

Energy conservation agreements, progress review 2003

Not to be published in print

Energy conservation agreements

Progress review 2003

Motiva Oy

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Foreword

The progress review on energy conservation agreements for the year 2003 contains information on energy conservation agreements current at the end of 2003 to the extent to which information has been available from databases and registers just after the new year. Information on activities in the agreement sectors in 2003 is available on Motiva's web site (only in Finnish), where the shares of the agreement sectors, updated with the data for 2003, will be shown in February 2004. Agreement sector-specific summaries of the activities reported by enterprises will be presented in the Annual Reports 2003, which will be published in the autumn (only in Finnish).

The reporting of the results achieved through activity within the framework of the agreements is based on the data reported by enterprises by the end of 2003. The information was published in the annual reports of the agreement sectors in autumn 2003.

Management groups set by the Ministry of Trade and Industry for different agreement sectors guide, develop, and monitor the implementation of energy conservation agreements concluded with branch associations with the aim of furthering energy conservation in various areas.

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1.1 Background

In the national climate strategy and the associated energy conservation programme, voluntary energy conservation agreements play a central role in the implementation of energy efficiency. The objective is that approximately a quarter of Finland's targeted greenhouse gas reduction in 2010 will be achieved by means of energy conservation measures. Measures increasing the use of renewable energy are expected to account for another quarter of the reduction.

At the end of 2003, there were in force eight energy conservation agreements concluded between the Ministry of Trade and Industry and various branch associations with the aim of increasing the efficiency of energy use. Four of the agreements were signed in autumn 1997 with the Confederation of Finnish Industry and Employers TT, the Finnish Energy Industries Federation Finergy, the Finnish District Heating Association FDHA, and the Finnish Electricity Association Sener. The new energy and climate agreement concluded with the municipal sector in autumn 2002 is a follow-up on the previous municipal energy conservation agreement. An agreement was signed in 1999 with the Finnish Association of Building Owners RAKLI, and it was extended in autumn 2002 to cover also the real property of the state sector. The extended agreement replaced the co-operation programme for the state property units, which was signed in 1997 and expired at the end of 2002. In March 2001, also the Finnish Bus and Coach Association concluded an energy conservation agreement. In November 2002, the agreement practice was extended to cover municipal and non-profit housing properties of the Federation of Housing Property Owners and Developers ASRA. In this sector, the responsibility rests with the Ministry of the Environment.

The energy and climate agreement of the municipal sector was the first agreement, which at the level of an agreement was extended to apply also to the use of renewable energy sources. In the other agreement sectors, attention is given to the use of renewable energy sources by including questions related to the subject in annual reporting. The possible revision of the contents and continuation of the other agreements will be decided after the results have been assessed. The assessments will be started in 2004.

In July 2002, the Finnish Oil and Gas Federation and the Finnish Oil and Gas Heating Association signed the "Höylä II" co-operation programme on furthering energy conservation in oil-heated properties. The agreement is a follow-up on the previous "Höylä" co-operation programme launched in 1997. The Finnish Trucking Association SKAL's energy conservation agreement, which expired at the end of 2002, was replaced with an energy conservation programme concerning truck and van transports at the beginning of 2003. The Ministry of Transport and Communications is responsible for this agreement.

The energy conservation agreements, which are mainly valid until 2005, are framework agreements by which branch associations undertake to further energy conservation and their members' accession to the energy conservation agreement. ASRA's agreement on housing properties extends to the end of 2012.

Enterprises and communities which join the agreements undertake to carry out energy audits or analyses at their 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 support energy audits and analyses, as well as energy conservation investments fulfilling certain criteria. With regard to housing properties, responsibility for audit subsidy rests with the Ministry of the Environment.

1.2 Assessment of the agreements

The agreements contain provisions on the assessment of the contents, objectives and implementation of the agreements, for some agreements also on interim assessments.

In 2001 an interim assessment of the agreement with industry and the energy sector was carried out. The feedback on the assessments was mainly positive, and the agreement will be prolonged in the present form until the end of the agreement period, in 2005. However, on the basis of the recommendations given in the assessment, a section concerning renewable sources of energy was added to the enterprises' annual reporting form. The assessment of the "Höylä" programme was also completed in 2001, and a new programme ("Höylä II") based on the results of the assessment was launched in 2002.

The assessment of the municipal sector agreement and of the co-operation programme for the state property units was completed in autumn 2002. On the basis of the assessment results, the municipal sector energy conservation agreement was broadened out into an energy and climate agreement in force until the end of 2005. The co-operation programme for the state property units expired at the end of 2002. The programme was not renewed; instead, the state sector properties can join the existing property and building sector agreement, which was expanded in autumn 2002. The assessment of the agreement on the truck and van sector was also completed in autumn 2002. On the basis of the feedback received on the assessment, the agreement was transformed into an energy conservation agreement, which was signed at the beginning of 2003. Assessment of the agreements in force until the end of 2005 will be started in 2004. Decisions on the continuation of energy conservation agreement activity in various sectors after 2005 will be based on the results of the assessment of the present agreements as well as on other changes taking place in the environment, such as the introduction of emissions trading.

1.3 Coverage

Coverage of the agreement sectors

In most agreement sectors, the aim was no longer to actively market the agreements; instead, the measures were primarily targeted at implementation of agreements.

Figure 1 presents the coverage of various agreement sectors at the end of 2003. Unlike previous years, the coverage of all agreement sectors is presented as the shares of the respective sectors in Finland to facilitate comparison of the shares. This alteration has caused changes in the previous shares, particularly in the property and building sector, the bus and coach sector, the housing property sector, and to some extent also in the district heating sector. In these sectors, the coverage has previously been calculated as a share of the housing stock, vehicle stock etc. controlled by the members of the association acting as a contractual party. The figure also presents the maximum coverage of the agreements in the respective sectors in Finland.

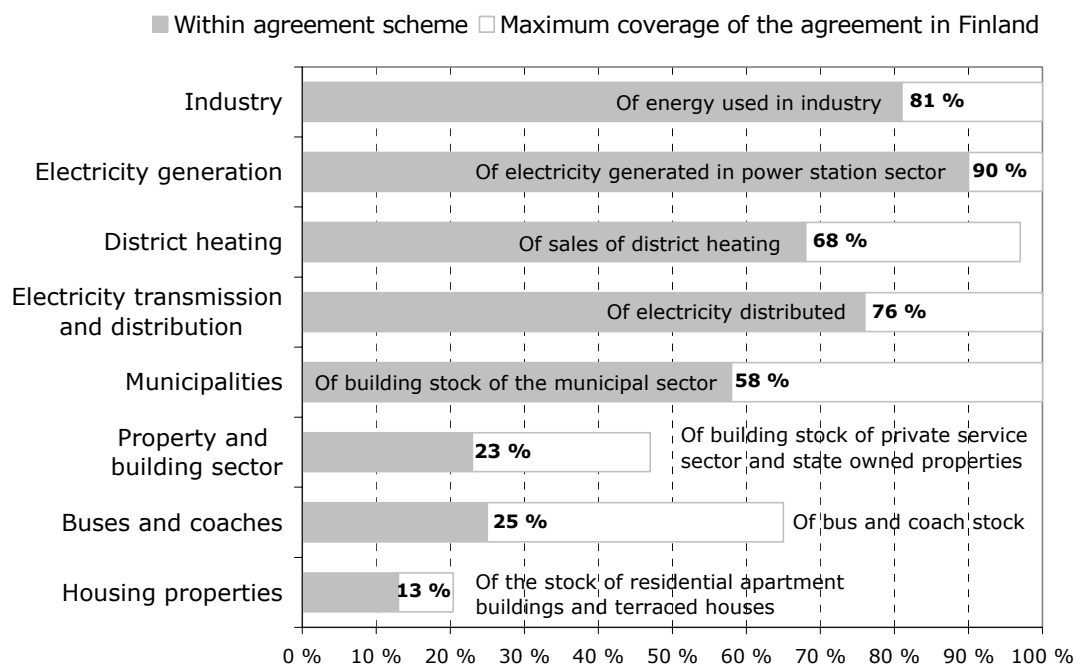


Figure 1. **Coverage of energy conservation agreements in Finland at the end of 2003**

Coverage of Finland's total energy consumption

According to the Energy Statistics 2002 published by Statistics Finland, Finland's total energy consumption was 1403 PJ. The enterprises and communities participating in the energy conservation agreements currently in force account for more than 55% of the total energy consumption. The industrial agreements account for more than half of the energy consumption covered by the enterprises and communities participating in the energy conservation agreements, and the energy sector agreements for more than one third of it. Correspondingly the transport sector agreements account for approximately one per cent and the agreements of the municipal sector, the property and building sector and the housing property sector for just under 10% of the energy consumption covered by the enterprises and communities participating in the energy conservation agreements. The oil-heated buildings within the framework of the Höylä II programme have been counted to participate in the conservation agreement activity, although no agreements are concluded with end-users within the scope of the programme. The share of oil-heated buildings in Finland's total energy consumption is nearly 4%.

In the agreement sectors, the share of energy consumption outside the agreements corresponds to approx. 18% of Finland's total energy consumption. Of the energy consumption outside the agreements, more than 40% is within the industrial agreement, 17% within the agreements of the transport sector and the energy sector, and a good 20% within the agreements of the municipal sector, property and building sector and housing property sector.

Total energy consumption includes both end use of energy (industry, transport, heating of buildings, others) and, e.g., losses of the energy sector, which consist mainly of losses associated with electricity and district heat production, transmission and distribution, and of other shares, associated with, e.g., oil refining. The end-user category "others" includes the energy consumption of households, agriculture, services, the public sector, and the building industry.

In addition to the energy consumption in the above-mentioned agreement sectors, the end-users of district heating and electric heating can be considered to partly fall within the scope of agreement activity, because the energy consumption of these end-users falls within the advisory and other services provided by enterprises participating in the conservation agreements in the district heating sector and the electricity transmission and distribution sector. They account for slightly more than 10% of Finland's total energy consumption.

1.4 Energy audits

With the exception of the areas covered by the energy conservation agreements of the transport sector, the central objective is to extend energy audits and energy analyses to the greatest possible extent to the energy consumption in the area in question. In most agreement sectors, the energy conservation agreements have indeed had a significant impact on the increase in the volume of energy audit activity in the last few years. In the industrial sector and the property and building sector, the impact of the agreements on the increase in the volume of energy audit activity has been great indeed. Still, it will be a big challenge to reach the coverage target set for energy audits in the agreements by the end of 2005.

In the period 1999-2002, approx. 90-95% of the granted audit subsidies were related to projects of enterprises and communities participating in the conservation agreements. In 2003, the share of the enterprises and communities participating in the energy conservation agreements had decreased to 88% of the granted audit subsidies. When calculated on the basis of the number of projects launched, the share had decreased by 5 percentage points, to a good 75%. The numbers of the energy audit and energy analysis projects associated with the implementation of the conservation agreements launched in 1998-2003, their costs, and subsidies granted for them by the Ministry of Trade and Industry are presented by agreement sector in Table 1.

Table 1. **Energy audit and energy analysis projects associated with energy conversation agreements and supported by the Ministry of Trade and Industry (MTI)**

Year	Agreement sector	Number of applications	Number of objects	Costs of projects, million €	Subsidy granted by MTI million €
98	Industry	21	71	1,11	0,55
98	Energy sector	5	8	0,32	0,15
98	Municipal sector	7	120	0,35	0,17
1998	Total	33	199	1,78	0,88
99	Industry	35	67	2,15	1,08
99	Energy sector	7	7	0,15	0,07
99	Municipal sector	8	135	0,52	0,25
99	Property and building sector	1	1	0,01	0,004
99	Transport sector	1	1	0,00	0,0005
1999	Total	52	211	2,83	1,40
00	Industry	50	55	2,66	1,35
00	Energy sector	6	14	0,18	0,09
00	Municipal sector	10	99	0,45	0,22
00	Property and building sector	2	28	0,15	0,08
00	Transport sector	1	1	0,01	0,003
2000	Total	69	197	3,45	1,74
01	Industry	38	50	1,65	0,82
01	Energy sector	13	49	0,64	0,32
01	Municipal sector	24	207	0,88	0,44
01	Property and building sector	10	88	0,47	0,23
01	Transport sector	1	2	0,01	0,004
2001	Total	86	396	3,64	1,82
02	Industry	46	76	1,97	0,79
02	Energy sector	2	3	0,03	0,01
02	Municipal sector	40	257	0,81	0,40
02	Property and building sector	29	230	1,15	0,46
2002	Total	117	566	3,96	1,67
03	Industry	39	42	2,31	0,92
03	Energy sector	10	18	0,37	0,15
03	Municipal sector	26	125	0,44	0,22
03	Property and building sector	29	82	0,51	0,20
2003	Total	104	267	3,63	1,50
98-03	Industry	229	361	11,85	5,51
98-03	Energy sector	43	99	1,70	0,80
98-03	Municipal sector	115	943	3,45	1,71
98-03	Property and building sector	71	429	2,28	0,98
98-03	Transport sector	3	4	0,01	0,01
1998-2003	Total	461	1 836	19,29	9,00

The total amount of audit subsidies granted for the sectors associated with energy conservation agreements remained on a high level in spite of the fact that the amount was reduced by approx. 8% from the previous year. The reduction in the amount of audit subsidies was due to a significant change in the audit volumes in both the municipal sector and the property and building sector compared to the previous year. In these sectors, the audit volume was only approximately half of the previous year's volume, although it remained on the same level in the property and building sector as in 2001 and had increased manifold from the volume of the year 2000. The subsidies granted to the municipal sector in 2003 remained on the same level as in 2000. The reduction in the service sector's volume does not necessarily mean a permanent and significant decline in the volume of audit subsidies. In the property and building sector, there was no reduction in the number of audit projects launched by enterprises participating in the conservation agreements, but the average projects size decreased essentially, which is visible, e.g., as a clearly smaller number of audit objects than in the previous year (Table 1).

In 2002, a total of eight enterprises in the property and building sector had launched a project with audit costs in excess of EUR 50 000, while in 2003 only four enterprises participating in the conservation agreements launched projects of equal magnitude. Of the enterprises which had launched major projects in 2002, only one launched a project also in 2003. In spite of the fact that the audit volumes of the service sector decreased in one year, there is no special reason to worry about the sector's volumes. It means, however, that attainment of the audit objectives set in the agreements (80% in the municipal sector by the end of 2010 and 80% in the property and building sector by the end of 2005) is a bigger challenge for these agreement sectors than before. In the municipal sector, the reduction in the volume is essentially due to the fact that at least some of the biggest municipalities failed to start significant audits in 2003; instead, the projects have been postponed until 2004. Both the number of the municipalities which started audits and the project size decreased clearly from the year before.

The audit volumes of the energy sector and the industrial sector increased in comparison with 2002. The change in the energy sector was promising, even though the sector's audit volume still remained the smallest, when the different agreement sectors were compared. Measured by costs, the industrial audit volume increased by nearly 20% from the previous year, but the number of projects launched and the number of associated audit and analysis objects was clearly reduced. In addition to one major project, the launch of a few of other big projects in 2003 also contributed to the increase in the industrial audit volume, measured by costs. According to industry's agreement, the objective was to perform energy audits or analyses on 80% of industrial energy consumption by the end of 2005. If the audit volume measured by energy consumption remains on the level of 2003 in 2004 and 2005, it is possible to bring approx. 80% of industrial energy use within the scope of audit activity. In the energy sector, the objectives set in the agreements (80% of energy consumption in the district heating sector, minimum 50% of the energy production of power plants) will not be attained by the end of the agreement period.

In industry and the energy sector, audits are also performed without the support of the Ministry of Trade and Industry, due to which the total volume of audit activity is not visible in the attached table. No statistical data is available on the volumes of the audits that enterprises performed entirely at their own expense.

1.5 Investment subsidies for measures increasing efficiency

In its energy subsidy policy, the Ministry of Trade and Industry lays the main emphasis on the introduction of new technology, which saves energy and uses renewable sources of energy. However, enterprises and communities, which have joined energy conservation agreements, can on certain conditions also receive investment support within the framework of the Ministry of Trade and Industry's available appropriations for projects representing conventional energy conservation technology. Subsidised investments must be verified by reported energy audits, energy analyses or other similar reports.

In 2003, the maximum subsidy percentage for conventional energy conservation investments was 15-20%. Before the year 2002, the maximum subsidy percentage has been 10%. The minimum amount of a subsidised project was EUR 25 000, the maximum subsidy to one enterprise as a rule EUR 150 000 per year. As regards subsidised conventional energy conservation measures, priority is given to projects which save electricity. Power-saving is only subsidised if the energy saving thus achieved is considerable or the reduction of emissions into the environment is otherwise significant. Subsidies are not granted for alterations to heating method, with the exception of switching over to the use of renewable sources of energy. As a rule, subsidy is granted for investments whose interest-free repayment period exceeds 2 years. Both audit and investment subsidy must always be applied for before the project is started.

In 2003, a total of approx. EUR 3 million of investment subsidies were granted for 42 projects within four agreement sectors. Since the conclusion of the agreements, subsidies have been granted for 116 projects to the total amount of EUR 7 million.

In 2002 and 2003, some of the enterprises which received investment subsidies were so-called ESCO projects. In 2002, the ESCO projects accounted for approx. 20% of the subsidies granted and in 2003 for more than 35%. In both years, the ESCO projects accounted for slightly less than 20% of the total number of projects. Of the projects which received investment subsidies in 2003, presented in the table, seven were ESCO projects, and the subsidies granted to them totalled approx. EUR 1 million. Five of them were industrial projects (EUR 422 383). Both the municipal sector (EUR 5 640) and the energy sector (EUR 644 000) had one project. The ESCO-concept is examined in more detail in section 1.6.

In addition to the investment subsidies granted for energy conservation investments and ESCO projects, presented in Table 2, investment subsidies totalling approx. EUR 4,2 million, aimed at promoting renewable energy production, were also granted to ten enterprises participating in energy conservation agreements in 2003. Of the subsidies granted, more than half was granted to one project of an enterprise participating in the power generation sector's agreement.

Table 2.

Investment subsidies granted by the Ministry of Trade and Industry (MTI), associated with energy conservation agreements

Year	Agreement sector	Number of applications	Granted subsidy by MTI million €
98	Industry	4	0,10
98	Municipal sector	3	0,06
1998	Total	7	0,15
99	Industry	4	0,33
99	Energy sector	2	0,01
99	Municipal sector	2	0,03
1999	Total	8	0,37
00	Industry	8	0,28
00	Energy sector	3	0,03
00	Municipal sector	5	0,21
2000	Total	16	0,53
01	Industry	11	0,85
01	Energy sector	1	0,04
01	Municipal sector	3	0,03
01	Property and building sec	1	0,004
2001	Total	16	0,92
02	Industry	15	1,77
02	Energy sector	3	0,08
02	Municipal sector	8	0,23
02	Property and building sec	1	0,01
2002	Total	27	2,09
03	Industry	24	1,37
03	Energy sector	7	1,39
03	Municipal sector	9	0,19
03	Property and building sec	2	0,02
2003	Total	42	2,96
98-03	Industry	66	4,70
98-03	Energy sector	16	1,55
98-03	Municipal sector	30	0,74
98-03	Property and building sec	4	0,03
1998-2003	Total	116	7,03

The subsidies granted for conventional energy conservation investments and the ESCO projects included in them, presented in the table, increased by more than 40% from the previous year, and the number of projects increased by more than 50%.

The most significant increase in the subsidies granted took place in the energy sector. More than 75% of the subsidies granted to the energy sector were granted to two major projects, one of which was related to the agreement of the district heating sector and the other to the agreement of the power plant sector.

The number of industrial projects increased from the previous year, but because the project size decreased, the industrial investment subsidies decreased clearly from the previous year. In 2002, nearly half of industrial investment subsidies were related to an individual project of the forest industry. No project of equal magnitude was launched in 2003. In 2003, the biggest project related to the industrial conservation agreement covered approximately one fifth and the three biggest projects nearly half of the total investment subsidies granted to industrial projects.

The number of the projects launched by the municipal sector increased by one from the previous year, but the project size decreased, due to which the total investment subsidies granted to this sector decreased from the previous year. In the municipal sector, the biggest project covered approx. 40% of the investment subsidies granted to the sector's conservation agreements in 2003. In the property and building sector, the number of applications for investment subsidy continued to be small. The number of subsidised projects continued to be only two.

Out of the total subsidy of EUR 7,0 million granted in 1998–2003, industry received approx. 67%, municipalities approx. 11%, the energy sector approx. 22%, and the property and building sector less than one per cent. The most significant changes have taken place in industry, whose share has decreased by more than 15 percentage points in comparison with the previous year, and in the energy sector, whose share has increased correspondingly by more than 18 percentage points.

The distribution of the investment projects launched during the conservation agreement period between various sectors has not changed significantly. Industry accounted for approx. 56%, the municipal sector for approx. 26%, the energy sector for approx. 15%, whilst the remaining approx. 3% comprised projects in the property and building sector.

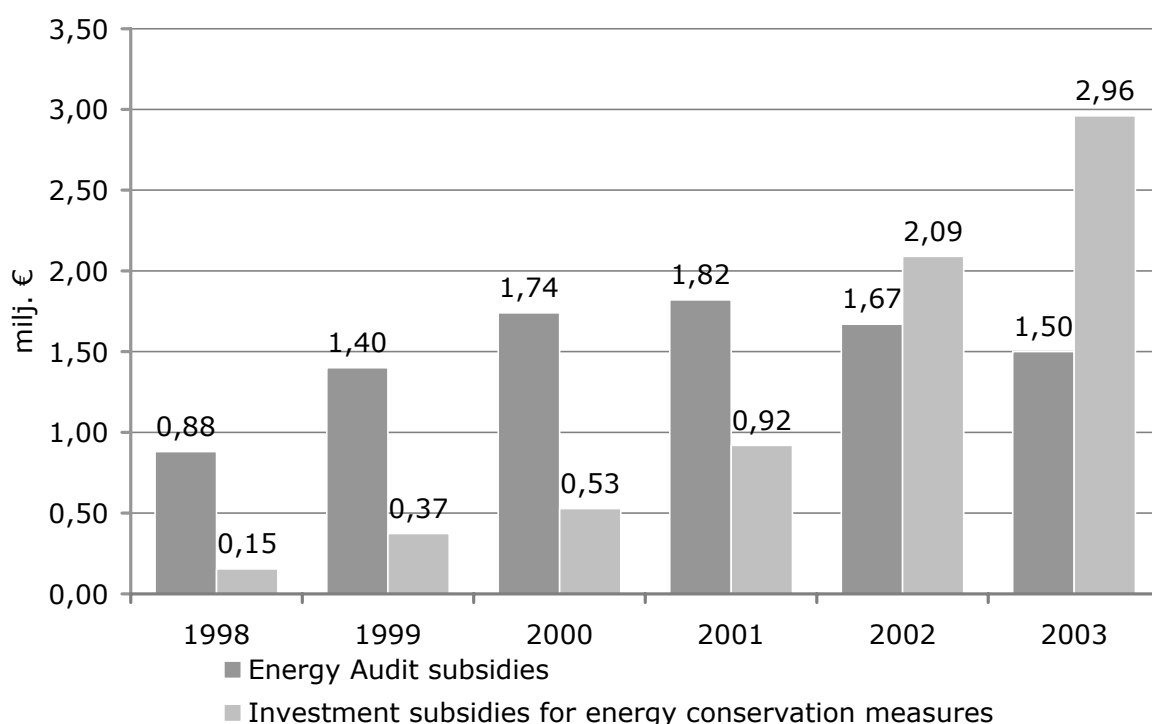


Figure 2. **The audit and investment subsidies granted by the Ministry of Trade and Industry (MTI), associated with energy conservation agreements, in 1998-2003**

In 2003, the number of subsidised energy conservation investment projects was distributed between various sectors mainly in the same way as in previous years. In 2003, however, the energy sector accounted for 47% and industry for 46% of the subsidies granted, which means a significant change in comparison with previous years. Previously, industry has always clearly represented most of the investment subsidies granted (85-92% in 2001 - 2002), and the energy sector has accounted for less than 5%.

1.6 **Implementation and financing of energy conservation investments**

In general, the enterprises participating in energy conservation agreements are responsible for implementing and financing their own energy conservation investments. Sometimes insufficient resources for the measures to be taken or the fact that enterprises require a higher profitability of energy conservation investments than of other investments hinders the implementation of sensible and cost-efficient conservation measures. In such a situation, one alternative is to order the implementation of energy conservation measures from a third party (the so-called ESCO operations model).

In the ESCO model, the ESCO (Energy Service Company) assumes overall responsibility for implementation, the implementation of conservation, financing, or all of these measures. The investment is repaid with the savings it creates during the agreement period, which is why no personnel or investment resources are required of the enterprise. Typically, the ESCO method is best suited for implementation of conservation investments with repayment periods of 2-6 years.

The ESCO method has been made known also in Finland, and currently there are a few ESCOs in operation here. The operations model has not become as widely prevalent as expected, however, although the feedback received on the implemented ESCO projects has been positive. Information on the conservation projects based the ESCO principle is available in the ESCO project register included in Motiva's web site.

To boost the ESCO activity, the Ministry of Trade and Industry has granted investment subsidies to ESCO projects and made them parallel with example projects for new technology. The subsidies granted to these projects may have exceeded the subsidies granted for conventional conservation investments of enterprises participating in conservation agreements. The ESCO projects of enterprises and communities participating in conservation agreements have received subsidies of 15-25%, while the ESCO projects outside conservation agreements have received subsidies of 15-20% (no subsidies are granted for conventional conservation projects outside conservation agreements).

1.7 **The impact of the agreements on energy conservation**

According to the annual reports of the agreement sectors, the total effect of the energy conservation measures implemented in the participating enterprises and communities by the end of 2002 was approx. 4,1 TWh/a (electricity 0,73 TWh/a, heating+fuels 3,33 TWh/a), which on average corresponds to the annual electric and heating energy consumption of approx. 180 000 single-family houses.

In excess of 85% (3,54 TWh/a) of the implemented conservation measures are reported in connection with the energy conservation agreement of industry. The energy sector accounted for approx. 10% (0,46 TWh/a) of the conservation effect of the implemented measures. The effects of the implemented measures reported by the energy sector in 2002 were clearly the greatest so far in this agreement sector. The rest of the

implemented conservation effects were reported by the municipal sector (0.05 TWh/a) and the property and building sector (0,01 TWh/a). In addition, completed measures, whose saving potential amounts to approx. 0,8 TWh/a, were reported by various agreement sectors.

The conservation effect of the measures implemented in 2002 was greater than the corresponding saving in 2001. The saving potential of the measures that have been decided upon clearly decreased in comparison with the previous year, but it continued to be significant, however. Therefore, it can be expected that positive progress has been made in the implementation of energy conservation agreements also in 2003. In addition to the above measures which have been implemented and completed, the total saving potential of the energy conservation measures which according to annual reports are under consideration is 3,43 TWh/a, a somewhat higher figure than in the previous year.

Figure 3 shows the cumulative annual energy conservation effect of implemented energy conservation measures reported by industry, the energy sector, the municipalities, and the property and building sector in reporting years 1998-2002

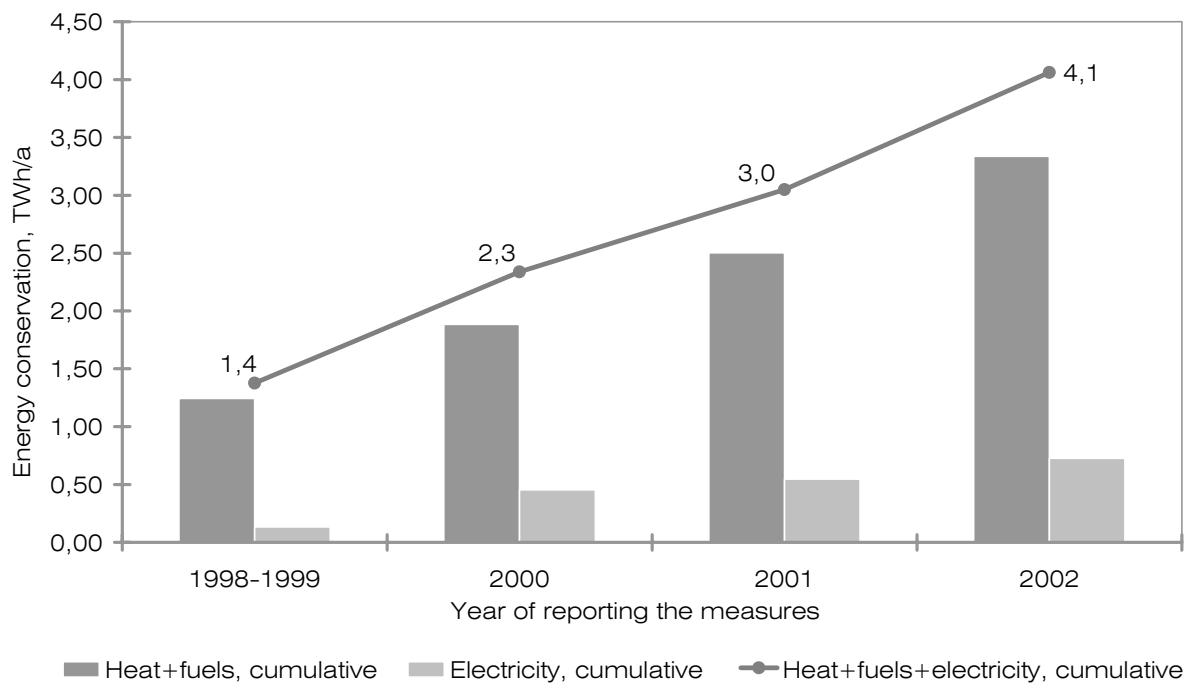


Figure 3. **The cumulative energy conservation effect of implemented energy conservation measures reported by industry, the energy sector, the municipalities, and the property and building sector in reporting years 1998-2002**

When the conservation agreement system was started, it was estimated that the total saving potential in various agreement sectors would be approx. 11 TWh by the end of 2005. Of this amount, electric energy would account for approx. 10%. It was estimated that approximately half of this saving potential would be implemented by 2010. The conservation effects of the implemented measures reported by the end of 2002 confirm the opinion presented earlier that the original estimate of the conservation effect, approx. 5.5 TWh, will be exceeded already during the agreement period, by the end of 2005.

So far, the annual effects of the implemented conservation measures on carbon dioxide reduction are approximately one million tonnes of CO₂, depending on the emission coefficients used in the calculations.