



European Commission
DG Energy
Department C
Unit C.3

Notification

TEM/2616/03.02.02/2013

05 December 2013

NOTIFICATION OF POLICY MEASURES IMPLEMENTED BY FINLAND UNDER ARTICLE 7(9) OF THE ENERGY EFFICIENCY DIRECTIVE (2012/27/EU)

1. Cumulative energy savings target under Article 7 of the Energy Efficiency Directive and its implementation

Article 7 of the Energy Efficiency Directive (2012/27/EU) obliges the Member State to set up an energy efficiency obligation scheme ensuring that energy distributors and/or retail energy sales companies operating in each Member State's territory achieve a cumulative end-use energy savings target by 31 December 2020. This target must be equivalent to achieving, each year from 2014 to 2020, new savings amounting to 1.5 % of the volume of annual energy sales to final customers by all energy distributors or all retail energy sales companies. The average volume of energy sold in 2010–2012 is used in calculating the target.

The Member State may exclude from the calculation the sales of energy, by volume, used in transport. In the calculation, the Member State may also

- (i) carry out the calculation using, instead of 1.5 %, values of 1 % in 2014 and 2015 and 1.25 % in 2016 and 2017;
- (ii) exclude from the calculation sales of energy used in facilities subject to the Emissions Trading Act (311/2011);
- (iii) allow taking into account energy savings achieved in the energy transformation, distribution and transmission sectors, with regard to certain measures set out in Article 14 of the Directive; and
- (iv) take into account energy savings resulting from individual measures implemented from 2009 to 2013.

The application of these four response mechanisms must not lead to a reduction of more than 25 % of the amount of cumulative energy savings by the Member State.

As an alternative to an obligation scheme on energy companies, the Member State may implement other policy measures to achieve energy savings among final customers, provided that these policy measures comply with the criteria set out in Article 7(10)-(11) of the Directive and that the annual new energy saving achieved is equal to that of the energy savings obligation scheme on companies as described above.

Finland has opted to implement other policy measures mentioned in Article 7(9) to implement the obligations set out in Article 7 of the Energy Efficiency Directive.

2. Calculation criteria for the cumulative energy savings target

The baseline data for calculating Finland's cumulative energy savings target are the statistical data on official final energy consumption in 2010 and 2011. Since we do not have official data available for 2012 yet, we will revise the calculation so that this figure represents the three-year average to comply with Article 7 of the Directive by 31 January 2014. In a preliminary three-year average calculation, we have used the 2011 figures for 2012 as well. Preliminary data suggest that the final energy consumption of 2012 will be very close to that of 2011, so the revision will have little impact on the preliminary cumulative energy savings target presented here.

- Final energy consumption, three-year average	298.15 TWh
- Transport energy consumption, three-year average	<u>-58.35 TWh</u>
	239.81 TWh ¹

In order for the calculation of the energy savings target to reflect the requirements of Article 7(1) of the Directive, the following energy volumes, which have not been sold to end users by retail energy sales companies operating in Finland, will have to be subtracted from the above statistical data.

- Energy generated and utilised by industrial facilities themselves	-68.47 TWh ²
- Utilisation of heating wood retrieved from own private woods	-13.85 TWh ³
- Electricity purchased by end users directly from Nord Pool Spot AS	<u>-2.09 TWh⁴</u>
	-84.41 TWh

Besides the items presented above, certain other fairly small energy volumes have been identified which are clearly not sold to end users by retail energy sales companies.

The final energy consumption that equates to the energy sold to end users by retail energy sales companies operating in Finland and meets the definition of Article 7 of the Energy Efficiency Directive is 155.40 TWh (239.81 – 84.41). The new annual energy saving of 1.5% calculated from this total is 2.33 TWh (155.40 x 0.015).

Converted to cumulative energy savings, Finland's overall energy savings target in years 2014–2020 is thus 65.27 TWh_{cum} (2.33 x 28).

3. Response mechanisms under Article 7(2) of the Energy Efficiency Directive

Under Article 7(3) of the Directive, the total impact of the response mechanisms under Article 7(2) may not be more than 25 % of the overall target under Article 7(1). The maximum volume of Finland's response mechanisms in cumulative energy savings is thus 16.32 TWh_{cum} (0.25 x 65.27).

The Member State must notify the Commission of the response mechanisms it has deployed by 5 June 2013.

¹ Average calculated based on Eurostat data from 2010 and 2011; data for 2012 copied from 2011.

² Eurostat data complemented with facility-specific national statistical data

³ Based on a survey by Finnish Forest Research Institute (Metla)

⁴ Reported by Nord Pool Spot AS

Finland will primarily make use of the response mechanism set out in Article 7(2)(d) of the Directive. The total cumulative energy savings resulting from early measures taken in compliance with this in years 2009 to 2013 is 99.33 TWh_{cum}. The savings impact of the early measures is presented in Annex 3 alongside each energy efficiency measure.

As necessary, Finland will carry out the calculation using the lower values under subparagraph a (1.0 % and 1.25 %) and exclude from the calculation part of the sales of energy used in industrial facilities covered by the Emissions Trading Act as provided in subparagraph b.

Taking into account the 25 % share of response mechanisms, the cumulative energy savings target for the period from 2014 to 2020 is 48.95 TWh_{cum} (65.27 - 16.32).

4. Finland's cumulative energy savings target periods

Finland will apply the periods of 2014–2016 and 2017–2020 in its energy savings target.

5. Policy measures

Finland's national energy efficiency programme, which will implement the obligations of Article 7(9) of the Energy Efficiency Directive, includes eight energy efficiency measures which are presented in Table 1 alongside their savings impact. The descriptions of the energy efficiency measures and the calculation of their energy savings impact is presented in Annex 3.

Calculated by the VATTAGE model of the Finnish Government Institute for Economic Research (VATT), the impact of energy or CO₂ taxes set out in Article 7(9)(a) of the Directive on Finland's overall final energy consumption is, as cumulative energy savings in 2014–2020, 72.9 TWh_{cum}. Since this savings impact would significantly coincide with the measure-specific cumulative energy savings presented in Table 1, the table only presents the savings impact of road traffic fuel taxation.

Table 1. Energy efficiency measures gathered in the national energy efficiency programme and their cumulative energy savings impact (TWh_{cum})

Energy efficiency measure	Measures 2009–2013 TWh _{cum}	Period 1 2014–2016 TWh _{cum}	Period 2 2017–2020 TWh _{cum}	Total 2014–2020 TWh _{cum}
Energy efficiency agreement activities	53.29	20.05	10.06	30.11
Transport fuel taxation / road traffic		9.86	13.15	23.01
Energy audit activities	4.77	1.78	0.93	2.71
Energy efficiency agreements/Action Plan for Energy Services and Höylä III – customers		3.72	4.75	8.47
Heat pumps for single-family houses, terraced houses	16.52	9.02	2.79	11.81
Boiler house investments	6.16	2.76	1.31	4.06
Energy efficiency regulations for renovation and start-up assistance for building renovation		4.78	2.50	7.28
Energy efficiency regulations for new construction	18.59	9.72	5.40	15.12
Total	99.33	61.69	40.88	102.57

In Table 1, the savings impact of the “Energy efficiency agreement activities” for the 2009–2012 period is calculated on the basis of completed energy efficiency measures reported. The impact projected for the 2014–2020 period is based on the actual energy savings attained in 2009–2012.

Since the energy efficiency agreement activity is a key measure in the national energy efficiency programme, the Ministry of Employment and the Economy has co-signed two letters of intent whereby it has committed itself to negotiating a new agreement period for years 2017–2020 and to aiming for satisfactory cumulative energy savings volume in the 2014–2020 period. The letter of intent, co-signed by the Ministry of Employment and the Economy, the Confederation of Finnish Industries (EK) and its member associations, sets an energy savings target of 28 TWh_{cum}. Another letter of intent, co-signed by the Ministry of Employment and the Economy and Finland’s six leading cities and one joint municipal authority, sets energy savings targets for each participating municipality, in total 0.956 TWh_{cum}.

6. Calculation and monitoring of energy savings

The procedures and frameworks for calculating, monitoring, controlling and reporting the energy efficiency measures set out in point 4 are described in Annex 3 individually for each energy efficiency measure.

The cumulative energy savings impact of energy efficiency measures set out in Table 1 has taken into account any mutually overlapping impacts.

ANNEX 1	Letter of intent by the Ministry of Employment and the Economy and EK member associations
ANNEX 2	Letter of intent by the Ministry of Employment and the Economy, Helsinki, Espoo, Tampere, Turku, Oulu, Vantaa and Helsinki Region Environmental Services Authority
ANNEX 3	Description of measures included in Finland’s national energy efficiency programme
	KETO-1-TEM Energy efficiency agreement activity
	KETO-2-VM/LVM Transport fuel taxation/road traffic
	KETO-3-TEM Energy audit activities
	KETO-4-TEM Energy efficiency agreement activities / Action Plan for Energy Services and Energy Efficiency Agreement for Heating Oils and Transportation Fuels (Höylä III) – Customers
	KETO-5-TEM Heat pumps for single-family houses, terraced houses
	KETO-6-MMM Boiler house investments
	KETO-7-YM Energy efficiency regulations for renovation and start-up assistance for building renovation
	KETO-8-YM Energy efficiency regulations for new construction

TEM/2414/05.05.01/2013

**Letter of intent
on continuing the Energy Efficiency Agreement for Trade and Industry in
2017–2020 and on cumulative energy savings target for 2014–2020**

1 Energy Efficiency Agreements 2008–2016

The Ministry of Trade and Industry, the Confederation of Finnish Industries (EK), the Finnish Food and Drinks Industries' Federation ETL, the Finnish Energy Industries, the Chemical Industry Federation of Finland, the Finnish Hospitality Association (MaRa), the Finnish Forest Industries Federation, the Finnish Plastics Industries Federation, the Federation of Finnish Commerce and the Federation of Finnish Technology Industries signed a framework agreement on 4 December 2007 to continue the energy savings agreement scheme expiring on 31 December 2007. The new Energy Efficiency Agreement for Trade and Industry for 2008–2016 agreed on co-operation to implement the measures that the objectives and implementation of the Energy and Climate Strategy, approved by the Government in November 2005, required. The Energy Efficiency Agreements for Trade and Industry have been crucial in the national implementation of the Energy Services Directive (2006/32/EC) which came into force in 2006.

In 2008 the Ministry of Employment and the Economy replaced the now defunct Ministry for Trade and Industry as the Government party to the agreement. In 2010 the Finnish Central Organisation for Motor Trades and Repairs joined the framework agreement as a new sector. By the end of 2012, a total of 520 companies had joined the Energy Efficiency Agreement for Trade and Industry through the framework agreement's sectoral action plans.

2 The European Union energy efficiency target and the new Energy Efficiency Directive

The European Union has made a commitment to increase energy efficiency by 20 % by 2020. The Energy Efficiency Directive (2012/27/EU), which came into force on 4 December 2012, set out common frameworks and measures for Member States to ensure the attainment of this EU energy efficiency target. Article 7 of the Directive sets out an obligation on Member States to create an energy efficiency obligation scheme or to implement other policy measures to attain cumulative energy savings equal to new energy savings of 1.5 % a year in 2014–2020. Article 7 mentions voluntary agreements as an example of other policy measures.

3 The significance of energy efficiency agreements in the implementation of the Energy Efficiency Directive

The Ministry of Employment and the Economy, the Confederation of Finnish Industries (EK) and the member associations that have signed the framework agreement believe that energy efficiency agreements will continue to play a crucial role in promoting energy efficiency in Finland, and that the energy efficiency agreements are a flexible and cost-efficient policy measure for attaining the objectives of the new Energy Efficiency Directive. Energy efficiency agreements can achieve a significant part of the cumulative energy savings target set out in Article 7 of the Energy Efficiency Directive for the period from 2014 to 2020.

The Energy Efficiency Agreement for Trade and Industry has achieved energy savings of 6.0 TWh¹ in a period of five years (2008–2012). Continuing the Energy Efficiency Agreement for Trade and Industry at the present energy savings level would bring the savings impact to 10.8 TWh by the end of 2016. The three latter years (2014–2016) of the agreement would account for 3.6 TWh.

Continued implementation of the Energy Efficiency Agreements for Trade and Industry until 2020 would bring the potential cumulative energy savings, as set out in Article 7 of the Energy Efficiency Directive, in the 2014–2020 objective period of the Directive to 28–34 TWh_{cum}. Thus the Energy Efficiency Agreements for Trade and Industry could cover approximately half of Finland's overall target for cumulative energy savings.

4 Content of the letter of intent

We, the parties to the Energy Efficiency Agreement for Trade and Industry, undertake to:

- carry out negotiations in 2015 for a new voluntary agreement scheme to start on 1 January 2017; and
- in the framework of the existing and new voluntary agreement scheme, strive for cumulative energy savings amounting to 28 TWh² by energy efficiency measures implemented in 2014–2020.

In order to attain this savings target, the Ministry of Employment and the Economy strives to ensure, with regard to the new voluntary agreement to be negotiated in 2015, that it can subsidise energy audits and analyses connected to participating companies' energy savings and renewable energy use as well as energy saving investments that meet the general criteria for energy subsidies. The Ministry will also strive to ensure sufficient resources to participate in joint development projects by companies signing the agreement.

The Confederation of Finnish Industries (EK) and its member associations will strive to ensure, with regard to the new agreement to be negotiated in 2015, that the volume of companies signing this agreement, due to commence on 1 January 2017, will be sufficient to achieve an effective coverage so that the targeted cumulative energy savings can be achieved.

¹ Does not include energy savings reported within the Action Plans for Energy Production and Energy Services.

² Investments implemented in 2014 and 2015 will be of great importance in calculating the cumulative energy savings. Therefore the target measuring unit used is 1 TWh of annual energy savings.

5 On the calculation of energy savings

In the Energy Efficiency Agreement for Trade and Industry, the energy savings of measures taken in 2014–2016 will be calculated mostly as under the current agreement. From 2014 onward, energy savings from measures affecting the energy consumption of end clients reported under the Action Plan for Energy Services can also be taken into account. Any needs to change the energy saving calculation routine required by the Energy Efficiency Directive for the new agreement period commencing in 2017 will be assessed in the context of the agreement negotiations.

In Helsinki, 29 November 2013

**Ministry of Employment and the
Economy**

Jan Vapaavuori
Minister of Economic Affairs

Esa Härmälä
Director-General

**Finnish Central Organisation for
Motor Trades and Repairs**

Pekka Helander
Chairman

Pekka Rissa
Managing Director

Finnish Energy Industries

Matti Rintanen
Chairman

Juha Naukkarinen
Managing Director

Confederation of Finnish Industries

EK

Ilpo Kokkila
Chairman

Jyri Häkämies
Managing Director

**Finnish Food and Drinks Industries'
Federation**

Juha Gröhn
Chairman

Heikki Juutinen
Managing Director

Federation of Finnish Commerce

Matti Halmesmäki
Chairman

Juhani Pekkala
Managing Director

**Chemical Industry Federation of
Finland**

Matti Lievonen
Chairman

Timo Leppä
Managing Director

Finnish Forest Industries Federation

Juha Vanhainen
Chairman

Timo Jaatinen
Managing Director

**Federation of Finnish Technology
Industries**

Jari Paasikivi
Chairman

Jorma Turunen
Managing Director

**Finnish Hospitality Association
(MaRa)**

Mikko Merivirta
Chairman

Timo Lappi
Managing Director

Finnish Plastics Industries Federation

Kimmo Kedonpää
Chairman

Vesa Kärhä
Managing Director

TEM/2415/05.05.01/2013

Letter of intent
on continuing the Energy Efficiency Agreement in 2017–2020
and on cumulative energy savings target for 2014–2020

1 Energy Efficiency Agreements 2008–2016

The Ministry of Trade and Industry, the City of Helsinki, the City of Espoo, the City of Tampere, the City of Turku, the City of Oulu and the City of Vantaa signed municipal energy efficiency agreements on 4 December 2007 to continue the energy savings agreement scheme expiring on 31 December 2007. The new Energy Efficiency Agreements for 2008–2016 agreed on co-operation to implement the measures that the objectives and implementation of the Energy and Climate Strategy, approved by the Government in November 2005, required. The Municipal Sector Energy Efficiency Agreements (KETS) and, for small municipalities, the Municipal Sector Energy Programme (KEO) have played a crucial role in the national implementation of the Energy Services Directive (2006/32/EC) which came into force in 2006.

In 2008 the Ministry of Employment and the Economy replaced the now defunct Ministry for Trade and Industry as the Government party to the agreement. The energy efficiency agreement of the Helsinki Region Environmental Services Authority (HSY) came into force on 15 February 2012. At the end of 2012, a total of 135 municipalities or joint municipal authorities were covered by the Municipal Sector Energy Efficiency Agreement and Municipal Sector Energy Programme.

2 The European Union energy efficiency target and the new Energy Efficiency Directive

The European Union has made a commitment to increase energy efficiency by 20 % by 2020. The Energy Efficiency Directive (2012/27/EU) which came into force on 4 December 2012 set out common frameworks and measures for Member States to ensure the attainment of this EU energy efficiency target. Article 7 of the Directive sets out an obligation on Member States to create an energy efficiency obligation scheme or to implement other policy measures to attain cumulative energy savings equal to new energy savings of 1.5 % a year in 2014–2020. Article 7 mentions voluntary agreements as an example of other policy measures.

3 The significance of energy efficiency agreements in the implementation of the Energy Efficiency Directive

The Ministry of Employment and the Economy and the municipalities which have signed this agreement believe that energy efficiency agreements will also in future play a crucial role in promoting energy efficiency in Finland, and that the energy efficiency agreements are a flexible and cost-efficient policy measure for attaining the objectives of the new Energy Efficiency Directive. Energy efficiency agreements can achieve a significant part of the cumulative energy savings target set out in Article 7 of the Energy Efficiency Directive for the period from 2014 to 2020.

The Municipal Sector Energy Efficiency Agreement has achieved energy savings of 0.2 TWh in a period of five years (2008–2012). The energy savings will rise to 0.5 TWh by continuing the implementation of the municipal sector energy efficiency agreements and energy programme until the end of 2016. The three latter years (2014–2016) of the agreement would account for 0.25 TWh.

Continued implementation of the Municipal Sector Energy Efficiency Agreement scheme until 2020 would bring the potential cumulative energy savings, as set out in Article 7 of the Energy Efficiency Directive, to 2.0–2.5 TWh_{cum} in the 2014–2020 objective period of the Directive. Thus the Municipal Sector Energy Efficiency Agreement scheme could cover approximately 5 % of Finland's overall target for cumulative energy savings.

4 Content of the letter of intent

We, the parties to the Municipal Sector Energy Efficiency Agreements, undertake to:

carry out negotiations in 2015 for a new voluntary agreement scheme to start on 1 January 2017; and
in the framework of the existing and new voluntary agreement scheme, strive for the following cumulative energy savings¹ by energy efficiency measures implemented in 2014–2020:

City of Helsinki	418 GWh _{cum}
City of Espoo	120 GWh _{cum}
City of Tampere	124 GWh _{cum}
City of Vantaa	84 GWh _{cum}
City of Oulu	70 GWh _{cum} ²
City of Turku	88 GWh _{cum}
Helsinki Region Environmental Services Authority	54 GWh _{cum} ³

In order to attain these savings targets⁴, the Ministry of Employment and the Economy strives to ensure, with regard to the new voluntary agreement to be negotiated in 2015, that it can subsidise energy audits and analyses connected to participating municipalities' energy savings and renewable energy use, as well as energy saving investments that meet the general criteria for energy subsidies. The Ministry will also strive to ensure sufficient resources to participate in joint development projects by municipalities signing the agreement.

The municipalities strive to contribute to the effect that the new agreement to be negotiated in 2015 will achieve sufficient volume and coverage so that Finland can attain its cumulative energy savings target pursuant to Article 7 of the Energy Efficiency Directive.

¹ The municipal cumulative energy savings targets have been calculated using an annual 1 % energy savings level for the years 2014–2020 using the average energy consumption by municipal buildings, street lighting, water management and machinery and equipment in 2010–2012 as baseline. For heating, the target is calculated on the basis of non-standardised consumption. Municipal buildings in this context mean all buildings directly owned by the municipality and housing and service buildings owned by companies fully owned by the municipality.

² The savings target for the City of Oulu has been calculated on the basis of Oulu as it stood before the 2013 merger with adjoining municipalities. The target will be updated when the new agreement is negotiated in 2015.

³ The savings target for the Helsinki Region Environmental Services Authority covers the operations' energy use in full.

⁴ The combined volume of cumulative energy savings through municipal targets based on current calculation methods is 958 GWh_{cum}. The share of municipalities that are signatories to the letter of intent is approximately 30 % of all municipal energy consumption.

5 On the calculation of energy savings

In the Municipal Sector Energy Efficiency Agreement and Energy Programme, the energy savings of measures taken in 2014–2016 will be calculated mostly as under the current agreement. Any needs to change the energy saving calculation routine required by the Energy Efficiency Directive for the new agreement period commencing in 2017 will be assessed in the context of the agreement negotiations.

In Helsinki, 5 December 2013

Ministry of Employment and the Economy

Jan Vapaavuori
Minister of Economic Affairs

Esa Härmälä
Director-General

City of Espoo

Jukka Mäkelä
Mayor

City of Vantaa

Kari Nenonen
Mayor

City of Helsinki

Jussi Pajunen
Mayor

Pekka Sauri
Deputy Mayor

Kristiina Matikainen
City Secretary

City of Tampere

Anna-Kaisa Ikonen
Mayor

City of Turku

Aleksi Randell
Mayor

Helsinki Region Environmental Services Authority

Raimo Inkinen
Managing Director

TABLE OF CONTENTS

Description of measures included in Finland's national energy efficiency programme:

KETO-1-TEM	Energy efficiency agreement activities
KETO-2-VM/LVM	Transport fuel taxation/road traffic
KETO-3-TEM	Energy audit activities
KETO-4-TEM	Energy efficiency agreement activities/Action Plan for Energy Services and Energy Efficiency Agreement for Heating Oils and Transportation Fuels (Höylä III) – Customers
KETO-5-TEM	Heat pumps for single-family houses, terraced houses
KETO-6-MMM	Boiler house investments
KETO-7-YM	Energy efficiency regulations for renovation and start-up assistance for building renovation
KETO-8-YM	Energy efficiency regulations for new construction

Measure	Measure code	
Energy efficiency agreement activities	KETO-1-TEM	
Measure periods	Period 1 2014–2016, 3 a	Period 2 2017–2020, 4 a
<p>Linkage to policy measures</p> <p>The Energy Efficiency Agreements 2008–2016 and the preceding Energy Savings Agreements (1997–2007) have played a crucial role in the implementation of Finland’s every climate and energy strategy since 2001. The energy efficiency agreement activities fall under category c) “voluntary agreements” under Article 7(9).</p>		
<p>Entrusted parties, participating parties and implementing public authorities</p>		
<p>Entrusted parties:</p>		
<ul style="list-style-type: none"> Motiva: Support to participating companies/organisations in the implementation of the agreement, development of implementation tools and services and guidance and dissemination of information through seminars, training, websites, joint development projects etc. Guidance in certain sectors is company-specific. Audit of individual participants' annual reporting data and requests for further clarification. Motiva also maintains and develops the energy efficiency agreement scheme database and monitors the results of agreement activities, assesses impacts and compiles reports. Centres for Economic Development, Transport and the Environment (ELY Centres): Processes investment subsidy applications related to agreement activities and allocates the subsidies. 		
<p>Participating parties:</p>		
<ul style="list-style-type: none"> Industrial companies, private service sector companies, municipalities and joint municipal authorities, industrial facility owners and rental housing associations that have joined in the agreement: These commit to the targets for implementing their own agreement/action plan, set an energy savings target for themselves and report annually on implemented measures and their savings impact, and on other measures taken under the agreement. http://www.energiatehokkuussopimukset.fi/en/ Confederation of Finnish Industries (EK) and the Finnish Association of Building Owners and Construction Clients (RAKLI): Both undertake to promote, in their own sectors, the achievement of the coverage target and the implementation of their own agreement/action plan. Both also undertake to comply with the implementation targets set for each association. http://www.energiatehokkuussopimukset.fi/en/ 		
<p>Implementing public authority:</p>		
<ul style="list-style-type: none"> Ministry of Employment and the Economy (TEM): Party to the energy efficiency agreement activities and the responsible administrative authority, except as regards the action plan for rental housing associations in the real estate sector. Undertakes to take the measures set out for the ministry in the agreement. http://www.energiatehokkuussopimukset.fi/en/ Ministry of the Environment (YM): Party to the energy efficiency agreement activities and the responsible administrative authority of the action plan for rental housing associations in the real estate sector. Undertakes to take the measures set out for the ministry in the agreement. http://www.energiatehokkuussopimukset.fi/en/ Energy Authority (EV): This is a new public authority, operational from the beginning of 2014. It will take over some of the administrative duties related to TEM’s agreement activities. 		
<p>Description of the measure</p>		
<p>The following three sectors are herein included in the energy efficiency agreement activities:</p>		
<p>The Energy Efficiency Agreement for Trade and Industry contains an action plan for energy-intensive industries, five sector-specific action plans for medium-sized industries (food, chemical, plastics, wood processing, technology) and a general industry action plan for companies that do not have a separate action plan for their own sector. The service sector has three sector-specific action plans (commerce, tourism and catering services and the automotive sector) and a general service sector action plan for companies that do not have a separate action plan for their own sector.</p>		
<p>In the municipal sector, there is the Energy Efficiency Agreement for large and mid-size municipalities and the Energy Programme for small municipalities. The municipal energy efficiency agreements are made between the participating municipality or joint municipal authority and the Ministry for Employment and the Economy. The small municipalities’ Energy Programme is administered by Motiva, and the municipality joins it by signing a separate accession document.</p>		
<p>The energy efficiency agreement for the real estate sector covers the industrial and commercial buildings owned by real estate companies and the residential buildings owned by rental housing associations.</p>		
<p>The energy efficiency agreements for trade and industry and the real estate sector are framework agreements which have been signed by the Ministry of Employment and the Economy, the Ministry of the Environment, the Confederation of Finnish Industries (EK), the Finnish Association of Building Owners and Construction Clients (RAKLI) and the participating industry and service sector associations. Companies join these agreements by a separate accession document.</p>		
<p>The total energy consumption by the industrial companies which have joined the agreement activities covers approximately 85 % of overall industrial energy consumption. As regards mid-sized industries, depending on sector, the energy consumption by companies which have joined in amounts to 60–70 % of the overall energy consumption covered by the action plan. The Municipal Energy Efficiency Agreement now covers 78 municipalities or joint municipal authorities and the Energy Programme covers 57 municipalities or joint municipal authorities. Municipalities participating in the municipal agreements contain almost 75 % of Finland’s population. The building stock of real estate associations participating in the real estate sector agreement covers approximately 80 % of the total building stock addressed by the action plan.</p>		

The housing stock of rental housing associations participating in the agreement covers around 80 % of the total number of homes in all rental, right-of-residence and part-ownership housing addressed by the agreement.

For more information on the agreement activities, see <http://www.energiatehokkuussopimukset.fi>. The companies and organisations which have joined in the energy efficiency agreement activities report their energy consumption, implemented energy saving measures and progress in implementing other obligations under the agreement annually through a web-based monitoring system. The energy saving measures reported may be either saving measures uncovered in energy audits and analyses or measures that the companies have discovered otherwise.

The company- and organisation-specific annual reporting is not accessible to public. Annual summaries are drawn from the reported data both by sector and covering the agreement activities as a whole. These summaries are published annually.

Assessment of energy savings impacts

Calculation premises and assumptions

The calculation includes other energy saving measures reported as realised (T) in the annual reporting of energy saving agreement activities except those uncovered in energy audits. The savings impact of measures proposed in the energy audits conducted in the participating companies is presented in the context of the energy audit activities to avoid overlapping reporting of data.

The savings used in calculations up until 2012 (MWh/a) are savings impacts from implemented measures reported by the participating companies and organisations in their annual reports. The savings for 2013 are estimated on the basis of actual figures in average in the 3 preceding years. The annual figures for years 2014–2020 are estimated to correspond to that of 2013. The information covers nearly all participating companies, since the reporting rate of participating companies has been between 95 and 100 % each year.

The measures are divided into operational and technical measures. The life of a saving resulting from technical measures is more than 12 years, so their impact will still be felt in 2020 whether they have been taken in the early period of 2009–2013 or in the Energy Efficiency Directive implementation period 2014–2020.

It is assumed that one half of the savings impact of each technical measure taken is achieved in the first year. Thus the factor used in cumulative saving calculation for measures implemented in 2014 is 6.5, and the same figure for measures implemented in 2020 is 0.5. It is assumed in the calculations that the lifetime of operational measures is two years for measures taken in the service sector action plans and five years for industrial operational measures. Industrial operational measures are often technical alterations related to process changes, which are implemented after careful consideration and with an eye on longer-term savings. The majority of these companies also have a management system in place that also incorporates energy efficiency.

Based on monitoring data, measures that require eco-design requirements to be taken into account for their savings impact to be properly calculated have been set apart from reported electricity savings. When it comes to lighting, only some of the savings come from the actual lamps and some come from lighting fixtures, inductors etc. Thus only 40 % of the savings impact of lighting-related measures is included in the cumulative calculation of the savings impact under Article 7. Similarly, in an assessment of engine savings, only 20 % of savings are included in the calculation. In addition, 15 % of remaining electricity savings is deducted in the industrial sector at this stage and 50 % in the service sectors.

Baseline data

The baseline data for calculations are retrieved from data gathered through annual reporting from those participating in the energy efficiency agreement scheme in the agreement monitoring system.

Each participating company and organisation reports data, including the following, on a yearly basis:

- general information (contact information, sector etc.)
- detailed energy use data
- energy saving measures taken (other than those reported in energy audits), including
 - year of implementation, investment required, pay-back period, etc.
 - estimated energy savings (electricity, heat, fuels) MWh/a
- information on the implementation rate of energy saving measures in process industry as proposed in energy audits
 - T = realised + year of implementation, P = due to be implemented, H = being considered, E = decision made to not implement
 - other information from the energy audit (e.g. savings impact)
- information on energy efficiency management systems, including information on monitoring of consumption, energy efficiency plans and environmental management system
- other issues relating to use of renewable energy, consideration of energy efficiency in planning and procurement, staff training on energy issues, communications on energy savings and efficiency, energy efficiency in transport and logistics, etc.

The precision of calculation of reported savings is equivalent to that achieved in normal field operations. Some of the baseline data is planning data or estimates, since actual measuring is not always possible. Savings achieved through saving measures are, as a rule, not verified by measurements, since measuring is often practically impossible and/or causes significant extra costs.

Calculation method

Our own bottom-up calculation method, which was used in the NEEAP-2 calculation and has since been modified to conform to the Energy Efficiency Directive.

The calculation takes into account the lifetime of savings separately for operational and technical measures. The calculation also takes into account the need arising from eco-design requirements to calculate the savings resulting from measures only to the extent that they exceed the minimum level set out for the technology.

The annual energy savings (ES) are based on the energy savings impact of measures reported as realised (T) each year (electricity + heat + fuels).

The annual energy savings (ES) are calculated using the formula

$$ES[\text{GWh/a}] = ES(\text{heat+fuels}) + ES(\text{electricity})$$

The cumulative energy savings impact shown in the table below for each year in the table is obtained by adding the energy savings impacts (ES) calculated each year by the above formula, multiplied by the cumulative factor for each year.

As stated above, the factor for the calculation of cumulative savings is 5 for industrial operational measures (4.5 for 2016 and 0.5 for 2020) and 2 for operational measures in the service sector (1.5 for 2019 and 0.5 for 2020). The factor for the calculation of cumulative savings for technical measures is 6.5 in 2014 and 0.5 in 2020. The factor for the calculation of cumulative savings for early technical measures is 11.5 in 2009 and 7.5 in 2013.

Overlaps

Overlapping impacts with respect to energy audit operations have been taken into consideration. With the exception of process industry energy analyses, this estimate excludes the impacts of measures observed in energy audits, which are only contained in the impact assessment of energy audit activities.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Employment and the Economy, Motiva

Monitoring of results and corrective measures

The results of the energy efficiency agreements are monitored through annual reporting by participating companies and organisations. The information annually reported by companies and organisations is described above under "Assessment of energy savings impacts – Baseline data". Once the reporting is completed, the order of magnitude of data provided and its general accuracy is reviewed by Motiva and further information is requested from the companies as necessary. The annual information reported by participants is not public.

Energy counselling is provided in some sectors involved in agreement activities. When companies are contacted, the reported implemented measures and issues relating to savings calculation are also discussed. A survey using random sampling was conducted in 2011 among mid-sized industrial companies regarding the calculation and documentation of the savings impacts of implemented saving measures they had reported as realised.

Written guidelines are provided for the assessment of savings impact of energy saving measures: [Säästöjen laskennan pelisäännöt ja ohjeet](#) and yearly seminars have been arranged for participants and their service providers regarding savings calculation at the start of the yearly reporting.

Based on reported company- or organisation-specific information, yearly summaries are compiled by sector as well as covering all energy saving agreement activities. These summaries are public: [Toimialakohtaiset vuosiraportit](#), e.g. [Energiatehokkuussopimukset tuloksia 2011.pdf](#).

Each agreement has its own steering group to assess the efficiency of agreement activities and, as required, to plan and implement corrective measures.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)		Early measures	2014–2016	2017–2020	2014–2020	
EED	KETO-1-TEM	Energy efficiency agreement activities	53 292	20 046	10 064	30 110

Measure		Measure code	
Transport fuel taxation/road traffic		KETO-2-VM/LVM	
Measure periods	Period 1	2014–2016, 3 a	Period 2
			2017–2020, 4 a
Linkage to policy measures			
Transport fuel taxation falls under paragraph 9(a) of Article 7			
Entrusted parties, participating parties and implementing public authorities			
Entrusted parties:			
<ul style="list-style-type: none"> • Not applicable 			
Participating parties:			
<ul style="list-style-type: none"> • Not applicable 			
Implementing public authority:			
<ul style="list-style-type: none"> • Ministry of Finance (VM): initiator of tax legislation in Finland • Customs: is in charge of collecting fuel taxes in Finland. 			
Description of the measure			
Act on excise duty on liquid fuels (1472/1994) and government proposal (HE 110/2013) to amend it			
Assessment of energy savings impacts			
Calculation premises and assumptions			
The examination covers the use of petrol and diesel fuel in passenger cars, trucks, buses and vans. The savings in this measure arise from Finland's higher transport fuel taxation (including excise tax, CO ₂ based taxes, strategic stockpile fee and value-added tax) compared to minimum levels set by the EU for fuel tax and value-added tax.			
Baseline data			
<p>The transport fuel consumption data for 2009–2012 was obtained from the transport statistics by Statistics Finland. In 2012, for example, petrol consumption by passenger cars amounted to 1 822 million litres and diesel consumption to 1 147 million litres. Diesel consumption by heavy trucks was 1 117 million litres, by buses 193 million litres, and by vans 450 million litres. Excluded from this examination are vehicles that use other fuel than petrol or diesel, petrol-driven vans (small consumption), motorcycles and mopeds. The consumption figures from 2012 have also been applied for years 2013–2020.</p> <p>The tax-free price of transport fuels is retrieved from the energy statistics by Statistics Finland. For each year, the average calculated from quarterly prices has been applied. For example, in 2012 the tax-free price of petrol was 72.17 cents/litre and that of diesel was 78.30 cents/litre.</p> <p>The minimum tax rate imposed by the EU for petrol was 35.9 cents/litre in 2009–2013. The minimum tax rate for diesel was 30.2 cents/litre in 2009 and 33.0 cents/litre in 2010–2013. The 2013 level has also been applied to years 2014–2020.</p> <p>In Finland, petrol taxation and levies and fees on petrol have developed as follows:</p> <ul style="list-style-type: none"> • The petrol excise tax was 62.02 cents/litre in 2009–2010. From 2011 onwards the excise tax has been split into an energy content tax, 50.36 cents/litre, and a CO₂ tax, 11.66 cents/litre. In 2012, the CO₂ tax was raised to 14 cents/litre, which held in 2013. • The strategic stockpile fee was 0.673 cents/litre in 2009–2013. • In 2014, the tax on petrol, including energy content tax, CO₂ tax and strategic stockpile fee, is 67.29 cents/litre. The same tax rate has been applied for years 2015–2020. <p>In Finland, diesel taxation and levies and fees on diesel have developed as follows:</p> <ul style="list-style-type: none"> • The diesel excise tax was 36.05 cents/litre in 2009–2011. From 2012 onwards the excise tax has been split into an energy content tax of 30.7 cents/litre, and a CO₂ tax of 15.9 cents/litre. This level was still in effect in 2013. • The strategic stockpile fee was 0.353 cents/litre in 2009–2013. • In 2014, the tax rate, including energy content tax, CO₂ tax and strategic stockpile fee, is 49.66 cents/litre. The same tax rate has been applied for years 2015–2020. <p>The EU minimum rate for value added tax is 15 % in 2009–2015, and this rate has been assumed for years 2016–2020 as well. In Finland, value added tax was 22 % in 2009. The value added tax rate was raised to 23 % on 1 July 2010, so the level used for 2010 is 22.5 %. In 2011 and 2012 the value added tax rate was 23 %. Value added tax has been 24 % from the beginning of 2013, and this rate has been applied for the years 2014–2020.</p> <p>The demand price elasticity figures are retrieved from those estimated in Sweden (Regeringskansliet, Finansdepartement, 19 March 2013. Bensin- och dieselkonsumtion i Sverige – ekonometriska skattningar av priselasticiteter. Author Runar Brännlund, CERE, Umeå Universitet.). The figures obtained were -0.49 for the short-term elasticity of petrol and -0.17 for diesel. However it should be kept in mind that the consumption of each is cross-connected; when the petrol price goes up and consumption wanes, diesel consumption increases, and vice versa.</p>			

A 10 % increase in petrol price impacts diesel demand by 1.2 % (price elasticity 0.12) and a 10 % increase in diesel price impacts petrol demand by 11 % (price elasticity 0.11). A simultaneous price increase reduces the effects of this cross-connection, but this has not been accounted for in the calculation. The calculation applies a model of short-term price elasticity which mostly accounts for changes in behaviour. Price changes also have long-term impacts, but these were not addressed.

The lifetime applied for the measures was one year.

Calculation method

Our own bottom-up calculation method. The method corresponds to the method set out in paragraph 1(c) of Annex V of the Energy Efficiency Directive and the requirements for calculating the tax impacts set out in paragraph 3 of Annex V.

The calculation examines the fuel prices at Finland's tax rates and at the EU's minimum tax rates year by year from 2009 until 2020. At Finland's tax rate, the price of petrol in 2009 was 41 % higher than it would have been at the EU's minimum rate. The price of diesel was 15 % higher. From 2014 onward the difference is 29 % for petrol and 24 % for diesel. By multiplying the annual price differences by the price elasticity factor we can see how many percent higher consumption would be if taxes were at EU level. When this figure is multiplied by actual consumption, the result is the saving owing to higher taxes. The observation has furthermore accounted for the above-mentioned cross-connection between petrol and diesel consumption in passenger car traffic.

The impacts of taxes and related fees on transport fuels were also calculated using the VATTAGE model by the Government Institute for Economic Research (VATT). Calculated by this model, the savings impact for the 2014–2020 period is 22 TWhcum. The documentation for the model is available online: [VATTAGE documentation](#)

Overlaps

No overlaps.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Employment and the Economy, Motiva, Government Institute for Economic Research

Monitoring of results and corrective measures

The development of transport energy efficiency is being monitored as part of the national energy and climate strategy implementation. The Ministry of Finance is authorised to issue proposals on fiscal changes affecting transport fuels as needed.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)			Early measures	2014–2016	2017–2020	2014–2020
EED	KETO-2-VM/LVM	Transport fuel taxation/passenger cars	–	9 861	13 148	23 009

Measure Energy audit activities	Measure code KETO-3-TEM
Measure periods	Period 1 2014–2016, 3 a Period 2 2017–2020, 4 a
Linkage to policy measures <p>Energy audit activities have long played a crucial role in Finland's energy policy. Energy audits were set out as an obligation in the Energy Conservation Agreements (1997–2007) and they are also a measure for implementing the Energy Efficiency Agreement for Trade and Industry in 2008–2016.</p>	
Entrusted parties, participating parties and implementing public authorities <p>Entrusted parties: Centres for Economic Development, Transport and the Environment (ELY Centres): Processes applications for energy audit subsidies and allocates the subsidies.</p> <p>Motiva: Is the practical operator in implementing the energy audit programme. Its duties include developing energy audit activities (e.g. energy audit models), training of energy auditors, arrangement of topical seminars, quality assurance of audit work, participation in marketing, and counselling applicants on audit subsidies. Its duties also include the maintenance, development and impact assessment of an energy audit activities monitoring system.</p> <p>Participating parties: Companies and organisations conducting energy audits: These order an energy audit/analysis from authorised energy auditors who have completed the energy auditor training. They use the results of the energy audit in improving the energy efficiency of their own operations.</p> <p>Energy auditors: These complete the energy auditor training arranged by Motiva and, after passing the final examination, are authorised to conduct energy audits subsidised by the Ministry of Employment and the Economy. They market energy audits and conduct them for companies and organisations.</p> <p>Implementing public authority: The Ministry of Employment and the Economy: Party to the energy efficiency agreement activities and the responsible authority, except as regards the action plan for rental housing associations in the real estate sector. Undertakes to take the measures set out for the ministry in the agreement. http://www.energiatehokkuussopimukset.fi/en/</p>	
Description of the measure <p>An energy audit programme has been operational in Finland since 1994. Under the programme, various energy audit models have been developed for different user groups and for different needs. Energy audits always include an assessment of current energy and water consumption, proposals for energy saving measures and their estimated savings impact as well as reporting. Energy audits are carried out by authorised energy auditors trained by Motiva.</p> <p>Three energy audit models are available for industry: industry energy audit, industry energy analysis and a two-stage process industry energy analysis. Industrial companies can also use energy audit models developed for the service sector for its regular facilities, such as office buildings.</p> <p>There are four building energy audit models available in the municipal sector and private service sector: real estate energy inspection, real estate energy audit, real estate follow-up audit, real estate commissioning audit. The municipal sector has also applied a municipal audit for renewable energy since 2005. This charts the potential for increasing renewable energy use throughout the municipal operations.</p> Assessment of energy savings impacts Calculation premises and assumptions <p>In calculating the actual savings brought by the energy audit activity, the data gathered on companies and organisations participating in the energy efficiency agreements on their yearly implementation of measures proposed in the energy audits and calculated savings impacts is utilised. The information is obtained from the annual reporting provided as part of the energy efficiency agreement activities. In energy audits of companies which have not joined in energy efficiency agreements, estimates of annual realised savings are based on the savings potential data (TSP) of measures proposed in the energy audits gathered into an energy audit database, as well as the implementation rate (IR) of proposed measures gathered from all participating companies and organisations as part of their yearly reporting.</p> <p>The savings potential data regarding the results of energy audits for energy audits conducted by companies and organisations which have not joined in the energy efficiency agreements are retrieved from energy audits reported in 2009–2012. The average realised savings potential of measures presented in the audits are calculated on the basis of data obtained from the annual reporting under the energy efficiency agreement in 2012. In the past few years, energy audits conducted by companies and organisations participating in the energy efficiency agreements has been around 75 to 95 % of industrial energy audits, 95–99 % of municipal energy audits and 53–61 % of private service sector energy audits. Savings affect both mid-sized industrial activity and energy-intensive industries, but the savings do not include the savings achieved through measures proposed in the second stage of process industry energy analyses, which are included in the annual reporting of the energy efficiency agreements. The results from the renewable energy audit of the municipal sector are also not included.</p>	

The savings used in calculations up until 2012 (MWh/a) are savings impacts from realised measures proposed in the energy audits and reported by the participating companies and organisations in their annual reports. The savings to be achieved in 2013 are estimated on the basis of the average realised savings from four preceding years (2009–2012, regardless of the fact that all energy audits launched in 2012 have not yet been reported to Motiva. For this reason the estimate is cautious at this point. The realised figures for years 2014–2020 are estimated to correspond to those of 2013.

The savings potential and implementation rate have been separately calculated for operational measures and technical measures. The lifetime of a saving resulting from technical measures is more than 12 years, so their impact will still be felt in 2020 whether they have been taken in the early period of 2009–2013 or in the Energy Efficiency Directive implementation period 2014–2020.

It is estimated that one half of the savings impact of technical measures implemented in each year is realised in the first year. Thus the factor used in cumulative saving calculation for measures implemented in 2014 is 6.5 and the same factor for measures implemented in 2020 is 0.5. It is assumed in calculations that the lifetime of operational measures is two years for measures taken in the service sector action plans and five years for industrial operational measures. Industrial operational measures are often technical alterations related to process changes, which are implemented after careful consideration and with an eye on longer-term savings. The majority of companies also have a management system in place that also incorporates energy efficiency.

Based on monitoring data, measures that require eco-design requirements to be taken into account for their savings impact to be properly calculated have been set apart from reported electricity saving. At this point, lighting and engine-related measures have been set apart from reported electricity savings. Only some of the savings related to lighting come from the actual lamps. Just 40 % of the savings impact of lighting-related measures is included in the cumulative calculation of savings impact under Article 7. Similarly, in an assessment of engine savings only 20 % of savings are taken into account in the calculation. In addition, 15 % of remaining electricity savings is deducted in the industrial sector at this stage and 50 % in the service sectors.

Baseline data

The baseline data for calculations are retrieved from the energy audit and energy efficiency agreement monitoring system, into which information on the facility is gathered in three stages.

- From the application and subsidy decision, at least the following:
 - volume, year of construction, building type, participation in the conservation activities, audit subsidy allocated
- From the energy audit report:
 - energy and water consumption data from the year preceding the audit
 - for each proposed measure, at least the following:
 - brief description of the measure or its name, measure classification that allows separation of operational and technical measures
 - heat, electricity and/or water savings in terms of energy units (kWh/a) and costs (€/a);
 - investment estimate and the direct pay-back period of the measure (€, a);
 - implementation rate of proposed measures (realised = T, decided = P, considered = H, not to be realised = E)
- From annual reporting related to energy efficiency agreements:
 - information on the realisation of measures proposed in the energy audits, used for updating the implementation rate of saving measures proposed in the audits (T, P, H, E);
 - whether the facility participates in emissions trading.

The data gathered from the energy audit report consist of information that authorised energy auditors have observed and/or measured on site and calculations based on this. The precision of calculation of savings is equivalent to that achieved in normal field operations. Some of the baseline data are planning data or estimates, since measuring is not always feasible. Savings achieved through saving measures are as a rule not verified by measurements afterwards since measuring is typically difficult to carry out and would bring significant additional costs.

Each measure proposed in the energy audit is assigned a status in the energy efficiency agreements' annual reporting based on whether the measure is realised (T), due to be implemented (P), being considered (H) or whether it has been decided to not implement (E) the measure. The implementation rate (IR) of the saving measures proposed in energy audits is taken into account in this calculation, calculated as an implementation percentage (I) which only contains realised savings, only based on measures proposed in energy audits and reported as actually implemented by participants to the energy efficiency agreements in their annual reports. $IR [\%] = I$

The implementation percentage is calculated separately for heat and electricity saving measures and for operational and technical measures, and it has been calculated for energy-intensive industry, mid-sized industry, private service sector and the municipal sector. In energy audits, the implementation rates (IR) of saving potential in impact assessment, based on data reported from 2012 and actually realised measures (not including measures due to be implemented or any part of measures being considered) are as follows:

- 68 % for operational measures targeting heat energy and fuel (H+F) and 65 % for measures targeting electricity (E) among mid-sized energy users; respectively 41 % (H+F) and 35 % (E) among energy-intensive energy users; and 58 % (H+F) and 52 % (E) in the municipal sector; and 73 % (H+F) and 58 % (E) in the private service sector.

- 31 % for technical measures targeting heat energy and fuel (H+F) and 39 % for measures targeting electricity (E) among mid-sized energy users; respectively 41 % (H+F) and 21 % (E) among energy-intensive energy users; and 27 % (H+F) and 26 % (E) in the municipal sector; and 17 % (H+F) and 37 % (E) in the private service sector.

Calculation method

Our own bottom-up calculation method, which was used in the NEEAP-2 calculation and has since been modified to conform to the Energy Efficiency Directive. The calculation takes into account the lifetime of savings separately for operational and technical measures. The calculation also strives to take into account the need arising from eco-design requirements to calculate the savings resulting from measures only to the extent that they exceed the minimum level set out for the technology. The calculation of savings in each group draws on the classification of energy audit measures. In future, the classification will be further specified for this purpose.

The assessment of new annual energy saving impact (ES) is based on the total heat and electricity saving potential (TSP) obtainable from saving measures proposed in the annual energy audits and on the implementation rate (IR) of proposed measures. The premises and assumptions for calculation are detailed in previous paragraphs.

The new annual energy saving (ES) is calculated by adding to the saving impact of the measures (proposed in energy audits) reported as implemented in the energy efficiency agreements' annual reporting (EEA-ES) the saving impact from other energy audits, drawing on the implementation rate (IR) described above and the total saving potential (TSP) of the energy audits by sector (energy-intensive industry, mid-sized industry, private service sector, municipal sector). The formula is:

$$ES \text{ [GWh/a]} = EEA-ES_{\text{by sector}} + IR(\text{heat}) * TSP(\text{heat})_{\text{sector}} + IR(\text{electricity}) * TSP(\text{electricity})_{\text{sector}}$$

The cumulative total energy saving impact shown in the table below is obtained by adding up the annual cumulative saving impacts (ES).

Above, the factor for cumulative saving calculation for industrial operational measures is 5 (year 2016: 4.5 and year 2020: 0.5) and for operational measures in the service sector 2 (year 2019: 1.5 and 2020: 0.5). The factor for cumulative saving calculation for technical measures in 2014 is 6.5 and in 2020 0.5. The factor for cumulative saving calculation for early technical measures taken in 2009 is 11.5 and in 2013 7.5 respectively.

Overlaps

The energy auditor proposes the order of implementation for the facility's saving measures and takes into account any overlaps in impacts resulting from individual measures.

Overlaps between the energy audit activities and energy efficiency agreement activities have been taken into account so that all measures proposed in the energy audits, also those by companies and organisations participating in the energy efficiency agreements, for which a saving impact has been determined, are included in the saving impact from energy audit activities as presented in this Annex, and such savings are no longer taken into account when calculating the saving impact from the energy efficiency agreement activities.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Employment and the Economy, Motiva

Monitoring of results and corrective measures

The energy audit volumes (including number of buildings and their cubic volume in the service sector; industrial energy use covered by energy audits), and results (saving potential) subsidised by the Ministry of Employment and the Economy are monitored on a yearly basis.

A summary of this data is submitted to the Ministry of Employment and the Economy and used to provide data for many purposes (including case cards, websites such as [Tilastotietoa energiakatselelmuksista](#) etc.).

Furthermore, the implementation of measures proposed in the energy audits is monitored through annual reporting under the energy efficiency agreements.

The responsible ministry (Ministry of Employment and the Economy) monitors the effectiveness of energy audit activities and takes corrective measures as required.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)		Early measures	2014–2016	2017–2020	2014–2020	
EED	KETO-3-TEM	Energy audit activities	4 767	1 784	925	2 708

Annex 3 Description of energy saving measures and impact assessment KETO-4-TEM 1(3)

Measure Energy efficiency agreement activities / Action Plan for Energy Services and Energy Efficiency Agreement for Heating Oils and Transportation Fuels (Höylä III) – Customers	Measure code KETO-4-TEM
Measure periods Period 1 2014–2016, 3 a Period 2 2017–2020, 4 a	
Linkage to policy measures <p>The Energy Efficiency Agreements for 2008–2016 and the preceding Energy Savings Agreements (1997–2007) have played a crucial role in the implementation of Finland’s every climate and energy strategy since 2001.</p> <p>The energy efficiency agreement activities fall under category c) “voluntary agreements” under Article 7(9).</p>	
Entrusted parties, participating parties and implementing public authorities <p>Entrusted parties:</p> <ul style="list-style-type: none"> • Motiva: Support to participating companies/organisations in the implementation of the agreement, development of implementation tools and services and guidance and dissemination of information through seminars, training, websites, joint development projects etc. Guidance in certain sectors is company-specific. Audit of individual participants’ annual reporting data and requests for further clarification and development of the process. Motiva also maintains and develops the energy efficiency agreement scheme database and monitors the results of agreement activities, assesses impacts and compiles reports. <p>Participating parties:</p> <ul style="list-style-type: none"> • Power sales and distribution companies and district heating and cooling sales and distribution companies which have joined the Energy Efficiency Agreement for Trade and Industry. The companies have undertaken, in compliance with the Action Plan for Energy Services, to promote their customers’ efficient energy use and to substantially promote the attainment of the indicative 9 percent energy savings target set out in the Directive on energy end-use efficiency and energy services (2006/32/EC) among these customers in years 2008 to 2016 compared with estimated development without energy efficiency measures. They also undertake to annually report to the agreement activities monitoring system on guidance and communication measures taken to guide customers in energy efficiency matters. http://www.energiatehokkuussopimukset.fi/fi/sopimusalat/energia-ala/energiapalvelut/ • The Finnish Petroleum Federation and the Oil Industry Service Centre, the Finnish Petrol and Traffic Service Retailers (SBL), all major heating and transport fuel sales companies operating in Finland: These undertake to promote the improvement of energy efficiency of oil heating systems in their own sector. They also undertake to comply with the implementation targets set for sector associations. http://www.energiatehokkuussopimukset.fi/en/ • Confederation of Finnish Industries and Finnish Energy Industries: Both undertake to promote, in their own sectors, the achievement of the coverage target and the implementation of their own agreement/action plan. They also undertake to comply with the implementation targets set for sector associations. http://www.energiatehokkuussopimukset.fi/en/ <p>Implementing public authority:</p> <ul style="list-style-type: none"> • Ministry of Employment and the Economy (TEM): Party to the energy efficiency agreement activities and responsible administrative authority. Undertakes to take the measures set out for the ministry in the agreement. http://www.energiatehokkuussopimukset.fi/en/ • Ministry of the Environment (YM): The second signatory ministry in the Höylä III agreement. Responsible for boiler inspections and related guidance. • Energy Authority (EV): New authority starting its operations from the beginning of 2014. It will take over some of the administrative duties related to the agreement activities currently handled by the Ministry of Employment and the Economy. 	
Description of the measure	
Energy Efficiency Agreement for Trade and Industry/Action Plan for Energy Services – Customers <p>The Action Plan for Energy Services is one of the action plans under the Energy Efficiency Agreement for Trade and Industry. The action plan sets out targets and obligations on participating companies regarding their own energy use and the energy use of their customers. This description of the measure addresses only the guidance and communication services targeted at the customers of participating companies in the Action Plan for Energy Services.</p> <p>The companies participating in the Action Plan for Energy Services cover around 90 % of Finland’s electricity distribution and sales, around 86 % of district heat sales and nearly 100 % of district cooling sales.</p> <p>The companies participating in the energy efficiency agreement activities report on the measures taken to improve customers’ energy efficiency annually in a web-based monitoring system. The measures monitored target the following areas: guidance, communications, consumption feedback and invoicing. As regards each measure, also quantitative data will be reported on implementation and target groups of measures. Based on this data, nearly all participating companies (95–99 %) have implemented measures on end customers in the said areas in each monitoring year.</p>	

Annex 3 Description of energy saving measures and impact assessment KETO-4-TEM 2(3)

The company- and organisation-specific annual reporting is not accessible to public. Annual summaries are drawn up on reported information by sector and regarding all agreement activities.

Below is a listing of some of the most popular customer-end measures reported in the companies' annual reporting. As said above, the participating companies cover the majority of electricity and district heat/cooling sales in Finland, so the data represents the extent of operations well. In Finland, energy companies also have a long tradition of implementing measures targeted at customers and these activities continue yearly. The number of and target group reached by measures taken in the entire agreement period 2008–2016 will thus be very significant.

Guidance

The most popular customer-targeted energy saving guidance measures are:

- Call service for energy saving tips
- Lending of consumption meters
- Guidance by email and online
- Energy saving advice in facilities
- Customer and stakeholder meetings

Communications

The most popular energy saving communication measures are:

- Energy saving tips in a customer magazine
- Online energy saving tips
- Other printed materials for customers
- Participation in the Energy Saving Week
- Provision of energy saving materials for schools

Consumption feedback

The most popular consumption feedback-related measures are:

- Providing the opportunity to monitor consumption online
- Remote reading
- Submitting energy consumption monitoring reports to customers
- Introducing hourly meters and the opportunity for customers to monitor their consumption online

Invoicing

As regards invoicing, most participating companies invoice their customers monthly or at least 4–6 times a year based on actual consumption.

Höylä III – Energy efficiency agreement for heating oils and transportation fuels – Customers

The agreement is a continuation to two previous Höylä programmes, I (1997–2001) and II (2002–2007).

The Höylä III agreement is more extensive than the previous two, covering transportation fuels as well. This description applies to oil-heated residential buildings.

The aim of the Höylä III agreement is to achieve savings of at least 9 percent in heating oil consumption in the period 2005–2016. The good maintenance of oil heating systems, boiler replacements and other building repairs with energy benefits are promoted within the framework of the agreement.

As part of the Höylä III agreement, regular boiler inspections and training and certification of inspectors will be implemented pursuant to Article 8 of the Directive on the energy performance of buildings (2002/91/EC).

As part of the agreement, participating parties also carry out extensive training, advice and communication to the target audience.

The Oil Industry Service Centre reports on measures taken to improve customers' energy efficiency annually in a web-based monitoring system. The measures monitored mainly focus on communications at fairs and trade shows and on guidance given to all owners of oil-heated homes or facilities on energy efficiency improvements in a targeted customer magazine. As regards each measure, also quantitative data will be reported on implementation and target groups of measures.

As part of the Höylä III agreement, regular boiler inspections and training and certification of inspectors will also be implemented pursuant to Article 8 of the Directive on the energy performance of buildings (2002/91/EC). Site-specific advice will be provided in the context of boiler inspections.

Assessment of energy saving impacts

Calculation premises and assumptions

A study was carried out in 2011 and 2012 to measure and evaluate the impacts of "soft" energy efficiency measures included in the customer end of the Action Plan for Energy Services. <http://energia.fi/julkaisut/pehmeiden-energiategohokkuustoimien-vaikutusten-mittaus-ja-arviointimeasuring-and-evaluating>

The study indicates that the estimated saving impact is around 2.5 % of household energy consumption (electricity, district heating, light fuel oil) and 1.5 % of energy consumption (electricity, district heating) by other target groups (small industry, service sector, agriculture and forestry).

Annex 3 Description of energy saving measures and impact assessment KETO-4-TEM 3(3)

The study covered household electricity and district heating consumption as well as 10 % of corresponding industrial energy consumption (small industrial companies), a third of service sector consumption and one half of corresponding energy consumption by agriculture and forestry. The target group also included residential buildings heated by light fuel oil. District cooling is not included in the estimate since no data was available from Statistics Finland on the volume of district cooling sales.

Baseline data

The baseline data used are gathered from the statistics provided by Statistics Finland regarding the measure's target group's electricity and district heating consumption data in 2009–2011 and the estimated consumption in the coming years based on this. When determining the energy consumption targeted by the saving impact, the share of energy sold and distributed by the participating companies of Finland's total electricity and district heat sales and distribution has been taken into account.

The assumptions also take into account the coverage reported by participating companies in measures related to guidance and communications (nearly 100 %).

The baseline data for oil-heated residential buildings comes from Statistics Finland's data on the energy consumption of residential buildings in 2009–2011 and the consumption in coming years estimated on this basis. When it comes to light fuel oil (domestic fuel), it is assumed that communications reach the target group in its entirety.

Calculation method

The calculation of savings draws on the results of the abovementioned study assessing the impact of customer end guidance and communications on savings and Statistics Finland data on energy consumption by the target groups.

The annual energy savings (ES) are calculated using the formula

Action Plan for Energy Services – Customers

$$ES[\text{GWh/a}] = 0.025 * \text{household energy consumption (electricity + district heat)} + 0.015 * \text{other target group energy consumption (electricity + district heat)}$$

Höylä III – Customers

$$ES[\text{GWh/a}] = 0.025 * \text{light fuel oil consumption in residential buildings}$$

When calculating cumulative savings, the lifetime of annual new energy saving applied is 1 year.

The measures were also in place in the early period of 2009–2013, but their impacts (6 316 GWh_{cum}) were not taken into account when calculating the cumulative saving impact under Article 7, since the saving impact of measures taken in 2009–2013 is no longer effective in 2020 (lifetime 1 year).

Overlaps

Overlapping impacts with respect to other agreement activities have been taken into consideration. This estimate does not include the mid-sized industry and energy-intensive industry customers or the service sector's energy consumption, which are covered by other energy efficiency agreement activities.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Employment and the Economy, Motiva

Monitoring of results and corrective measures

The results of the energy efficiency agreements are monitored through annual reporting by participating companies and organisations. Once the reporting is completed, the order of magnitude of data provided and its general accuracy is reviewed by Motiva and, as required, further information is requested from the companies. The annual information reported by participants is not public.

Based on reported company- or organisation-specific information, yearly summaries are compiled by sector as well as covering all energy saving agreement activities. These summaries are public: [Toimialakohtaiset vuosiraportit](#), e.g. [Energiatehokkuussopimukset tuloksia 2011.pdf](#), [Energiatehokkuussopimukset energiantuotannon ja energiapalvelujen toimenpideohjelman vuosiraportti 2012](#).

Each agreement has its own steering group to assess the efficiency of agreement activities and, as required, to plan corrective measures.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)		Early measur	2014–2016	2017–2020	2014–2020	
EED	KETO-4-TEM-A	Energy efficiency agreement activities / Action Plan for Energy Services – Customers	–	3 299	4 179	7 478
EED	KETO-4-TEM-B	Energy efficiency agreement activities / Höylä III – Customers	–	425	566	991
EED	KETO-4-TEM	Energy efficiency agreement activities / Action Plan for Energy Services and Höylä II – Customers	–	3 724	4 745	8 469

Measure	Measure code																									
Heat pumps for single-family houses, terraced houses	KETO-5-TEM																									
Measure periods	Period 1 2014–2016, 3 a	Period 2 2017–2020, 4 a																								
<p>Linkage to policy measures</p> <p>Households have been allowed since 2001 to apply a domestic help credit in their tax returns for paying for work related to the installation of a heat pump. The financial impact of this domestic help credit is EUR 200 to 3 500 depending on the type of pump.</p> <p>The acquisition and commissioning of heat pumps is actively promoted through information and communication measures and projects financed by ministries. The popularity of heat pumps follows from sustained work which started in the early 2000s.</p> <p>Heat pumps in single-family houses and terraced houses fall under categories (b), (d) and (f) of Article 7(9).</p>																										
<p>Entrusted parties, participating parties and implementing public authorities</p> <p>Entrusted parties:</p> <ul style="list-style-type: none"> Motiva: The Ministry of Employment and the Economy designated Motiva Oy as the national coordination centre for energy guidance in 2010. As part of its energy guidance to consumers, Motiva Oy promotes the commission of heat pumps in its own communications and in communication projects coordinated by it. <p>Participating parties:</p> <ul style="list-style-type: none"> Not applicable. <p>Implementing public authority:</p> <ul style="list-style-type: none"> Tax administration: The domestic tax credit has to be applied for on a separate form annexed to the tax return. The taxpayer has to keep the receipts for six years and the tax office may request them as needed. 																										
<p>Description of the measure</p> <p>Heat pumps are installed as an energy saving measure in existing single-family houses and terraced houses and in new houses as an energy efficient main or additional heating system. The sales of heat pumps started to soar in 2000, when the Finnish Heat Pump Association (SULPU) and Motiva Oy started to promote their use. In 2012 around 60 000 heat pumps were sold, up from fewer than 1 000 units in 1999. By the end of 2012, a total of 522 000 heat pumps had been installed in Finnish single-family houses and terraced houses. In Finland heat pumps are a crucial measure in achieving both the 2020 renewable energy target and energy efficiency target.</p> <p>Assessment of energy saving impacts</p> <p>Calculation premises and assumptions</p> <p>The saving impact is calculated on the basis of annual heat pump sales figures gathered by the Finnish Heat Pump Association (SULPU) from importers and manufacturers. Statistics Finland uses these to generate the official data on energy produced by heat pumps. The sales figures are collected by pump type and capacity. The average capacity of heat pumps installed by pump type is used in the calculation. The allocation of heat pumps by building type is based on an annual survey (Building Information Foundation RTS). The following lifetimes are applied in considering the saving impact of different pump types.</p> <ul style="list-style-type: none"> terrestrial heat pump (THP) 20 years air source heat pump (AHP) 10 years air-to-water heat pump (AWHP) 15 years exhaust air heat pump (EAHP) 15 years. <p>As regards early measures (years 2009–2013), the calculation applies actual sales figures from the years 2010, 2011 and 2012, which are higher than estimated in the NEEAP-2 report. From 2013 onwards, the sales figures are forecasts updated in the autumn of 2013. At the end of the 2017–2020 period a significant number of air source heat pumps will be replacements for old ones, which means that they can no longer be counted in the saving impact.</p> <p>Baseline data</p> <p>In calculating the saving impact from heat pumps installed in single-family houses and terraced houses, the baseline data (estimates) used are the following installed pump figures for years 2010, 2016 and 2020. The annual sales figures for the interim periods 2014–2016 and 2017–2020 are calculated on the basis of data for these three years.</p> <table border="1" data-bbox="194 1895 1337 2063"> <thead> <tr> <th>Year</th> <th>THP</th> <th>AHP</th> <th>AWHP</th> <th>EAHP</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2010</td> <td>47 390 pcs</td> <td>319 500 pcs</td> <td>6 326 pcs</td> <td>18 033 pcs</td> <td>391 000 pcs</td> </tr> <tr> <td>2016</td> <td>135 800 pcs</td> <td>561 300 pcs</td> <td>17 300 pcs</td> <td>30 400 pcs</td> <td>745 000 pcs</td> </tr> <tr> <td>2020</td> <td>226 600 pcs</td> <td>549 100 pcs</td> <td>29 100 pcs</td> <td>40 000 pcs</td> <td>845 000 pcs</td> </tr> </tbody> </table>			Year	THP	AHP	AWHP	EAHP	Total	2010	47 390 pcs	319 500 pcs	6 326 pcs	18 033 pcs	391 000 pcs	2016	135 800 pcs	561 300 pcs	17 300 pcs	30 400 pcs	745 000 pcs	2020	226 600 pcs	549 100 pcs	29 100 pcs	40 000 pcs	845 000 pcs
Year	THP	AHP	AWHP	EAHP	Total																					
2010	47 390 pcs	319 500 pcs	6 326 pcs	18 033 pcs	391 000 pcs																					
2016	135 800 pcs	561 300 pcs	17 300 pcs	30 400 pcs	745 000 pcs																					
2020	226 600 pcs	549 100 pcs	29 100 pcs	40 000 pcs	845 000 pcs																					

It is estimated that the average capacity of heat pumps will increase from 2014 to 2020 as follows:

Type/year	2010	2016	2020
THP	11.9 kW	13.4 kW	14.5 kW
AHP	4.8 kW	5.4 kW	5.9 kW
AWHP	11.6 kW	13.0 kW	13.9 kW
EAHP	3.4 kW	3.8 kW	4.1 kW

Calculation method

The method c) “scaled savings” of Annex V of the Energy Efficiency Directive is used in calculating the energy savings brought by heat pumps. Commission decision (2013/114/EU) provides guidelines to Member States on how to calculate the amount of renewable energy generated by various heat pump technologies under Article 5 of the RES Directive (2009/28/EC). It contains a formula and variables to be used with heat pumps. Energy savings and the volume of renewable energy achieved by other heat pump technologies are equally high. The energy saving achieved by an exhaust air heat pump is practically much higher than the volume of renewable energy calculated by the said guideline.

In assessing the saving impact, four heat pump types used in single-family houses and terraced houses are examined. Heat pump sales figures have been estimated for each year between 2014 and 2020. Based on these figures, ERES and the attainable cumulative energy saving under the Energy Efficiency Directive by the end of 2020 (GWhcum) are calculated. From 2016 onwards, the calculations of new energy savings take into account a 50 % deduction owing to probable EU-level energy efficiency minimum requirement. The cumulative energy saving impacts (GWhcum) calculated by heat pump type are as follows:

Type/period	2009–2013	2014–2016	2017–2020
THP	8 958	5 206	2 445
AHP	7 159	3 333	140
AWHP	345	437	194
EAHP	62	41	15
Total	16 524	9 017	2 794

Overlaps

Overlapping impacts have been taken into account to an amount of 500 GWhcum from the saving impact of building regulations on new construction.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Employment and the Economy, VTT Technical Research Centre of Finland and Finnish Heat Pump Association (SULPU)

Monitoring of results and corrective measures

The Finnish Heat Pump Association gathers annual information on heat pump sales in Finland for Statistics Finland. If the annual heat pump sales figures are not sufficient to meet the RES target for 2020 and the Energy Efficiency Directive target for the period 2014–2020, the responsible ministries can take corrective measures, which may be promotional measures and/or regulations.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)			Early measures	2014–2016	2017–2020	2014–2020
EED	KETO-5-TEM	Heat pumps for single-family houses, terraced houses	16 524	9 017	2 794	11 811

Measure Boiler house investments	Measure code KETO-6-MMM				
Measure periods	<table border="0"> <tr> <td style="text-align: center;">Period 1</td> <td style="text-align: center;">2014–2016, 3 a</td> <td style="text-align: center;">Period 2</td> <td style="text-align: center;">2017–2020, 4 a</td> </tr> </table>	Period 1	2014–2016, 3 a	Period 2	2017–2020, 4 a
Period 1	2014–2016, 3 a	Period 2	2017–2020, 4 a		
<p>Linkage to policy measures</p> <p>The Ministry of Agriculture and Forestry (MMM) promotes the use of wood and other renewable natural resources as construction materials and energy sources. Many Finnish farms are self-sufficient in their supply of wood chips, and switching to wood fuel is usually a profitable investment. Other biofuels arising from agricultural operations are also utilised. The ministry has allocated funds since 1996 to subsidising farms' boiler house investments. Most of the subsidised investments bring a switch from fossil fuels to biofuels produced at the farm, which is in line with the Energy Services Directive's energy saving policies since the volume of purchased energy decreases.</p> <p>The investment subsidy falls under category (b) of Article 7(9).</p>					
<p>Entrusted parties, participating parties and implementing public authorities</p> <p>Entrusted parties:</p> <ul style="list-style-type: none"> Centres for Economic Development, Transport and the Environment (ELY Centres): Processing of applications for assistance, assistance decisions and processing of applications for payment. <p>Participating parties:</p> <ul style="list-style-type: none"> Not applicable. <p>Implementing public authority:</p> <ul style="list-style-type: none"> Agency for Rural Affairs (Mavi): Is responsible for implementing and monitoring the subsidies. Centres for Economic Development, Transport and the Environment (ELY Centres): Supervision. 					
<p>Description of the measure</p> <p>The investment aid can be either a subsidised loan (maximum 50–80 % depending on investment) or assistance (maximum 15–30 % of eligible costs). The assistance planned for 2014 is 35 %. The level of aid after that is not yet decided.</p>					
<p>Assessment of energy saving impacts</p> <p>Calculation premises and assumptions</p> <p>The Centres for Economic Development, Transport and the Environment save the information from applications into the electronic RAHTU database. Each application indicates the magnitude of the project (boiler house capacity to be compensated), estimated costs, information on the applicant and the date of application. Assistance decisions and related information are entered in the same database.</p> <p>Assistance can be granted for constructing a new boiler house for the farm or renovating or extending an existing one.</p>					
<p>Baseline data</p> <p>The following information is extracted from the applications for assistance:</p> <ul style="list-style-type: none"> Around 330 applications a year were submitted from 1996 to 1999. Total capacity that the applications propose to replace is around 5.5 MW a year. The number of applications from 2001 to 2005 was between 200 and 300 a year, and the combined boiler house capacity that those applications proposed to replace is around 28 MW a year. No statistics on boiler house capacities were compiled from 2006 to 2012. Therefore the average capacity of boiler houses since the beginning of 2009 has been estimated by the Ministry of Agriculture and Forestry on the basis of capacity requirement estimates based on the type and extent of the investment in question. The estimates rely on data from projects subsidised from 1996 to 2005. The estimated total capacity of the projects was 85 MW in 2009, 31 MW in 2010, 66 MW in 2011 and 74 MW in 2012. 					
<p>Calculation method</p> <p>The calculation method is based on the number of boiler house projects realised, average capacity, and estimated annual run time and utility rate.</p> <p>The following aspects have been taken into account in impact assessment:</p> <ul style="list-style-type: none"> The biofuel-fired boiler houses will replace not just oil-fired boiler capacity but also older wood and chips boilers; these are assumed to account for 15 % of the projects. Around 85 % of boiler house replacement projects for which assistance is sought are expected to be realised. Some applicants will not obtain fuel from their own farm, but will run their boiler on bought fuel (wood pellets, chips, etc.). 80 % are estimated to be self-sufficient in this respect. <ul style="list-style-type: none"> Owing to the combined effect of these factors, it is estimated that 57.8 % of the total capacity cited on the applications will be realised. 					

- The annual run time of biofuel-fired boilers at top capacity is around 4 500–5 000 hours. A biofuel-fired boiler is rarely scaled to meet maximum demand, and the farms are likely to use oil-fired boilers as an addition in periods of extreme cold (and the oil-fired boiler will also serve as a reserve system).
- It is assumed in impact assessments that 30 % of projects for which assistance is applied are completed by the end of the year and the remainder within the following year.
- The boiler house capacity stated in the applications is assumed to decrease 5 % annually from 2010 onward.

Overlaps

No overlaps.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of Agriculture and Forestry (MMM), Motiva Oy, engineering company Granlund Oy

Monitoring of results and corrective measures

The Ministry of Agriculture and Forestry and the Agency for Rural Affairs monitor realised projects and assistance sums annually.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)			Early measures	2014–2016	2017–2020	2014–2020
EED	KETO-6-MMM	Boiler house investments	6 159	2 755	1 306	4 061

Measure	Measure code			
Energy efficiency regulations for renovation and start-up assistance for building renovation	KETO-7-YM			
Measure periods	Period 1	2014–2016, 3 a	Period 2	2017–2020, 4 a
Linkage to policy measures				
<p>The decree on the improvement of buildings' energy efficiency in repair and retrofitting work was issued on the basis of the Land Use and Building Act. This decree plays a crucial role in improving buildings' energy efficiency and indoor air quality in building renovations which are subject to permission as well as in the implementation of Finland's climate and energy strategy.</p> <p>In the construction of new buildings, buildings' energy efficiency and similar issues have been steered by government regulations since 1975. Under the existing Land Use and Building Act (2000) and its predecessor, the Building Act, regulations have been applied to building renovation and refurbishment to the extent that the quality and extent of the measure and the possibly changed usage of the building or its part have required.</p> <p>The start-up assistance for building renovation in 2013 and 2014, a measure enabled by the government's supplementary budget, will promote systematic maintenance of buildings, for example by requiring that retrofitting measures that are subject to permission involve drafting a use and maintenance manual for the building, and by strengthening the attention paid to energy efficiency and indoor air quality management. By renovating the building stock the state supports modernisation projects which create new jobs.</p> <p>The measure falls under category (b) and (d) of Article 7(9).</p>				
Entrusted parties, participating parties and implementing public authorities				
<p>Entrusted parties:</p> <ul style="list-style-type: none"> • Municipal building supervision authorities: Supervise compliance with regulations as part of the permission process and compliance of implementation as part of the inspection routine and final approval. • The Housing Finance and Development Centre of Finland (ARA): Conducts the expediency consideration and makes decisions based on applications for modernisation assistance. <p>Participating parties:</p> <ul style="list-style-type: none"> • Municipalities: Play an important role either directly or indirectly e.g. as owners of non-profit rental residential housing in initiating modernisation in their housing associations. • Other building owners: Play an important role as building owner in initiating renovations and modernisations. <p>Implementing public authority:</p> <ul style="list-style-type: none"> • Ministry of the Environment (YM): Preparation and issuing of decrees on the basis of the Land Use and Building Act. Prepares the proposal for including modernisation subsidies in the supplementary budget. Under the government supplementary budget proposal, the National Housing Fund can allocate start-up assistance for building renovation. 				
Description of the measure				
<p>Under the Land Use and Building Act, buildings' energy consumption is governed by regulations and guidelines set forth in the National Building Code of Finland (SRMK). Its regulations lay down the minimum requirements.</p> <p>In the construction of new buildings, buildings' energy efficiency has been steered by government regulations since 1975. Since Finland's building stock is relatively young, energy efficiency issues have already been taken into account in the construction of existing buildings. Under the Land Use and Building Act, regulations have been applied to building renovation and refurbishment to the extent that the quality and extent of the measure and the possibly changed usage of the building or its part have required.</p> <p>Separate energy efficiency provisions specifically drafted for renovation building came into force in June 2013.</p> <p>They target building renovation which is subject to permission, including change of the building's purpose, when this is technically, operationally and financially possible.</p> <p>Renovation building regulations target construction companies, construction engineers, DIY builders and developers, including housing associations.</p> <p>To speed up building renovation, a decision has been made to grant start-up assistance for building renovation in the years 2013 and 2014. The assistance can cover renovation, retrofitting, extension and other equivalent operations made to an apartment or building. Measures for which subsidies can be granted include: plumbing refurbishment, replacement of windows and entrance doors, air conditioning system refurbishment, heating system refurbishment, foundations refurbishment, lift modernisation, roof refurbishment, balcony refurbishment. The total budgeted appropriation is EUR 115 million: EUR 15 million for 2013 and a maximum of EUR 100 million for 2014. The commencement subsidy is 10 % of acceptable costs.</p> <p>The start-up assistance for building renovation is targeted at housing associations, right of residence housing associations and non-profit rental housing associations, i.e. the body that actually owns the building.</p>				

Assessment of energy saving impacts

Calculation premises and assumptions

The premise is that all structural elements have been constructed in compliance with the regulations in force at the time of construction. The assumption is that the buildings are refurbished to a level that is improved by some 50 % from the original level when the elements have reached the end of their technical life.

The saving impact achieved in buildings' specific consumption of heating energy is calculated on the basis of the volume of building stock to be renovated subject to permission and a location-weighted heating degree day figure. Energy savings arising from renovation construction that exceeds the standards set in regulations are not allocated to the building code. Owing to the high level of construction supervision in Finland, energy efficiency below regulated level does not occur in construction.

The annual saving impact is assumed to remain stable. The ageing of structures of a renovated building is not thought to significantly impair its energy efficiency. In Finland, building management and maintenance are for the most part highly professional. All other assumptions are also based on the same data as in new construction.

The saving impact achieved by the regulations will last the building's lifetime. The lifetime of building stock built since 2003 is expected to be at least 50 years, and the lifetime of air conditioning systems equipped with heat recovery devices is expected to be 20–25 years, which is a typical technical life of equipment in Finland.

The saving impact achieved in buildings' specific consumption of heating energy is calculated on the basis of the volume of building stock to be renovated and a location-weighted heating degree day figure.

The start-up assistance will increase and bring forward renovation activities, and the regulations now in force will ensure energy efficiency.

Baseline data

The volume of building stock by building type and age is based on construction statistics by Statistics Finland. The future volume of renovation is assessed on the basis of both statistics and findings from extensive supplementary studies.

The volume of renovation launched because of start-up assistance is assessed on the basis of both statistics and findings from extensive supplementary studies.

Calculation method

Our national bottom-up calculation method, the principles of which were also used in the NEEAP-2 calculation. The calculation method has been developed at the Tampere University of Technology (TUT) with support from the Ministry of the Environment. The model determines the specific energy consumption by structural elements, building type and age, while also taking into account factors such as changes in the heating system. The total energy consumption is determined on the basis of specific consumption figures, volume of new construction and renovation activities and building stock demolition. In assessing the development of the building stock volume, the population base and changes in average living space have been taken into account. The renovation volumes are assessed on the basis of building types and ages and typical solutions of each period.

The decree on the improvement of buildings' energy efficiency in repair and retrofitting work was issued on 27 February 2013. It came into force with regard to all buildings indicated in the decree by 1 September 2013. The calculation assumption was to reduce the energy consumption of existing buildings by 6 % in building stock by 2020.

At this point it is not possible to provide a highly accurate estimate of the saving impact of building renovation regulations imposed in 2013, since they only came into force this year. The statistics on 2013 will be published at the end of 2014.

Overlaps

No overlaps.

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of the Environment, Tampere University of Technology / Department of Civil Engineering

Monitoring of results and corrective measures

The energy consumption trend in the entire building stock is monitored, among other things, by annual statistics published by Statistics Finland (construction and energy statistics) as part of a broader spectrum of data and through studies published within the sector on its operations. The responsible ministry (Ministry of the Environment) can effect amending measures within the scope of its authority, be it promotional measures or new legislation.

The granting authority monitors the use and allocation of start-up assistance for building renovation, and whenever other similar assistance measures are decided, relevant allocation conditions are laid down.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)		Early measures	2014–2016	2017–2020	2014–2020	
EED	KETO-7-YM -A	Energy efficiency regulations for building renovation	–	4 500	2 500	7 000
EED	KETO-7-YM - B	Start-up assistance for building renovation	–	282	0	282
EED	KETO-7-YM	Energy efficiency regulations for renovation and start-up assistance for building renovation	–	4 782	2 500	7 282

Measure Energy efficiency regulations for new construction	Measure code KETO-8-YM				
Measure periods <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Period 1</td> <td style="text-align: center;">2014–2016, 3 a</td> <td style="text-align: center;">Period 2</td> <td style="text-align: center;">2017–2020, 4 a</td> </tr> </table>		Period 1	2014–2016, 3 a	Period 2	2017–2020, 4 a
Period 1	2014–2016, 3 a	Period 2	2017–2020, 4 a		
Linkage to policy measures <p>Energy efficiency regulations for new buildings have played a crucial role in the national objective to improve buildings' energy efficiency and indoor air quality since 1975, as well as in the implementation of the national climate and energy strategies since 2001.</p> <p>The measure falls under category (d) of Article 7(9).</p>					
Entrusted parties, participating parties and implementing public authorities <p>Entrusted parties:</p> <ul style="list-style-type: none"> • Municipal building supervision authorities supervise compliance with regulations as part of the permission process and compliance of implementation as part of the inspection routine and final approval. <p>Participating parties:</p> <ul style="list-style-type: none"> • Not applicable. <p>Implementing public authority:</p> <ul style="list-style-type: none"> • Ministry of the Environment (YM) issues a decree based on the Land Use and Building Act. 					
Description of the measure <p>Under the Land Use and Building Act, new buildings' energy consumption is governed by regulations and guidelines set forth in the National Building Code of Finland (SRMK). Buildings' energy efficiency has been steered by government regulations since 1975. Energy efficiency regulations have been amended in 1978, 1985, 2003, 2008, 2010 and 2012. The 2008 change was structural and did not contain any significant change to energy efficiency regulations. In 2012 the amendment brought tougher requirements as well as a structural change whereby the building's energy consumption is now examined as a whole, including the manner of energy production.</p> <p>New building regulations target construction companies, construction engineers, DIY builders and developers.</p>					
Assessment of energy saving impacts					
Calculation premises and assumptions <p>The premise is that all buildings are constructed in compliance with the regulations in force at the time of construction.</p> <p>Energy savings arising from construction that exceeds the standards set in regulations are not allocated to the building code. Owing to the high level of construction supervision in Finland, energy efficiency below regulated level does not occur in new construction.</p> <p>The annual saving impact is assumed to remain stable. The ageing of structures is not thought to significantly impair energy efficiency, since windows and heat recovery devices in air conditioning systems are serviced and maintained as needed. In Finland, building management and maintenance are for the most part highly professional.</p> <p>The saving impact achieved by stricter heat insulation regulations will last the building's lifetime. The lifetime of building stock built since 2003 is expected to be at least 50 years, and the lifetime of air conditioning systems equipped with heat recovery devices is expected to be 20–25 years, which is a typical technical life of equipment in Finland. When devices and structures are replaced and repaired, the new choice is almost always at least equally energy efficient as the old one.</p> <p>The saving impact achieved in buildings' specific consumption of heating energy is calculated on the basis of the volume of building stock to be renovated and a location-weighted heating degree day figure. Agricultural production buildings are excluded from this examination with the assumption that they are largely unheated.</p>					
Baseline data <p>The volume of building stock by building type and age is based on construction statistics by Statistics Finland. The outlook for new construction volume is estimated on the basis of realised average construction from the past 10 years.</p>					
Calculation method <p>Our national bottom-up calculation method, the principles of which were also used in the NEEAP-1 and NEEAP-2 calculation. The calculation method has been developed at the Tampere University of Technology (TUT) with support from the Ministry of the Environment. The model determines the specific energy consumption by structural elements, building type and age, while also taking into account factors such as changes in the heating system. The total energy consumption is determined on the basis of specific consumption figures, volume of new construction and renovation activities and building stock demolition.</p> <p>The impact of regulations that came into force in July 2012 will only show in the 2013 new construction stock. The calculation assumption is that new regulations will cause the heat energy consumption of residential and service buildings to fall by 20 %. The regulations only apply to new buildings, and their key change is a holistic approach to energy consumption.</p>					

The energy examination now takes into account all energy consumption occurring in the building. This means that in addition to heating, all electricity and hot water use, which were previously excluded in determining the building's compliance, are now included.

The saving impact of the new construction regulations issued in 2012 cannot be assessed with precision at this point, since the regulation structure was altered to address primary energy consumption, and savings are calculated at building level. The statistics on 2013 will be published at the end of 2014. The regulatory alteration will change heating choices, which will have a significant impact on energy savings.

Overlaps

The overlapping impact concerning heat pumps in single-family house and terraced houses has been taken into account (-0.5 TWhcum).

Party responsible for impact assessment and party/parties conducting the assessment

Ministry of the Environment, Tampere University of Technology / Department of Civil Engineering

Monitoring of results and corrective measures

The energy consumption trend in the entire building stock is monitored, among other things, by annual statistics published by Statistics Finland (construction and energy statistics) as part of a broader spectrum of data and through studies published within the sector on its operations. The responsible ministry (Ministry of the Environment) can effect amending measures within the scope of its authority, be it promotional measures or new legislation.

Cumulative energy savings under Article 7, GWh _{cum} (final consumption)			Early measures	2014– 2016	2017– 2020	2014– 2020
EED	KETO-8-YM	Energy efficiency regulations for new construction	18 590	9 721	5 401	15 122