

material efficiency schools energy saving
consumers industry transport carbon dioxide
wood chips traffic properties public sector
recycling biomass renewable energy solar energy climate change
energy efficiency energy auditing
service sector hydro power cooperation
wind energy

Online monitoring system for companies in the Finnish Energy Efficiency Agreement scheme and the Energy Audit monitoring system
– lessons learned (extended version)

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IEA - IIP Policy Pathway on Energy Management Programmes Workshop,
30th September, Paris

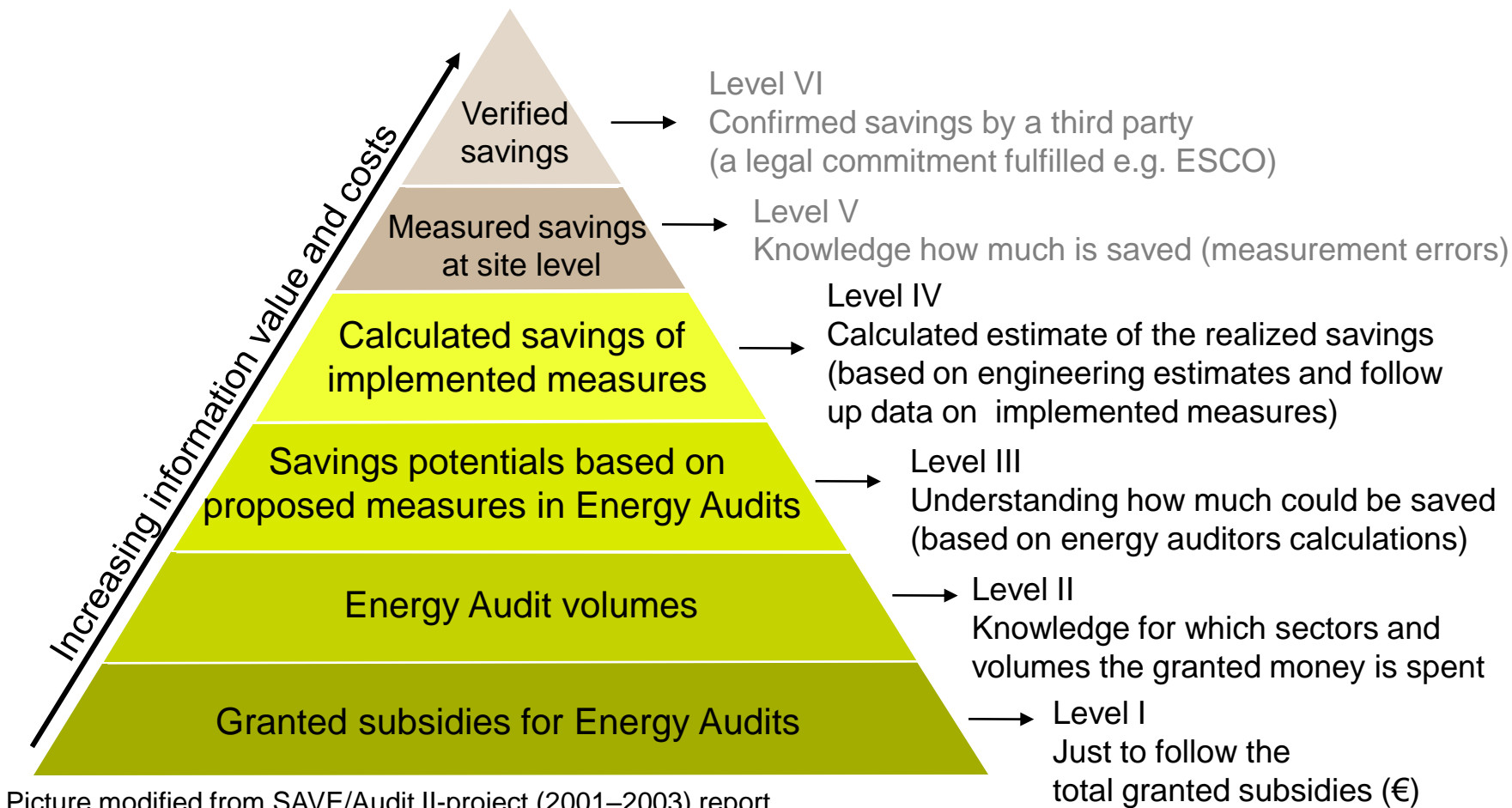
heat pump environment municipal sector construction

Well planned is almost half done

- The monitoring system should be planned at the same time as the programme
 - include obligations for reporting to the agreements with companies/communities and granted subsidy schemes
- Different target groups for the collected data should be taken into account
 - ministries, feed back for the companies/communities, energy auditors, media etc.
- Level of ambition should be decided upon as early as possible
- Monitoring system should cope with an expansion of the programme

Different levels of monitoring

E.g. Energy Audit programme → levels I–IV



Picture modified from SAVE/Audit II-project (2001–2003) report

Be realistic

- How to get reliable data with reasonable costs
 - the end-users seldom interested to spend money on monitoring and verification (M&V) above their own needs
 - who will pay the additional M&V costs?
- On-site field conditions are far away from laboratory conditions
 - be realistic what can be with reasonable costs and accuracy measured and verified and what not
 - be careful what and how much data can be gathered in annual reporting from the companies/communities
- Small savings cannot be identified from the total consumption
 - consider what is worth to monitor and follow up
- Prepare to develop the system
- Keep it as simple as possible – how true also here!

Energy Efficiency Agreements 2008–2016 in Finland

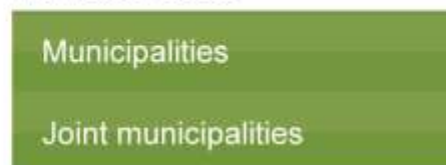


Energy efficiency agreement for industries



Responsible Ministry:
Ministry of Employment and the Economy

Energy efficiency agreement and Energy Programme for municipal sector



Responsible Ministry:
Ministry of Employment and the Economy

Energy efficiency agreements for transport sector



Responsible Ministry:
The Ministry of Transport and Communications

Energy efficiency agreement for oil sector - Höylä III



Responsible Ministry:
Ministry of Employment and the Economy

Energy efficiency agreement for property and building sector 2010-2016



Responsible Ministries:
1) Ministry of Environment
2) Ministry of Employment and the Economy

Energy programme for Finnish farms 2010-2016



Responsible Ministry:
The Ministry of Agriculture and Forestry

Same monitoring and reporting system adjusted to each agreement area

www.energyefficiencyagreements.fi



Energy Audit programme since 1992 covers sectors widely

- Buildings
 - 2 auditing models (energy inspection, energy audit)
- Industry
 - 3 auditing models (energy audit, energy analysis, 2 phased process energy analysis)
- Energy sector
 - 2 auditing models (power plants energy analysis, district heating energy audit)
- Other models
 - Post-acceptance audit (buildings)
 - Follow up energy audit (buildings and industry)
 - Energy audit for logistics chain (service and industry)
 - Renewable energy municipal audit (municipals)
- On top of the previous some supplementary guidelines related to the process services like
 - Compressed air systems
 - Refrigeration and cooling systems
 - Steam and condensate systems (under preparation)

New monitoring and reporting database



- New internet based monitoring system for the new agreement period 2008–2016 since spring 2009
(related to the agreements on the responsibility of the Ministry of Employment and the Economy)
 - more flexible and easier to use – number of reporters increased
 - target to save resources both on administration and on organisational level
 - enables the generation of feedback and summary data for joined companies/communities, associations and ministry
 - allows more flexible modifications and sector specific features
- At the same time Energy Audit monitoring system was connected to the same database
- Development project for the new monitoring system started in 2007
 - target to serve at the same time Energy Services Directive (ESD) bottom up monitoring requirements
 - now including 17 reporting areas, about 1900 users
 - development costs to build up the system 2007–2010 about 0,5 million euros – development continues also in year 2011 and 2012

Annual reporting in Energy Efficiency Agreements

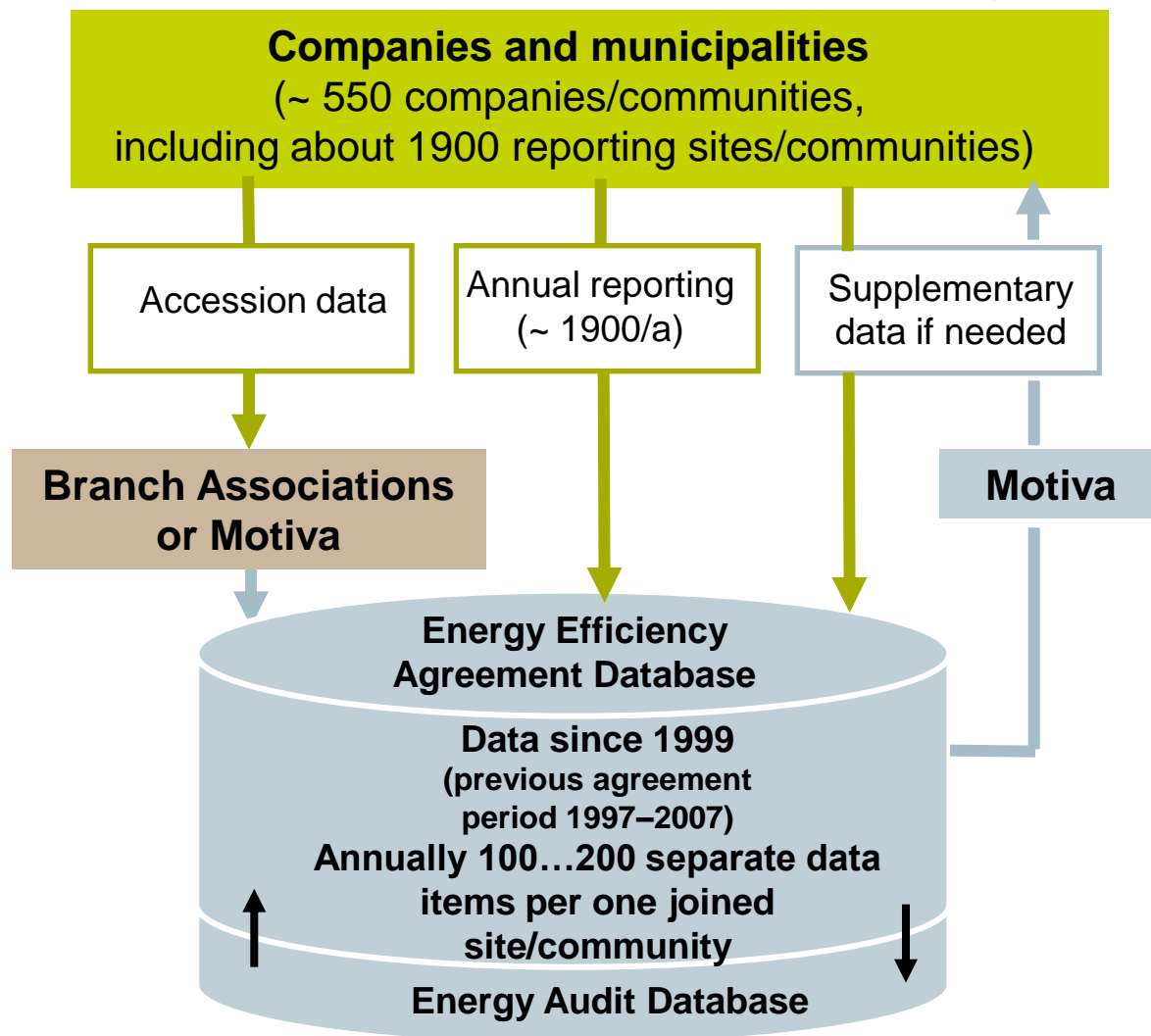


Data collection has quite similar main categories in all agreement areas on site/community level:

- General issues
 - Name of the organisation, contact information, name and contact information for the appointed person responsible of the energy efficiency agreement etc.
 - Energy savings target in 2016
- Energy consumption data
 - Electricity, purchased heat, fuels, water consumption (transferred electronically in some areas from the statistics gathered from other organisations)
- Energy efficiency improvement measures
 - The follow-up of the implementation of the implemented measures proposed in the energy audits
 - Other EEI-measures reported with analogues data than energy audit measures
- Continuous improvement
 - Divided in subcategories: management systems, energy consumption monitoring, training and communication, design and procurement, logistics)
- Innovation ideas

Energy Efficiency Agreements

Data collection – online monitoring



Annual online reporting for companies and communities – an example of a reporting window

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

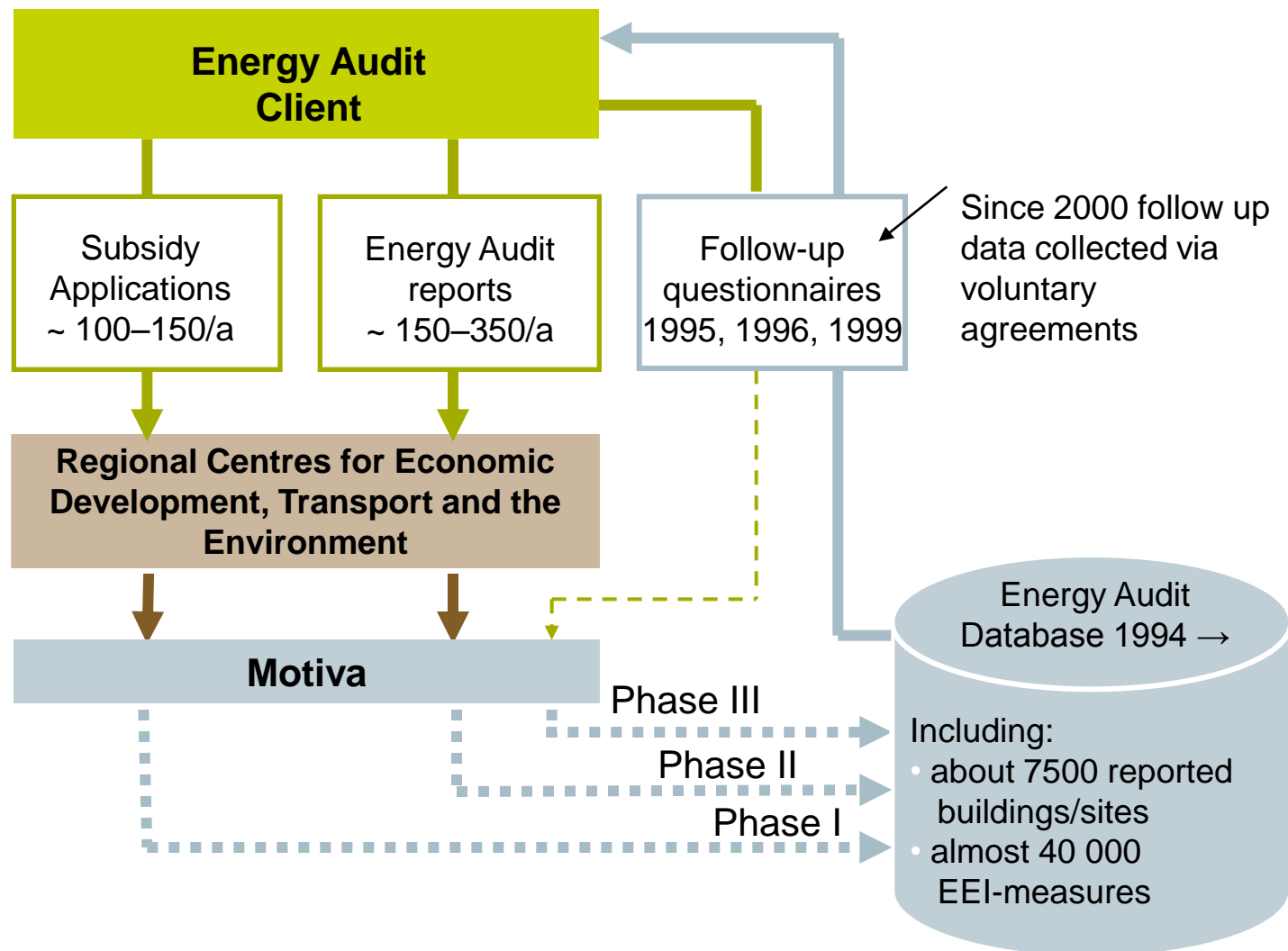
The responsibilities for the energy efficiency issues are appointed

Company level

Site level

Energy Audits

Data collection in three phases



Energy Audit Programme

Three phase data collection



Phase I Subsidy application – data filled in manually

- General data: (e.g., volume, year of construction, type of building, involvement in energy efficiency agreements etc.)
- Energy audit model, granted subsidies, auditing costs, energy auditor

Phase II Energy audit report – most data transferred to the database via Excel-file

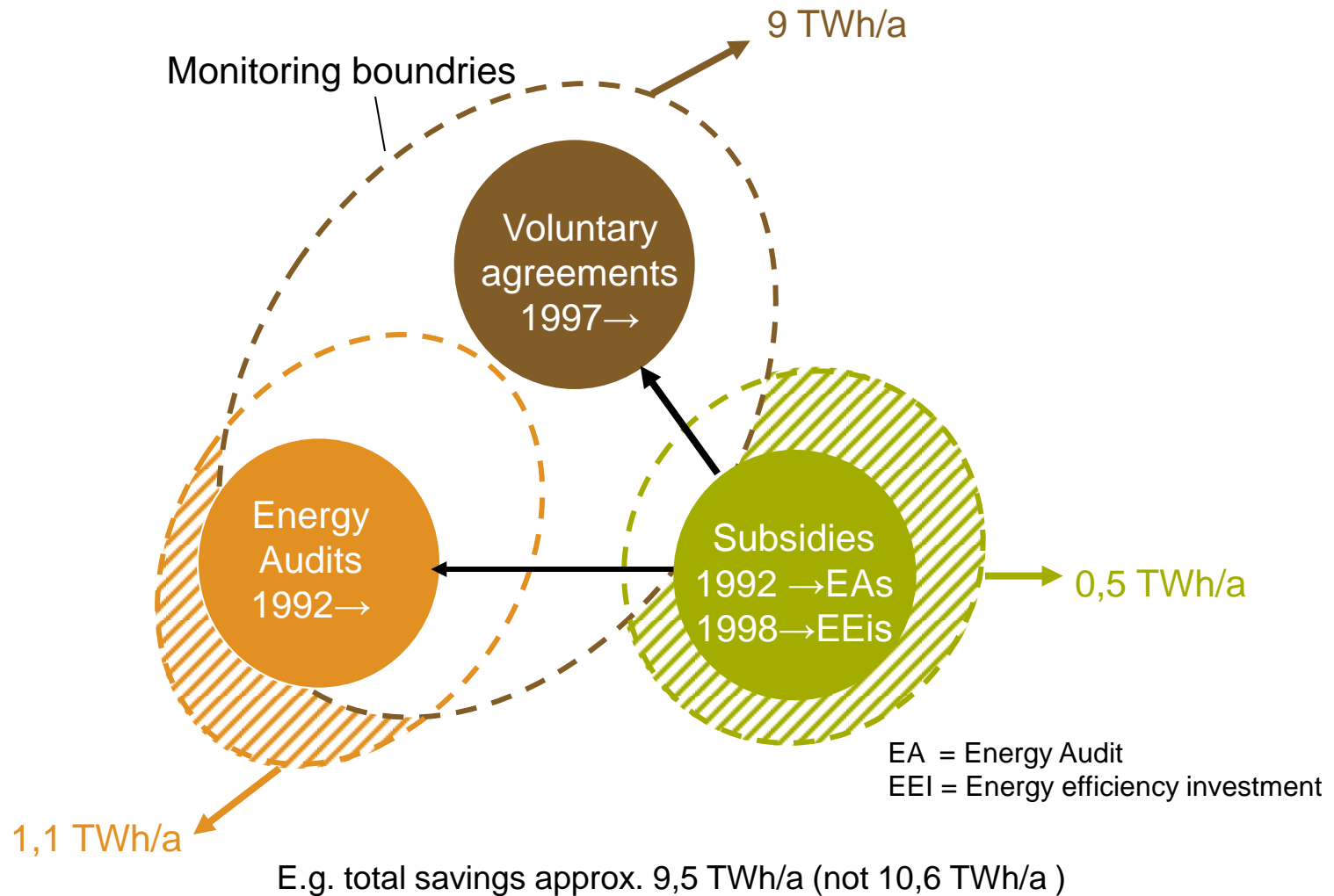
- Reviewing/updating general data
- “Table 1: Energy and water consumption” and “Table 2: Proposed EEI-measures and their impacts”

Phase III Follow up – data via online energy efficiency agreement’s annual reporting

- Follow up data related to the implementation of the proposed measures in energy audits, Table 2, see below (most of the energy audits are made in the companies/communities who has joined to EE agreements)

TABLE 2 SUMMARY OF THE PROPOSED MEASURES														
	MEASURE	TOTAL SAVING	ROI	INVEST- MENT	CO2 reduction	ENERGY SAVING						WATER SAVING		STATUS OF IMPLEMEN- TATION
						HEAT			ELECTRICITY					
						energy	costs		energy	costs		water	costs	
							energy	power		energy	power			
		€/a	a	€	t/a	MWh/a	€/a	€/a	MWh/a	€/a	€/a	m³/a	€/a	
1	Description of measure	0	0,0	0	0	0	0	0	0	0	0	0	0	IMPLEMENTED DECIDED CONSIDERED NO
2	Description of measure	0	0,0	0	0	0	0	0	0	0	0	0	0	
3	Description of measure	0	0,0	0	0	0	0	0	0	0	0	0	0	
.														
.	Normally approx. 4...10 measures/audit													
.														
	TOTAL	0	0,0	0	0	0	0	0	0	0	0	0	0	

To avoid double-counting within three instrument package is essential



Monitoring has a crucial role to reveal the results and create trust and commitment

- Well functioning monitoring systems has been crucial to reveal the results and for credibility and commitment potential both for agreement scheme as well as for energy audit scheme connected closely to the agreements
- Long term top-level commitment achieved
 - Energy Efficiency Agreements (Voluntary Agreements) have been part of all national energy policy and strategy papers since they were launched 1997 and Energy Audits already before, since 1992
 - Energy Audit subsidies available since 1992
 - Investment subsidies for EEI measures available since 1998
 - Adequate recourses for programme administration



Thank you!

www.motiva.fi/en
www.energyefficiencyagreements.fi

Motiva

An expert company promoting efficient and sustainable use of energy and materials.

Motiva Group

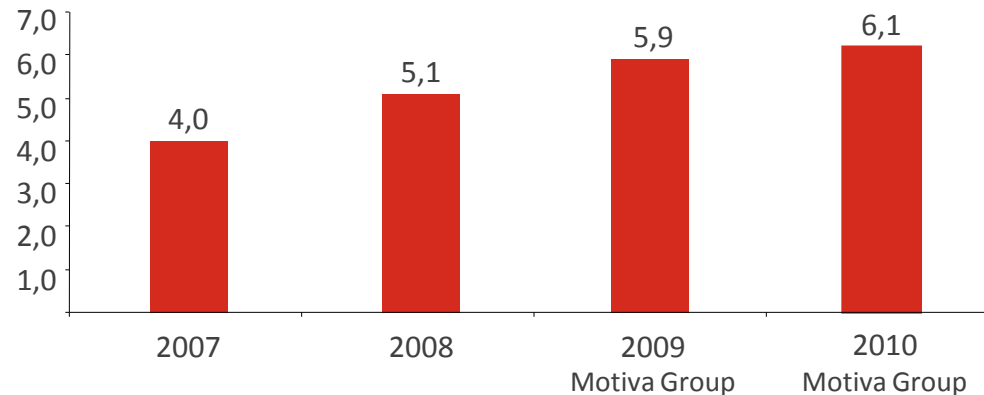
Motiva Oy

- Owned by the Finnish State (100%)
- Number of personnel 44
- Expert services
 - Mainly for Finnish governmental authorities (ministries, agencies, institutes)

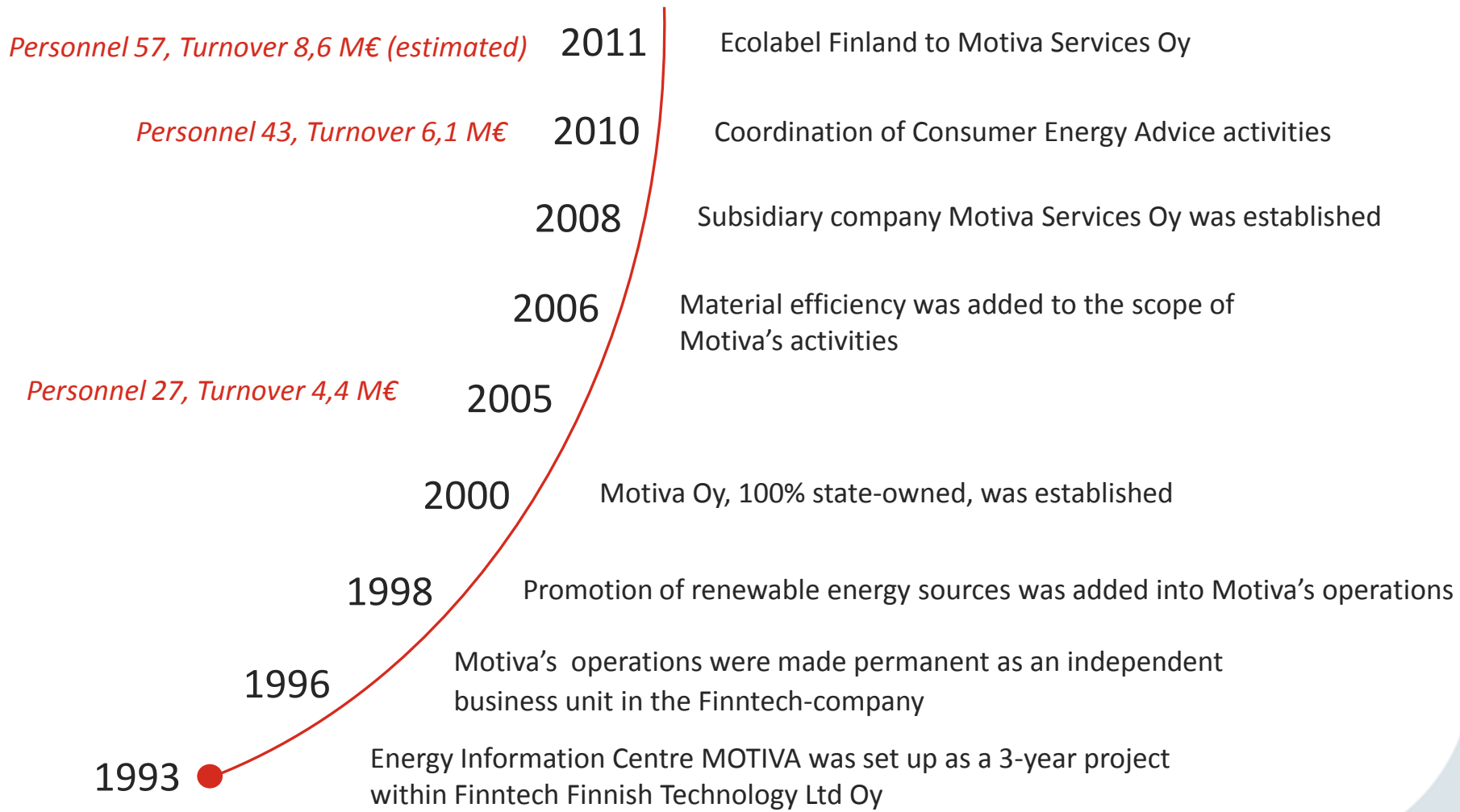
Motiva Services Oy

- Owned by Motiva Oy (100 %)
- Number of personnel 13
- Expert services
 - For companies, associations , municipalities, international projects

Annual Turnover (Million €)



Motiva's Milestones



Method of Operation

to bind

methods

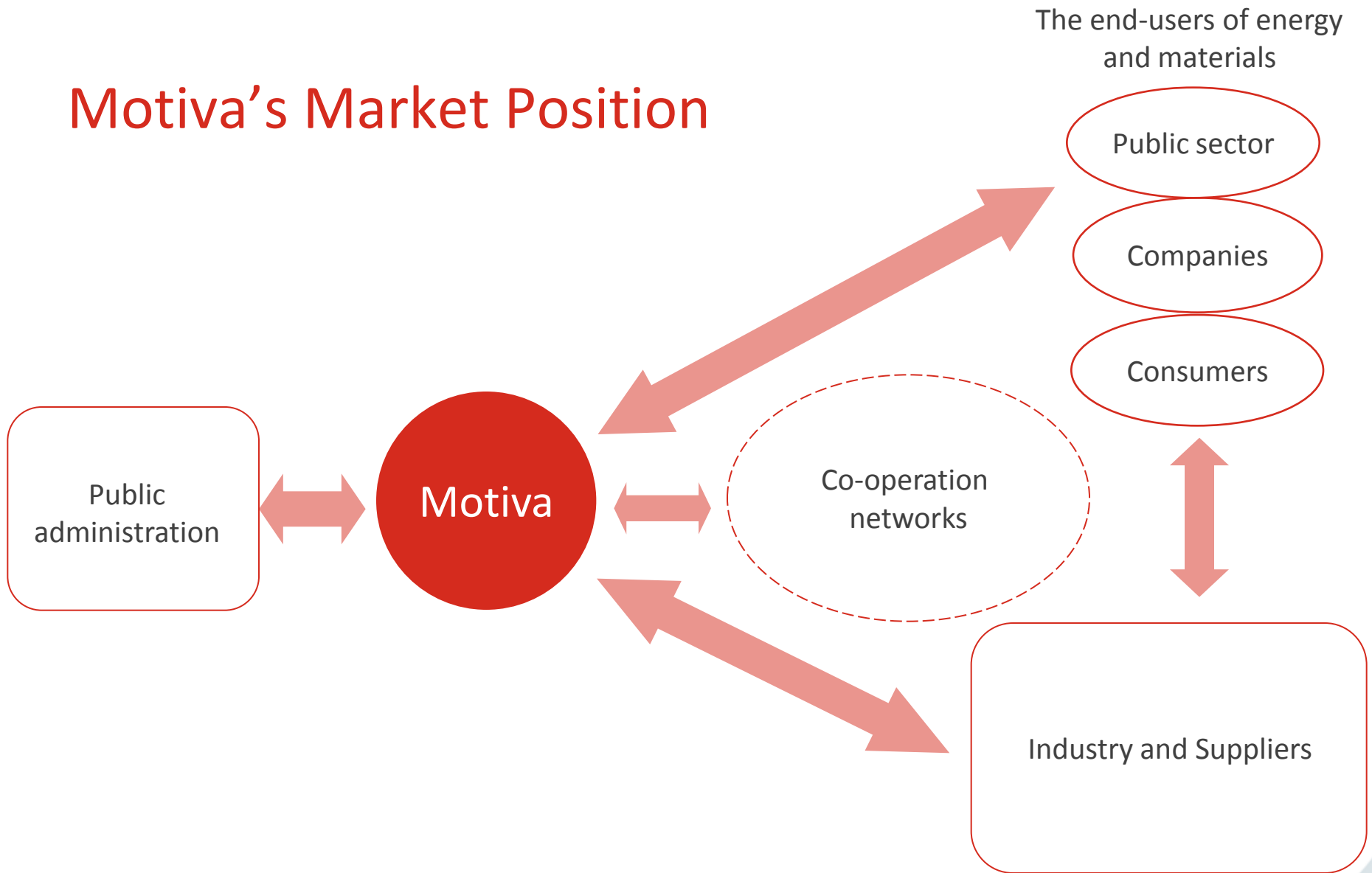
technologies

communication

into an efficient entity.

Motiva produces, refines and disseminates information, develops methods and boosts the introduction of advanced technology.

Motiva's Market Position



Areas of Operation 1/2

Energy Efficiency Agreements

- development, promotion of implementation, monitoring, advisory services

Energy Audits and Analyses

- development, training and qualification, promotion, quality control, advisory services

Energy-efficient Technology

- speeding up introduction of new technologies

Energy Management

- energy management systems, continuous improvement of energy efficiency

Renewable Energy

- increasing sustainable use of energy, speeding up of introduction of different technologies

Areas of Operation 2/2

Material Efficiency

- efficient use of materials

Monitoring and Impact Assessment

- effectiveness of programmes and activities

Advisory Services and Communications

- influencing in attitudes and consumption behaviour, communication campaigns

Training Services

- competence development, training programmes and events

Ecolabelling

- administration of the Nordic ecolabel and European ecolabel

More information
www.motiva.fi/en