

# Energy conservation agreements – progress review 2005

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*Energy conservation agreements – progress review 2005*

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## Introduction

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The progress review on voluntary energy conservation agreements 2005 contains summary information on energy conservation agreements current at the end of 2005 to the extent that information was available from the parties' databases and registers after the year end.

Results achieved through the agreement scheme in this report reflect the situation in companies at the end of 2004, based on information reported in 2005. The data is based on annual reports specific to agreement sectors published in the autumn of 2005 (available only in Finnish). The summary of results for the year 2005 will be available in the autumn of 2006.

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### 1.1 Energy conservation agreements implementing climate strategy

#### Voluntary agreements play crucial role in climate strategy

Voluntary energy conservation agreements play a crucial role in implementing energy efficiency under the Climate Strategy (2001) and the associated Energy Conservation Programme (2003–2006). The target is to achieve about a quarter of Finland's greenhouse gas reduction targets by 2010 through energy conservation measures. The starting point for measures to increase use of renewable energies is similarly to achieve about a quarter of Finland's greenhouse gas emissions reduction target.

The Government's report submitted to Parliament in November 2005, Energy and Climate Policy Outlines for the Near Future – National Strategy for Implementation of the Kyoto Protocol, energy conservation agreements are still deemed to be an important means of reaching the climate targets.

#### Commitment to long-term energy conservation through agreements

The energy conservation agreements currently in force are framework agreements, under which sector associations undertake to promote energy conservation and encourage their membership to join in the energy conservation agreement scheme. Companies and communities subscribing to the agreements undertake to carry out energy audits or analyses in their own properties and production plants, to draw up an energy conservation plan, and to implement cost-effective conservation measures.

The Ministry of Trade and Industry, for its part, undertakes to subsidise energy audits and analyses, as well as energy conservation investments fulfilling certain criteria. With regard to housing properties, responsibility for audit subsidies and assistance for improvements in energy economy rests with the Ministry of the Environment.

Energy conservation agreements contain action programmes agreed between ministries and sector associations, aiming at improving energy efficiency in the sectors covered by the agreements.

The municipal energy and climate agreement is the only one of the agreements also explicitly covering use of renewable energies. In the other agreement sectors, attention has been drawn to renewable energies by relevant questions attached to annual reporting.

#### Energy conservation agreements operating in eight sectors

At the close of 2005, eight energy conservation agreements signed by ministries and various associations were in force. Four of the agreements were signed in the autumn of 1997 between the Ministry of Trade and Industry, the Confederation of Finnish Industry and Employers TTT (since 1.1.2005 Confederation of Finnish Industries, EK), the Finnish Energy Industries Federation Finergy, the Finnish District Heating Association and the Finnish Electricity Association Sener (since 1.1.2005 Finnish Energy Industries). The new municipal

sector energy and climate agreement signed in the autumn of 2002 follows on from the municipal energy conservation agreement. An agreement with the Finnish Association of Building Owners RAKLI was signed in 1999, and extended in the autumn of 2002 to cover also public sector real estate. The extended agreement replaced the co-operation programme for public property units signed in 1997 and expired at the end of 2002. The ministry responsible for these agreements has also been the Ministry of Trade and Industry.

In March 2001, the Finnish Bus and Coach Association also signed an energy conservation agreement. At the start of 2005 the agreement terminated, when it was integrated with the more extensive public transport agreement, with the Finnish Public Transport Association also becoming a signatory. With this, the agreement encompassed also local services of the national railways, tram services and the metro, in addition to bus transport. The ministry responsible for the public transport agreement is the Ministry of Transport and Communications.

In November 2002, the agreement to cover municipal and non-profit housing properties of the Federation of Housing Property Owners and Developers ASRA was signed. This sector is under the governance of the Ministry of the Environment.

#### **Energy conservation programmes for the heavy goods transport sector and oil-heated properties**

In addition to the energy conservation agreements, there are two energy conservation programmes ongoing, to which enterprises or other parties do not actually sign up. The first of these was the Höylä II co-operation programme on furthering energy conservation in oil-heated properties, signed in July 2002 between the Ministry of Trade and Industry, the Finnish Oil and Gas Federation and the Finnish Oil and Gas Heating Association. The agreement is a follow-up on the previous Höylä co-operation programme launched in 1997.

In the early part of 2003, an energy conservation programme concerning truck and van transport was launched, with The Ministry of Transport and Communications taking responsibility. The programme replaced The Finnish Trucking Association SKAL's energy conservation agreement, which covered the sector and expired at the end of 2002.

#### **Agreement scheme continues**

The majority of the voluntary energy conservation agreements signed mainly in 1997 were due to expire at the end of 2005. Based on evaluation of the agreement scheme and feedback received from the field, it was decided that the agreements would be extended by two years. The truck and van transport scheme was also similarly extended.

Unlike the other agreements, ASRA's agreement on housing properties extends to the end of 2012, and the latest agreement concerning public transport until the end of 2010. The Höylä II co-operation programme on furthering energy conservation in oil-heated properties also continues to the end of 2007, as originally planned.

## 1.2 Energy conservation agreement scheme evaluated – new agreements under way

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### Evaluation results reinforced planning of continued agreement scheme

Assessment of the agreements in force until the end of 2005 was begun in spring 2004 and reported in January 2005, to allow for its results and ideas for further development to be utilised during 2005, while considering the prerequisites for continuing the agreement scheme.

The assessors reported that the energy conservation agreement scheme appeared to have functioned at least well in terms of the targets established for it, with reference to coverage of the agreements, attainment of agreed targets and opinions of agreement parties. Overall, the results obtained through the conservation agreement scheme are also significant. However, sector-specific differences in coverage, commitment of various parties and performance of agreements have been pronounced.

Signatories to the energy conservation agreements list as the most important benefits identification of potential energy savings, development of their own activities, clarification of energy efficiency targets, and the energy subsidies for audits and investments. Benefits related to organisational image also emerged clearly. The agreements have also been instrumental in spawning co-operative networks and exchange of information between operators. Understanding of energy conservation has increased, as has application of a systematic approach to improving energy efficiency.

While the assessors found that there was strong support among agreement signatories for continuing and further development of the agreement scheme, they reported, however, that future expectations of the energy conservation agreement system are different, and put forward a number of ideas for development that had emerged from the assessments. The interviews had also brought out the importance of expert functions related to conservation agreement activity, and a need for increased personal contacts in implementation, reporting and communications.

### Preparation of new agreements well under way

The entirely new voluntary energy conservation agreements to be launched by the beginning of 2008 at the latest, for which tools and methods now under preparation will be adopted, will take account of changes that have taken place in the operational environment. At the same time, in developing tools, more attention will be paid to e.g. the needs of energy users of different sizes in each sector.

New methods and tools require testing, which will be completed during the extended period of the current agreements by the end of 2007. Of particular interest is inclusion of innovative activities under energy conservation agreements. Through networking of developers of products and services and their users, we aim to find innovative solutions and to break down the barriers preventing entry into the markets of energy-efficient technology.

According to the Government's report submitted to Parliament in the latter part of 2005, Energy and Climate Policy Outlines for the Near Future – National Strategy for Implementation of the Kyoto Protocol, preparation of new energy conservation agreements is progressing rapidly.

Coverage good for majority of agreement sectors

In recent years, activity in the agreement sectors has primarily focused on implementation of agreements, while in the early years the emphasis was on marketing the agreements and increasing coverage. Only in the most recently added agreement sectors has the activity still also included marketing.

Figure 1 shows the coverage of various agreement sectors at the end of 2005. Coverage of all agreement sectors is presented as the percentage of total volumes of the respective sectors in Finland, to render them more directly comparable. In the property and building sector, bus and coach sector under the public transport agreement, housing property sector, and the district heating sector, coverage of the current energy conservation agreement scheme does not extend to the entire sectors in Finland. For these sectors, maximum coverage of the agreements in the respective sectors in Finland is also shown.

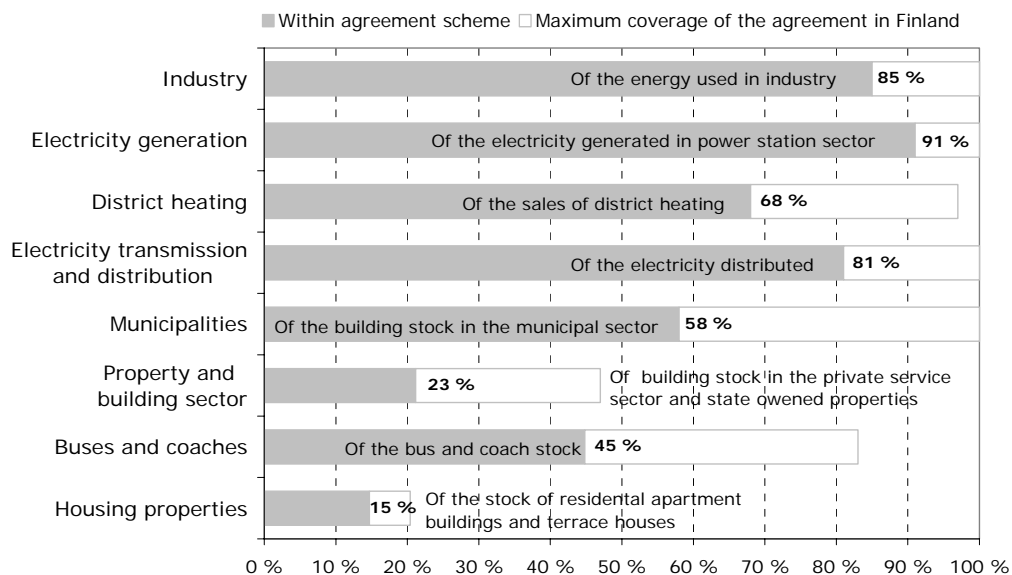


Figure 1. Coverage of energy conservation agreements in Finland at the end of 2005

The figure does not show the national railways local services, tram services or metro covered by the public transport agreement signed in 2005. The coverage of these areas both in terms of those participating and the sector in the whole of Finland is 100%.

In addition to the agreement sectors shown in the figure, there is in force an energy conservation programme for truck and van transport covering almost 70% of truck and van deliveries, and the Höylä II energy conservation programme of oil-heated properties covering more than 15% of energy used on heating domestic, service and agricultural buildings. The programmes cover the whole of these sectors and operators do not join individually, as is the case in the agreement sectors shown in the figure.

## Agreements cover approx. 60% of Finland's total energy consumption

According to Statistics Finland, total energy consumption of the country was 1,487 PJ in 2004, of which transport accounted for 195 PJ or approx. 13%. The total energy consumption includes both the energy end-usage (industry, transport, heating of buildings, others) and losses, mainly associated with electricity and district heating production, transmission and distribution, and other losses linked to e.g. oil refining. The end-user group 'others' includes e.g. domestic households, agriculture, services and public consumption, and electricity consumption of building construction.

Coverage of the agreement scheme of Finland's total energy consumption (1,487 PJ) is approximately 61%, when, for the part of the truck and van transport sector programme, energy consumption of the whole vehicle stock of SKAL's member companies is included as signed up to the agreement scheme. The corresponding coverage is about 58%, if the energy consumption of SKAL's vehicle stock is not included in the agreement scheme, because no company-specific participation agreements were signed within the truck and van transport sector programme. Energy consumption of companies and communities signed up to energy conservation agreements currently in force, excluding transport, covers about 66% of Finland's total energy consumption, when the share of transport has been excluded (1,292 PJ).

Of energy consumption by agreement participants, more than half is in the industrial sector, and a good third in the energy sector. The share of the municipal sector, property and building sector and the housing property sector agreement participants of Finland's total energy consumption totals well under 10%. The oil-heated buildings within the framework of the Höylä II programme have been counted as participating in the conservation agreement scheme, although no agreements are signed with end-users within the scope of this programme. The share of thermal energy consumption of oil-heated buildings, covered by the Höylä II programme, of Finland's total energy consumption (1,487 PJ) is approximately 2%.

In addition to the energy consumption in the above-mentioned agreement sectors, the end-users of district heating, electric heating, and e.g. domestic households other than users of thermal electricity, can also be considered to partly fall within the scope of the agreement scheme, because the energy consumption of these end-users falls within the advisory and other services provided by companies participating in the conservation agreements in the district heating and power transmission and distribution sectors. These end-users account for more than 10% of Finland's total energy consumption.

In the transport sector, the share of agreement scheme participants of total transport energy consumption (195 PJ) is almost a third, if the energy conservation programme for truck and van transport is deemed to cover the entire vehicle stock of the association (SKAL) that signed the agreement. This accounts for more than 4% of Finland's total energy consumption (1,487 PJ). The share of the energy usage of vehicle stock covered by the truck and van transport sector's programme of this energy consumption is about 88%, and the share of signatories to the public transport sector agreement about 12%.

Of energy consumption within the agreement sectors, the share outside the agreements corresponds to less than 15% of Finland's total energy consumption, excluding transport. Almost half of consumption within the agreement sector, but not signed up to the agreements, is within the industrial sector, more than a quarter in the energy sector, and the

remaining less than a quarter within the municipal sector, property and building sector and housing property sector.

#### 1.4 Energy audit activity lively

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##### Central role of audits in agreement scheme

One of the central objectives of the conservation agreements of industry, the municipal sector, the property and building sector and the energy sector is to extend energy audits and analyses to the greatest possible degree to energy consumption in these sectors. In most agreement sectors, the conservation agreements have indeed had a significant impact on the volume of energy audit activity in recent years. In the industrial sector and property and building sector in particular, the impact of the agreements on the increase in the volume of energy audit activity has been decisive.

During the course of the conservation agreement scheme 1998–2005, approx. 90% on average of audit subsidies granted have been related to projects of enterprises and communities participating in the conservation agreements. In 2005, the share of enterprises participating in the energy conservation agreements was 83%. When calculated on the basis of the number of projects launched, the proportion of projects of scheme participants has been a little over 70%, being 68% in 2005.

##### Energy audit activity continues lively in conservation agreement sectors

The numbers of energy audit and energy analysis projects associated with implementation of conservation agreements launched in 1998–2005, their costs, and subsidies granted for them by the MTI are presented by agreement sector in Table 1. Between 1998–2001, the maximum audit subsidy for all enterprises and communities signed up to conservation agreements was 50%, but from 2002, the maximum subsidy applying to all except the municipal sector has been 40% of total project costs. In addition to projects shown in the table, audits and analyses have also been conducted without MTI subsidies, at least within the scope of industrial and district heating sector agreements.

In 2006, energy audits and analyses will be subsidised as before, both within the emissions trading sector and establishments outside it. The report on energy and the climate policy outlines in the near future, published late 2005, proposes that the audit and analysis subsidies should be preserved. The report will go before Parliament during spring 2006.

The Table also includes audit projects implemented by companies or communities before signing up to energy conservation agreements. The total number of such projects, carried out before the company or community entered into the energy conservation agreement, included in the table is 28, and their total subsidies have amounted to approx. 0.17 million euros. The majority of these projects were in the municipal sector.

The total value of audit subsidies granted to the sectors covered by energy conservation agreements in 2005 was about 10% up on the previous year. Conversely, the number of projects and audit targets was clearly down on 2004. The most pronounced change in the number of projects launched was in the municipal sector.

Table 1. *Energy audit and energy analysis projects for energy conservation scheme participants subsidised by MTI*

Year	Agreement sector	Number of decisions	Number of sites	Audit costs million €	Audit subsidy granted by MTI million €
98	Industry	20	62	0.915	0.455
98	Electricity generation	2	5	0.224	0.105
98	District heating	3	5	0.098	0.049
98	Electricity transmission	1	1	0.010	0.005
98	Municipalities	11	132	0.404	0.194
98	Property and building s	4	4	0.018	0.007
<b>1998</b>	<b>Total</b>	<b>41</b>	<b>209</b>	<b>1.67</b>	<b>0.82</b>
99	Industry	36	68	2.171	1.085
99	Electricity generation	2	2	0.105	0.053
99	District heating	4	6	0.222	0.111
99	Electricity transmission	2	2	0.009	0.005
99	Municipalities	11	151	0.622	0.297
99	Property and building s	3	3	0.021	0.009
99	Transport sector	1	1	0.001	0.000
<b>1999</b>	<b>Total</b>	<b>59</b>	<b>233</b>	<b>3.15</b>	<b>1.56</b>
00	Industry	51	58	2.715	1.358
00	Electricity generation	3	4	0.136	0.068
00	District heating	5	11	0.201	0.100
00	Electricity transmission	1	1	0.007	0.003
00	Municipalities	12	113	0.480	0.237
00	Property and building s	3	29	0.163	0.081
00	Transport sector	1	1	0.006	0.003
<b>2000</b>	<b>Total</b>	<b>76</b>	<b>217</b>	<b>3.71</b>	<b>1.85</b>
01	Industry	38	55	1.650	0.823
01	Electricity generation	8	41	0.557	0.275
01	District heating	2	2	0.072	0.036
01	Electricity transmission	3	6	0.012	0.006
01	Municipalities	25	240	0.896	0.445
01	Property and building s	10	89	0.466	0.233
01	Transport sector	1	2	0.007	0.004
<b>2001</b>	<b>Total</b>	<b>87</b>	<b>435</b>	<b>3.66</b>	<b>1.82</b>
02	Industry	46	83	1.969	0.787
02	Electricity generation	2	3	0.035	0.014
02	Municipalities	46	270	0.833	0.412
02	Property and building s	29	230	1.146	0.463
<b>2002</b>	<b>Total</b>	<b>123</b>	<b>586</b>	<b>3.98</b>	<b>1.68</b>
03	Industry	38	41	2.284	0.914
03	Electricity generation	3	3	0.221	0.088
03	District heating	4	9	0.130	0.052
03	Electricity transmission	3	9	0.022	0.009
03	Municipalities	27	133	0.448	0.223
03	Property and building s	28	81	0.504	0.202
<b>2003</b>	<b>Total</b>	<b>103</b>	<b>276</b>	<b>3.61</b>	<b>1.49</b>
04	Industry	44	54	1.993	0.797
04	Electricity generation	3	3	0.124	0.050
04	Electricity transmission	1	2	0.009	0.004
04	Municipalities	42	232	0.854	0.427
04	Property and building s	12	49	0.318	0.127
<b>2004</b>	<b>Total</b>	<b>102</b>	<b>340</b>	<b>3.30</b>	<b>1.40</b>
05	Industry	40	41	2.388	0.941
05	Electricity generation	5	7	0.490	0.196
05	District heating	1	3	0.066	0.026
05	Electricity transmission	1	1	0.032	0.013
05	Municipalities	24	145	0.480	0.239
05	Property and building s	13	39	0.277	0.111
<b>2005</b>	<b>Total</b>	<b>84</b>	<b>236</b>	<b>3.73</b>	<b>1.53</b>
98-05	Industry	313	462	16.09	7.16
98-05	Electricity generation	28	68	1.89	0.85
98-05	District heating	19	36	0.79	0.37
98-05	Electricity transmission	12	22	0.10	0.04
98-05	Municipalities	198	1 416	5.02	2.48
98-05	Property and building s	102	524	2.91	1.23
98-05	Transport sector	3	4	0.01	0.01
<b>1998-2005</b>	<b>Total</b>	<b>675</b>	<b>2 532</b>	<b>26.8</b>	<b>12.1</b>

## Decline in audit activity in municipal sector

The volume of audits in the municipal sector declined clearly from 2004, measured both in amount of audit subsidy, number of projects launched, and volume of building stock to be audited. On the other hand, it is level with the year 2003. The volume of buildings covered by audit activity in 2005 was 2.9 million m<sup>3</sup>.

In order to reach the audit coverage target (80% of the public properties of participating local and joint municipal authorities by the end of 2010) as stated in the municipal sector agreement, the audit volume of the years 2004–2009 should average about 3 million m<sup>3</sup> per annum. The volume of audits launched in 2004 (3.98 million m<sup>3</sup>) exceeded the above average target, and in 2005 almost reached the same level.

Despite the high volume of audits in terms of buildings volume in recent years, reaching the audit target of the municipal sector agreement in 2010 would seem challenging. At the close of 2004, coverage amounted to approx. 50% of heated public property stock of agreement participants. Of the largest municipalities, at least in Helsinki and Turku, the audit coverage is already approaching or exceeding the set 80% target, and thus the municipalities auditing large property masses are declining, which is likely to affect the annual numbers of audits in the municipal sector in the future.

## Target almost reached on reports from property and building sector

The audit volume of the property and building sector in 2005 (1.9 million m<sup>3</sup>) clearly continued to decline when measured by property volume, and was now down to the 2000 level. However, it should be noted that audit projects initiated by enterprises participating in the property and building sector agreement already cover the majority of the property stock included in the reporting of companies participating in the agreement. On this basis, it's not expected any more significant audit projects to be initiated in the future in the private service sector conservation agreement companies, but the emphasis of the activity is likely to be on projects initiated outside the conservation agreements.

Coverage of audits with regard to property stock included in the reporting of property and building sector enterprises participating in the agreement scheme is extremely good (74% at the end of 2004), but this property stock represents only about a fifth of property stock owned and managed by participating companies. Thus, the audit target set in the agreement (80% of energy consumption of participating enterprises by the end of 2005) will not be reached with regard to the whole property stock.

## Industrial sector audit activity continuing lively

Audit and analysis activity in the industrial sector remained buoyant. The number of projects launched remained at the same level, although the number of individual sites associated with them declined slightly. However, the audit costs and audit subsidies granted for them grew by almost one fifth.

The size of the average project had grown on the previous year in 2005. With reference to the industrial conservation agreement, the number of process industry phase two definitive analyses initiated has again been significant. They included a power station energy analysis in a power plant owned by industry in 2005.

Regardless of the volume of audits which in itself remained high, there was a clear decline in energy consumption entering the scope of audit activity for the first time. This is partly expected, as the coverage of audits on energy consumption is already at a high level.

The target according to the industrial agreement is auditing or analysis of 80% of industrial energy consumption by the end of 2005. As for companies signed up to the agreement, the audit coverage target for electrical energy was exceeded. We were somewhat short of the target for heating and fuels. The audit coverage target for energy consumption of the whole industrial sector was not quite reached by the end of 2005. For electricity, coverage was somewhat under 75%, and for heating and fuels a little below this.

However, it should be noted that audits are carried out in the industrial sector also without MTI subsidies. There is no statistical data available on the volumes of these audits, commissioned entirely at the companies' own expense. However, it would appear that the audit target set in the agreement would be reached, if it was possible to include also the data of these self-financed audits and analyses.

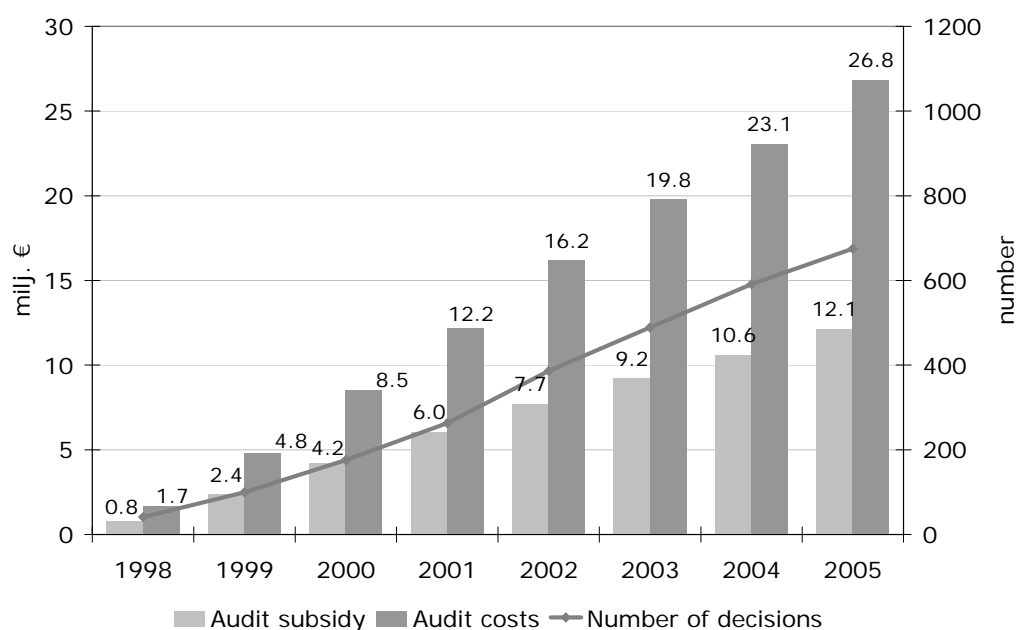


Figure 2. *Cumulative energy audit subsidies granted by MTI and audit costs to all enterprises and communities subscribed to energy conservation agreements 1998-2005.*

### Audit activity in power generation sector buoyant in 2005

In the power generation sector, nine new power plant energy analyses were launched in 2005, and the volume of audits grew both in terms of subsidies and the number of projects. Good results have been obtained from power plant energy analyses, and it would seem that the power generation sector energy analysis is beginning to establish itself. Nevertheless, maintaining the volumes of energy analyses at the current good level, set as the target in previous years, requires strong commitment of the relevant parties and investment in marketing.

One of the analyses initiated in 2005 was implemented outside the conservation agreement scheme, and one in a company subscribed to the power transmission and distribution sector agreement. Additionally, one analysis of a power plant belonging to the industry itself was initiated.

In the district heating sector audit activity has been subdued. One project was launched in 2005, auditing the district heating networks of three different areas. Not one project was launched the year before. In the power transmission and distribution sector too, only one property audit project was initiated.

In the energy sector, targets set in agreements for audits for the years 2000 (district heating sector) and 2003 (power industry sector) were not reached (district heating sector 80% of district heating sales, power industry sector minimum of 50% of power plant energy production), even if it was taken into account that particularly in the district heating sector, energy conservation surveys have also been conducted without subsidies.

Coverage of district heating audits subsidised by the Ministry of Trade and Industry at the end of 2004 was 10%, and the coverage of other energy surveys commissioned without subsidy almost 60% of district heating sales in Finland. The coverage of power plant energy analyses at the end of 2004 was approx. 25% of electricity production in Finland.

## 1.5 Investment subsidies for measures increasing efficiency

### Priority for new energy-saving technology

The main focus of MTI energy subsidies is in commissioning of new technology promoting energy-saving and renewable energy sources. However, under certain conditions, enterprises and communities participating in energy conservation agreements may receive investment subsidies for energy conservation measures within the scope of MTI's available funds also for customary energy-saving technology projects. In order to qualify for subsidy, the investments must be quantified in reported energy audits, analyses or other comparable investigations.

The subsidy rate of customary conservation investments since 2002 has been 15–20 % at most. Before the year 2002, the maximum subsidy was 10%. The minimum size of projects qualifying for subsidy is 25,000 euros and the maximum subsidy for one company is usually 150,000 euros per annum. Smaller savings investments may be combined so that the above minimum project size is fulfilled.

Priority in subsidising customary energy-saving measures is given to projects that conserve electricity. Subsidies for power conservation are considered only if the concurrent energy saving is significant or reduction of emissions is otherwise notable. Subsidies are not granted for alternative heating methods, except in cases where the upgrade is for renewable energy sources.

Subsidies are granted for investments with a repayment term excluding interest exceeding 2 years. As with audit subsidies, applications for investment subsidies must always be submitted before the project is started.

In 2006, the emissions trading sector is only awarded subsidies for projects on new technology. Outside the emissions trading sector, subsidies are awarded as before on an individual basis also for customary energy-saving technology projects. The conditions for

awarding investment subsidies in 2006 already take into account the current policy decision presently under discussion with regard to energy subsidies.

#### **Investment subsidy in 2005 targeted at industry and municipal sector**

In 2005, a total of 2.1 million euros was awarded as investment subsidies to 39 projects in total. All the subsidised projects were either in industry or the municipal sector. 80% of the launched projects were in industry, and a little under a fifth thus in the municipal sector. More than 90% of all subsidies concerned industrial projects. In previous years, a few projects have also been initiated in the energy sector and the property and building sector.

Since the agreements were signed, total subsidies of about 16.5 million euros have been awarded to 208 projects. Table 2 shows the distribution of projects and subsidies across different agreement sectors in more detail. In 2005, subsidies were clearly down on the previous year, but the 2004 subsidy had been exceptionally large, due to one large energy generation sector project which accounted for about half of the total subsidies for the year.

On the other hand, three large investment subsidy applications submitted in 2005 were deferred to be dealt with in 2006. The total subsidy sought in these applications amounted to several million euros.

#### **Initiation of industrial sector projects continued brisk**

The only conservation agreement sector where the number of projects to be awarded investment subsidies remained at last year's level was industry. On the other hand, investment subsidies granted for industrial projects also fell on the previous year, nevertheless reaching a higher figure than in the preceding years 1998–2003.

Like last year, the subsidies were more evenly distributed between various projects than was the case in the early years of the agreement scheme. The largest single project accounted for less than 15% of all the subsidies awarded for industrial projects in 2005. Of investment subsidies for energy conservation awarded in 2005, more than 90% was for industrial projects. Also in the whole agreement scheme period 1998–2005, almost 60% of corresponding subsidies and number of projects were in industry.

#### **Number of projects launched in municipal sector down**

In the municipal sector, fewer investment projects attracting energy subsidies were launched in 2005 than in some of the previous years. Subsidies awarded amounted to less than half of the year before, and the number of projects was also down by half. As in the last monitoring year, the largest municipal sector project awarded in 2005 accounted for about a third of the sector's investment subsidies for energy conservation.

The proportion of municipal sector projects of investment subsidies for energy conservation awarded in 2005 was well below 10%, and throughout the agreement term, the share of the municipal sector has been similar. However, in terms of number of projects, a quarter of all projects initiated during the agreement term have been from the municipal sector.

Table 2. *Investment subsidies awarded by MTI to energy conservation scheme participants*

Year	Agreement sector	Number of decisions	Investment subsidy granted by MTI million €
98	Industry	4	0.098
98	Municipalities	3	0.057
<b>1998</b>	<b>Total</b>	<b>7</b>	<b>0.154</b>
99	Industry	4	0.335
99	Electricity generation	1	0.005
99	District heating	1	0.005
99	Municipalities	2	0.028
<b>1999</b>	<b>Total</b>	<b>8</b>	<b>0.37</b>
00	Industry	8	0.279
00	Electricity generation	1	0.026
00	District heating	1	0.001
00	Municipalities	5	0.215
<b>2000</b>	<b>Total</b>	<b>15</b>	<b>0.52</b>
01	Industry	11	0.847
01	Electricity generation	1	0.042
01	District heating	1	0.007
01	Municipalities	3	0.027
01	Property and building sector	1	0.004
<b>2001</b>	<b>Total</b>	<b>17</b>	<b>0.93</b>
02	Industry	15	1.775
02	Electricity generation	2	0.049
02	District heating	1	0.029
02	Municipalities	8	0.228
02	Property and building sector	1	0.010
<b>2002</b>	<b>Total</b>	<b>27</b>	<b>2.09</b>
03	Industry	24	1.369
03	Electricity generation	4	0.610
03	District heating	3	0.780
03	Municipalities	9	0.187
03	Property and building sector	2	0.016
<b>2003</b>	<b>Total</b>	<b>42</b>	<b>2.96</b>
04	Industry	31	2.985
04	Electricity generation	3	3.786
04	District heating	2	0.102
04	Municipalities	13	0.323
04	Property and building sector	4	0.145
<b>2004</b>	<b>Total</b>	<b>53</b>	<b>7.34</b>
05	Industry	32	1.975
05	Municipalities	7	0.139
<b>2005</b>	<b>Total</b>	<b>39</b>	<b>2.11</b>
98-05	Industry	129	9.663
98-05	Electricity generation	12	4.519
98-05	District heating	9	0.924
98-05	Municipalities	50	1.203
98-05	Property and building sector	8	0.175
<b>1998-2005</b>	<b>Total</b>	<b>208</b>	<b>16.5</b>

No new projects in energy sector and property and building sector

No new investment projects qualifying for energy subsidies were launched in the energy sector in 2005. In previous years, a few projects have usually begun both in the power plant

sector and the district heating sector. In the power transmission and distribution sector, there were no subsidised investment projects at all in the entire agreement term.

The share of the power plant sector of all initiated projects throughout the whole agreement term has been a good 5%. On the other hand, the projects have been large, and in terms of subsidies in relation to all subsidies awarded during the agreement term, 30% have gone to the power plant sector.

In the district heating sector, fewer projects than in the power plant sector have been launched throughout the agreement term, which in practice means less than 5% of all initiated projects. The proportion of the district heating sector of all investment subsidies awarded during the agreement term has amounted to a little more than 5%.

Throughout the agreement term, investment projects initiated in the property and building sector that have been awarded energy subsidies have been few, and interest in investment subsidies subdued. Not one project was launched in 2005. Under 4% of investment projects initiated during the whole agreement term that have been awarded energy subsidies and only about 1% of corresponding subsidies granted have been in the property and building sector.

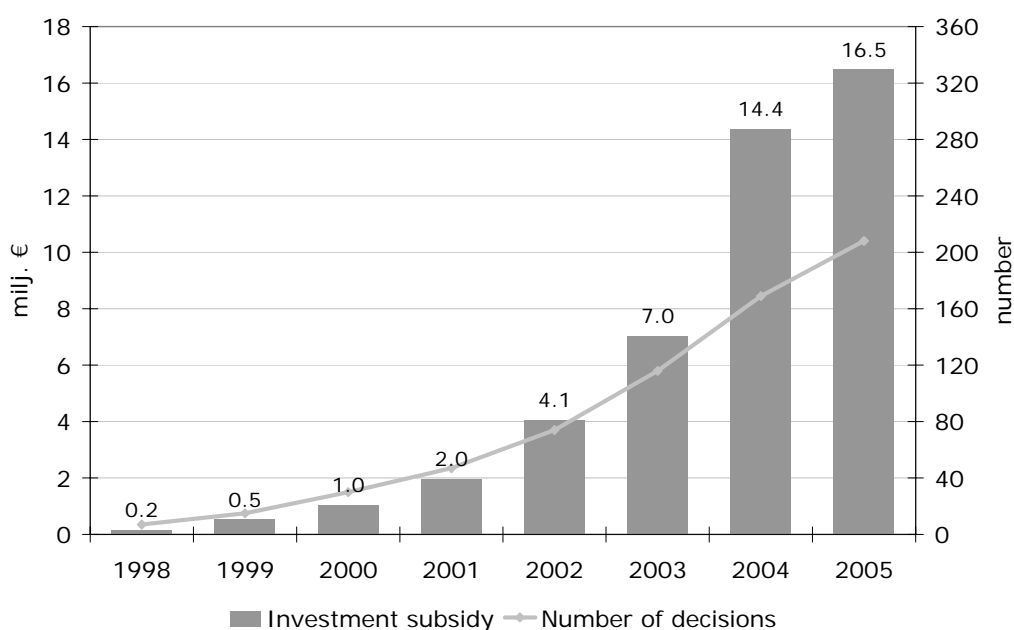


Figure 3. *Cumulative investment subsidies for energy conservation measures granted by MTI and number of launched projects to companies/communities participating in the conservation agreement scheme 1998–2005*

### Share of industrial projects highlighted throughout the agreement term

Of the total investment subsidies granted between 1998–2005 for energy conservation measures, 16.5 million euros, the share of industry has clearly been the greatest. Of total subsidies, the share of industry has been 59%, that of the power plant sector 27%, the municipal sector 7%, district heating sector almost 6% and property and building sector a good one per cent.

Also measured by the number of investment projects the proportion of industrial projects initiated in the conservation agreement term 1998–2005 has been significantly greater than that of other agreement sectors. The share of industry of the total number of subsidised investment projects during the whole agreement term was over 60%, and that of the municipal sector almost 25%. The remaining 15% of the projects are fairly evenly distributed between the power plant, district heating and property and building sectors.

### Some of investment projects ESCO projects

Since 2002, some of the projects granted investment subsidies have been so-called ESCO projects. Of the investment subsidy projects in 2005, seven were ESCO projects, and subsidies awarded to them totalled approx. 0.74 million euros. The subsidy accounted for 35% of total investment subsidies awarded in 2005. Of the ESCO projects signed up to energy conservation agreements in 2005, five were industrial projects (total 680,881 euros) and two in the municipal sector (total 59,000 euros).

In the years 2002–2005, when a proportion of investment subsidy projects awarded energy subsidies have been ESCO projects, their share measured by the amount of subsidy granted has been one fifth on average. The proportion of subsidies awarded to ESCO projects has varied annually between approx. 10% and 35%. Of the number of projects, the share of ESCO projects throughout the years has been fairly steady at a little under one fifth.

The majority, more than 60%, of subsidies awarded to ESCO projects between 2002–2005 has been for industry, with 18 projects launched and a total of about 2 million euros awarded in subsidies. The corresponding number of projects launched in the municipal sector was 9, with a total subsidy of 0.27 million euros. In the energy sector, only one district heating sector ESCO investment project was launched, with subsidies of 0.64 million euros awarded; however, its share of total subsidies granted to the district heating sector in 2002–2005 amounted to more than one fifth. The share of ESCO projects of total investment subsidies granted to energy conservation agreement enterprises and communities in 2002–2005 has been approx. 15%. The next paragraph contains more information about the ESCO model.

#### 1.6 Implementation and funding of conservation investments – ESCO projects

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In general, enterprises participating in conservation agreements implement and finance the conservation investments themselves. Occasionally, lack of resources required to implement the measures or the higher cost-effectiveness expected by companies of energy-saving investments than of other investments place obstacles on implementation of conservation measures that are economically viable. Particularly in such cases, an alternative way of implementing the energy-saving investment is to outsource it as a total service package from a third party (so-called ESCO model).

Under the ESCO model, total responsibility for either implementation, effecting of the saving, organising the funding or all the above can be undertaken by a company specialising in energy conservation, a so-called ESCO company (Energy Service Company). In such cases, the investment is repaid by the savings produced by the measures during the agreement term, so that it does not tie up the company's investment resources nor its human re-

sources to the same degree. The ESCO option is suitable most typically for implementation of conservation investments with a 2–6 year repayment term.

The ESCO model has been publicised in Finland for some years. Several companies offering ESCO services operate in Finland. However, the model has still not become as widely used as anticipated on the basis of experiences abroad, although the feedback on completed ESCO projects has been positive.

In order to speed up ESCO activity, MTI has awarded investment subsidies to ESCO projects during 2002–2005, treating them as so-called new technology model projects. In such cases, the subsidy may have been greater than in previously processed customary conservation investments of companies participating in the conservation agreement scheme.

In 2005, subsidies were awarded to nine ESCO projects (total 0.79 million euros), of which seven were in connection with projects in companies or communities that had joined the conservation agreement scheme. In addition to these, two small municipal sector ESCO projects (total 0.045 million euros) were initiated.

With the exception of a single large project in the energy sector in 2003, all subsidised ESCO projects during the agreement term have concerned industrial and municipal sector projects. The number of subsidised projects has varied very little over the years. Similarly, the amounts of subsidies awarded have not varied significantly, with the exception of the large district heating project in 2003, which accounted for the notable increase to that year's subsidies (0.644 million euros).

ESCO projects have also been launched without MTI support, but the Motiva project register does not necessarily contain full records of these. Awareness of the ESCO model has increased, tools have been developed to promote the service, and future expectations are hopeful.

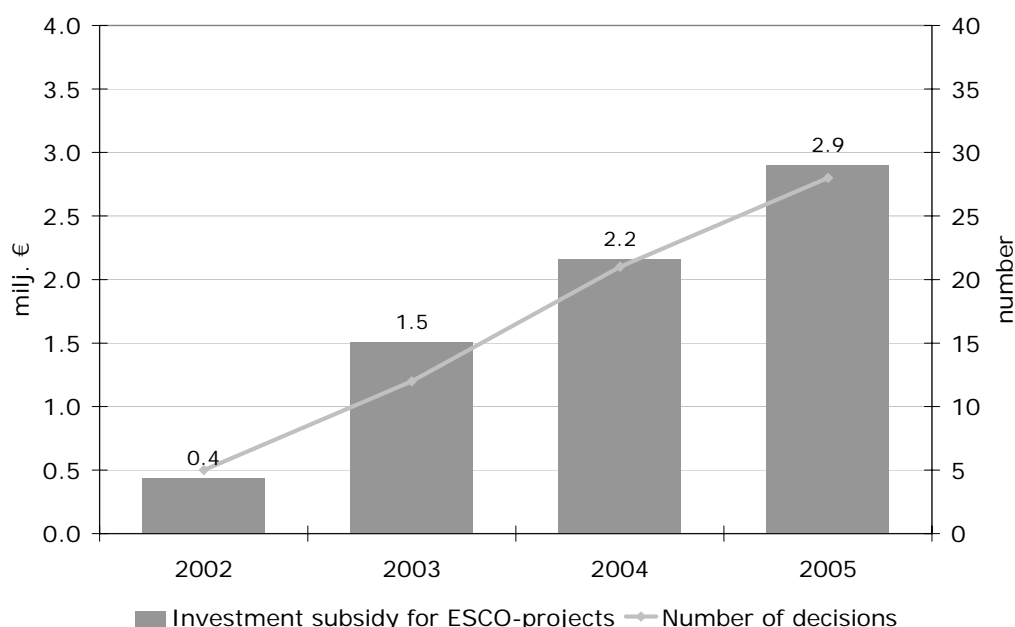


Figure 4. *Cumulative investment subsidies awarded by MTI for ESCO projects of companies/communities participating in conservation agreements and number of projects initiated 2002–2005.*

Significant impacts of implemented conservation measures

Based on sector-specific annual report data for 2004, the impact of conservation measures implemented in enterprises and communities participating in the agreements by the end of 2004 totalled approx. 6.1 TWh/a (electricity 1.1 TWh/a, heating + fuels 5 TWh/a), which is equivalent to the annual electricity and thermal energy consumption of about 300,000 single family houses, calculated on the customary house consumption of 20,000 kWh/a.

85% (5,2 TWh/a) of the energy conservation effect of implemented conservation measures is reported under the industrial conservation agreement. The proportion of the power plant sector of the conservation impact of the implemented measures is 11% (0.65 TWh/a). The remainder, about four percent, of the conservation impact of implemented measures was reported in the district heating sector (0.09 TWh/a), municipal sector (0,07 TWh/a), power transmission and distribution sector (0.05 TWh/a) and the property and building sector (0,04 TWh/a).

The annual saving in energy costs achieved through implemented conservation measures across the agreement sectors is approx. 115 million euros, estimated using the average heating and fuel price of 15/MWh and the average electricity price of 35/MWh. In order to implement the conservation measures, corresponding investments or more than 220 million euros have been made in industry, and approx. 50 million euros in the power plant sector.

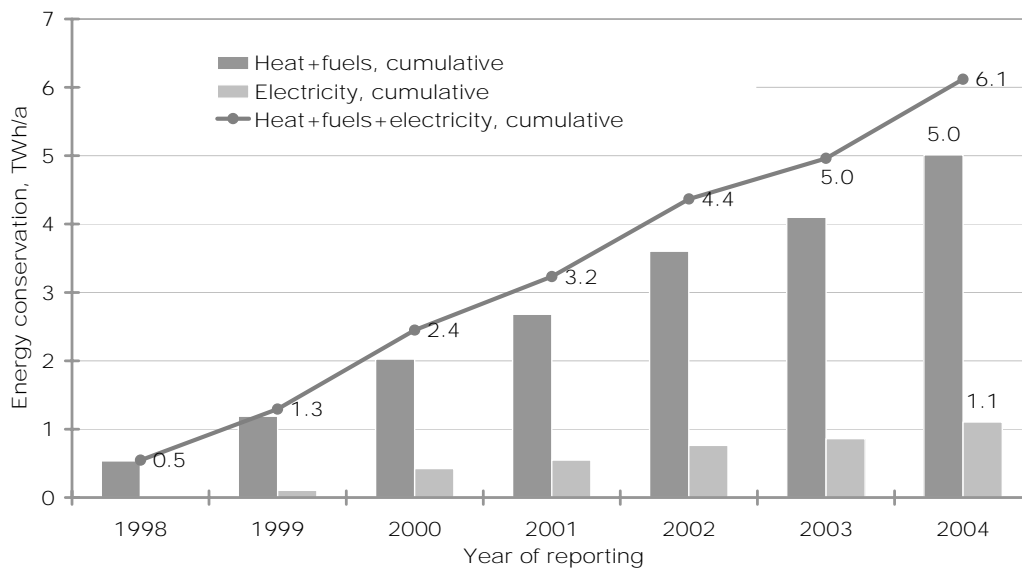


Figure 5. Cumulative energy saving impact of conservation measures reported as implemented by the industrial, energy, municipal and property and building sectors in reporting years 1998–2004.

The energy-saving effect of the measures implemented in 2004 rose as had hoped, after the small dip in the previous year. It was particularly pleasing that the impact of implemented electricity conservation measures was again up. This is thought to be at least partly due to systematic investment in recent years into electricity-saving projects, which in industry have been connected e.g. to efficient use of compressed air. Since energy audit and analysis activi-

ties have also remained buoyant, we may be confident that there will be conservation measures for implementation in future years and that significant savings will be achieved through them.

### Much conservation potential still under consideration

As well as the savings achieved, the report covered measures where the decision to implement had been made, with a total savings potential across the various agreement sectors of approx. 1.0 TWh/a. The bulk of this savings potential, almost 90%, is reported in the industrial and power plant sector agreements, the share of industry being clearly more than a half. The savings potential of confirmed measures rose a little from the previous year, but it has varied only a little over the years.

In addition to implemented and confirmed measures, the report includes measures classified as being under consideration, with a total savings potential of 4.8 TWh/a. The proportion of these measures under consideration has grown annually throughout the whole agreement term, and their average repayment term is a little over three years. Converting this savings potential, equivalent to almost 80% of savings potential already fulfilled, into real conservation is a great opportunity, and at the same time also a challenge to all parties.

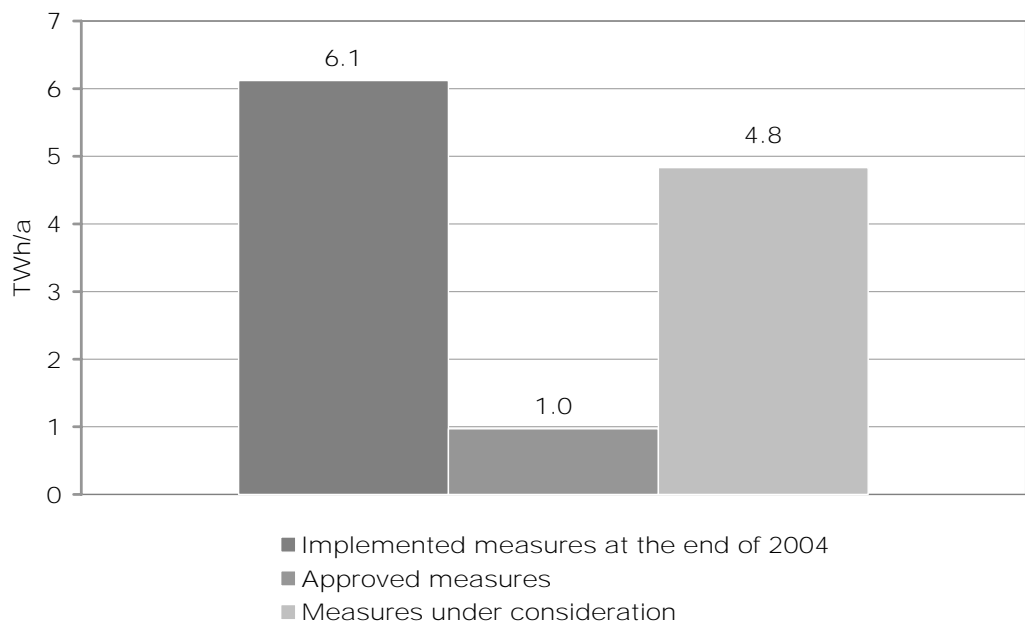


Figure 6. *Summary of effects of efficiency measures in energy use reported by the industrial, energy, municipal and property and building sectors (measured implemented in years 1998-2004, as well as confirmed measures and those under consideration).*

### Original energy conservation estimate exceeded

At the launch of the conservation agreement scheme, the total savings potential across the various conservation agreement sectors at the end of 2005 was estimated at around 11 TWh/a, of which the share of electric energy would be about ten percent. Of this savings potential, about half was estimated to be reached by the year 2010.

The cumulative energy-saving impact of conservation measures reported as implemented by the end of 2004, 6.1 TWh/a, was thus already clearly in excess of the original estimate. The share of electricity of implemented savings reported to date has been about 18%.

### Carbon dioxide emissions reduced

The Climate Strategy and the associated Energy Conservation Programme (2003–2006) set the target of a reduction in greenhouse gas emissions to be achieved through all energy conservation measures at 3–4 million CO<sub>2</sub> tonnes. The energy conservation agreements have been assumed to play an important role in reaching this target.

Indeed, the reduction effects on CO<sub>2</sub> emissions of energy conservation measures reported under the energy conservation agreement scheme are considerable. The annual impacts of conservation measures implemented to date on reduction in carbon dioxide (CO<sub>2</sub>) emissions are 1.7–2.2 million CO<sub>2</sub> tonnes, depending on whether calculated by using the average coefficient 200 kgCO<sub>2</sub>/MWh as the coefficient of CO<sub>2</sub> emissions for electricity, or the coefficient 700 kgCO<sub>2</sub>/MWh based on marginal emissions. The average CO<sub>2</sub> emissions coefficient employed for heating and fuels is 290 kgCO<sub>2</sub>/MWh, where distribution of implemented savings across different agreement sectors has been taken into account.