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Finland's National Energy Efficiency Action Plan NEEAP-3

29 April 2014

Report pursuant to Article 24(2) of the Energy Efficiency Directive (2012/27/EU)
to the European Commission

CONTENTS

FOREWORD

On 26 November 2012, the Finnish Ministry of Employment and the Economy set up a working group to begin preparations for the national implementation of the European Energy Efficiency Directive (2012/27/EU) which entered into force on 5 December 2012, including any necessary amendments to national legislation. The EED working group established a number of sub-divisions, which each examined issues relating to the implementation of one or more articles. The sub-divisions reported to the working group.

More than 60 experts took part in preparing for the implementation of the Energy Efficiency Directive through the working group and its sub-divisions. The EED working group submitted its final report at the end of 2013. The report, called "Implementation of the Energy Efficiency Directive – final report of the EED working group", was published in January 2014[1]. Although the EED working group's mandate ended on 31 December 2013, preparations for the implementation of the Directive have continued in 2014, primarily within the Ministry and various government agencies.

The Energy Efficiency Directive needs to be fully transposed into national legislation by 5 June 2014. The Directive also lays down several obligations that need to be enforced earlier. One of the most important obligations is the submission of the National Energy Efficiency Action Plan (NEEAP) by 30 April 2014, for the purpose of which the EED working group set up a specialist NEEAP sub-division in May 2013.

This NEEAP-3[2] report includes all the information that was available at the time of drawing up the report. Not all of the articles had yet been fully transposed into national legislation at the time, and it was therefore not possible to describe them in detail.

The NEEAP-3 report is accompanied by the latest EED Annual Report. Member States have an obligation to draw up and submit their annual reports to the Commission by the end of April each year. The first EED Annual Report was submitted to the Commission in 2013. The next comprehensive report, NEEAP-4, will be drawn up in 2017.

[1] https://www.tem.fi/files/38617/Energiatehokkuusdirektiivin_toimeenpano_EED-tyoryhman_loppuraportti_2014.pdf

[2] The first comprehensive report drawn up pursuant to the EED is also referred to here as the First EED NEEAP.

ABBREVIATIONS

ARA	Housing Finance and Development Centre of Finland[3]
BU	Bottom-up (analytical approach)
CHP	Combined Heat and Power
EPBD	Energy Performance of Buildings Directive (2010/31/EU)
EED	Energy Efficiency Directive (Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC)
ELY Centre	Centre for Economic Development, Transport and the Environment
ESCO	Energy Services Company
ESD[4]	Energy Services Directive (Directive 32/2006/EC on energy end-use efficiency and energy services)
KTM	Finnish Ministry of Trade and Industry (Ministry of Employment and the Economy as of 1 January 2008)
LVM	Finnish Ministry of Transport and Communications
Mavi	Finnish Agency for Rural Affairs
MMM	Finnish Ministry of Agriculture and Forestry
NBCF	National Building Code of Finland
NEEAP-1	First National Energy Efficiency Action Plan pursuant to the ESD (26 June 2007)
NEEAP-2	Second National Energy Efficiency Action Plan pursuant to the ESD (27 June 2011)
NEEAP-3	First National Energy Efficiency Action Plan pursuant to the EED (29 April 2014)
Non-ESD	Energy consumption and savings not governed by the Energy Services Directive (energy production and industrial premises governed by the Finnish Emissions Trading Act)
OKM	Finnish Ministry of Education and Culture
Sitra	Finnish Innovation Fund
SYKE	Finnish Environment Institute
TD	Top-down (analytical approach)
TEKES	Finnish Funding Agency for Innovation
TEM	Finnish Ministry of Employment and the Economy (Ministry of Trade and Industry until 31 December 2007)
Trafi	Finnish Transport Safety Agency
TUT	Tampere University of Technology
VM	Finnish Ministry of Finance
VTT	VTT Technical Research Centre of Finland
YM	Finnish Ministry of the Environment

[3] The former Housing Fund of Finland split into a government agency and a fund on 1 January 2008. The government agency was named the Housing Finance and Development Centre of Finland and the fund retained the name of the Housing Fund of Finland.

[4] The Commission also uses the abbreviation ESD to refer to the so-called "Effort Sharing Decision" (406/2009/EC) associated with the European Climate and Energy Package.

1 INTRODUCTION

One of the most important obligations laid down in the European Energy Efficiency Directive (2012/27/EU), which entered into force in December 2012, is the drawing up of National Energy Efficiency Action Plans every three years. The obligation was already included in the European Energy Services Directive (2006/32/EC). Finland submitted its NEEAP-1 report to the Commission on 26 June 2007 and its NEEAP-2 report on 27 June 2011. The reports drawn up pursuant to the Energy Services Directive (ESD) focused on descriptions of energy efficiency measures and energy savings. In the reports drawn up pursuant to the Energy Efficiency Directive (EED), more attention is given to describing the implementation of specific obligations laid down in the Directive.

This NEEAP-3[5] report describes the implementation of the EED in accordance with the action plan template[6] provided in the Commission Implementing Decision (2013/242/EU). The report also includes information about national energy efficiency measures and their impacts on energy consumption in 2010, 2016 and 2020. These energy savings relate to the indicative 9% energy saving target laid down in the Energy Services Directive, which must be achieved by 2016 and which needs to be reported on in accordance with the provisions of the Energy Efficiency Directive in 2014 and 2017. This 2014 report does not include information about the cumulative end-use energy savings target laid down in Article 7 of the Energy Efficiency Directive for the period 2014–2020.

In addition to the comprehensive NEEAP reports that need to be submitted to the Commission at three-year intervals, the EED also obligates Member States to submit EED annual reports based on indicators and changes in the same, which are used to monitor and evaluate the development of energy consumption and energy efficiency in the Member States. The first EED annual report was submitted to the Commission on 26 April 2013. The second EED annual report is annexed to this report (Annex 1 EED Annual Report of 30 April 2014).

The most important conclusion to be drawn from the EED annual report is that final energy consumption increased in households and the service sector from 2011 to 2012 but decreased in the industrial sector and transport. Total energy consumption increased by 1.2%. The main reason for the increase was the higher-than-usual need for heating due to the cold winter and an increase in demand and floor space in the service sector. A longer-term examination of a period of 5–10 years reveals that energy consumption has only grown steadily in the service sector. Energy consumption has continued to decrease in other sectors, as have Finland's primary energy consumption and total final energy consumption.

Finland's national indicative 9% energy saving target for 2016 laid down in the NEEAP-1 equates to 17.8 TWh in energy. The interim target set for the year 2010 was 5.9 TWh. According to the NEEAP-3, energy savings by 2010 amounted to 11.9 TWh, which was more than double the interim target. The energy saving projection for the year 2016, which stands at 25.4 TWh, exceeds the ESD target by 43%.

[5] The first comprehensive report drawn up pursuant to the EED is also referred to here as the First EED NEEAP.
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:141:0048:0053:EN:PDF

The energy saving projection for the year 2020, which stands at 37.6 TWh, equates to an energy saving of just over 19%[7] when calculated across the energy services governed by the ESD.

Finland's NEEAP-3 report was drawn up by a specialist NEEAP sub-division set up under the working group established to prepare for the national implementation of the EED. The division was chaired by Heikki Väisänen from the Finnish Energy Authority (from the Finnish Ministry of Employment and the Economy until 31 December 2013). The following experts contributed to the NEEAP-3 report: Saara Jääskeläinen from the Finnish Ministry of Transport and Communications, Veli-Pekka Reskola from the Finnish Ministry of Agriculture and Forestry, Riina Vuorento from the Finnish Ministry of Education and Culture, Taina Eckstein from the Finnish Ministry of Finance, Merja Laitinen and Juha-Pekka Maijala from the Finnish Ministry of the Environment, Outi Ampuja from the Finnish Transport Safety Agency, Juha Muttilainen from Senate Properties and Ulla Suomi from Motiva Ltd, who also acted as the project coordinator and the sub-division's expert secretary. Several other individuals from the aforementioned organisations also gathered information for the report. Lea Gynther from Motiva Ltd contributed to the drawing up of the EED Annual Report.

Ulla Suomi coordinated the assessment of the impacts of energy efficiency measures. The following experts contributed to calculating energy savings: Ulla Suomi, Saara Elväs and Lea Gynther from Motiva Ltd, Juhani Heljo from Tampere University of Technology, Juhani Laurikko, Tuuli Järvi and Kari Mäkelä from VTT Technical Research Centre of Finland and Juha Muttilainen from Senate Properties. Several other parties also helped to gather information for the report.

[7] The calculations included in the NEEAP-3 do not cover all energy efficiency measures across the ESD sectors. These kinds of measures are discussed in Annex 3 to the NEEAP-3. With all measures factored in, Finland is on course to achieving an energy saving of -20% in 2020.

2 OVERVIEW OF NATIONAL ENERGY EFFICIENCY TARGETS AND SAVINGS

2.1 National 2020 energy efficiency target

Finland submitted its first annual report pursuant to the Energy Efficiency Directive (Annex 1 EED Annual Report of 30 April 2014) to the Commission on 26 April 2013. At that time, Finland disclosed an indicative national energy efficiency target according to which Finland's absolute final energy consumption would be 310 TWh in 2020. This corresponds to an absolute level of primary energy consumption of 417 TWh. Finland's national target was set in connection with a review of the climate and energy strategy[8]. Revisions to the strategy were drawn up under the guidance of the ministerial working group on energy and climate policy and a Government report (VNS 2/2013 vp) of the updates was submitted to the Parliament of Finland on 20 March 2013.

The energy efficiency target was calculated on the basis of sector-specific reports and estimates, which the various ministries commissioned from specialist organisations or drew up themselves. The premises, assumptions and calculation principles relating to the strategy are discussed in more detail in a report underlying the energy and climate strategy, a summary of the scenario calculations and impact assessments drawn up by VTT Technical Research Centre of Finland / Government Institute for Economic Research and the Finnish Environment Institute[8].

2.2 Target pursuant to Article 7

Finland submitted a notification of the implementation of Article 7 of the Energy Efficiency Directive to the Commission on 5 December 2013[9]. The notification was supplemented on 30 January 2014 once the 2012 energy statistics required for the notification became available (Annex 4 Supplementary information for the notification of 5 December 2013 concerning the implementation of Article 7 of the EED). Average final energy consumption in 2010–2012 corresponding to energy sales by retail energy sales companies to end users as per Article 7 of the Directive amounts to 154.75 TWh. The annual new energy saving calculated on the basis of this figure at 1.5% is 2.32 TWh. Finland's total cumulative energy saving target for the years 2014–2020 is 65.00 TWh_{cum}.

According to paragraph 3 of Article 7 of the Directive, Member States may apply the mechanisms referred to in paragraph 2 of the Article, but the application of these mechanisms must not lead to a reduction of more than 25% of the total energy saving target. With regard to these kinds of mechanisms, Finland primarily applies the so-called early actions provided for in sub-paragraph d, the cumulative energy saving effect of which amounts to almost 100 TWh_{cum}, which is clearly above the maximum level of 25%.

Considering the ceiling of 25% set for these kinds of mechanisms, the cumulative energy saving target for the period 2014–2020 comes to 48.75 TWh_{cum}.

More detailed information about the implementation of Article 7 is included in the notification submitted on 5 December 2013 and the supplementary information submitted on 30 January 2014.

[8] https://www.tem.fi/en/energy/energy_and_climate_strategy/strategy_2013
[9] http://ec.europa.eu/energy/efficiency/eed/doc/article7/2013_fi_eed_article7_en.pdf

2.3 Additional energy efficiency targets

Finland has only set sector-specific energy efficiency targets with regard to transport. As regards policy measures, targets have been set for energy efficiency agreements.

Energy efficiency agreements

Finland's extensive energy efficiency agreement scheme for 2008−2016 is aimed at reaching the 9% energy saving target by 2016. Energy efficiency agreements already cover multiple sectors of the economy (industry, energy sector, private services), local governments, the property sector, the oil industry, transport and agriculture[10].

A letter of intent concerning the renewal of the energy efficiency agreements for businesses and local governments relating to the implementation of Article 7 of the Energy Efficiency Directive, which was signed in December 2013, sets a cumulative energy saving target of 31 TWh_{cum} for the period 2014–2020.

Transport

The Finnish Ministry of Transport and Communications published its environmental strategy for the years 2013–2020 in December 2013. The environmental strategy for transport lays down the most important targets for environmental action and priorities for all forms of transport. It also includes an updated version of the climate policy of Finland's transport administration (Climate Policy Programme, 2009[11]). With regard to energy, the environmental strategy aims to stop the increase in energy consumption and to bring about a decrease before 2020. In 2020, the final energy consumption of domestic transport must not exceed 48 TWh (currently approximately 50 TWh).

Stopping the growing energy consumption in transport requires changes both in the distribution of forms of transport and in the volume of car traffic as well as in the choice of fuels and vehicle technologies. According to the strategy, reaching the target requires new means of financial steering, such as road tolls or incentives for investing in low-emission technology.

Agriculture

A sector-specific agreement for the agricultural sector was signed in January 2010 between the Finnish Ministry of Agriculture and Forestry and national organisations of agricultural and horticultural producers. The agreement incorporates a Farm Energy Programme the goal of which is for farms participating in the programme to represent at least 80% of the total energy consumption of the agricultural sector. The contracting parties have agreed on an indicative target for increasing energy efficiency in the agricultural sector, which is to cut the energy consumption of the participating farms by nine per cent by 2016.

2.4 Primary energy savings

Not all primary energy savings have been factored into the calculations presented in the NEEAP-3.

[10] http://www.energiatehokkuussopimukset.fi/en/

[11] http://www.lvm.fi/julkaisu/1278532/liikenne-ja-viestintaministerion-hallinnonalan-ilmastopoliittinen-ohjelma-2009-2020-seuranta-2011

Finland provided information about some savings not included in the scope of the Energy Services Directive (ESD) in the NEEAP-2. Of these savings not governed by the ESD, some are primary energy savings reported annually by businesses that implement the Energy Production Action Plan, which is associated with the energy efficiency agreement scheme. These primary energy savings have been converted into final energy in Table 1 in Section 2.5 and in Table 10 in Section 5.1.2, using the default coefficient of 2.5 given in the Energy Services Directive.

The primary energy savings reported under the Energy Production Action Plan are shown in Table 10 in Section 5.1.2 and they amounted to 0.45 TWh/a in 2010. Primary energy savings are estimated to amount to 1.41 TWh/a in 2016 and to 2.08 TWh/a in 2020.

2.5 Final energy savings

Finland's energy saving target for 2016 pursuant to the Energy Services Directive is 17.8 TWh. The interim target set for the year 2010 was 5.9 TWh. The combined energy saving effect of the measures discussed in this report amounted to 11.9 TWh in 2010 (estimated at 12.1 TWh in the NEEAP-2). The energy saving effect has been estimated to rise to 25.4 TWh by 2016 (24.7 TWh in the NEEAP-2), which would mean that Finland would exceed its energy saving target for 2016 by 43%.

The energy saving effect has been estimated to rise to 37.3 TWh by 2020 (33.7 TWh in the NEEAP-2), which equates to an energy saving of just over 19%. As the NEEAP-3 report does not include an estimate of all energy efficiency measures by the volume of energy, reaching the 20% energy saving target in the sectors governed by the ESD looks very likely. Some of the measures the energy saving effects of which have not been evaluated are discussed in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment).

The energy saving calculations presented in the NEEAP-3 are mostly based on the same national methods as those used in the NEEAP-1 and NEEAP-2 reports. The calculation systems and the associated baseline data and assumptions are explained in connection with each of the energy efficiency measures described in the annexes (Annex 2 Description of energy saving measures pursuant to the ESD).

A summary of the energy saving effects relevant to the Energy Services Directive in 2010, 2016 and 2020 is shown in Table 1. Similarly to the NEEAP-2, the table also includes some non-ESD energy saving effects, in so far as these have been evaluated.

Table 1. Summary of impacts on energy consumption

Sector	Energy saving		
	2010 GWh/a	Estimate 2016 GWh/a	Estimate 2020 GWh/a
ESD:			
Buildings	6 614	15 081	21 009
Public sector	393	674	842
Services – private	189	433	506
Industry	1 962	2 145	2 396
Transport	1 478	3 461	5 669
Agriculture	1 222	2 316	2 896
Horizontal measures	0	1 278	4 259

NON-ESD:			
Industry	8 844	9 693	10 807
Energy sector	611	2 336	3 460
TOTAL ENERGY SAVING – ESD	**11 858**	**25 388**	**37 577**
TOTAL ENERGY SAVING – NON-ESD	9 455	12 029	14 267
TOTAL ENERGY SAVING – ALL	21 313	37 417	51 844

3 EFFICIENCY OF ENERGY USE – IMPLEMENTATION OF THE ENERGY EFFICIENCY DIRECTIVE

3.1 Energy performance of buildings – Articles 4 and 5

3.1.1 Long-term strategy for mobilising investment in the renovation of buildings – Article 4

Article 4 urges Member States to take measures to encourage investment in the deep renovation of both public and private residential and commercial buildings.

Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private. Annex 5 includes Finland's national strategy for building renovations, which satisfies the requirements a)–e) laid down in Article 4:

a) an overview of the national building stock based, as appropriate, on statistical sampling; Annex 5, Section 2 – Overview of Finland's building stock
b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone; Annex 5, Section 3 – Cost-effective deep renovations suitable for Finland's climate
c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations; Annex 5, Section 4 – Policies and measures that promote deep renovations
d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions; Annex 5, Section 5 – Decision-making, service provision and financing relating to renovations
e) an evidence-based estimate of expected energy savings and wider benefits; Annex 5, Section 6 – Energy savings, reductions in emissions and other benefits

In connection with the transposition of the Energy Performance of Buildings Directive (EPBD), Finland introduced cost-optimal levels of minimum energy performance requirements for renovations that require planning permission, which entered into force in 2013. The Finnish Ministry of the Environment also promotes the objectives of the Renewable Energy Sources (RES) Directive with regard to buildings undergoing thorough renovation.

Comprehensive requirements have been set for renovating the building stock with regard to energy performance. Article 4 of the EED is designed, instead of setting requirements, for finding ways to mobilise investment in the energy efficiency of public and private residential and commercial buildings and to implement these in a systematic and timely manner in connection with renovation.

3.1.2 Central government buildings – Article 5

Instead of the 3% renovation obligation applicable to central government buildings, Finland has decided to implement Article 5 by means of an alternative approach for reaching the required energy saving target and submitted a notification of this[12] to the Commission on 18 December 2013.

In order to satisfy the 3% renovation target for central government buildings, the energy saving to be achieved during the period 2014–2020 amounts to 8 225 MWh. The energy saving target for 2014 is

[12] http://ec.europa.eu/energy/efficiency/eed/doc/article5/2013_fi_eed_article5_en.pdf

1 285 MWh. The notification submitted to the Commission included eight energy saving measures that will help to achieve the energy saving target. Based on statistical information, the energy saving achieved in recent years has been approximately 30% above the Article 5 target on average.

3.1.3 Buildings of other public bodies – Article 5

All of the measures listed in paragraph 7 of Article 5 of the Energy Efficiency Directive are included in the energy efficiency agreement for local governments and the associated energy programme (2008–2016):

- adopting an energy efficiency plan, containing specific energy saving and efficiency objectives and actions (a)
- setting an energy saving target of at least 9% for the year 2016 and an interim target for the year 2013 (a)
- providing instructions for the supervision of engineering and construction in new development and renovations so that technological choices are based on life cycle economy and energy efficiency wherever possible (a)
- carrying out energy audits so that 80% of local government building stock has been audited by the end of 2013 as well as commissioning audits in new buildings and follow-up audits as needed (b)
- setting a target of 80% for the coverage of monthly consumption monitoring by 2013 and 90% by 2016 and making active use of monitoring data (b)
- using the expertise of ESCOs to implement investments, identifying and eliminating barriers resulting from the administrative and decision-making processes of local governments and making use of ESCOs whenever the shortage of funding prevents the execution of cost-effective investments (c)

A total of 137 local authorities and joint authorities have signed the energy efficiency agreement for local governments (information correct on 6 February 2014). Relative to population, the agreement covers approximately 75% of all Finnish local governments. Based on annual reports, two thirds of the local governments that have signed the agreement had drawn up an action plan by the end of 2012. Approximately 20% of local governments had already revised their plans. At the end of 2012, energy audits covered approximately 35% of the service building stock of the local governments that have signed the agreement.

Senate Properties, which manages the Finnish State's building stock, implements the Commercial Property Action Plan associated with the energy efficiency agreement for the property sector, the obligations laid down in which are largely consistent with those laid down in the energy efficiency agreement for local governments. Most state-owned public organisations rent their premises from Senate Properties in practice.

The Government Resolution of 4 February 2010 on energy efficiency measures obligated public bodies to draw up an energy efficiency plan by the end of 2012. The plan of the Finnish Ministry of Employment and the Economy was drawn up and approved in May 2011. Specialist training events have been organised concerning the drawing up of energy efficiency plans for three years (2011, 2012 and 2013). Various ministries have urged their departments to draw up energy efficiency plans through their respective performance management processes.

State-run public bodies have no obligation to make their action plans available to the public, and such plans have not been compiled so far. Nevertheless, plenty of energy efficiency action plans have been drawn up. Some public bodies have made their plans available to the public and others have voluntarily submitted their plans to the Finnish Ministry of Employment and the Economy or to Motiva Ltd.

3.2 Purchasing by public bodies – Article 6

3.2.1 Central government purchases

The requirements of the Directive will be satisfied by reviewing the recently issued Government Resolution (13 June 2013) on the promotion of new and sustainable cleantech solutions in public procurement during the spring of 2014. The Government Resolution will be updated to include a reference to the Energy Efficiency Directive, which will ensure that the Government Resolution remains up to date even if the list of products concerning energy efficient purchasing provided in Annex III of the Directive were to be supplemented at a later date. The Annex currently includes the products referred to in the Energy Labelling Directive (such as domestic dishwashers, refrigerators, washing machines and light bulbs), appliances governed by the Ecodesign Directive (2009/125/EC), Energy Star office equipment, tyres, services and buildings. With regard to services, only products sourced by service providers for the provision of a specific service need to be energy-efficient.

In practice, the only central government organisation that purchases these kinds of products and services in volumes that exceed the EU thresholds is the Finnish Government's central purchasing body Hansel Ltd. It is therefore enough for Hansel Ltd to observe the revised Government Resolution and report on any relevant purchases.

Due to the provisions of the new Procurement Directive, Finland's public contracts portal (HILMA) will be revised in the next few years to also include a section on compliance with the Energy Efficiency Directive. Until then, information on this can be compiled with the help of Hansel Ltd's data on joint procurement.

3.2.2 Purchasing by other public bodies

The observance of the principles of energy efficiency in public procurement is promoted in Finland by a number of different means.

The cleantech procurement advice service[13] set up in connection with Motiva in 2009 continues its work as a consultancy service and promoter of sustainable purchases for public procurement units. One of Motiva's most important tasks is to disseminate information about best practices in energy-efficient procurement. A workshop for public procurement units and suppliers will be held in the autumn of 2014 concerning the implementation of Article 6 of the EED in real-life procurement projects.

The eco-procurement network[14] set up by nine towns in 2002 to promote cooperation between public procurement units in connection with environmentally friendly procurement has been expanded to encompass all public-sector procurement units. Motiva contributes to the coordination of the network with funding from the Finnish Ministry of the Environment.

The guidelines of the Finnish Ministry of Employment and the Economy on factoring energy efficiency into public procurement were revised in 2011[15].

The Government Resolution of 13 June 2013[16] covers not just the procurement of the central government but also all purchases of all procurement units of the Finnish State: energy, products and

[13] http://www.motivanhankintapalvelu.fi/in_english
[14] http://www.motivanhankintapalvelu.fi/hankintapalvelu/ekohankintaverkosto
[15] https://www.tem.fi/files/30410/Energiatehokkuus.pdf
[16] http://valtioneuvosto.fi/toiminta/periaatepaatokset/periaatepaatos/fi.jsp?oid=388570

equipment, deliveries and transport as well as buildings and services. Compliance with the Government Resolution is regularly monitored and evaluated by the ministerial working group on energy and climate policy.

Measures pursuant to paragraph 3 of Article 6 of the Energy Efficiency Directive are among the most important contractual obligations laid down in local government energy efficiency agreements and the associated energy programme (2008–2016). Based on annual reports, compliance with the energy efficiency guidelines issued for public procurement has continued to improve throughout the contracting period. By the end of 2012, a total of 81% of large local governments and 58% of small local governments observed the energy efficiency guidelines. The figures were 44% and 33% respectively in 2008.

3.3 Energy efficiency obligation schemes – Article 7

Finland has chosen to implement Article 7 of the Energy Efficiency Directive by means of other policy measures as provided in paragraph 9 of the Article. The potential of adopting an energy efficiency obligation scheme for energy companies was studied in the autumn of 2013. Experts concluded that the scheme would be administratively burdensome and difficult to implement in an efficient and cost-effective manner in Finland. The alternative policy measures adopted instead are laid down in Finland's National Energy Efficiency Programme.

3.3.1 Calculating impacts on energy consumption

Finland uses the so-called straight-forward principle in calculating cumulative energy savings pursuant to Article 7. When calculating the cumulative energy saving effect attributable to early actions, only measures the energy saving effects of which extend to the year 2020 are included.

With regard to far-reaching energy efficiency measures implemented between 2014 and 2020 (whose energy saving effects extend beyond the year 2020), the cumulative energy saving effect has been calculated up to the year 2020. With regard to short-term energy efficiency measures (whose energy saving effects expire before the year 2020), the cumulative energy saving effect has been calculated according to the life of each measure. More detailed descriptions of how the cumulative energy saving effects of each measure have been calculated pursuant to Article 7 are included in the annexes to the notification submitted by Finland to the Commission on 5 December 2013[17].

The national coefficients used in calculating cumulative energy saving targets are shown in the annexes (Annex 6 Energy content of selected fuels for end use – conversion tables).

3.3.2 Alternative policy measures

Finland's National Energy Efficiency Programme, which implements the obligations listed in paragraph 9 of Article 7 of the Energy Efficiency Directive, incorporates the following eight energy efficiency measures:

- Energy efficiency agreements
- Transport fuel taxes / road transport
- Energy audits

[17] http://ec.europa.eu/energy/efficiency/eed/doc/article7/2013_fi_eed_article7_en.pdf

- Energy efficiency agreements / Energy Services Action Plan and Höylä III with regard to customers
- Heat pumps for detached and terraced houses
- Investments in heating plants
- Energy efficiency regulations for renovations and subsidies to incentivise renovations
- Energy efficiency regulations for new development

The measures to be implemented during the first years of the programming period (2014–2016) have been estimated to bring about a cumulative energy saving of a total of 61.69 TWh_{cum} and the measures to be implemented during the latter years (2017−2020) to bring about a cumulative energy saving of a total of 40.88 TWh_{cum}. The total cumulative energy saving to be achieved across the entire period 2014−2020 has been estimated at 102.57 TWh_{cum}.

More detailed descriptions of the energy efficiency measures incorporated into Finland's National Energy Efficiency Programme are included in the notification submitted to the Commission on 5 December 2013[17].

3.4 Energy audits and energy management systems – Article 8

Finland has promoted systematic, high-quality energy audits since 1993. In its current format, the scope and quality of Finland's energy audit system is almost sufficient for meeting the requirements laid down in paragraph 1 of Article 8 of the Energy Efficiency Directive concerning the availability to all final customers of high-quality energy audits which are cost-effective and carried out by qualified experts.

The current energy audit schemes introduced by the Finnish Ministry of Employment and the Economy for the private and public service sector, the industrial sector and the energy sector already satisfy the requirements of Article 8. An energy audit model for detached houses still needs to be introduced in the housing sector. In the transport sector, a suitable energy audit model needs to be developed for delivery companies which, in practice, will be a combination of the current delivery chain energy audit model and the energy audit model for buildings. With regard to agriculture, the availability of energy audits has been ensured as part of the Farm Energy Programme coordinated by the Finnish Agency for Rural Affairs.

The current status and upcoming changes to energy audits in Finland are described in more detail in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment, HO-14-TEM/YM/MMM/LVM). The energy saving effects of energy audits are discussed per sector in Section 3.6 of the report.

The energy audit obligation applicable to large corporations pursuant to paragraph 4 of Article 8 will be laid down in the new Finnish Energy Efficiency Act, a bill of which is being drafted by the Finnish Ministry of Employment and the Economy. The views presented below are therefore of provisional nature. Large corporations that have adopted an ISO 50 001 certified environment and energy management system or both an ISO 14 001 certified environmental system and a certified energy management system will be exempt from mandatory energy audits. Responsibility for official duties relating to mandatory energy audits of large corporations will be divided so that the Finnish Energy Authority will be responsible for the certification of energy auditors as well as for quality assurance and oversight in all sectors apart from transport, where responsibility for quality assurance and oversight will rest with the Finnish Transport Safety Agency. As the deadline for making energy audits mandatory for large corporations is 5 June 2014, it will only be possible to report numbers of energy audits that have been carried out in the NEEEAP-4 which will be submitted by 30 April 2017.

National minimum requirements for energy audits will be laid down in the new Finnish Energy Efficiency Act and any associated Government Decrees.

3.5 Metering and billing – Articles 9–11

3.5.1 Measuring of consumption – Article 9

The Finnish Act on energy efficiency services of companies operating in the energy market (1211/2009) and the Government Decree on electricity supply statements and metering (66/2009) issued under the Finnish Electricity Market Act cover most of the requirements laid down in paragraph 1 of Article 9 concerning the provision of meters to final customers for electricity, natural gas, district heating and district cooling and the requirements laid down in paragraph 2 of Article 9 concerning the implementation of intelligent metering systems.

The provisions of the Finnish Energy Efficiency Services Act concerning metering can be incorporated, with minor revisions, into the new Finnish Energy Efficiency Act if needed. The provisions of the Finnish Electricity Market Act concerning metering as well as any regulations issued on the basis of the same will also be reviewed. Moreover, the Government Decree issued on the basis of the Finnish Electricity Market Act will be revised so as to make it correspond, unambiguously, with the provision of the Directive concerning the disclosure of information to third parties acting on behalf of final customers for electricity. These provisions are being drawn up at the moment.

More than 95% of all electricity usage points already have an hourly electricity meter that can be read remotely. Remote reading is also already in use for more than 80% of district heating customers. There is very little retail-level supply of natural gas to consumers, and current regulations do not require hourly meters that can be read remotely.

Energy companies advise their customers in how to make use of the information generated by new meters as part of normal customer service as well as via the internet.

Article 9.3 stipulates that where heating, cooling or hot water are supplied to a building from a district heating network or from a central source servicing multiple buildings, a heat or hot water meter must be installed at the heating exchanger or point of delivery.

In Finland, all points of delivery for district heating are equipped with a meter for market reasons alone in order to ensure that customers are billed correctly. All water supplied to buildings via mains water pipes is cold in Finland and heated inside buildings with the help of a heat exchanger.

According to the Finnish Act on energy efficiency services of companies operating in the energy market, energy suppliers at retail level have an obligation to provide final customers for district heating and district cooling with meters that can be used to verify energy consumption as well as to provide information about the temporal distribution of consumption whenever a new supply is installed and whenever it is technically and economically reasonable to provide metering otherwise. These provisions are due to be incorporated into the new Finnish Energy Efficiency Act.

A decree of the Finnish Ministry of the Environment on the energy performance of new buildings issued on the basis of the Finnish Land Use and Building Act stipulates that all buildings must be equipped with energy consumption meters or have readiness for metering in order to be able to easily verify the consumption of different forms of energy.

A decree issued on the basis of the Finnish Land Use and Building Act concerning plumbing and sewerage systems in properties has been revised to stipulate that new properties with multiple units must, in addition to a main water meter, also be equipped with unit-specific meters for measuring the volume of cold and hot water supplied to each unit. It must be easy to monitor water consumption and it must be possible to use meter readings as the basis for billing. The use of unit-specific water consumption data as the basis for billing is regulated by the Articles of Association of housing associations.

The provisions have, on the basis of the Finnish Land Use and Building Act, been applied to renovations and alterations. Compliance with the provisions was also made mandatory under the 2013 decree of the Finnish Ministry of the Environment on improving the energy performance of buildings in connection with renovations and alterations.

The new Finnish Energy Efficiency Act will include a provision according to which a thermal energy meter needs to be installed in a building's heat exchanger or point of delivery whenever a heating system is replaced or when a new supply is installed in a new building if the building is supplied with heating or cooling from a district heating network or from a central source servicing multiple buildings.

A report commissioned by the Finnish Ministry of Employment and the Economy from VTT Technical Research Centre of Finland concerning technical and economic conditions for unit-specific metering and cost allocators was published in October 2013. The report is based on information about the direct costs of cost allocators compiled from sources abroad. The report did not strive to factor in all possible indirect costs. The report also does not factor in heat conveyance between units, which causes problems with regard to the allocation of costs in a fair manner. These problems would be amplified if unit-specific metering or cost allocators were to be introduced.

According to the report, cost allocators would only pay for themselves once consumers would be able to use them to save more than 21% of their energy in apartment blocks and more than 14% in terraced houses. Covering the costs of unit-specific heating volume metering requires a more substantial energy saving: more than 45% in apartment blocks and 30% in terraced houses.

These thresholds have been calculated without factoring in any discount rates in profitability calculations. If discount rates are factored in, the required energy savings are even greater. Another question is how substantial the financial benefit would have to be for it to steer consumers' choices. The aforementioned thresholds would only be enough to cover the costs incurred.

Of the types of residential properties examined, cost allocators paid for themselves at an energy saving rate of 10% only in relatively large terraced properties built before the year 1980. These kinds of properties account for five per cent of all terraced houses (1% of all terraced houses and apartment blocks). This means that in 99% of existing buildings with multiple residential units, energy metering and indirect determination of heating consumption would generate costs beyond what can be covered by energy savings resulting from changes in consumer behaviour. It would be more cost-effective to invest in adjusting and balancing the heating systems of buildings, which is more likely to bring savings than equipment with indirect effects.

The report by VTT Technical Research Centre of Finland shows that unit-specific heating consumption metering is technically extremely difficult to implement in existing buildings and that cost allocation is not cost-effective even with radiator-specific equipment. Neither solution seems economically viable with

current technology in new buildings either, considering that energy regulations applicable to new buildings are already efficient and due to become increasingly strict in the future.

3.5.2 Billing – Articles 10 and 11

The current Finnish Act on energy efficiency services of companies operating in the energy market (1211/2009) covers most of the requirements laid down in Article 10. In the current situation, consumption data are collected by means of electronic reporting services made available by system operators.

Work is in progress concerning a legislative reform that will make the provisions of the current Finnish Act on energy efficiency services of companies operating in the energy market (1211/2009) on the provision of consumption data consistent with those of Article 10 and Annex VII. The revised provisions will be incorporated into the new Finnish Energy Efficiency Act. With regard to electricity, similar provisions will be included in regulations issued on the basis of the Finnish Electricity Market Act.

Work is also in progress concerning a regulation according to which any consumption data generated must be made available, at the request of the final customer, to an energy service provider designated by the final customer.

3.6 Other measures related to energy end-use efficiency in different sectors

This section sets out Finland's energy efficiency measures divided between five sectors and the energy saving effects of the same calculated according to the methods laid down in the Energy Efficiency Directive for the years 2010, 2016 and 2020. More detailed descriptions of Finland's energy efficiency measures are included in the annexes (Annex 2 Description of energy saving measures pursuant to the ESD).

3.6.1 Buildings

With regard to buildings, the most important energy efficiency measures relate to heat pumps in terraced and detached houses, energy performance regulations applicable to new development and the Höylä III energy efficiency agreement.

The annual energy saving effect of 6 614 GWh calculated for the year 2010 equates to a 5% energy saving across the total energy consumption attributable to buildings. The following measures are expected to raise the annual energy saving to a level of 12% by the year 2016 and to a level of 16% by 2020:

Table 2. Buildings (RA) – summary of impacts on energy consumption

Code	Measure*	Energy saving		
		2010 GWh/a	Estimate 2016 GWh/a	Estimate 2020 GWh/a
RA-01-YM	Energy efficiency regulations for new development in 2003, 2008, 2010 and 2012	1 923	4 925	7 085
RA-02-YM	Energy efficiency regulations for renovations	0	750	1 750
RA-03-YM	Energy subsidies for residential buildings	282	1 323	1 321

RA-04-TEM	Heat pumps for detached and terraced houses	2 326	5 347	7 726
RA-05-YM	Mandatory installations of unit-specific water meters	0	74	128
RA-06-TEM	Energy labelling of windows	52	66	93
RA–07–TEM/YM	Höylä III energy efficiency agreement – oil-heated detached houses	1 988	2 297	2 476
RA-08-YM	Energy efficiency agreement for the property sector – residential lettings associations	44	299	430
TOTAL ENERGY SAVING – ESD		**6 614**	**15 081**	**21 009**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2 (Annex 2 Description of energy saving measures pursuant to the ESD).

3.6.2 Public sector

The two most important energy efficiency measures that are monitored separately in the local government sector are the energy efficiency agreement for local governments and the associated energy programme as well as local government energy audits. The annual energy saving effect of 275 GWh calculated for the year 2010 equates to approximately 2.4% of the total energy consumption attributable to the local government sector. With the help of these measures, the annual energy saving has been estimated to rise to a level of approximately 3.4% by the year 2016 and to a level of 3.8% by 2020. Measures that have an impact on energy consumption in the local government sector are also included in the measures discussed in Section 3.6.1 "Buildings" and in the horizontal measures discussed in Section 4, the energy saving effects of which have in most cases not been evaluated.

With regard to central government, energy saving effects have been evaluated across four measures implemented by Senate Properties, the most important of which relates to maintenance and user information. The energy saving effect of 118 GWh calculated for the year 2010 equates to approximately five per cent of the total energy consumption attributable to the central government. The energy saving has been estimated to rise to a level of approximately 13% by the year 2016 and to a level of 18% by 2020. Measures that have an impact on central government energy consumption are also included in the horizontal measures discussed in Section 4.

Table 3. Public sector (KU, VA) – summary of impacts on energy consumption

		ENERGY SAVING		
CODE**	MEASURE*	2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
KU-01-TEM	Local government energy efficiency agreement and energy programme	178	266	328
KU-02-TEM	Energy audits – local government sector	97	125	112
VA-01-VM	Increasing the efficiency of use of space in central government	7	70	126
VA-02-VM	Renovation of the state's building stock	3	32	61
VA-03-VM	Increasing energy efficiency in new development in the state sector	1	10	21

VA-04-VM	Maintenance and user information for the state's building stock	107	171	194
ENERGY SAVING, LOCAL GOVERNMENTS (KU) – ESD		275	391	440
ENERGY SAVING, CENTRAL GOVERNMENT (VA) – ESD		118	283	402
TOTAL ENERGY SAVING – ESD		**393**	**674**	**842**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

** KU = Local governments, VA = Central government

3.6.3 Services – private

The most important energy efficiency measures that are monitored separately in the service sector include energy audits and two energy efficiency agreements. The annual energy saving of 189 GWh calculated for the year 2010 equates to 0.9% of the total final energy consumption of the private services sector. The energy saving effect of these measures has been estimated to rise to a level of approximately 2.2% by the year 2016 and to a level of 2.5% by 2020. Energy efficiency measures that have an impact on energy consumption in the private services sector are also included in the measures relating to buildings discussed in Section 3.6.1 and in the horizontal measures discussed in Section 4.

Table 4. Private services (PA) – summary of impacts on energy consumption

		ENERGY SAVING		
CODE	MEASURE*	2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
PA-01-TEM	Energy audits – private services	141	118	108
PA-02-TEM	Energy efficiency agreement for businesses – service sector	33	162	200
PA-03-TEM	Energy efficiency agreement for the property sector – commercial properties	15	153	198
TOTAL ENERGY SAVING – ESD		**189**	**433**	**506**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

3.6.4 Industry

The most important energy efficiency measures that are monitored separately in the industrial sector are a comprehensive energy efficiency agreement scheme for businesses and energy audits. The energy saving effects of these measures are monitored separately at industrial sites governed by the Energy Services Directive and emissions trading. Of the energy saving of 10.8 TWh calculated for the year 2010, a total of 1.9 TWh (18%) is attributable to industry governed by the Energy Services Directive and 8.8 TWh (82%) to the energy consumption of industrial sites participating in emissions trading. Relative to the total energy consumption attributable to Finnish industry, which amounted to 140 TWh in 2010, the energy saving effect of all the implemented measures came to more than 7.5% of the sector's total final energy consumption. The saving effect of measures implemented by sites governed by the ESD amounted to 1.4% of the total final energy consumption of the industrial sector.

Table 5. Industry (TE) – summary of impacts on energy consumption

			ENERGY SAVING	
	MEASURE*		ESTIMATE	ESTIMATE

CODE		2010 GWh/a	2016 GWh/a	2020 GWh/a
TE–01–TEM	Industrial energy audits, ESD	851	955	986
	Industrial energy audits, non-ESD	1 930	704	655
TE–02–TEM	Energy efficiency agreement for businesses – medium-sized industrial organisations, ESD	290	540	712
	Energy efficiency agreement for businesses – medium-sized industrial organisations, non-ESD	48	116	130
TE–03–TEM	Energy efficiency agreement for businesses – energy-intensive industry, ESD	821	650	698
	Energy efficiency agreement for businesses – energy-intensive industry, non-ESD	6 866	8 873	10 022
TOTAL ENERGY SAVING – ESD		**1 962**	**2 145**	**2 396**
TOTAL ENERGY SAVING – NON-ESD		8 844	9 693	10 807
TOTAL ENERGY SAVING – ALL		10 806	11 838	13 203

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

Compared to the NEEAP-2 report, the division between savings attributable to the ESD sector and the non-ESD sector has been revised by examining the distribution of sites participating in emissions trading and those not participating in emissions trading. As a result, even more of the savings attributable to the industrial sector come from savings in the final energy consumption of the non-ESD sector.

3.6.5 Transport

The most important energy efficiency measures in the transport sector include improving the energy efficiency of cars, promoting fuel economy among car users and professional drivers, promoting public transport, promoting walking and cycling, winter-time speed limits, tyre pressure checks and changes in the mass and dimensions of heavy goods vehicles.

The annual energy saving of 1 478 GWh calculated for the year 2010 equates to 3.4% of the total final energy consumption attributable to road transport. The energy saving effect of these measures has been estimated to rise to a level of 8% by the year 2016 and to a level of 13% by 2020.

There are also certain other measures aimed at improving the energy efficiency of transport. These include energy efficiency agreements for the transport sector, energy labelling of tyres, factoring energy efficiency into public contracts for vehicle and transport services and improving the energy efficiency of vans. The energy saving effects of these measures have not been calculated, as there is no up-to-date information about them available at the moment or their effects are expected to be small.

Table 6. Transport (LI) – summary of impacts on energy consumption

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
LI–01–LVM	Improving the energy efficiency of cars	707	1 900	3 600
LI–02–LVM	Promoting fuel economy among car users	186	241	271
LI–03–LVM	Promoting fuel economy among bus and coach drivers	43	55	53

LI–04–LVM	Promoting fuel economy among lorry drivers	121	277	274
LI–05–LVM	Promoting public transport	38	40	100
LI–06–LVM	Promoting walking and cycling	38	190	460
LI–07–LVM	Winter-time speed limits	165	165	165
LI–08–LVM	Changes in the mass and dimensions of heavy goods vehicles	0	400	550
LI–09–LVM	Tyre pressure checks	180	193	196
TOTAL ENERGY SAVING – ESD		**1 478**	**3 461**	**5 669**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

3.6.6 Agriculture

Five energy efficiency measures from the agricultural sector are discussed here, one of which is an extensive energy saving programme. These measures had helped to achieve a 9% saving from the energy consumption of farms and horticultural facilities by 2010. The energy saving effect of these measures has been estimated to rise to a level of 17% by the year 2016 and to a level of 21% by 2020.

Table 7. Agriculture (MA) – summary of impacts on energy consumption

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
MA-01-MMM	Investments in heating plants	1 201	2 131	2 458
MA-02-MMM	Fresh grain silos	4	19	35
MA-03-MMM	Energy efficiency of cattle sheds and pig farms	2	10	19
MA-04-MMM	Reparcelling projects	15	97	156
MA-05-MMM	Farm Energy Programme	0	59	228
TOTAL ENERGY SAVING – ESD		**1 222**	**2 316**	**2 896**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

3.7 Summary of impacts on energy consumption

The table below shows a summary of the annual energy saving effects of the energy efficiency measures of different sectors discussed in Section 3.6 above, calculated in accordance with the Energy Efficiency Directive for the years 2010, 2016 and 2020. Annual energy saving effects have been calculated for 34 measures, 31 of which relate purely to energy consumption in the ESD sector. The effects of industrial measures are split between the ESD sector and the non-ESD sector (= sites participating in emissions trading).

Of the measures discussed in Section 3.6, two are new measures for which assessments of energy saving effects were not included in the NEEAP-2 (RA-02-YM, LI-08-LVM). In addition, compared to the NEEAP-2, some of the content and/or numbering have been updated with regard to the building stock measures RA-03-YM and RA-04-TEM.

The greatest energy savings can be achieved in the building sector, where the most important individual measures relate to building regulations, heat pumps in detached and terraced houses and measures relating to oil-heated detached houses. The industrial sector also has considerable potential, but most of the energy savings to be achieved there are attributable to energy consumption outside the scope of the ESD. The second greatest saving potential within the scope of the ESD comes from the transport sector, where the most important single measure relates to improving the energy efficiency of cars, a saving to which several different factors contribute. The annual energy savings attributable to measures in the agricultural sector are similar in size to the annual energy savings that can be achieved at industrial sites governed by the ESD.

Table 8. Summary of the impacts of energy efficiency measures discussed in Section 3.6

	ENERGY SAVING

Sector	2010 GWh/a	Estimate 2016 GWh/a	Estimate 2020 GWh/a
ESD:			
Buildings	6 614	15 081	21 009
Public sector	393	674	842
Services – private	189	433	506
Industry	1 962	2 145	2 396
Transport	1 478	3 461	5 669
Agriculture	1 222	2 316	2 896
Non-ESD:			
Industry	8 844	9 693	10 807
Total energy saving – ESD	**11 858**	**25 388**	**37 577**
Total energy saving – non-ESD	8 844	9 693	10 807
Total energy saving – all	20 702	33 803	44 125

4 HORIZONTAL MEASURES – IMPLEMENTATION OF THE ENERGY EFFICIENCY DIRECTIVE

4.1 Information and training – Articles 12 and 17

4.1.1 Information

Finland has a long history of investing in the dissemination of information, advice and training relating to energy efficiency. One of the most important organisations in this respect is Motiva Ltd, which covers all sectors from consumers to industry. Different ministries contribute approximately EUR 2 million to Motiva's communications each year.

A network of regional consultancy organisations coordinated by Motiva as well as energy companies are the most important providers of energy advice targeted at consumers. Advice is also available for businesses. In addition, the Finnish Ministry of the Environment hosts an online portal called Korjaustieto.fi, which contains information about property renovations for consumers and property owners, and coordinates a renovation consultancy network. More detailed information about the dissemination of information and advice concerning energy efficiency in Finland is included in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment / Communications and advice: HO-07–HO-11 and EP-02).

Energy efficiency advice for the transport sector is provided in connection with national mobility management work, which is coordinated by Motiva Ltd on commission from the Finnish Transport Agency. The Finnish Transport Agency also grants funding to regions and local governments for the purposes of mobility management. The measures are described in more detail in the annexes (Annex 2 Description of energy saving measures pursuant to the ESD/Transport: LI-05 and LI-06 as well as Annex 3 Description of energy efficiency measures – excluding impact assessment / Horizontal measures: HO-08).

In addition to the renovation consultancy provided by the Finnish Ministry of the Environment, the Ministry has commissioned Motiva to disseminate information about the energy performance of buildings and energy certificates. Advice on themes such as property management and maintenance, material efficiency, damp and mould problems and accessibility is also provided nationwide.

Responsibility for advising consumers on ecodesign and energy labelling requirements lies with Motiva. Communications are financed by the Finnish Ministry of Employment and the Economy and the Finnish Ministry of the Environment.

Motiva and lighting companies have set up a joint website containing information about lighting products for households[18]. The website has information about choosing the right kinds of light bulbs and locations where light bulbs can be taken for recycling. An online training course[19] about light bulbs has also been developed for retailers.

Motiva's website http://www.motiva.fi/en/areas_of_operation/renewable_energy/bioenergy showcases ways to promote renewable sources of energy and energy efficiency as well as related services in rural

[18] http://www.lampputieto.fi

[19] http://www.lamppukoulu.fi

areas. The website also incorporates content taken from the bioenergiatieto.fi website, which was hosted by the Finnish Ministry of Agriculture and Forestry until the end of 2013. In addition, advice on the energy efficiency of farms is available from various consultancy organisations such as ProAgria and the Work Efficiency Institute.

4.1.2 Training

In Finland, sustainable development and energy efficiency are featured at all levels of education from comprehensive schools to universities. The way energy efficiency is factored into training is discussed in more detail in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment / Training: HO-02–HO-06).

4.2 Availability of qualification, accreditation and certification schemes – Article 16

In terms of the technical competence of operators, objectivity and reliability, Finland's qualification and certification schemes are sufficient in the current circumstances. With regard to the training provided to energy auditors in particular, considering the annual volume of energy audits and the actual demand for new auditors, auditor training functions as a basic course for energy efficiency experts in practice. All individuals participating in the courses need to have passed basic training in their respective fields (e.g. electrical engineering or heating, plumbing and air-conditioning engineering).

Motiva has been providing energy auditor training on commission from the Finnish Ministry of Employment and the Economy since 1993. By the end of 2013, a total of almost 1 900 energy auditors had been trained and certified to carry out audits in the service sector, industrial sector and energy sector. In the last five years, between approximately 85 and 95 new energy auditors have obtained the qualification each year. Qualitatively and quantitatively speaking, Finland has enough qualified energy auditors. As of the beginning of 2014, responsibility for organising energy auditor training was transferred from the Finnish Ministry of Employment and the Economy to the Finnish Energy Authority. Changes will be planned to the energy auditor training and certification scheme during 2014 so that training and certification according to the new procedure can begin as of the beginning of 2015. Some of the changes are designed to respond to the new challenges presented by the Energy Efficiency Directive, others are due to the reshuffle of official tasks and responsibilities implemented at the beginning of 2014.

The Finnish Ministry of the Environment has estimated that individuals who have been authorised by the Housing Finance and Development Centre of Finland to issue energy certificates are qualified to carry out energy audits in residential properties. Finland currently (17 March 2014) has 1 716 energy certifiers with basic-level qualifications and 183 energy certifiers with advanced qualifications. Energy auditors trained and certified by Motiva are also qualified to carry out energy audits in residential properties.

Accreditations for drawing up energy plans for farms are issued by the Finnish Agency for Rural Affairs. Training is provided by Motiva Ltd.

As a market for ESCO services, Finland is small. Due to the limited number of ESCOs (3−5 companies), there has been no need to set up a separate qualification or certification scheme for service providers and no such need is foreseen in the near future either. In practice, providers of ESCO services are already covered by the current energy auditor training and other vocational further education schemes.

According to Article 14.3 and Annex IV of the European Renewable Energy Directive (2009/28/EC), Finland has set up a voluntary certification and training scheme for installers of solar heating, solar energy, bioheat, heat pump and pellet systems. The advanced and in-training courses provided in

accordance with the certification scheme give installers and other service providers an opportunity to prove their competence and gain certification. From the perspective of the Finnish education system, the scheme represents vocational further education.

4.3 Energy services – Article 18

The promotion of energy services is an important part of Motiva Ltd's energy programme, the total budget for which is approximately EUR 3.4 million in 2014. Promotion typically takes the form of disseminating information about energy efficiency and organising development projects with various operators.

Operators classified and registered as providers of energy services in Finland mostly comprise businesses that carry out energy audits[20], individuals who issue energy certificates[21] and ESCOs[22]. Motiva Ltd maintains lists of auditing companies that have carried out energy audits in a satisfactory manner and of ESCOs that have submitted information to the ESCO project register. Lists of individuals who issue energy certificates are maintained by the Housing Finance and Development Centre of Finland. Motiva has been commissioned by the Finnish Ministry of the Environment to organise networking and training events for individuals who issue energy certificates and by the Finnish Ministry of Employment and the Economy to hold retraining events for energy auditors.

Taking into account various services and electronic systems relating to the management of energy consumption and energy supply, Finnish service providers are versatile and knowledgeable. There are numerous service providers on the market who have their own products and efficient channels and resources for marketing these. Projections for the future are encouraging.

The development of energy services in Finland is promoted by means of programmes coordinated by the Finnish Funding Agency for Innovation (Tekes). The most important programmes, which also incorporate business relating to energy services, include Green Growth[23] – Road to sustainable economy (2011–2015, EUR 80 million) and Built Environment[24] (2009–2014, EUR 75 million).

4.4 Other measures to promote energy efficiency – Article 19

There are no legislative barriers to prevent landlords and tenants in Finland from agreeing to implement energy efficiency measures and to split any energy savings thus achieved.

One good example of ways to enable benefit sharing between landlords and tenants is the development and promotion of the so-called Green Lease concept. To set an example in the public sector, Senate Properties[25] developed the first Green Lease contracts in 2011. Senate Properties currently has four different contract templates in use. New tenancy agreements are made using these templates whenever

[20] http://www.motiva.fi/en/areas_of_operation/energy_auditing/mee-supported_energy_auditing/qualified_energy_auditors

[21] http://energiatodistus.motiva.fi/energiatodistustenlaatijat/

[22] http://www.motiva.fi/toimialueet/energiakatselmustoiminta/esco-palvelu/esco-hankerekisteri/esco-yritykset_suomessa

[23] http://www.tekes.fi/en/programmes-and-services/tekes-programmes/green-growth/

[24] http://www.tekes.fi/en/programmes-and-services/tekes-programmes/built-environment/

[25] http://www.senaatti.fi/en

possible. With regard to state-owned properties, however, the landlord (Senate Properties) and tenants (state-owned public bodies) have had no obstacles to implementing energy efficiency measures.

One of the obligations laid down in the Commercial Properties Action Plan associated with the energy efficiency agreement for the property sector is to promote energy-efficient tenancy and service agreement practices. The Finnish Association of Building Owners and Construction Clients' Green Lease templates[26] were developed in the course of the Energy Efficient Contractual Practices project in 2011 and their adoption is being monitored as part of the annual reporting on contracts.

Another obligation laid down in property sector energy efficiency agreements is to promote the incorporation of energy efficiency targets into property management agreements. Senate Properties has been following an operating model that incorporates an energy saving target for several years, which is also one of the most important energy efficiency measures with regard to the implementation of Article 5 of the EED.

There are no legislative barriers preventing the public sector in Finland from acquiring energy-efficient technology or from implementing energy efficiency investments when these are technically and economically feasible. There are also no barriers that would limit access to ESCO services.

Local governments that have signed the local government energy efficiency agreement have committed themselves to acquiring sufficient expertise in considering and subscribing to ESCO services whenever a viable energy efficiency investment would otherwise need to be abandoned due to lack of funding.

4.5 Funds and financing – Article 20

Finland has no plans to establish a national energy efficiency fund. The Parliament of Finland has no control over state funds that are not part of the state budget, which is why a restriction on founding extra-budgetary funds is provided in Section 87 of the Constitution of Finland. An extra-budgetary fund may be created if the performance of a permanent duty of the State requires this in an essential manner. However, the decision of the Parliament to adopt a legislative proposal for the creation of an extra-budgetary fund must be supported by at least two thirds of the votes cast. No new funds are set up in practice.

4.6 Other energy efficiency measures of a horizontal nature

This section describes a few of the most important horizontal measures for promoting energy efficiency.

4.6.1 Financial steering

Tax administration (HO-01-VM)

In addition to other energy efficiency measures, energy efficiency in Finland is promoted by means of energy tax, car tax and vehicle tax as well as tax credits for households. The effects of taxes have not been evaluated separately as ESD savings in the NEEAP-3, as the saving effects would overlap with the

[26] http://www.rakli.fi/energia-tehokkuus/energiatehokkuus/ekotehokkaat-sopimuskaytannot.html

effects of other measures discussed in this report. The energy saving effect of the tax credit available to households also overlaps with the effects of energy subsidies.

A description of the measure HO-01-VM is included in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment / Taxes).

Energy subsidies granted by the Finnish Ministry of Employment and the Economy (budget item No 32/60/40)

The Finnish Ministry of Employment and the Economy grants energy subsidies to businesses and non-governmental organisations towards investments aimed at promoting energy conservation and the use and production of renewable forms of energy as well as towards energy audits. The annual energy subsidy budget is divided into subsidies towards energy audits and subsidies towards energy saving investments. The subsidies are granted by the Energy Department of the Ministry of Employment and the Economy as well as 15 regional Centres for Economic Development, Transport and the Environment.

Subsidies for conventional energy saving investments are only available to businesses that have signed an energy efficiency agreement, and the subsidies normally cover 20% of the investment costs. Subsidies towards investments in new technology are available to all businesses and non-governmental organisations, and the subsidies normally cover 30–35% of the investment costs. Energy subsidies granted towards energy saving investments between 1998 and 2008 amounted to between EUR 2 million and EUR 4 million each year.

The energy efficiency agreement scheme launched in 2008 has had a considerable impact on the number of energy efficiency projects. EUR 5.4 million was granted in energy subsidies towards investments in 2009, EUR 12 million in 2010 and EUR 22.5 million in 2011.

Subsidies towards energy audits have been available since 1992. The annual amount of energy subsidies has been EUR 1.4 million on average, and the subsidies have covered between 40% and 60% of the costs depending on the type of energy audit and the applicant. Energy subsidies amounted to approximately EUR 2.2 million in 2009 and 2010 and to a record-breaking EUR 2.9 million in 2011.

The recession also affected the amount of energy subsidies granted. Investment subsidies amounted to EUR 10.4 million and energy audit subsidies to EUR 1.3 million in 2012.

The energy saving effects of energy subsidies have not been evaluated separately, as they mostly overlap with the effects of energy saving investments reported in the context of energy audits and energy efficiency agreement schemes, the energy saving effects of which are discussed in Section 3.3.

4.6.2 Ecodesign and Energy Labelling Directives

In addition to market surveillance, national measures relating to the Ecodesign Directive and the Energy Labelling Directive have an important role in disseminating information. The energy saving effects of energy efficiency regulations applicable to specific types of appliances are discussed in the annexes (Annex 2 Description of energy saving measures pursuant to the ESD/Others: HO-13-TEM).

In the context of the implementation of the Ecodesign Directive, the Finnish Ministry of Employment and the Economy and the Finnish Ministry of the Environment joined forces with the Finnish Safety and Chemicals Agency in 2009 to disseminate information to manufacturers and importers, especially SMEs. The initiative is ongoing and has an annual budget of approximately EUR 70 000.

A website[27] has been set up for the project, containing in-depth, up-to-date information about the regulations applicable to each product group. A newsletter has been published since 2010. One of the most important elements of the project involves business visits which are designed for informing importers about changes brought about by the Ecodesign Directive. Approximately 130 businesses were visited in 2010 and 2011, and these visits proved to be a very effective way of communicating with micro-enterprises in particular, which cannot be reached by other means.

The website was updated in 2012, and it now covers both ecodesign and energy labelling as well as regulations that are due to be adopted in the future. A total of 45 different businesses were visited for the purpose of disseminating information. The visits focused on future regulations and the types of products covered included ventilation machinery, heat pumps, boilers, fireplaces, room heaters and water heaters. A new important element that has been introduced for the purpose of disseminating information is a system of ecodesign forums. Between two and three ecodesign forums have been held each year since 2012. In 2013, the website was developed further, new information was compiled and surveys were conducted among Finnish operators affected by current and future regulations.

4.6.3 Civil engineering (HO-12-YM)

Several projects are in progress within the administrative sector of the Finnish Ministry of the Environment which are aimed at improving the energy efficiency of local communities. The measure incorporates subsidies, evaluations of the effectiveness of steering mechanisms, collaboration between the state and local governments as well as regional analyses.

A description of the measure is included in the annexes (Annex 3 Description of energy efficiency measures – excluding impact assessment / Civil engineering and planning: HO-12-YM).

4.7 Summary of impacts on energy consumption

Finland has introduced numerous horizontal measures that promote energy conservation and energy efficiency, the energy saving effects of which it has not been possible to calculate. Typically these measures are so-called “soft measures” and involve education, dissemination of information and advice as well as research and development programmes and projects. Considering the ESD savings reported in the NEAAP-3, it was not considered expedient to produce separate impact assessments of all means of financial steering such as taxes and subsidies.

The saving effects of these measures largely overlap with the effects of measures for which energy saving effects have been reported in Section 3.7 of the NEAAP-3. The only measure of horizontal nature the energy saving effects of which have been calculated is the Ecodesign Directive and the energy efficiency requirements it imposes on specific product groups.

The table below shows the annual estimated energy saving effects resulting from the implementation of the Ecodesign Directive calculated in accordance with the Energy Services Directive for the years 2010, 2016 and 2020. The savings have been calculated ensuring that they do not overlap with the saving effects of other measures reported in the NEEAP-3.

[27] http://www.ekosuunnittelu.info

Table 9. Horizontal measures (HO) – summary of impacts on energy consumption

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
HO-13-TEM	Ecodesign Directive and equipment group specific energy efficiency requirements	0	1 278	4 259
TOTAL ENERGY SAVING – ESD		**0**	**1 278**	**4 259**

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

5 EFFICIENCY OF ENERGY PRODUCTION AND SUPPLY – IMPLEMENTATION OF THE ENERGY EFFICIENCY DIRECTIVE

5.1 Promotion of efficient heating and cooling – Article 14

5.1.1 Comprehensive assessment of cogeneration and district heating and cooling

Finland has made good use of the potential of CHP and district heating. Recent studies and other available information can be used to draw up the comprehensive assessment required under Article 14. The assessment will be put out to tender and an order placed with a specialist consultant.

The comprehensive assessment also requires information about issues such as the efficiency of construction, the locations of industrial and energy plants, district heating networks and demand for heating energy. The Finnish Ministry of Employment and the Economy and its partners will commission a consultant to draw up a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling largely on the basis of existing information, and the assessment will be available in the autumn of 2015 at the latest. If the assessment yields information about areas where carrying out a plant-specific cost-benefit analysis is not expedient due to low heating demand sufficiently early, these exemptions will also be incorporated into the new Finnish Energy Efficiency Act or decrees issued on the basis of the same. If this information does not become available sufficiently early, the regulations will need to be revised at a later date.

Finland's provisional thresholds for exemptions from the obligation to draw up plant-specific cost-benefit analyses pursuant to paragraph 6 of Article 14 were notified to the Commission on 17 December 2013. These thresholds and their rationale will be examined in more detail during the spring of 2014 in connection with drawing up the Finnish Energy Efficiency Act, and the Commission will be notified of any changes.

The Finnish Electricity Market Act (588/2013) obligates power distribution companies to connect any electricity generation plants that satisfy the relevant regulations to their systems and to accept electricity from them.

The provisions of the Directive concerning the verification of the origin of electricity produced from high-efficiency cogeneration have already been transposed into national legislation by means of the Finnish Act on Verification and Notification of Origin of Electricity (1129/2003, as amended by 445/2013) and an associated Government Decree (417/2013).

5.1.2 Other measures relating to efficient heating and cooling

In Finland, energy efficiency agreement schemes have covered both energy generation and the production, transmission and distribution of district heating as well as the Energy Services Action Plan which covers measures relating to electricity and district heating customers ever since 1997.

Moreover, various development projects aimed at improving energy efficiency are carried out each year in connection with the energy efficiency agreement schemes for energy production and the industrial sector.

Energy efficiency agreement – Energy Production Action Plan

The measures laid down in the Energy Production Action Plan associated with the energy efficiency agreement for businesses focus on improving the efficiency of primary energy consumption and the overall efficiency of energy generation. The businesses that have signed the agreement have committed themselves to saving 1 000 GWh of primary energy and to increasing the efficiency of energy generation by 1 000 GWh by the year 2016.

The businesses that implement the Action Plan represent more than 90% of Finland's energy generation and more than 70% of Finland's heating generation. The energy saving effect shown in the table below has not been included in the savings reported for the ESD sector.

Table 10. Energy production (ET) – summary of impacts on energy consumption (non-ESD)

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
ET–01–TEM	Energy efficiency agreement for businesses – energy production, non-ESD			
	Primary energy saving**	452	1 413	2 075
	Increasing efficiency in electricity production	324	1 392	2 078
TOTAL CONVERTED INTO SAVINGS – NON-ESD**		505	1 957	2 908

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

** Primary energy savings have been converted into final energy using the default coefficient 2.5.

Energy efficiency agreement – Energy Services Action Plan

The energy efficiency agreement for businesses obligates companies that engage in electricity transmission and distribution as well as district heating sales and implement the Energy Services Action Plan to set themselves a target of cutting their own energy consumption by at least five per cent by the year 2016.

Businesses that implement the Action Plan represent the majority of electricity and district heating distribution and sales as well as all district cooling in Finland. They account for approximately 90% of Finland's total electricity distribution, just over 90% of electricity sales and 86% of district heating sales as well as approximately 100% of district cooling.

The table below only shows the saving effect of measures that focus on the businesses' own energy consumption. Energy savings have not been calculated across the ESD sector although some of the savings are achieved there, due to uncertainties relating to the splitting of savings between the ESD sector and the non-ESD sector.

Table 11. Energy services (EP) / own operations – summary of impacts on energy consumption (non-ESD)

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
EP–01–TEM	Energy efficiency agreement for businesses – energy services / own operations, non-	106	379	552

	ESD**			
TOTAL ENERGY SAVING – NON-ESD		106	379	552

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

** The effects of the measures have not been split between the ESD sector and the non-ESD sector at this stage.

In addition to the obligation of companies that engage in electricity transmission and distribution as well as district heating sales and implement the Energy Services Action Plan to increase their own energy efficiency, the energy efficiency agreement for businesses also obligates them to engage in energy efficiency measures together with any customers subscribing to energy services that significantly promote the reaching of the 9% energy saving target set in the ESD in the energy consumption of these customers between 2008 and 2016. The majority of the energy services offered to customers are so-called "soft measures" the energy saving effects of which have not been calculated in the NEEAP-3.

A description of the measure relating to collaboration with customers under the Energy Services Action Plan (EP–02–TEM) is included in Annex 3.

Development projects – making use of surplus heat

Various development projects aimed at improving energy efficiency are carried out each year with businesses and other operators under the energy efficiency agreement schemes for energy production and the industrial sector. Funding for these projects mostly originates from the Finnish Ministry of Employment and the Economy, trade unions and businesses. One example of such development projects was an extensive development initiative concluded at the end of 2013 which focused on exploring and disseminating information about possibilities of utilising heat left over from industrial operations and energy generation. In addition to communicating the outcomes of the project in the final report, the project group also published a brochure[28]. The project was also featured extensively in the media, including television news broadcasts.

5.2 Energy transformation, transmission, distribution and demand response – Article 15

5.2.1 Energy efficiency criteria in network tariffs and regulation

The provisions of the Finnish Electricity Market Act (588/2013) will be supplemented during the spring of 2014 to stipulate that tariffs cannot include incentives that could jeopardise the overall efficiency of electricity generation, transmission, distribution and supply or incentives that could compromise the application of demand response. Provisions on incentives used in the terms and conditions and pricing (tariffs) of system services will be laid down in Sections 24a and 24b of the Electricity Market Act.

The provisions of the Electricity Market Act will be supplemented during the spring of 2014 in so far as obligating system operators to factor in energy efficiency when designing and using infrastructure. Provisions on this will be incorporated into Section 19 of the Electricity Market Act, which concerns the obligation to develop electricity systems and currently lays down requirements relating to designing, building and maintaining electricity systems.

[28] http://www.motiva.fi/files/8501/Tuotannon_hukkalampo_hyodyksi.pdf

The current provisions on the terms and conditions and pricing (tariffs) of electricity system services do not include restrictions on the structure of tariffs. The legislation governing the terms and conditions and pricing of system services therefore does not prevent consumer participation in system efficiency, including demand response. Moreover, according to Section 18 of the Electricity Market Act, which lays down the general principles of the provision of system services, system operators have an obligation to provide their system services to all electricity market participants in an equitable and non-discriminatory manner.

5.2.2 Facilitating and promoting demand response

Of the demand response measures listed in paragraph 3 of Annex XI of the Energy Efficiency Directive, Finland has already implemented at least a) time-of-use tariffs and c) real-time pricing. The current legislation on the terms and conditions and pricing of system services does not prevent demand response or the development of tariffs that support dynamic pricing.

Energy efficiency criteria in network design and regulation

An evaluation of the potential to improve the energy efficiency of Finland's national gas and electricity infrastructure will be carried out within the deadline laid down in the Directive, after which information about measures and their timings can be provided.

5.2.3 Summary of impacts on energy consumption

The table below shows a summary of the annual energy saving effects of the saving measures discussed in Section 5 above for the years 2010, 2016 and 2020. The annual saving effects shown in the table are not included in the scope of monitoring progress with regard to the target laid down in the ESD.

Table 12. Energy sector – summary of impacts on energy consumption (non-ESD)

CODE	MEASURE*	ENERGY SAVING		
		2010 GWh/a	ESTIMATE 2016 GWh/a	ESTIMATE 2020 GWh/a
ET–01–TEM	Energy efficiency agreement for businesses – energy production, non-ESD			
	Primary energy saving**	452	1 413	2 075
	Increasing efficiency in electricity production	324	1 392	2 078
EP–01–TEM	Energy efficiency agreement for businesses – energy services / own operations, non-ESD**	106	379	552
TOTAL ENERGY SAVING** – NON-ESD		611	2 336	3 460

* Descriptions of the measures and the principles for calculating energy savings are included in Annex 2.

** Primary energy savings from energy generation have been converted into final energy using the default coefficient 2.5.