefit from several different policy instruments. Swedish companies participating in the EU Emissions Trading System enjoy an overall reduction in expenditure for climate-related taxes through a restructuring of energy and carbon dioxide tax. In addition, many companies in the trading system have received freely allocated emission allowances that are surplus to their needs. More than half the companies that elected to participate in the first period of the PFE enjoyed these advantages, while they were also exempt from the quota obligation for electricity certificates. Altogether, the tax exemptions, exemptions from quota obligation and surplus of freely allocated emission allowances have meant that parts of industry have been economically favoured. However, increased electricity prices

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resulting from the trading system partially reduce this economic advantage. Exceptions from various policy instruments also mean a reduction in policy signals for reducing emissions.

Recommendations to the Government

Since the PFE has probably not produced such great effects as reported, but nevertheless incurred costs for central government, the Swedish National Audit Office makes the following recommendations:

- If the Government proposes that the Riksdag introduce a new voluntary programme to achieve energy efficiency, the Government should consider:
 - determining quantified objectives for such a programme
 - imposing requirements for further energy efficiency improvement for the companies that have already participated in the PFE
 - ensuring specification of the grounds on which companies that do not meet the energy efficiency requirements can be excluded from the programme.

In that case the Government should also instruct the Swedish Energy Agency to produce a basic scenario to facilitate evaluation of the results of any future programme.

In view of the lack of clear objectives and coordinated analyses, the Swedish National Audit Office makes the following recommendations:

- To be able to coordinate policy instruments for the various energy and climate objectives the Government should ensure that there is an updated overview of the various objectives, what they mean and how they interact.
- The Government should clarify the energy efficiency objective to clarify the action needed to achieve real energy efficiency improvements and enable clear follow-up of the objective.
- The Government should make an integrated analysis of the economic effects on companies of policy instruments to achieve climate and energy objectives and to what extent the policy instruments provide incentives for companies to reduce emissions. The Government should then take into consideration the effect on emissions of the EU Emissions Trading System. The most important results of such an analysis should be reported to the Riksdag.

Recommendations to the Swedish Energy Agency

- The Swedish Energy Agency should improve its analyses and reporting of the PFE and clarify the companies' reporting requirements within the programme. The Agency should ensure that reporting of the effects of the second period of the programme is clear. This



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means that the Agency needs to take into account or at least comment on whether some of the measures would have been implemented even without the PFE. Furthermore, the Agency should ensure that reporting is clear as regards whether efficiency improvement refers to individual years or the entire period. The Agency should also ensure that it is possible to follow developments over time.

- The Swedish Energy Agency should improve controls and supervision of the electricity efficiency improvements that the PFE companies report, partly for the ongoing programme period and partly for any future new programme.

