



Energy Efficiency Agreements in Finland M&V experiences

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Content

Energy Efficiency Agreements (EEA) in Finland

Background, parties and roles in EEA implementation

EED Article 7 implementation in Finland

Role of the Energy Efficiency Agreements

M&V for Energy Efficiency Agreements

Reporting obligation for participants, M&V and control process, M&V resources

Monitoring system for Energy Efficiency Agreements

Database and online data collection, savings calculations, impact assessments, double counting

Success factors and lessons learned

Importance for long term commitment, same system serves various needs



Energy Efficiency Agreements (EEA) in Finland



Energy Conservation Agreements 1997–2007



Energy Efficiency Agreements 2008–2016

ENERGY EFFICIENCY
agreements



Energy Efficiency Agreements 2017–2025

ENERGY EFFICIENCY
AGREEMENTS



- Long history in Finland – 1st broad scheme started already 1997
- Voluntary based, no legislation connected to the agreement scheme
- A flexible tool to implement parts of national energy and climate strategy as well as many other obligations e.g. in EU Energy Services Directive (ESD) and EU Energy Efficiency Directive (EED)
- An alternative and complementary mean for regulations and taxes
- Motivation for companies and communities to join agreements
 - Targeted, flexible instrument to improve energy efficiency and save energy costs
 - Possibility to fulfill energy efficiency requirements by environmental authorities
 - Energy audits* and energy efficiency investments (including conventional technologies) are subsidised by the Government

* After 5.6.2014 energy audit subsidies granted only for SMEs due to the EED mandatory audit obligation for large companies



ENERGY EFFICIENCY
AGREEMENTS

Energy Efficiency Agreements 2017-2025

INDUSTRIES

ENERGY EFFICIENCY AGREEMENT

INDUSTRY

Energy Intensive Industry | Food and Drink Industry | Chemical Industry | Technology Industry | Wood Product Industry | Industry - General

ENERGY SECTOR

Energy Production | Energy Services

SERVICE SECTOR

Commerce Sector | Hotel and Restaurant Sector | Motor Trades & Repairs | Services – General

PROPERTY SECTOR

ENERGY EFFICIENCY AGREEMENT

COMMERCIAL PROPERTIES
HOUSING PROPERTIES

MUNICIPAL SECTOR

ENERGY EFFICIENCY AGREEMENT

CITIES & MUNICIPALITIES &
JOINT MUNICIPALITIES

HÖYLÄ IV – OIL SECTOR

ENERGY EFFICIENCY AGREEMENT

DISTRIBUTION OF LIQUID HEATING FUELS
Oil-heated real estates

www.energiatehokkuussopimukset2017-2025.fi/en/



GOVERNMENT

(Ministry and Authority*)

- overall aims and targets
 - targets for agreements
 - development projects
 - EU directive interfaces
 - financial incentives
 - evaluation
- Implementing public authority

ASSOCIATIONS

- targets in sectoral action plans
 - marketing
 - motivation of the companies
 - development projects
 - participation to reporting process
 - cooperation forums
 - guidance, training
- Participating party

COMPANIES/COMMUNITIES

- company/community target setting
 - energy audits
 - saving measures
 - energy monitoring
 - training of staff
 - reporting
 - cooperation
 - development of own performance
 - communication
- Participating party

OPERATOR



- assistance for government parties
 - marketing, motivation
 - advice, guidance, training
 - communication
 - development projects
 - coordination of annual reporting, summary reports
 - monitoring system development & operation
 - impact assessments
- Entrusted party

OTHERS

- parties assisting and helping implementation in companies/communities and participating in development projects within the EEA scheme e.g.
 - energy auditors
 - consultants
 - ESCO's
- Third parties

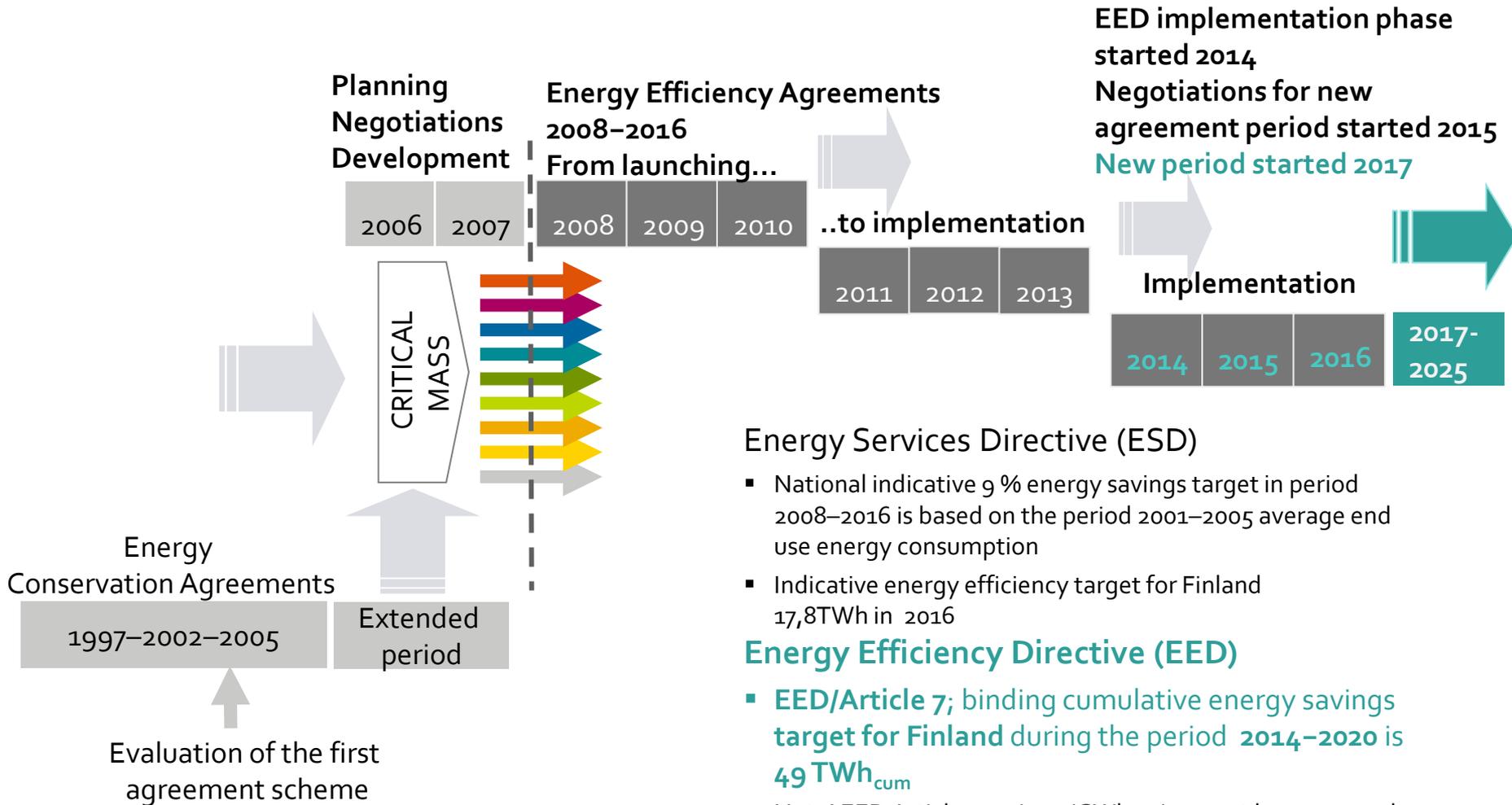
*Energy Efficiency Unit/Energy Authority established 1.1.2014



EED Article 7 implementation in Finland

Role of Energy Efficiency Agreements

Energy Efficiency Agreements have essential role in energy policy implementation in Finland



Energy Services Directive (ESD)

- National indicative 9 % energy savings target in period 2008–2016 is based on the period 2001–2005 average end use energy consumption
- Indicative energy efficiency target for Finland 17,8TWh in 2016

Energy Efficiency Directive (EED)

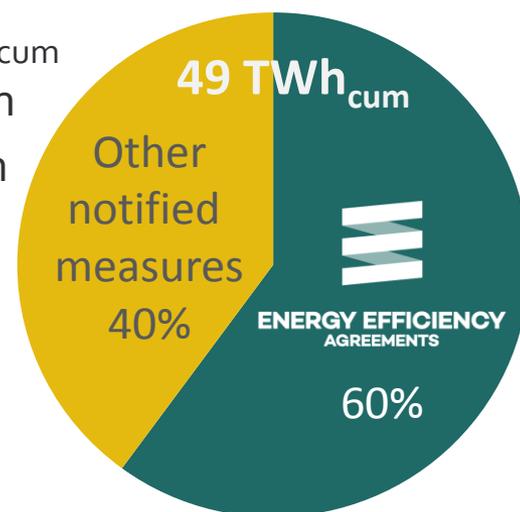
- **EED/Article 7; binding cumulative energy savings target for Finland during the period 2014–2020 is 49 TWh_{cum}**
- Note! EED Article 7 savings (GWh_{cum}) cannot be compared to ESD energy savings (GWh/a)

Energy Efficiency Agreements one of the alternative measures used for article 7 implementation in Finland



- Only alternative measures used to implement Art. 7
 - 8 alternative measures notified
 - Total expected cumulative savings in 2020 related all notified alternative measures during the period 2014–2020 are over the Art.7 cumulative target for Finland
- Expected savings from Energy Efficiency Agreements in 2020 are covering over half of the Art. 7 cumulative target 49 TWh_{cum}
 - 2014 reported new EEA annual savings 1.27 TWh
 - 2014 reported total new annual savings 6.5 TWh
 - Includes 3.9TWh savings with lifetime 1 year

Share of EEAs expected savings in 2020 from the Art. 7 cumulative target in Finland





M&V for Energy Efficiency Agreements

Reporting obligation for participants
M&V and control process
M&V resources



Energy Efficiency Agreements

Annual reporting requirement for participants

- **Data collection has similar main categories in all EEA areas:**
 - General issues (name, address, contact person, email, phone number etc.)
 - Energy consumption data
 - EE improvement measures (short description, technical or operational measure, energy savings, investment, year of implementation, lifetime etc.)
 - Continuous improvement (issues supporting to improve energy efficiency)
- **Annual reporting monitors, in addition of implemented energy efficiency improvement measures, implementation of the various other obligations in the EEAs related to continuous improvement**
 - Like energy management systems, monitoring of energy consumption, training, communication, EE in planning and procurement etc.
- **Annual reporting is done on site level in companies**
- **Company/community data is reported during the spring**
 - Timeline varies depending on the agreement: end of February ... end of April
 - Data checking and chasing process starts in March and ends during the summer
- **Preliminary results June...final results and branch specific reports in autumn**



Energy Efficiency Agreements

An example of the user interface in annual reporting

- Section: Continuous improvement – Tab: Management systems and the action plan

Energy efficiency improvement measures

General Energy consumption Continuous improvement Innovation ideas

Yleinen Energiatiedot Energiakatselmukset ja toimenpiteet **Jatkuva parantaminen** Innovaatioidut

Johtamisjärjestelmät ja tehostamissuunnitelma Energiankulutuksen seuranta Koulutus ja viestintä Suunnittelu ja hankinnat Logistiikka

Management systems and the action plan Energy consumption monitoring Training and communication Design and procurement Logistics

Management system	Status	Certified		
<input type="checkbox"/> ISO14001	<input type="text"/>	<input type="checkbox"/>	Is energy efficiency integrated to the management system?	<input type="text"/>
<input type="checkbox"/> EMAS	<input type="text"/>	<input type="checkbox"/>	Is Energy Efficiency System (EES) in use in the company?	<input type="text"/>
<input type="checkbox"/> ISO9001	<input type="text"/>	<input type="checkbox"/>	Is the promotion of the renewables included in the management system ?	<input type="text"/>
<input type="checkbox"/> Not in use				
<input type="checkbox"/> Other, what?	<input type="text"/>	<input type="checkbox"/>		

The site's action plan to improve the energy efficiency

The action plan is completed (month+year)

The plan is updated within the follow up year

The responsibilities for the energy efficiency issues are appointed

Company level

Site level



Energy Efficiency Agreements

Confidentiality of the data

- **All data gathered from the companies/communities is confidential**
 - Applies all data gathered via the Energy Efficiency Agreement's annual reporting or from Energy Audits
- **Rules applied are the same than used in the Statistics Finland**
 - There have to be enough companies (minimum 3) in one group to avoid a possibility to identify individual data
 - Company/community special individual data is not given or published in any circumstances without a permission of this party
- **In the new agreement period 2017–2025 companies are asked to give a authorization for Motiva to forward the company/site level energy consumption data to the Statistics Finland**
 - Aim is to reduce administrative burden especially for the biggest energy users to provide similar information to many places as well as to improve the data bases for energy consumption data for different branches in national statistics



Energy Efficiency Agreements

M&V and control process

- **All joined companies and communities report annually to the online database individual implemented EE measures**
 - Reporting of the EE measures possible during the whole year
- **Training for companies and communities related to the reporting is organized in the beginning of each year – since 2014 mainly via webinars**
- **Companies and communities are supported via email seuranta-apu@motiva.fi**
- **Desk check in Motiva annually for all reported EE measures**
 - In average about 2 400 reported measures per year during the period 2008-2016
 - Checking related to the EE measures include e.g. magnitude of the savings (decimals, share of energy use), category, information on life time, reported investment cost..
 - Further clarifications on savings calculations and missing data is asked when needed
- **Annually about 150 measures (over 5%) will get investment subsidy**
 - All will be checked due to the Government rules by an independent expert
- **Some EEA branches have energy advise support for joint companies**
 - Related to the adviser contacts to companies reported measures and savings calculations are also covered
- **Additional control via a separate survey including site-visits**
 - About 20 days/year



Energy Efficiency Agreements

Rough summary of M&V resources

- **Monitoring system development and maintenance (database)**
 - Building costs for the online database system 2007 – 2008:
 - Approx. 300.000 eur for the third party
 - Approx. 200 days for Motiva's own work (specification, testing, introduction)
 - Annually 2009–2016:
 - Approx. 30.000–50.000 eur for additional development for third party
 - Approx. 1 person years for Motiva's own work (involved 1–4 persons)
 - In 2017 more development costs due to some changes in the 2017 started new agreement period as well as due to the need to update some technical features in the system
- **Data checking, analyses for branch specific reports and reporting in Motiva**
 - Annually approx. 2 person years (involved 1–8 persons)
- **In addition**
 - Working hours used for reporting in companies and communities
 - Reporting support and training for participant by Motiva
 - Impact assessment for EED purposes based on the data in the database (Motiva)
 - Resources used in the Ministry and the Energy Authority



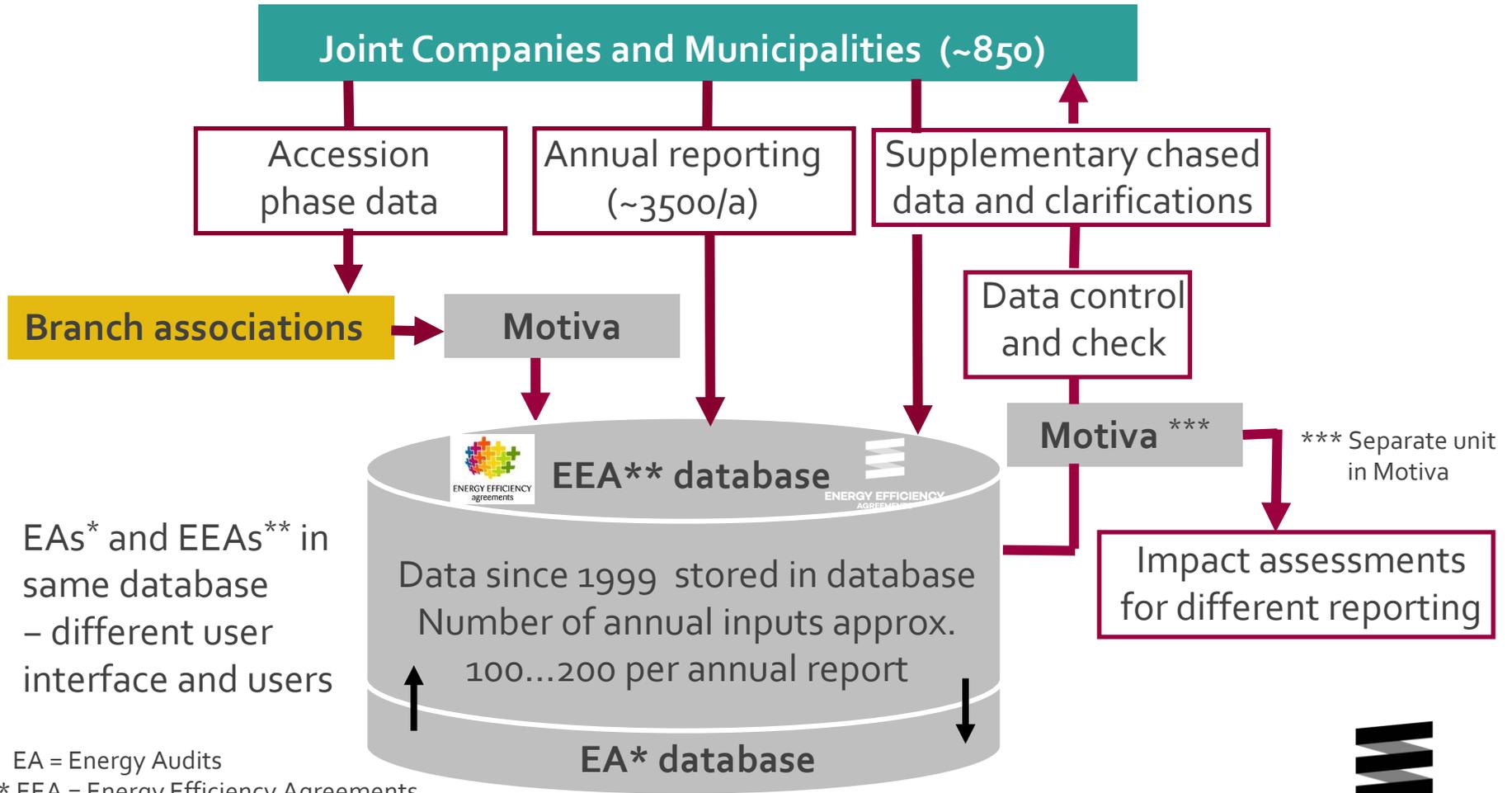
Monitoring system for Energy Efficiency Agreements

Online database

Data collection and checking process

Savings calculations

Double counting tackled



EAs* and EEAs** in same database – different user interface and users

*** Separate unit in Motiva

* EA = Energy Audits
** EEA = Energy Efficiency Agreements



Energy Efficiency Agreements

Monitoring system covers 18 fields of operation

- **Online monitoring system includes in the 2008–2016 agreement period 18 separate reporting areas/branches**
 - 7 for industry, 4 for service sector, 2 for property and building sector, 2 for municipalities, 2 for energy sector, 1 oil sector
- **Well over 2 500 individual users in companies/communities**
 - Last annual reporting for 2008–2016 scheme going on in spring 2017
- **Response rate in EEA's annual reporting is high**
 - >95–100% for industrial areas depending on the field of operation
 - 85–90% for municipalities
- **Monitoring system enables feedback data for companies and municipalities:**
 - Energy consumption trends
 - Follow up related to the achievement of the set targets of the joint company/community
 - Possibility to export own reported data during the agreement period for own use



Energy Efficiency Agreements

Main savings calculation principals – participants

- **Annually reported energy savings regarding implemented measures by participants are mainly engineering calculations made by experts**
 - General guidance available for energy savings calculations and eligible measures for joined participants and for energy service companies serving them
 - Training workshops organised
 - Mostly used method is EED Annex V 1 c scaled savings
 - In some cases EED Annex V 1 b metered savings used
- **Measures are categorised to technical and operational measures**
 - Big difference in savings life time for these categories
 - Savings life time is taken into account in the system
- **On national level participants will have credit for all savings based on the principal: energy consumption before – energy consumption after**



Energy Efficiency Agreements

Savings calculations for impact assessments

- Impact assessment for different purposes are made based on reported information by participants and calculated according to the appropriate rules for each reporting (ESD, EED, PaMs ..)
- **EEAs impact assessment for EED is based on:**
 - Electricity and heat and fuel savings reported for individual EE measures by participants in annual reporting
 - Realisation information* reported by participants separately for each measure
 - Only implemented measures in each year will be counted
 - Only half of the total savings of implemented measures in each year is taken into account in the first year in the cumulative savings calculations while all measures are not implemented in the beginning of the year
 - Lifetime for technical and operational measures is different
 - Average conservative values for lifetimes technical measures is used based on EC recommendations for ESD purposes
 - Only savings above eco-design requirements are taken into account
 - The method described in the description of the measure
 - In ex-ante evaluations estimation for the coming savings in following years is calculated based on average annual realised savings in past agreement years

* Implemented, Decided to implement, Considered to implement, Will not be implemented

Description of the measure and energy savings calculations



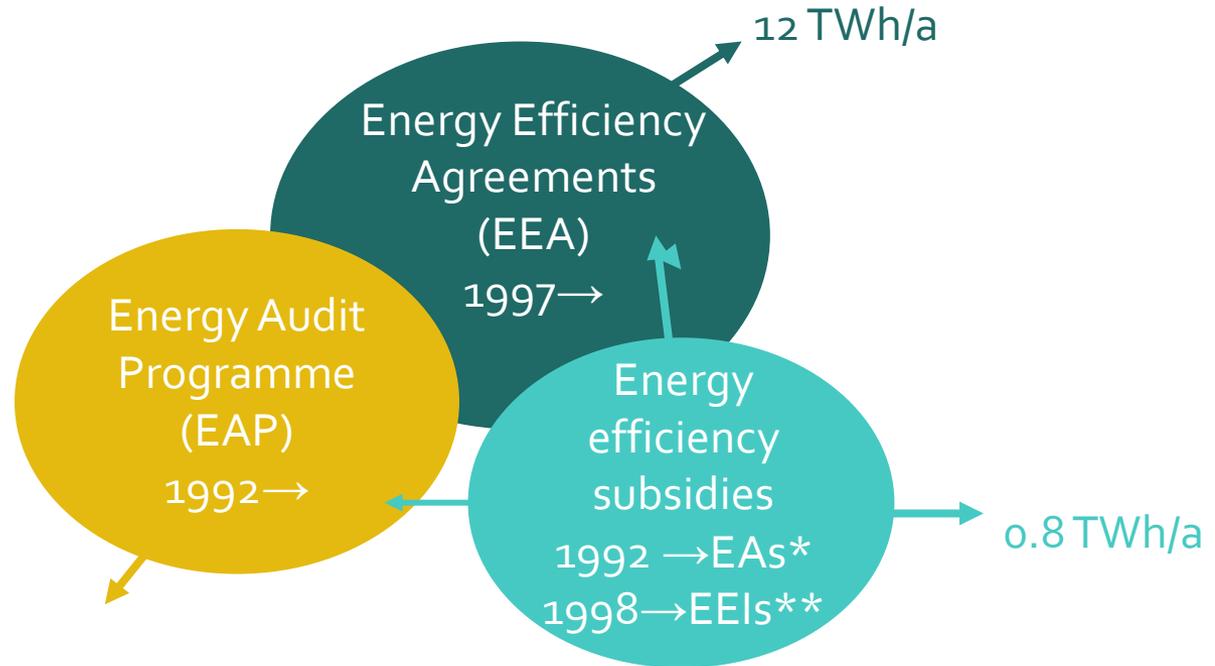
- Descriptions, premises and assumptions for calculation methods used in Finland for energy efficiency agreements for Energy Services Directive (ESD) and Energy Efficiency Directive (EED) purposes can be found in the NEEAP Annexes
 - 2011: [2nd NEEAPs translated in English](#) >Previous energy efficiency action plans (Note: Translations in zip-file are unofficial and made by the Commission)
 - 2014: http://ec.europa.eu/energy/efficiency/eed/needp_en.htm (Finland 1st EED NEEAP-3, Annexes are not translated)
- **Clustered and slightly modified method compared to the NEEAP calculations to fulfil EED Art. 7 purposes is described in the notification for Article 7 5.12.2013**
 - Measure “KETO-1-TEM” (Energy Efficiency Agreements)
 - [Article 7 notification - Finland December 2013](#) (Note: COM unofficial translation)
 - Description for KETO-1-TEM in Annex was slightly revised when EED was notified 5.6.2014 [Article 7 revised notification - Finland June 2014](#) – available only in Finnish
 - Will be also included in NEEAP-4



Double-counting tackled

Energy Efficiency Agreements • Energy Audits • Energy subsidies

- Savings from measures proposed in Energy Audits are excluded in EEAs impact assessments
- EE subsidy scheme is not assessed as a separate measure



* EA = Energy Audits
**EEI = Energy Efficiency Investments

E.g. total savings for the package of three energy policy measures approx. 12.5 TWh/a (not 13.9 TWh/a)



Success factors and lessons learned

Monitoring and reporting is seen essential from the beginning for the main EE measures in Finland



- **Well functioning monitoring system for the voluntary Energy Efficiency Agreement scheme (EEA) as well as for Energy Audit programme (EAP) has had a central role to:**
 - Reveal the results
 - Create trust and credibility to all parties – not only for Government
 - Achieve long term top-level commitment.
- **Reporting obligations and the monitoring system were planned at the same time as the policies**
 - Reporting obligations for companies/communities in Energy Efficiency Agreements and in granted subsidy schemes
 - Momentum is often at least partly lost if monitoring decision is done when the policies are already in implementation phase
- **Long term top-level commitment by government**
 - Energy Efficiency Agreements have been part of all national energy and climate policy and strategy papers since they were launched 1997 and Energy Audits already before, since 1992
 - Investment subsidies for energy efficiency (EE) measures available since 1998
 - Reasonable recourses targeted for programme administration and continuous maintenance and development of the monitoring system



Monitoring system serves various needs

- **Same bottom-up monitoring system serves impact assessments for national, EU and other international reporting**
 - E.g. fulfil requirements by directives (Energy services Directive, Energy Efficiency Directive) and is used for other EU and international reporting like PaMs/EU Effort Sharing Decision and reporting for the United Nations Framework Convention on Climate Change (UNFCCC)
- **Due to different assumptions in different reporting impact assessments for the same measures in different reporting are varying!**
 - variation in reporting years and timeframe of the reporting
 - variation how the energy covered by the Emission Trading Scheme is defined
 - variation if the measures implemented according to EU legislation are eligible
 - variation in main calculation principals: e.g. annual energy savings in force calculated in Energy Services Directive and a cumulative approach defined in EED Art. 7 etc.

→ causes extra work and administrative burden

→ is confusing for third parties



Be realistic when planning M&V

- **How to get reliable data with reasonable costs**
 - Companies/communities seldom are interested to spend money on monitoring and verification (M&V) above their own needs
 - Consider what is worth to monitor and follow up
- **On-site field conditions are far away from laboratory conditions**
 - Be careful what and how much data can be gathered in annual reporting from the companies/communities
 - Be realistic what can be with reasonable costs and accuracy measured and verified and what not
 - In practice, there are not always tools or resources available for all types of policies and measures
- **Guidance and support available for companies/communities**
 - Guidance needed for eligible energy savings measures and calculation principals and documentation
 - An email address for questions operated e.g. by the entrusted party
 - Feedback data appreciated by the companies/communities regarding the data they have reported
- **Prepare to develop the M&V system at the same time than the policy**
- **Keep it as simple as possible!**



Thank you!

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[EnergyEfficiencyAgreements2017-2025](https://www.motiva.fi/en/EnergyEfficiencyAgreements2017-2025)
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