

# Public Procurement of Energy Saving Technologies in Europe – Country Study for Finland

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## **1. Executive Summary**

### ***1.1 Energy Efficiency in Current Public Sector Purchasing, Building and Replacement Practices***

The Finnish Climate Strategy from year 2000 represents Finland's main effort to reach the Kyoto targets and includes the national Energy Conservation Programme. There are no official government target figures for energy efficiency in Finland. The Ministry of Trade and Industry has set the aim to increase energy efficiency by 10-20% by the year 2010 and to stop growth of primary energy consumption within the next 10-15 years. The MTI has also published recommendations on energy efficiency in public procurement including public procurement of products, buildings and services. As to buildings, in 1998 the Council of State made a decision-in-principle on a programme on ecologically sustainable construction. Among other parties, the public sector has signed voluntary agreements with the MTI to improve energy efficiency in public building stock. Though national government supports promotion of energy efficiency and energy conservation, implementation of practical measures is mainly based on voluntary efforts and is strongly dependent on the motivation and attitude of the persons involved in day-to-day procurement activities and building management.

The estimated annual purchase of products and services by the public sector in Finland is about 19 billion EUR. Public purchases fall within the responsibility of different procurement agencies, units and material offices on both national and local government level, and are controlled by law. National legislation requires public procurement units to submit competitive tenders also for purchases under the threshold value. In public procurement, the price is still the most important parameter. Finnish legislation enables a macroeconomic assessment approach for public procurement, where in addition to the purchase cost also e.g. the procurement's quality, energy costs, usability, expenditure during operation and environmental impacts that provide the client with a measurable economic benefit can be taken into account.

The procurement process itself is rather complicated, time-consuming and requests sufficient knowledge on national and EC legislation. Currently, environmental criteria and energy efficiency issues in public procurement are not explicitly addressed in either national or EC procurement legislation, and there is a clear need for guidelines on how environmental considerations and energy efficiency issues can be practically applied in public procurement in the frame of valid legislation and international agreements.

Though national government supports voluntary efforts, energy efficiency as well as environmental aspects in public procurement is not yet considered a matter of first priority. There are no legal barriers for the implementation and promotion of energy efficiency in public procurements. The general attitude towards energy efficiency is good, but especially on regional and local government level there do exist several obstacles for practical implementation that need to be addressed in the future. National government and the Association of Local Authorities both picked up this issue recently and developed internet-based, easy to use, and practically orientated information databases for public procurement, including energy efficiency.

Following the development under way, local governments will act as important forerunners in energy efficiency matters also in the future, but need the strong support of national government for further progress. Some municipalities have already developed good examples on how to practically implement green purchasing practices, and the management unit of the largest part of Finland's state property has introduced life cycle thinking in new public construction projects. Voluntary efforts are perceived to be a good starting-point for concrete actions on energy conservation. Probably in the long-term, the most effective way to promote energy efficiency in public procurement could be a well-balanced mixture of voluntary efforts, guidelines, regulations and legislation.

## **2. General Information on the Political, Legal, and Economic Framework for Energy-Efficient Public Purchasing**

### ***2.1 National Targets for Energy Efficiency and Climate Protection in the Public Sector***

The CO<sub>2</sub> emissions in Finland were 54 million tons of CO<sub>2</sub> in 2000. The Kyoto target is about the same (53 million tons of CO<sub>2</sub>).

There are no official government target figures for energy efficiency in Finland. The Ministry of Trade and Industry has set as their objective to strive for a 10-20% increase in the energy efficiency by 2010. Basically, implementation of measures to improve energy efficiency is in practice voluntary. Industries and the public sector have signed voluntary agreements with the MTI to improve their energy efficiency.

### ***2.2 Policy Programmes on Energy Efficiency in Public Institutions***

Energy conservation is part of the Finnish Climate Change Strategy, but not a programme coordinated separately. The national aim is to increase energy efficiency by 10-20% by the year 2010 and to stop growth of primary energy consumption within the next 10 to 15 years.

There is no special law governing energy conservation, but since 1997 Government has concluded voluntary energy conservation agreements with industry, the energy sector, local governments, the state's real estate units, the real estate and construction sector, and the lorry and van transport sector. These energy conservation agreements are part of the Finnish Climate Change Strategy and their aim is to make energy efficiency promotion, including energy efficiency of procurements, an integral part of all actions performed by the contract parties.

On a national level, public institutions are recommended to follow the recommendations for energy efficiency considerations in public procurement published by the Ministry of Trade and Industry (September 2000). The recommendations address both product procurement and building energy management and are a direct contribution to the implementation of Finland's Climate Change Strategy and the Government Energy Conservation Programme. They are mainly directed at the service offices and other bodies of the State and municipalities, but are

also applicable in the private sector. In addition, they also support the implementation and follow-up of the energy conservation agreements concluded with different sectors. State and municipalities are recommended to set a good example to the other sectors by enhancing energy efficiency measures in all planning and decision-making.

On regional and local government level, national energy efficiency efforts are promoted through the voluntary framework agreement on energy conservation concluded between the Association of Local Authorities and the Ministry of Trade and Industry in 1997. Within the frame of this general agreement, approximately 50 municipalities have signed energy conservation agreements with the MTI until October 2001. The energy conservation agreements last for 5 years and focus on energy conservation in the building sector. In spring 2001, approximately 52% of all building stock owned by municipalities and local governments were covered by the agreement. In order to cover the whole public building stock, the state's real estate units signed a voluntary co-operation agreement with similar goals. The objectives of the energy conservation agreement are:

- ❑ To cover as much as possible of all municipalities' activities.
- ❑ To reduce heat consumption from 1990 by 10% until 2005 and 15% until 2010.
- ❑ To stop increase of buildings' electricity consumption and bring it to decrease before 2005.
- ❑ To perform energy auditing and follow-up activities in 80% of the municipalities' public buildings until 2010.

Figure 1 shows the pathway for promotion of energy efficiency including public procurement.

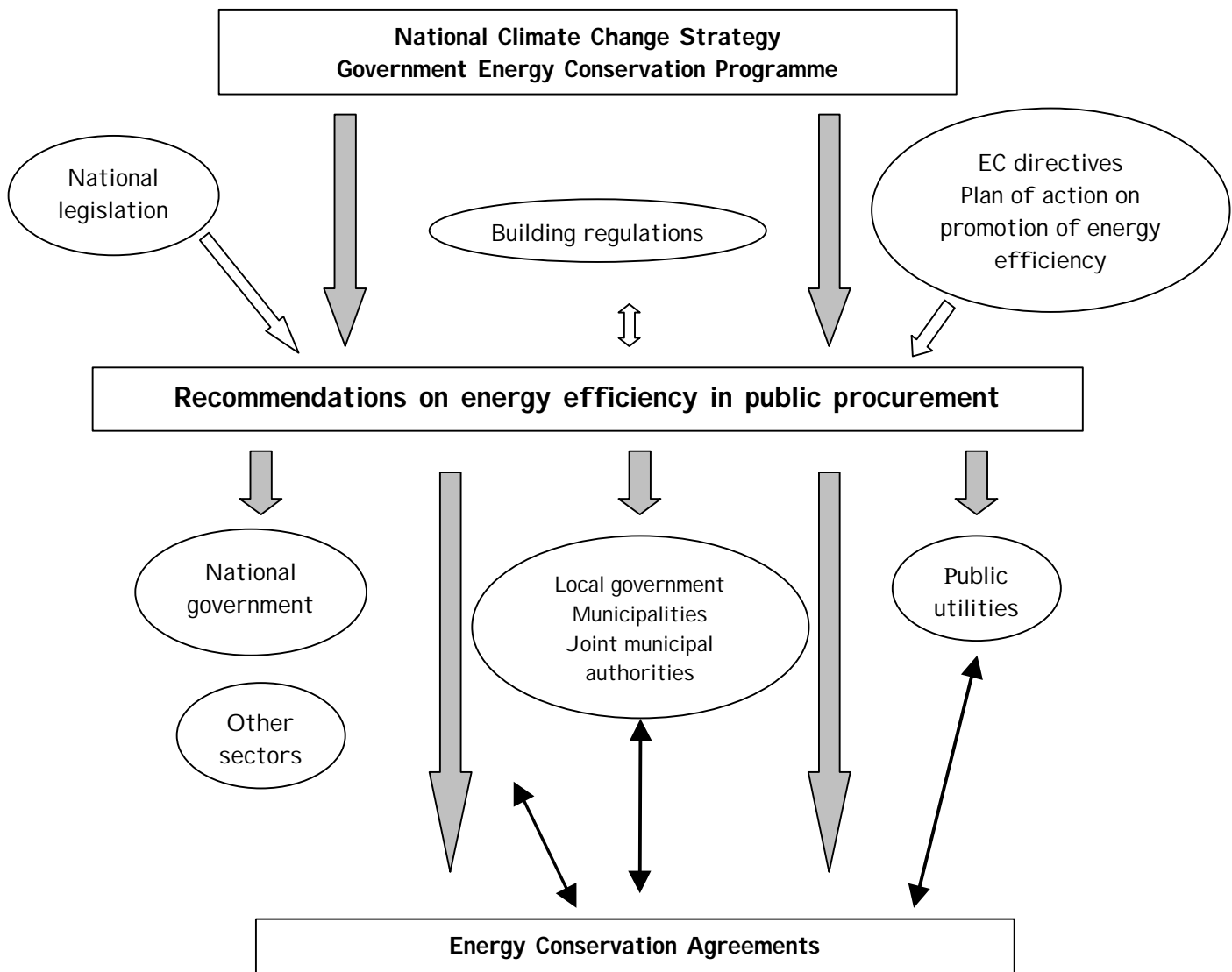


Figure 1: Organizational scheme for promoting energy efficiency including public procurement.

## 2.3 Co-operative Purchasing by Public Institutions

### 2.3.1 Public Buying Agencies

Public purchases can be tendered by the respective procurement unit itself, or the procurement unit can use the services of a buying agency specialized in public procurement. In this case, the products or services in question have been competitively tendered in beforehand by the buying agency and can be ordered directly by the public sector.

In Finland, the Trading House Hansel Ltd, a government owned public administration's network company, is the buying agency and operator for public sector's procurement and materials management. In addition to a wide range of pre-procured products, Hansel offers the public sector also tailor-made procurements. In the frame of agreements concluded, public organizations can require special criteria for procured products and services, and Hansel handles all further tendering and

decision making on their behalf. It is estimated that approximately 50% of all public procurements in Finland are done through the public buying agency Hansel.

Considering the large purchase volume of the public sector, criteria on energy efficiency set by public organizations may have a tremendous impact on the range, quality and purchase costs of energy efficient products and services offered by manufacturers and wholesalers.

### 2.3.2 Internet-Based Platforms for Public Procurement

In order to ease the decision making for public purchasing agents towards energy efficient and environmentally friendly choices, there has been developed a unique internet-based tool for public procurements. The tool, named HYMONET, was developed under the guidance of a consulting company owned by the Association of Local Authorities and includes as a special feature an environmental database on a broad range of products.

In autumn 2001, the Ministry of Trade and Industry launched its new Internet page on public procurement, JULMA. The purpose of this internet-based market place for public procurement is to improve the interaction between buyers and sellers and to make the public procurement process more efficient. In addition to announcements of tenders and branch of activity profiles of suppliers, the service offers to public procurement agents overall information on procurement legislation and practical examples of documents related to the procurement process.

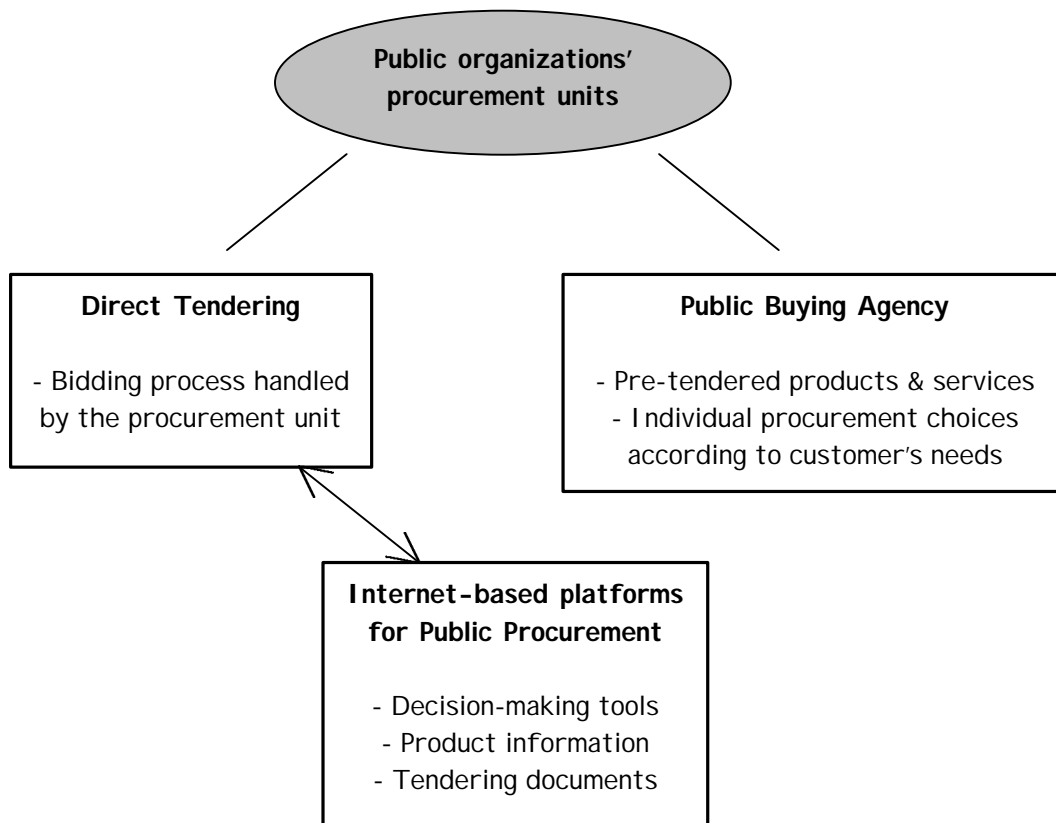


Figure 2: Co-operative purchasing by public institutions.

## 2.4 Energy Management in Public Institutions

For more than 180 years, until 1995, most of the Finnish state's property was managed by the National Board of Public Building and its predecessors. In 1995, the National Board of Public Building was closed and the state's property focused on 15 property units. The largest of these units, the State Real Property Agency (SRPA), was given responsibility for managing almost half of the Finnish state's property assets. In early 1999, the SRPA became a government enterprise and in early 2001 its name was changed to Senate Properties.

Senate Properties' property stock is divided into seven different property regions, each of which is responsible for customer service, letting property, building management and building maintenance in its own region. Building maintenance and construction services are bought from outside providers. Each division is responsible for business orientation and each property region for business operations.

The Finnish Ministry of Finance decides the guidelines for management of the state's property assets. Aside from Senate Properties, the Ministry of Defense, Finnish Rail Administration, Finnish Road Enterprise, the Border Guard, the Ministry of Education, the National Board of Antiquities, the Administration of Suomenlinna, the Finnish Forest Research Institute, the Maritime Administration, the Finnish Parliament, the Office of the President of the Republic, the Prime Minister's Office and the Ministry of Foreign Affairs are responsible for property used by the state.

In 1999, the Finnish state established a property investment company, Kapiteeli Oy, which focuses on the state's current property assets. Apart from Kapiteeli, the state also has major holdings in Sponda Plc, a listed property investment company. The state founded a separate company, Engel-Yhtymä Oy, to manage planning, building consultation, property management and cleaning services.

*Table 1: Property owned by the Finnish state as at 1 January 2000 (Balance sheet value: EUR 10,7 million).*

Senate Properties	33%
Other government enterprises	19%
Other departments and institutions dependent on the state budget	14%
Ministry of Defense	13%
Kapiteeli Oy	11%
Sponda Plc	8%
Prison Administration	2%

Senate Properties' buildings are spread over three divisions: University Premises, Office Premises, and Special Premises. Defense administration property forms a fourth division. Government will decide on the transfer of defense administration property to Senate Properties' management in 2001.

The property managed by Senate Properties had a balance sheet value of EUR 3,532 million at the end of financial year 2000. The total available surface area for rent was 3.73 million square meters. At the turn of the year, Senate Properties had 2,383 valid leases.

University Premises is Senate Properties' largest division, accounting for two fifths of the let surface area of property in the balance sheet. Around half of Senate Properties' total rental surface area is in the Uusimaa property region, which likewise accounts for half of the net yield.

Senate Properties is also contractor for the State of Finland's new construction projects and one of Finland's largest builders for premises. In 2000, Senate Properties invested 94.5 million EUR in renovation and 101.5 million EUR in new construction of public buildings. More than half of the investments were allocated to university buildings.

*Table 2: Key figures for property stock of Senate Properties by division, 2000.*

	Property yield	Property value (Million EUR)	Investments (Million EUR)	Surface area (Million m <sup>2</sup> )
University Premises	815	1 478	107	1 564
Office Premises	747	1 217	44	1 215
Special Premises	482	834	45	949
Total	2 044	3 529	196	3 728

*Table 3: Key figures for property stock of Senate Properties by property region, 2000.*

	Property yield	Asset value (Million EUR)	Investments (Million EUR)	Surface area (Million m <sup>2</sup> )
Uusimaa	943	1 837	110.3	1 466
Southwestern Finland	185	267	8.5	366
Häme	189	315	29.1	426
Southeastern Finland	108	157	7.1	227
Central Finland	180	255	14.3	362
Eastern Finland	176	274	0.7	344
Northern Finland	268	424	26	567
Total	2 044	3 529	196	3 728

Senate Properties is one of the largest real estate managers in the industry and as such is a trendsetter and forerunner in the business. The company is committed to exemplary activities through lifecycle and environmental building in line with the principle of sustainable development.

As a public institution, Senate Properties also follows the recommendations of the MTI and strives for introducing energy efficiency and sustainability in both new construction and renovation projects belonging to their administrative responsibility. The wishes of the client are, however, important when trying new or rather unusual solutions. In the planning stage of new buildings, a detailed analysis of the expected energy use is done. Senate Properties gives target values that have to be met by the planners. In comparison to the average energy use in the existing building stock managed by Senate Properties, new buildings planned use about 50% less. In new construction, the heat demand of public buildings comes down to ca. 15 kWh/m<sup>3</sup>, yr compared to the average heat demand of 45 kWh/m<sup>3</sup>, yr in existing public building stock.

Senate Properties has also introduced life cycle thinking in the building process. Two recently finished university buildings were partly tendered based on life-cycle costs: In addition to general investments also 5 years of full operational costs (incl. energy) were included. Also, Senate Properties is planning to introduce LCC tendering to elevators and lighting systems.

## ***2.5 Key Statistical Data***

### *2.5.1 Energy Data*

Official energy statistics in Finland do not keep track separately for the public sector. Basically, the energy used is classified according to the end-use sectors.

In terms of total primary energy use, the whole public sectors' energy use was estimated in 1995 to be some 10% of the whole energy end-use in Finland. This would be about 91 500 TJ.

The total heat demand of buildings owned by the Finnish municipalities in 1998 was 4.8 TWh/yr and 2.6 TWh/yr for electricity. The buildings owned by the state correspond to 20% of the public sector's heat use, or, 1.2 TWh/yr and for electricity 0.7 TWh/yr is estimated.

### *2.5.2 Product Data*

The total amount of energy (mainly electricity) influenced by public purchasing is estimated to be roughly 0.5 TWh/yr. There are no mandatory norms except for the building codes. However, the Ministry of Trade and Industry has issued voluntary recommendations on energy efficiency in public procurement and it can be estimated that annual savings of about 0.3 TWh/yr could be achieved if these guidelines were followed.

The detailed breakdown of statistics is shown in Table 4. For the public sector's share of total appliances three different sources have been used in this study: exact sales numbers whenever found, public sector's GDP share of total sales, or public sector's share of total building volume.

### *2.5.3 General Data*

The total building stock of the public sector is about 200 million m<sup>3</sup>, which corresponds to 15% of the national building stock. The municipalities correspond to 10% and the state to 5%.

The population in Finland is 5.2 million persons. The number of economically active persons was 2.1 million. The public sector has 634,000 employees (state 149,000, municipalities 484,000). The public sector in Finland corresponds to about 15% of the total GDP.

Basic statistics of # units in different categories are in the following:

- 47,000 beds in hospitals
- 1,133,000 students
  - 152,000 university and college students
  - 101,000 polytechnics
  - 158,000 vocational schools and colleges
  - 130,000 upper secondary general schools
  - 591,000 comprehensive schools
- 23 prisons, 3494 prison places in use
- Military expenses 1.6% of GDP, 32,000 men in military service

Product	Nr.sold	Nr sold	"Procured energy"	Share of total	Energy Efficiency	100% follows	Savings
Office equipment	per year	public bodies	per year		Recommendations	recommendations	
PC	450,000	78,750	21	4.3%		14	7
Printers	325,000	56,875	10	2.1%	Ministry of Trade and	10	0
<i>matrix</i>	5,000	875		0.0%	Industry has issued		
<i>laser</i>	70,000	12,250	6	1.1%	recommendations	5	0
<i>ink</i>	250,000	43,750	5	1.0%	on energy efficiency	5	0
Screens	500,000	87,500	44	8.8%	in public procurement	17	27
Faxes	40,000	7,000	2	0.4%	which applies to	2	0
Copiers	15,000	2,625	4	0.9%	all energy efficiency	3	1
Multifunction machines	1,500	263	0	0.1%	aspects	0	0
<b>White Goods</b>							
<i>Fridge/freezers</i>	170,000	25,994	20	4.1%		9	11
<i>Dishwashers</i>	52,000	7,951	2	0.4%		2	0
<i>Washin machine</i>	70,000	10,704	3	0.5%		2	1
<i>Drying cupboard</i>	6,000	917					
<i>Tumbler</i>	25,000	3,823	1	0.3%		1	0
<b>Lighting</b>							
<i>Indoor</i>	300,000	45,872	22	4.5%		17	5
<i>Street</i>	60,000	9,174	20	4.1%		19	1
<i>Park</i>	27,000	4,129	1	0.3%		1	0
<i>Traffic Signals</i>							
<i>Presence sensors</i>		0	0	0.0%		0	0
<i>Incandescent</i>	25,000,000	3,822,688	150	30.3%		30	120
<i>Fluorescent tube</i>	2,000,000	305,815	22	4.4%			
<i>CFL - pin base</i>	900,000	137,617	10	2.0%			
<i>CFL - screw base</i>	700,000	107,035	7	1.4%			
<b>"Brown Goods"</b>							
<i>TV</i>	200,000	30,582	6	1.1%		5	0
<i>Video</i>	120,000	18,349	1	0.2%		1	0
<b>Ventilation</b>	4,000	612	121	24.4%		97	24
<b>Windows</b>	200,000	30,582	17	3.4%		13	4
<b>TOTAL</b>			<b>495</b>			<b>253</b>	<b>204</b>

Table 4: Breakdown of statistics

## ***2.6 Laws and Regulations Governing Product Purchasing and Investments by Public Institutions***

The Government Energy Conservation Programme, being part of the national Climate Change Strategy, was updated in late 2000 and approved in early 2001. It specifies that the State and the municipalities shall enhance energy efficiency in all planning and decision-making. Furthermore, it is stated that energy-efficiency requirements are to be set for public procurements, taking into account the international market legislation of the European Union. By these measures the growth of primary energy consumption in Finland shall be brought to a halt within the next 10 to 15 years, without restrictions to Finland's economic growth and customers' scope of activities. In the long term, the public sector being a substantial procurement maker can considerably affect economic life and the environment through energy-efficient procurement. Improvement of the efficiency of energy use is seen to be important for both emissions reductions and economic reasons. National promotion of procurements of energy-efficient technologies also will contribute to energy efficiency promotion on EU level in accordance with the plan of action on promotion of energy efficiency published by the European Commission in spring 2000.

In public procurement, the lowest price achieved still is a crucial parameter for decision-making. However, Finnish legislation on public procurement also provides that the macro-economically most advantageous tender can be approved instead of considering only the lowest purchase costs per se. Using the approach of macroeconomic assessments, the procurement cost of the product, as well as the procurement's quality, energy costs, usability, expenditure during operation and environmental impacts that provide the client with a measurable economic benefit can be taken into account.

Legislation demands that selection criteria of public procurements must be non-discriminatory, objectively measurable, and clearly related to the procurement target. Tendering parties are to be informed beforehand on all specified criteria and energy efficiency requirements related to the product or service procured. In the evaluation process of the tenders received, specifications and requirements set for the procured products and services must be taken into consideration when making the procurement decision.

For the procurement of machinery, equipment and buildings it is recommended that appropriate dimensioning in relation to the use of the procurement target be done. Installation, service and maintenance of buildings, machinery and equipment procured should be expedient and promote upkeep or improvement of energy efficiency. When procuring services related to maintenance of e.g. buildings and transport services, it is recommended to consider the energy efficiency of the service procured. In addition, the deliverer of procured products and services should provide sufficient guidelines or training, if necessary, to ensure that all energy efficient properties of the provided product or service are utilized.

When making decisions on energy procurement, organizations of the public sector may take parameters like energy conservation promotion and use of renewable energies into consideration when choosing an energy supplier. In this case, detailed

criteria used in the decision making process have to be specified already in the invitations to tender.

Public procurements are governed and influenced by a broad spectrum of different laws, regulations and guidelines (figure 3). A detailed description of national legislation and recommendations on public procurement and energy efficiency issues is given below.

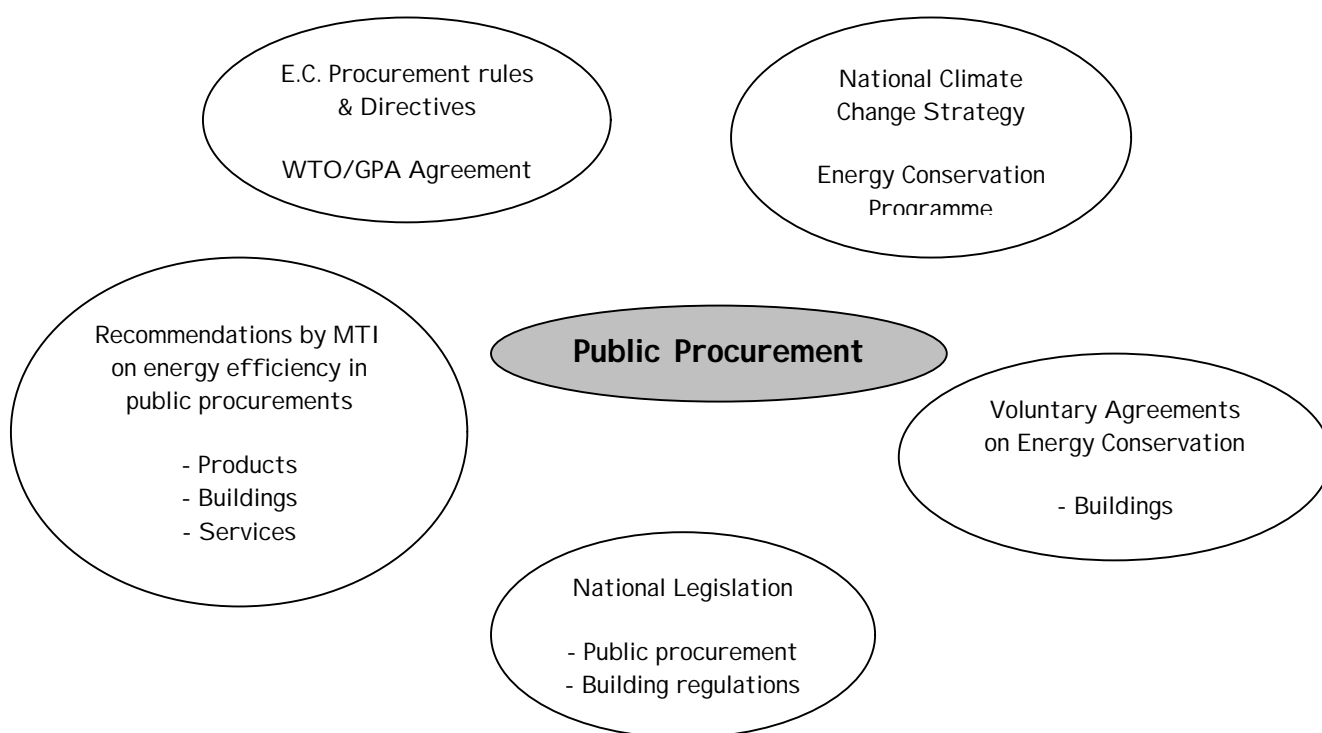


Figure 3: Policy measures governing public procurement in Finland.

### 2.6.1 General Laws and Regulations

For public procurements of or above the threshold value, Finnish procurement agencies follow the procurement rules of the European Community and the World Trade Organization's GPA agreement. For public procurements below the threshold value, national legislation applies.

The threshold values are set as follows (4 January 2000 – 31 December 2001):

#### 1. AUTHORITIES

##### General state administration

Goods: 139 312 EUR

Services: 139 312 EUR

Works: 5 000 000 EUR

**Prior notification**

Goods: 750 000 EUR

Services: 750 000 EUR

Works: 5 000 000 EUR

**Other state authorities, local authorities and joint municipal authorities, legal persons regarded as part of the public administration**

Goods: 200 000 EUR

Services: 200 000 EUR

Works: 5 000 000 EUR

**Prior notification:**

Goods: 750 000 EUR

Services: 750 000 EUR

Works: 5 000 000 EUR

**2. UNITS OF THE WATER; ENERGY; TRANSPORT OR TELECOMMUNICATIONS SECTORS****Units of the water, energy and transport sector**

Goods: 400 000 EUR

Services: 400 000 EUR

Works: 5 000 000 EUR

**Periodic indicative notice**

Goods: 750 000 EUR

Services: 750 000 EUR

Works: 5 000 000 EUR

**Units of the telecommunications sector**

Goods: 600 000 EUR

Services: 600 000 EUR

Works: 5 000 000 EUR

**Periodic indicative notice**

Goods: 750 000 EUR

Services: 750 000 EUR

Works: 5 000 000 EUR

National legislation requires public procurement units to submit competitive tenders to a sufficient number of potential suppliers in the respective field either by publishing an announcement or by requesting tenders directly. This obligation applies for procurements above the threshold value cogitated in the ETA-agreement as well as smaller procurements with less purchase value. The competitive bidding process must ensure equal and non-discriminatory treatment of the suppliers. The aim of these procedures is to ensure efficient use of limited public funds and to improve opportunities of companies to offer their products and services to the public sector.

### *National Law on Public Procurement*

In contrast to purchases of the private sector, the procurements of the public sector are controlled by law. Legislation on public procurement secures competition as well as equal and non-discriminatory treatment of all parties participating in the competitive bidding process. The law on public procurement applies for the following procurement units:

1. Public authorities of government, municipalities, and federations of municipalities as well as the Evangelical-Lutheran Church, the Orthodox Church and their congregations.
2. Juristic persons belonging to the public administration.
3. Units with business activities in water supply, energy supply, traffic, transport, and telecommunications.
4. Business companies as defined in the law on public utility companies (627/87), if not otherwise settled there.
5. Any other procurement unit, if the units mentioned under article 1, 2, or 4 finance over half of the procurement value.

Public procurement is governed by the procurement legislation that consists of the following laws:

- ❑ Law on public procurement (1505/92)
- ❑ Law on the modification of the law on public procurement (1247/97)
- ❑ Act on procurement of products, services and building contracts over the threshold value (380/98)
- ❑ Act on procurements over the threshold value of water-, energy supply-, transport- and telecommunications units (381/98)
- ❑ Act on government purchases (1416/93)
- ❑ Act on government building contracts (436/94)

There is no law on energy efficiency requirements of public procurements, but the law on public procurement allows an overall-economic approach and thus enables public bodies to consider energy efficiency as part of the environmental criteria in the invitations to tender. Separate recommendations on energy efficiency in public procurement were published by the MTI in late 2000.

### *Building Regulations*

The building norms in Finland are from 1985 and include mandatory target values on the U-values of building components. In 2003, the energy efficiency requirements will be improved by 30%. Measures to improve energy efficiency of old buildings are also considered.

## 2.6.2 *Special Energy Efficiency Regulations for Public Purchasing*

### 2.6.2.1 Recommendations by the Ministry of Trade and Industry

The Ministry of Trade and Industry has published recommendations on the energy efficiency in public procurements including public procurement of products, buildings and services. Though mainly directed to procurements of the state, municipal authorities, public utilities and the joint municipal authorities, the recommendations can also be applied by the private sector. Those responsible for energy conservation in the respective company are responsible to bring the recommendations into use when tendering and making procurement decisions.

It is recommended that public organizations should set a good example for the other sectors. This includes participation in first buyer groups for new energy-efficient technology as well as encouraging the implementation of the recommendations as part of the result-oriented management practices belonging to their administrative responsibility.

The recommendations are also implemented as part of the energy conservation agreements concluded in the private and public sector. In the compulsory annual reporting connected with the energy conservation agreements, the contracting parties are requested to give an account of the implementation of the recommendations.

Correct installation and correct use of procured machinery and equipment have a major impact on energy efficiency. Therefore, the recommendations deal besides energy efficient procurements also with guidelines on this aspect. The recommendations for energy efficiency can later be integrated into possible recommendations for the environmental requirements of public procurements.

The effect of the recommendations will be monitored by the Ministry of Trade and Industry. On the basis of experiences gained and taking into account the work done within the European Union, the need for further actions and possible amendments will be considered later.

In the following, the recommendations for energy efficient procurement of different products, vehicles and non-road mobile machinery are summarized.

#### *Electric machinery and equipment*

1. Micro PCs and other hardware:
  - ❑ Energy consumption should be lower than the average consumption level in their active operating mode.
  - ❑ Automatic switch-off function or minimal electricity consumption when not in operation.
  - ❑ Micro PCs and office equipment should meet Energy Star criteria or corresponding requirements, or provide better performance than conventional models.
  - ❑ Procure only TV-, VCR- and other AV equipment-models that have low closed-circuit currents.
2. Household equipment and appliances:

- ❑ Select as a rule only such appliances for office use and other premises that have the A category energy label or meet corresponding requirements.
  - ❑ Expedient and reasonable placement of equipment (e.g. refrigerators) should be considered.
3. Luminaries and sources of light:
- ❑ Acquire only office lighting fixtures with fluorescent lamps.
  - ❑ If the lighting quality is not impaired and the solution is macro-economically cost efficient, replace bulbs of incandescent lamps by screw-based low-voltage fluorescent lamps.
  - ❑ Choose fluorescent lamps with high lighting intensity that meet the color requirements set by the duties concerned.
  - ❑ Prefer long-life lamps with low luminous flux maintenance factors.
4. Extra electric heaters:
- ❑ To be avoided. Use and procure only in exceptional cases.
5. Special equipment:
- ❑ Procure only highly energy efficient equipment. However, when procuring special equipment serving the needs of health care, the function itself, e.g. the safety of patients, is of primary importance.
  - ❑ Where applicable, follow the same principles as for other procurements.

#### *Vehicles and non-road mobile machinery*

- ❑ Consider fuel consumption, suitable size, safety, quality, and procurement price, taking into account that these criteria may not be discriminatory.
- ❑ Where applicable, consider energy efficiency and ecological values in procurements of vehicles and non-road mobile machinery. However, non-road mobile machines should be primarily chosen in view of their suitability for the job at hand.
- ❑ Pay particular attention to energy efficient driving habits and avoid unnecessary trips and transports.

#### *2.6.3 Special Energy Efficiency Regulations for Public Buildings*

In December 1998, the Council of State made a decision-in-principle on a programme on ecologically sustainable construction. As in the case of public procurement, the public sector is asked to set an example for other contractors, enhancing the use of ecological principles and sustainable development in public construction.

Questions on sustainable development and energy efficiency are getting more and more important and also affect the building sector. The Ministry of the Environment has drafted guidelines for new construction and renovation complying with energy-efficient and sustainable development in co-operation with the Ministry of Trade and Industry and other public organizations. The recommendations on energy efficiency of public procurements in the building sector will be developed further on the basis of this work. Furthermore, the guidelines will also have a direct impact on the new building regulations under preparation.

As a general rule for the building sector, it is recommended that energy efficiency be considered at every stage of renovation and new construction projects. In new

construction projects, a higher energy efficiency level than that required by the building regulations should be achieved. For renovation building projects it is recommended to raise energy efficiency to the level required by the building regulations governing new constructions. Furthermore, public construction is encouraged to promote innovative building projects in an unprejudiced way. In building design, the increased use of natural light and exploitation of passive solar energy should be considered.

During the use of the building, follow-up activities and reporting on energy consumption are recommended in order to ensure energy efficient functioning of building equipment and systems. In addition, follow-up activities should be planned and implemented with sufficient accuracy in relation to the energy use intensity.

When property maintenance agreements are concluded, matters related to the control of energy consumption should be stressed e.g. by setting consumption targets and agreeing on a bonus system.

In the following, a brief overview on the recommendations for public procurement of different building-related equipment is given.

1. Heating and cooling systems:
  - Pay attention to costs and measurable environmental impacts.
  - Choose oil- and gas heating boilers only from the best efficiency category.
  - Utilize ventilation control, heat-recovery, and low-temperature heating systems.
  - Analyze and utilize as far as possible possibilities of using passive and active solar energy.
  - Avoid need for mechanical cooling with architectural means and by making use of free cooling. If mechanical cooling is used, utilize the recovery of condensate heat.
2. Lighting systems:
  - With regard to the purpose of use.
  - Luminaries, lamps and lighting control gear to be as energy efficient as possible; choose according to purpose of use.
  - Make use of energy efficiency requirements in force (e.g. energy efficiency requirements with quality criteria set by the national energy agency Motiva and the Swedish Energy Authority).
  - In addition to energy efficiency, pay also attention to appropriate number and placing of luminaries, maintenance costs, and expedient use (e.g. office buildings, street and road lighting).
  - As a general rule, use electronic HF-control gear in fluorescent lamps. If use of conventional ballast is appropriate, choose low-loss ballast.
  - Ensure sufficient and high-standard lighting in an energy-efficient way by using timers, presence detectors, and standard lighting systems.
3. During lighting design, pay special attention to appropriate intensity of lighting  
Electric motors, pumps and fans:
  - Choose electric motors meeting the best energy efficiency category (also, if part of other equipment).
  - Select pumps and fans in terms of optimum dimensioning and efficiency. Consider the suggestions for consumption classification of pumps and fans by the national research center VTT.

4. Other machinery, equipment and functional elements
  - In public procurements for public housing production, pay special attention to energy-efficiency of household appliances.
  - When procuring institutional kitchen equipment, choose energy efficient appliances, pay attention to appropriate dimensioning and placement as well as to instructing the users in the equipment's energy efficient use.
  - In renovation projects, pay special attention to the energy economy of ventilation systems and windows.

#### 2.6.3.1 Voluntary Agreements

First experiences show that voluntary agreements are often perceived to be more flexible than laws and regulations. They offer promotion of energy conservation with due respect to both economic and technological goals. Energy conservation agreements seem to be an appropriate way of saving energy in all kinds of companies, independent of size and sector. Based on energy audits and analyses, the contract party sets its own energy efficiency targets and draws up an implementation plan following its own needs and time schedule.

The framework agreement on voluntary energy conservation concluded in 1997 between the Association of Local Authorities and the Ministry of Trade and Industry is of outstanding importance for the promotion of energy efficiency and energy savings in the public sector. Municipalities signing the agreement are entitled to receive 50% subsidy on energy audits, and up to 10% subsidy on investment costs improving energy efficiency.

In Finland there are 452 municipalities of different size. The total building stock of municipalities and local federations is approximately 115 million m<sup>3</sup> of public buildings and 50-60 million m<sup>3</sup> of dwellings. During the last years, the average heat demand of public buildings was 46-47 kWh/m<sup>3</sup>, varying between different municipalities. Some municipalities succeeded in reducing their yearly heat demand, e.g. the cities of Rovaniemi and Kuopio reported 34 kWh/m<sup>3</sup>, whereas in other municipalities the heat demand slightly increased. In terms of money, an average saving of 5% in the heat demand of public buildings means cost savings of 30-40 million FIM (5-6.7 million EUR) per year.

The average yearly electricity demand in Finnish public buildings is estimated as follows:

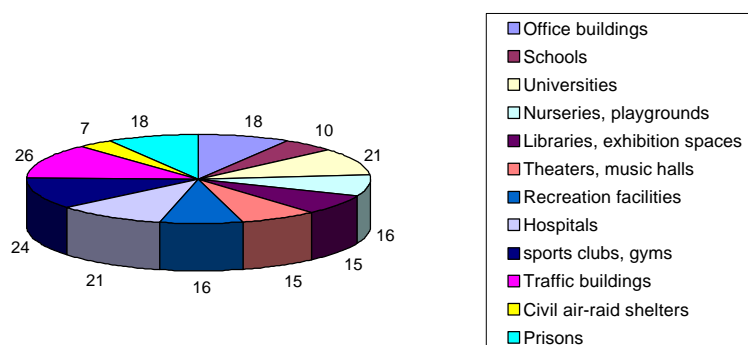
Average yearly electricity demand in public buildings (kWh/m<sup>3</sup>, yr)

Figure 4: Average electricity demand in Finnish public buildings.

Until end of 2000, 34 municipalities and 8 local federations have joined the agreement. Thus, the energy conservation agreement covers ca. 50 million m<sup>3</sup> of public buildings and 19 million m<sup>3</sup> of municipality-owned dwellings so far, that is approximately 41% of all building stock owned by local governments and 43 % of all public buildings.

Table 5: Public buildings and municipality-owned dwellings covered by voluntary energy conservation agreements in late 2000.

	Municipalities	Government owned building stock (million m <sup>3</sup> )	
		Public buildings	Dwellings
Total	452	115	50 - 60
Agreement signed	34 + 8	50	19

The voluntary energy conservation agreement offers municipalities and local governments a concrete possibility to develop energy efficiency measures: Based on energy audits and analyses, the contracting party sets its own target for energy savings and draws up an implementation plan. Energy conservation measures are carried out with own resources and by own time schedule. Governmental subsidies are granted for audit activities (50%) and energy saving investments (10%). A responsible contact person for energy conservation is appointed within each municipality and monitoring results on detailed energy consumption are reported annually.

In order to improve knowledge on energy efficiency measures and energy saving possibilities, the national energy agency Motiva co-ordinates a two-stage training package targeted at local government officials and trustees. The aim is to inform and train key persons in the decision making process on how to implement energy saving measures in their municipalities. Course participation for officials representing municipalities that have signed the energy saving agreement is financed by the Ministry of Trade and Industry.

Energy audits and analyses form a crucial part in the framework of energy conservation agreements and are compulsory for governmental subsidies on energy saving investment. During the auditing process, the actual energy consumption of the building is evaluated, possibilities for energy savings are indicated, and suggestions for energy-efficient and cost-effective investments are proposed. The Energy Auditing Programme (EAP) is coordinated by the national energy agency Motiva. By end of 2000, 8 different energy audit models have been in use, serving the needs of different buildings and industrial processes. Energy audits have been carried out since 1992.

By the end of 2000, 331 objects of government-owned building stock, representing 6.2 million m<sup>3</sup>, have applied for energy auditing in the frame of the energy conservation agreement. In 169 buildings, representing 2.43 million m<sup>3</sup>, energy auditing and reporting were finished. Based on these energy audits, the following average energy-saving potential in government-owned buildings could be confirmed:

- Thermal energy: 11%, or 18.5 GWh/yr
- Electricity: 5%, or 3.4 GWh/yr

The average savings on energy costs are 9% and the average payback-time for investments on energy-efficient and energy saving technologies is 2 years.

In public buildings, the highest energy saving potential could be allocated to 4 main parameters

- Lighting,
- Decrease of in-door air temperature,
- Operation time of ventilation and/or air conditioning,
- Compensation of electricity tariff and parasitic losses.

The average energy saving potential for heat and electricity in different public buildings is shown in Table 6:

*Table 6: Average energy saving potential for heat and electricity in different public buildings.*

Type of public building	Energy saving potential for heat	Energy saving potential for electricity	Saving potential for energy expenses
public office buildings	18%	7%	14%
schools	13%	10%	12%
sports facilities and gyms	26%	12%	15%

Energy-saving investment does not necessarily have to be expensive. In many cases a significant part of energy savings in public buildings can be obtained by changing user-habits, e.g. by reconsidering the operational hours of the buildings ventilation and air conditioning equipment and reduction of indoor air temperature. The Ministry of Trade and Industry grants a maximum of 10% subsidy on energy-efficient and energy saving investments based on the results of energy audits concluded in the frame of the energy saving agreements. Usually subsidies are granted for major investments that have a payback time between 2 and 8 years. The maximum granted subsidy for a municipality is 500 000 FIM (84 094 EUR) per year. In 2000, 4 major project applications were approved and 1.28 million FIM (0.22 million EUR) were granted for energy saving investments in municipalities. Since the beginning of the agreement, municipalities were granted a total of 1.78 million FIM (0.3 million EUR) on subsidies on energy saving investment, covering 10 major projects.

Energy auditing started in 1992. During the years 1992-1999 a total of 1 763 objects equal to 27.8 million m<sup>3</sup> of building stock belonging to the public sector were energy audited. As a result of the energy auditing, a summary of energy consumption, energy saving potential and total investment costs could be identified (Table 7).

*Table 7: Summary on energy consumption, energy saving potential and investments in public buildings (1992-1999).*

<b>Actual energy consumption</b>	<b>Public sector Energy saving potential</b>		<b>Investments</b>
<b>1763 public buildings</b>			
Heat: 1 428 776 MWh/yr 36 648 974 EUR/yr	234 399 MWh/yr 5 863 055 EUR/yr	16.4 % 16.0%	13 188 921 EUR
Electricity: 491 533 MWh/yr 29 350 873 EUR/yr	37 284 MWh/yr 3 109 474 EUR/yr	7.6 % 10.6 %	4 778 842 EUR
<b>Total consumption on Heat and electricity</b>	<b>Total savings on Heat and electricity consumption</b>		<b>Total investments</b>
1 920 309 MWh/yr 65 999 847 EUR/yr	271 683 MWh/yr 8 972 529 EUR/yr	14%	17 967 763 EUR

#### 2.6.4 Trends

During the last years, the international efforts on reducing greenhouse gases and other emissions related to climate change became matters of first priority also on national level. The Finnish Climate Strategy from 2000 including the national Energy Conservation Programme is the Finnish main effort to reach the Kyoto targets. It obliges the state to promote energy conservation and reduction of greenhouse gases in all areas of decision-making belonging to their administrative responsibility.

Though a clear national strategic goal, implementation of energy efficiency and energy conservation by different sectors is so far mainly based on voluntary efforts. In order to implement energy efficiency voluntarily on a broad basis, it is important for other actors that the state gives an example and is among the first to set concrete actions. The example of the state itself is perceived to give confidence and encourages other sectors to participate in a joint effort.

In Finland, matters of energy efficiency are mainly addressed in connection with sustainability and environmental impacts of products and services. Energy auditing has impressively shown that large cost savings in buildings can be achieved through energy conservation measures and use of energy efficient equipment. Cost savings are the main motivation for municipalities to implement energy conservation measures in the building sector. In addition to this, the importance of sustainable development and environmental concerns in public sector organizations is steadily increasing. Some larger municipalities in Finland made these items part of their environmental management strategies and succeeded in developing their image as a “green” city, setting an example for others.

Until now, most of the concrete actions for climate protection were set on local level and it is expected that this trend will continue. Climate change is perceived to become a genuine threat for society and municipalities, being responsible for the well-being of their inhabitants, want to contribute to the joint global effort on climate protection. Energy conservation and efficient use of energy are part of these efforts.

Until October 2001, about 50 municipalities have signed the energy conservation agreement with the MTI. According to the Association of Local Authorities, most of the Finnish municipalities are involved somehow in activities promoting sustainable development and efficient use of energy, even if they have not yet signed the agreement. Some larger municipalities do not participate in the agreement, but nevertheless act as forerunners. Usually these municipalities have conducted energy audits and related investments on energy efficiency in public buildings by themselves earlier and perceive the frame of the agreement as too rigid for their own needs, not offering them any specific added value.

About 42 municipalities participate in the Campaign on Climate Protection of Finnish Municipalities. This national campaign coordinated by the Association of Local Authorities is part of ICLEI’s worldwide “Cities for Climate Protection” campaign. Furthermore, more than 50% of all municipalities in Finland have developed a Local Agenda on sustainable development, showing the intention for further action. Due to lack of money and inhabitant’s migration from rural areas to larger cities, the implementation of concrete actions often has to be postponed.

The Association of Local Authorities promotes climate protection issues on local and regional level. However, there is still a major need for know-how dissemination and training regarding different possibilities on energy efficiency measures in many municipalities. Of the 452 municipalities in Finland, only about 20 municipalities are larger cities. For the future development of local activities on climate protection and energy conservation in the remaining major part of Finnish rural municipalities, it will be important to develop national strategies that ensure tailor-made choices for specific local needs in relation to the funds available.

As to the public procurement of products, a macro-economical approach seems to get more important in the future. This development enables buyers to consider besides the lowest purchase price also other parameters including energy efficiency and environmental impacts of the procurement over the whole life time in the decision making process. However, to encourage these development further, more pioneers with visions, education, training and databases will be needed in the public sector in order to provide decision makers with sufficient information on legislation, product's different qualities including energy efficiency, and easy-to-use decision making tools. First steps in this direction have already been done and the prospects are encouraging.

In the purchasing process, the requirements for products set by large and influential buyers can considerably influence the product range offered by buying agencies and manufacturers. The influence of strong buyer groups in technology procurement related to energy efficiency has been impressively shown in pan-European projects. Also on a national basis, buyers requiring energy efficient products and looking on macro-economically cost-effective choices will force buying agencies and whole sellers to update their product range accordingly in order to satisfy their customers. In this development too, the public sector representing large purchase volumes is a driving force.

In order to support decision-making for energy-efficient procurements in the future, products should not only be classified according to labels, but manufacturers should provide a detailed description of their products' technical and environmental features. This will also enable comparison between energy-efficient products of different labels and ensure that procurement decisions are made on a product or service as a whole and not solely based on single criteria required by a certain label. In Finland, a first step in this direction is the development of a database on the environmental features of different products, in order to ease the decision-making on energy efficient and environmentally friendly public procurements.

In the building sector, the building regulations are the common basis for decision-making. New building regulations, taking into account the national goals set in the Finnish Climate Change Strategy and the Government Energy Conservation Programme, are under way. They will set stricter targets for efficient use of energy and implementation of energy-saving technologies in both new building construction and building renovation projects. In addition, the recommendations published by the Ministry of Trade and Industry further promote energy efficiency in public building construction and renovation and encourage public actors to take up new energy-saving building approaches in all phases of the construction process.

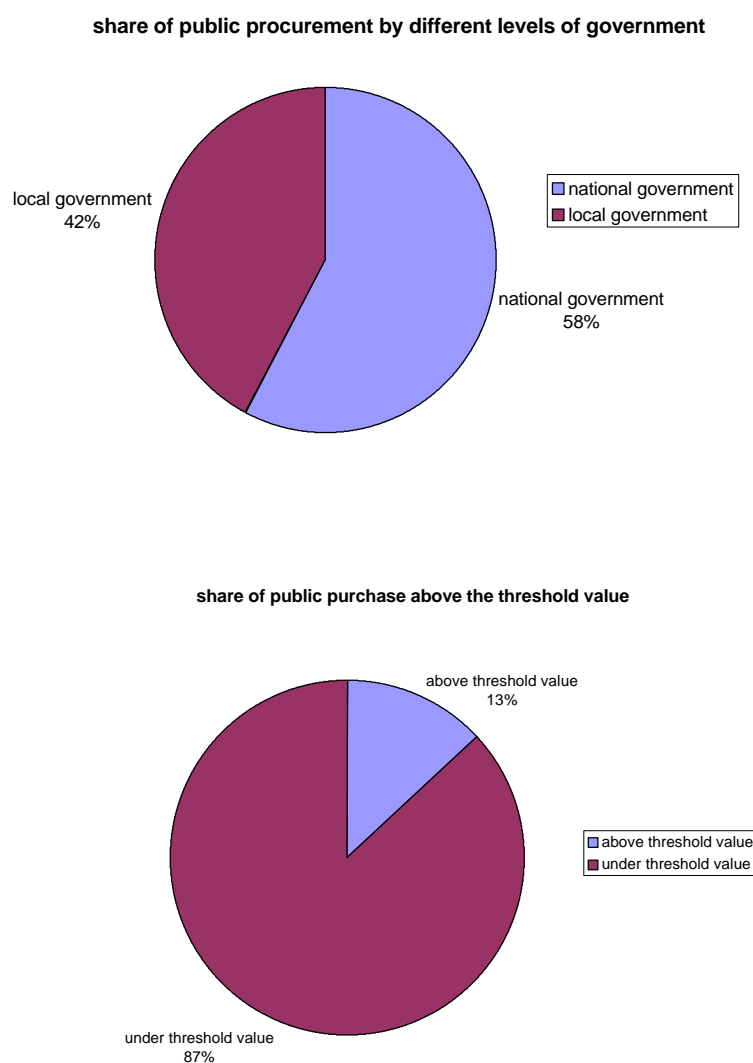
In the future it will be even more important to seek for new approaches in the implementation of energy efficiency. Voluntary energy conservation agreements offer municipalities a concrete possibility to improve energy efficiency locally. However, in order to meet different local needs, the agreement with the MTI needs to be broadened in its content, offering participating municipalities more freedom of action, tailor-made choices, and thus real added value. Following the development already under way, local governments will be important forerunners in energy efficiency matters also in the future, but need the strong support of national government for further progress. Voluntary efforts are perceived to be a good starting-point for

concrete actions on energy conservation and energy efficient procurements, but hardly will be sufficient to reach the national goals. Therefore it is expected, that in the long-term a well-balanced mixture of voluntary efforts, guidelines, regulations and legislation will probably be the most effective way to proceed.

## ***2.7 Organisation of and Decisions on Product Purchasing and Buildings Investments in Public Institutions***

### *2.7.1 Purchasing Volume of the Public Sector*

It is estimated that the annual purchase of products and services by the public sector in Finland is about 19 billion EUR in total, of which 2.5 billion EUR concern purchases above the threshold value. The share of purchases done on local government level is estimated to be about 8 billion EUR. According to the Association of Local Authorities, approximately 10,000 purchase decisions are done daily in Finnish municipalities.



*Figure 5: Domestic public sector purchasing volume.*

In accordance with the legislation and rules on procurement, domestic procurement tenders above the threshold value are published in the Finnish Public Procurement Journal and the Official Journal of the European Community. In addition to national tenders above the threshold value, the Public Procurement Journal publishes also a broad range of smaller domestic competitive tenders for purchases under the threshold value.

Announcements on domestic public procurements above the threshold value are grouped in two main categories: building contracts and products/services. Furthermore, the procurements of each category are classified according to the procurement procedure applied into open, limited, and negotiable procurements.

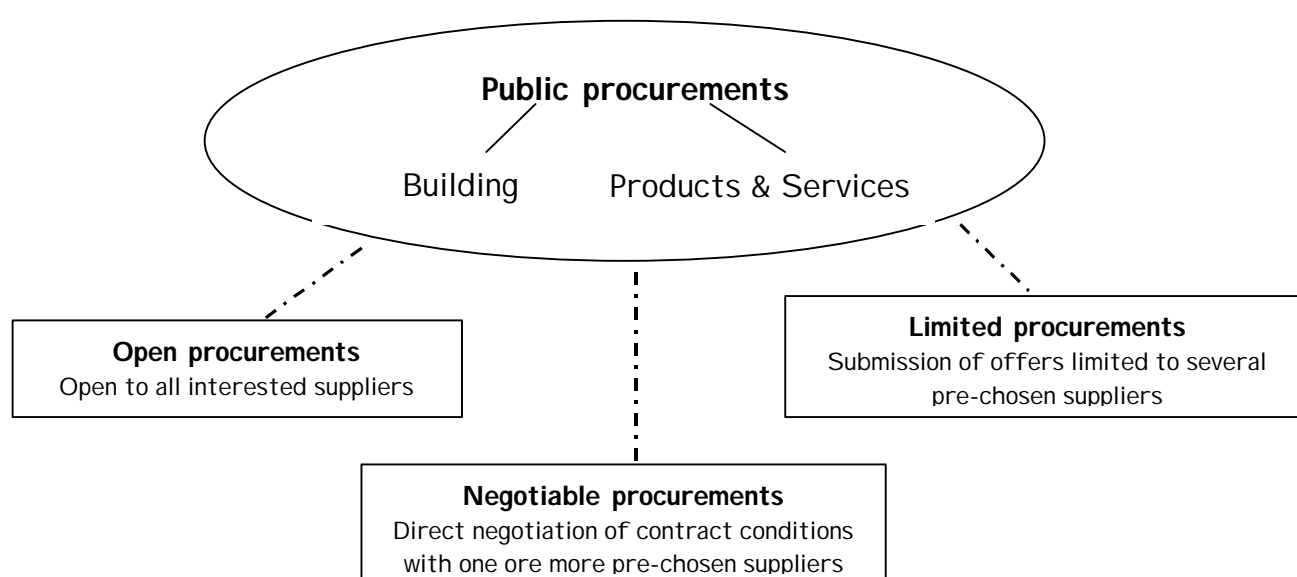


Figure 6: Classification of domestic public procurements above the threshold value.

### 2.7.2 Purchasing Process and Decision-Making Chain

Public purchases fall within the responsibility of different procurement agencies, units and material offices on both national and local government levels. It is not known how many procurement units making daily decisions on public purchases do exist in Finland.

The purchasing process in the public sector is rather decentralized. For an average larger Finnish municipality with about 80,000 inhabitants it is estimated that up to 2000 decision makers may be involved in the public procurement process. In practice, not only state departments, universities, ministries, and city administrations do have their own procurement offices, but also each department unit may have an independent procurement unit of its own. On local government level the organizational structure is even more complex and involves many different levels of decision-making. To illustrate the average chain of the decision-making process in public procurement on municipal level, a school has been chosen as example (figure 7).

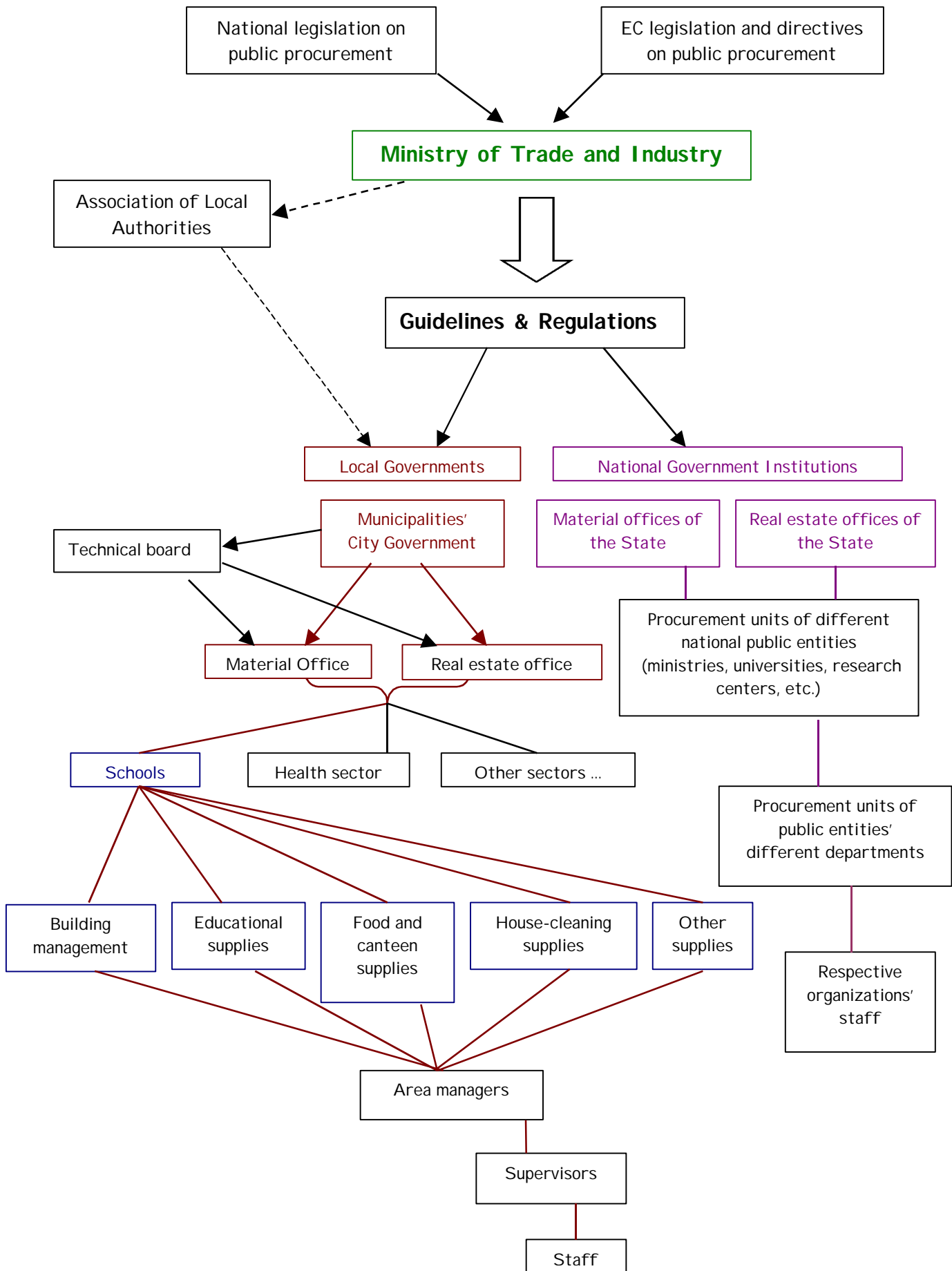


Figure 7: Organizational structure of the decision-making process in public procurement.

The procurement process itself is reported to be complicated and time-consuming, requesting from the officer sufficient knowledge on both EU legislation and national legislation. Besides larger building management departments and material offices of the state where experts on public procurement are available, usually employees who have other main responsibilities within their organization are responsible for daily procurement decisions. Most of them are not experts on energy efficiency either and make their decisions according to the procurement procedures applied successfully in the organization before. If an organization of the public sector decides to consider energy efficiency in their procurement decisions, it is usually due to the activity and motivation of a few committed individuals.

The City of Pori was one of the first municipalities considering environmental and energy-efficiency aspects of public procurements in Finland. Today, the material office of the City of Pori is both forerunner and example to others: From some ideas in the early 1990s, concrete measures to promote environmental and energy efficiency aspects for public procurements were developed during the last ten years. During the years of experience, it was found that one of the most crucial parameters for successful implementation of ideas on energy efficiency and sustainable development in public procurements is efficient information-dissemination to all decision-makers involved.

As to environmental aspects and energy efficiency, procurement legislation on both national and Community level is perceived to lack sufficient information on possibilities concerning concrete implementation of “green” procurement. To the average decision-makers it does not become clear, if national and EC legislation consider environment, sustainable development, and energy efficiency to be important procurement criteria.

This circumstances together with lack of user-friendly information, training and concrete case studies is the main reason, why energy efficient procurement decisions in the public sector aren't yet widely used and heavily depend on the personal engagement of visionary forerunners in different organizations.

### *2.7.3 Procurement habits*

Public procurement decisions nowadays are mainly based on the so-called total economical efficiency of a purchase, providing a clear economic benefit for the buyer. When tendering, the buyers have to identify in beforehand the criteria that will be given priority when making the procurement decision. The price is still the most important criterion for most kinds of purchases.

Ecological purchasing practices have become a matter of considerable debate also in the public sector due to the growing importance of environmental management practices in public organizations. Though environmental considerations in general are getting more and more important, they do not yet have a measurable impact on public procurement decisions. Energy efficiency in public procurements is not a criterion of its own, but is taken into account through other criteria, e.g. the environmental impacts and running expenses of a purchase.

Currently, environmental criteria are not sufficiently considered by either national or EC procurement legislation, and do not address clearly possibilities on how to apply environmental considerations in public procurements. This is one of the main reasons why environmental aspects as well as energy efficiency are not yet considered a matter of first priority in public procurements. There is a strong need for a guide as well as case studies demonstrating the possibilities and operation modes for implementation of environmental and energy efficiency criteria in public procurements.

The procurement process itself is a time intensive process and further selection criteria make the decision making even more complicated. E.g. the analyses of a product's environmental impacts over its whole life cycle including energy consumption is a very difficult and broad assignment and often exceeds the capabilities of an average purchasing agent. Furthermore, the perception of what will be the best choice in respect to the environment changed frequently in the past based on new information available and overall values applied. In a selected product group, environmental labels can ease the identification of "green" choices. However, comparison between products of different environmental labels is difficult, because the product's qualities behind the label often remain unclear to the buyer.

Visionary forerunners in green public procurement habits have shown that negative attitudes among purchasing agents can be changed substantially through training and access to accurate information. Larger procurement units of the state, e.g. universities, as well as municipalities often have their own modified procurement guidelines according to which they make purchase decisions. In principle, this opens also possibilities for energy efficient and green product choices. Thus, a municipality or state department can decide upon priority criteria for their procurement decisions, including energy efficiency and green procurements, if they consider it to be of larger economic advantage for the organization than a low purchase price alone.

In order to promote energy efficiency considerations in the public sector, several organizations and municipalities also have started to consider the necessity of certain purchases in general, and increasingly intend to apply alternative choices to new purchases, e.g. repair, update, leasing, outsourcing, and joint-use of products and services.

Statistics do not provide separate numbers for government purchases on products, services, and investments in buildings, but consider them as part of the government total consumption expenditures by administration sector. Purchases above the threshold value are reported to the Ministry of Trade and Industry, but do not give detailed information on different purchase sectors and applied decision criteria. Therefore, numbers on the share of energy-efficient purchases in overall public procurement are not available.

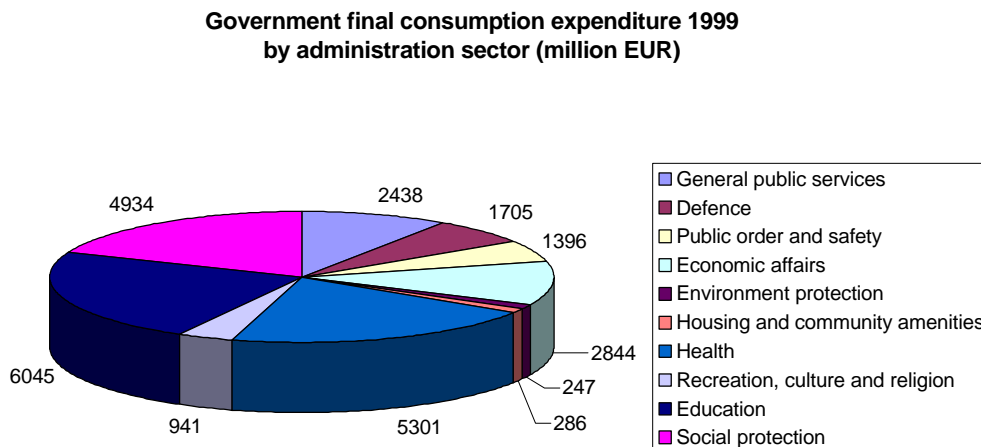


Figure 8: Government final consumption expenditure 1999 by administration sector in Million EUR (ESA 1995). (Source: Statistical Yearbook of Finland, 2000)

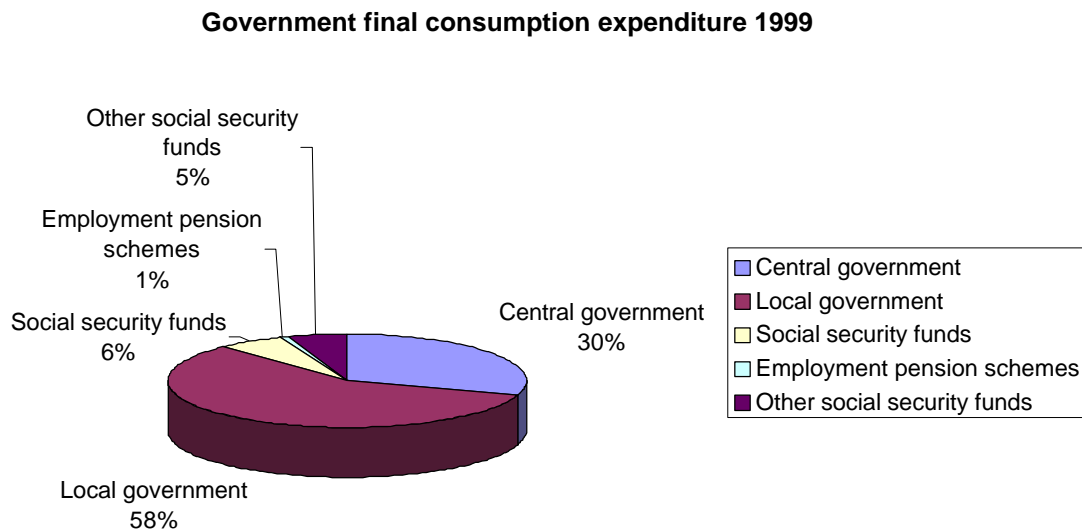


Figure 9: Government final consumption expenditure 1999 by government level. (Source: Statistical Yearbook of Finland, 2000)

### 2.7.3.1 Products

Energy efficiency aspects for products can be taken into account indirectly by applying environmental selection criteria. A review of Finnish invitations to tender for the year 2001 shows, that running expenses and environmental selection criteria are usually ranged number 6 to 10 in importance when price and quality are ranged number 1 and 2, thus priority decision criteria. When making decisions on office equipment and appliances, procurers give main priority to their functional and technical features, choosing the less-expensive product choice fulfilling these criteria (figure 10).

1.	Price
2.	Quality
3.	Functional features
4.	Technical features
5.	Time for delivery
6.	Running costs
7.	Maintenance services
8.	Reliability of delivery
9.	Technical support
10	Environment

*Figure 10: Ranking criteria for public procurement decisions on products and services.*

Energy-efficient products are often perceived to be more expensive than the common choices. Life cycle cost assessments considering energy efficient purchases are not yet the common basis for decision-making, but are applied already by some public organizations and municipalities. The basic approach for public procurements is still to get as much as possible for as good as possible quality with the limited public funds available.

Energy- and environmental labels help procurers to identify products with average less energy consumption, but do not inform on the detailed technical or environmental features of a product in detail. Thus, also comparison between products with different labels is difficult. In addition, procurement agents perceive that suppliers apply environmental labels often mainly for marketing purposes, and that an environmentally friendly product choice thus not necessarily provides any added value to the purchase decision as a whole. However, procurement agents are willing to make purchase choices according to energy-efficiency criteria, if the price level of the energy efficient product as well as its technical and functional features is comparable to common products with a high quality-cost ratio.

### 2.7.3.2 Buildings

In Finland, the large majority of public buildings are government-owned. Leasing of space for public purposes is applied only rarely. Also, total outsourcing of maintenance services and HVAC services for public buildings is not yet a real alternative. Public procurement decisions on buildings are usually based on a balance between price and quality, the cheapest choice as such being rarely the conclusive decision maker. In the building sector, special attention is also given to the suppliers' possibilities in coping with a tight time schedule and availability of additional services as technical support and after-service (figure 11).

1.	Price
2.	Quality
3.	Technical features
4.	Time for delivery
5.	Reliability of delivery
6.	Running costs
7.	Technical support
8.	After-service
9.	Functional features

*Figure 11: Ranking criteria for public procurement decisions concerning buildings.*

Energy audits have shown that there is a huge potential for energy conservation in public buildings. Minimum building standards have to be fulfilled as required by the building regulations, and the additional recommendations by the MTI for higher energy conservation standards can be applied voluntarily.

For decision making in the building sector too, there is a clear additional need for practical information on energy saving possibilities. Energy saving possibilities concerning the use and operation of a building are addressed in a concrete way by energy audits. Energy audits have already been conducted in more than 50% of the total public building stock and continue. Based on energy audits conducted in public building stock and following energy conservation measures, municipalities can participate to national efforts by saving own expenses at the same time.

However, energy-efficient approaches in the building process itself are still limited to innovative and ecological building demonstration projects.

Based on former experiences with mould and moisture problems occurred in Finnish buildings, energy conservation measures in the building structure easily become a matter of controversy. Due to lack of information and training, energy conservation in buildings is often understood to correspond to a tight building envelope with reduced ventilation, thus raising fears among decision makers on moisture problems that already caused many municipalities large expenses in the past.

## ***2.8. Incentives and Barriers for Energy-Efficiency in Public Procurements***

There are no legal barriers for the implementation and promotion of energy efficiency issues in public procurement.

Though national government supports promotion of energy efficiency and energy conservation by means of voluntary policy measures, practical implementation is strongly dependent on the motivation and attitude of the persons involved in day-to-day procurement activities. It can be stated that energy efficiency has not yet become a first priority parameter in the overall decision-making process of public procurement.

The general attitude towards energy efficiency is good, but especially on regional and local government level there do exist obstacles for practical implementation that need to be addressed in the future. National government as well as the Association of Local Municipalities both picked up this issue recently and started to develop internet-based, easy to use, and practically orientated information databases for public procurement.

A main practical obstacle for further, continuous improvement of energy efficiency, environmental and life cycle issues in public procurement is, that purchasing units do not have sufficient, up-to-date and easily accessible knowledge of:

- ❑ National and international (EC) procurement legislation.
- ❑ Procurement procedures implementing assessment and evaluation of environmental qualities of products and services.
- ❑ Environmental properties of products, services, and building materials.
- ❑ Labels and ratings developed for “green” products.

For an average purchasing agent, especially interpretation of procurement legislation is difficult. There is a clear need for precise interpretation of national and EC procurement legislation in accordance to the implementation possibilities of green purchasing practices including energy efficiency aspects. The procurement process is quite complex and the procurer has to consider many different parameters before making a procurement-decision that has to be inexpensive in terms of overall economy. Therefore, especially procurement units with low staff and low budget, representing the huge amount of regional and local government procurement organizations, would need clear instructions including practical case studies on implementation possibilities of green purchasing methods in public procurement in the frame of procurement legislation.

Positive attitude towards energy efficiency issues and green purchasing among procurers can be significantly influenced by means of training and effective information-dissemination as practical experiences have shown. In addition, it is also important to consider a change in attitude among manufacturers and suppliers, participating in public procurement tendering. Both, procurers and suppliers need to see an added value for their business when taking up energy efficiency seriously. In addition, energy efficiency considerations should by no means complicate the procurement process any more, but questionnaires on environmental qualities of products and services including energy efficiency should be done in a practice-orientated way that can easily be taken up and answered by suppliers.

Concerning energy conservation in municipal building management, there has been conducted a broad investigation by the national LINKKI 2 programme (“Decision-making on energy conservation in municipal building management”, Maarit Haakana, VTT, 2000). The study revealed that the activity, motivation and professional skills of the building management personnel together with enough money and time are the most important factors for promotion of energy conservation in municipalities. The same observation also applies for public procurement of products and services.

Usual obstacles for the implementation of energy efficiency and green purchasing measures in public procurements are:

- ❑ Lack of funds
- ❑ Lack of personnel resources and time
- ❑ Negative attitude
- ❑ Lack of information
- ❑ Lack of motivation
- ❑ Lacking follow-up activities
- ❑ Operation- and user habits

On the other hand, implementation of energy efficiency and green purchasing in the public sector is supported by the following parameters:

- ❑ Professional, active and motivated personnel
- ❑ Sufficient funds available
- ❑ Practice-orientated information-dissemination
- ❑ Training
- ❑ Consumption monitoring (buildings)
- ❑ Energy auditing
- ❑ Already achieved savings
- ❑ Centralized buildings maintenance
- ❑ Tele-monitoring, increased use of building automation systems

Voluntary energy saving agreements are a concrete step towards large-scale implementation of energy conservation measures in buildings. For further success and improvement of these activities, the procedures in signing the voluntary agreement and applying for subsidies on energy saving investments should be simplified, tailor-made choices according to the true needs of municipalities should be considered, and energy conservation training in municipalities for building caretakers, maintenance personnel, and decision makers should be increased.

### **3. Success Stories and Good Examples of Energy Efficiency in Public Institutions**

#### ***3.1 The City of Pori***

During the last 10 years, the City of Pori has acted as a forerunner in “green” purchasing issues and has been since then an example to other municipalities. Energy conservation and environmental impacts of public purchases are considered in public procurements. The City of Pori understood quite soon, that training and education are crucial factors, if promotion of sustainable development in all activities should become an important issue in day-to-day public procurement. Therefore, the material office of the City of Pori developed some years ago practical instructions for public purchasing agents belonging to the municipality’s administrative district that were published on the internet in 1997. The instructions include a broad assembly of documents related to public procurement as well as detailed information on environmental- and energy saving impacts of public purchases. Furthermore, the material office of the City of Pori has employed an eco-advisor who offers practical information and training to public organizations and departments and acts as contact in all questions concerning ecological procurement.

The instructions for eco-procurement focus on the following product- and service areas:

- Car- and garage branch
- Public sanitation
- Food service
- Offices
- Health care
- Buildings

When making decisions on public procurement, price-quality and environmental comparisons are conducted and often a life cycle cost analysis is performed.

The City of Pori also has succeeded in making alternatives to new purchases more attractive: e.g. long maintenance agreements enable circulation of office equipment to other public users even after the normal life cycle of the product is over. Thus instead of buying a new one, a school can e.g. receive a copying machine with a valid maintenance agreement when the City Office has deducted the machine after several years of use.

Green purchase practices have become a clear image-maker for the City of Pori. The basic motivation of the visionary people involved in the process is, to show that through a well considered purchasing practice one can make a difference and contribute to energy conservation and a better environment.

The City of Pori has 76,000 inhabitants and conducts about 2000 procurements per year. The total budget for products and services procured is about 22 –25 million EUR/year (excluding new building construction), of which almost half are accomplished as “green” purchases.

The practical experiences of the City of Pori have been brought forward through the internet-based services HYMONET and JULMA, which were designed to reach the whole public sector.

### **3.2 HYMONET**

In order to ease the day-to-day procurements of municipalities and other local government authorities and to direct public purchases towards energy efficient and environmentally friendly choices, a unique internet-based tool for public procurement has been developed.

Efektia Ltd, a consulting company owned by the Association of Local Authorities, developed the tool HYMONET in close co-operation with public sector organizations. HYMONET is an internet-based decision support system for environmentally friendly procurement, including energy efficiency. This database of purchasing, products and their environmental effects was taken into operation in June 2001. HYMONET understands itself as a process and platform for open discussion between equipment users, purchasers and suppliers. The programme is updated continuously and provides public purchasing agents with the following information:

- ❑ Information on legislation.
- ❑ Models for different procurement procedures implementing environmental criteria.
- ❑ General environmental knowledge on the life cycles of products.
- ❑ Specific information on environmental properties of products and criteria for selection of environmentally preferable products.
- ❑ Product arena, where manufacturers and suppliers can introduce and discuss environmentally friendly product choices.

The tool was designed to be an “easy-to use” environmental database for both buyers and suppliers. At present, the HYMONET database includes specific environmental information on products of the following product groups:

- ❑ Electrical devices
- ❑ Building materials
- ❑ Hospital supplies
- ❑ Cleaning agents
- ❑ Food

The development of HYMONET was a first step in giving concrete and practical instructions on considering environmental impacts and energy efficiency in day-to-day purchases of the public sector. The public sector gives a strong signal and functions as example not only for other large purchasers, but also in respect to manufacturers and whole sellers. These circumstances are taken strongly into account when developing HYMONET further. The ultimate goal would be that the classifications used in HYMONET become part of the environmental requirements of public purchasing.

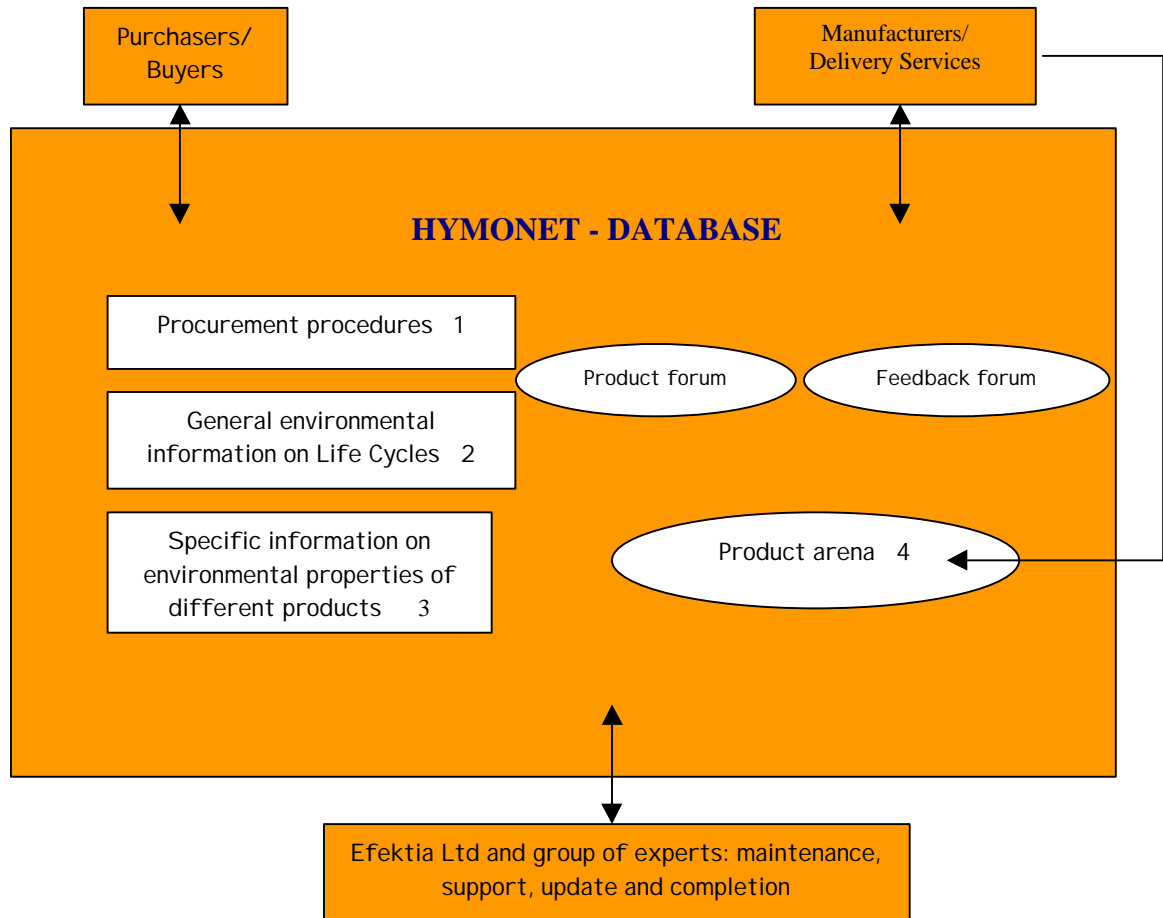


Figure 12: HYMONET database for public procurement (source: Efektia Ltd).

### 3.3 JULMA

In autumn 2001, the Ministry of Trade and Industry launched an internet-based service on public procurement, JULMA. The intention of this public market service is to improve the interaction between buyers and suppliers in the public bargaining process.

National legislation requires procurement units to submit competitive tenders for procurements that fall below the threshold value by sending out requests for tender to a sufficient number of potential suppliers in that field or by publishing an announcement, written in free form, regarding the competitive tender.

The goal of the JULMA service is to upgrade the efficiency of public procurements and to thereby improve the effectiveness of the use of public funds. The main principles in the rules of procurement are that the purchases should be made on an open and efficiently competitive basis, and that suppliers should be treated equally and without discrimination. The principle of openness stipulates that the procurement unit announces, on a sufficiently large scale, that it is making purchases; while the principle of equality and non-discrimination entails that the decision to buy must be made in accordance with established criteria, which are to be applied equally to all

prospective suppliers. Through JULMA, also the opportunity of companies to offer their products and services to the public sector increases. In addition to announcements of tenders and branch of activity profiles of suppliers, the service offers to public procurement agents overall information on procurement legislation and practical examples of documents related to the procurement process.

Other than HYMONET, which focuses on environmental and energy efficiency issues in public procurement, JULMA deals with public procurement issues in general. Both internet-based services are easy to handle and aim to provide the users with crucial up-to-date information needed in the day-to-day procurement routines. The Ministry of Trade and Industry also plans to publish later on the JULMA page information, including interpretations, of laws and directives concerning environmental issues and energy efficiency in public procurements and thereby to increase the actual knowledge-level of the officials dealing with public procurement. Also case studies or a manual on "green" procurement, that could give concrete examples on possibilities in applying energy efficient or environmental issues in the frame of national and EU legislation, would be of great help to public procurement actors.

### ***3.4 Energy Audits and Energy Saving Agreements***

Energy auditing has turned out to be an effective and successful measure in promoting energy conservation in buildings. The Ministry of Trade and Industry has supported energy auditing in buildings and processes on service and industrial sectors since 1992. The total subsidy on energy audits by the MTI during period 1992-2000 was 11.8 million EUR. The estimated cumulative savings in energy and water costs of the audited buildings during period 1992-2000 are over 170 million EUR. The cumulative savings in energy consumption over this period are approximately 4.3 TWh.

A substantial growth in energy auditing volumes started in 1998 and continued in year 2000. Crucial impact has been received from the comprehensive scheme of voluntary Energy Saving Agreements between the MTI and various end-use branches, and specifically from the energy intensive process industry that has begun auditing within this scheme. In year 2000, the number of energy audit projects compared to 1999 increased by 13 %. During period 1998-2000, 90% of the subsidies by the MTI have been granted to enterprises and municipalities within the Voluntary Agreement Scheme.

At the end of year 2000, a total of 3 274 statistically valid reports with almost 19 500 energy saving measures have been submitted. During the years 1995-2000, 1 920 energy audits representing total energy and water costs of approximately 270 million EUR were reported. The average saving potential is 13% or 37 million EUR, and the total investment of the proposed energy saving measures is about 109 million EUR.

Figure 13 gives an overview on the average heat-, electricity- and water saving potential based on 3 274 energy audits conducted during the period 1992-2000.

SECTOR	TOTAL SAVINGS	PAY-BACK TIME	INVEST-MENT	ENERGY SAVINGS						WATER SAVINGS	
				HEAT			ELECTRICITY			Water	Costs
				Energy	Costs		Energy	Costs			
					Energy	Perfor-mance		Energy	Perfor-mance	Water	Costs
Million EUR/yr	yr	Million EUR/yr	GWh/yr	Million EUR/yr	Million EUR/yr	GWh/yr	Million EUR/yr	Million EUR/yr	km3/yr	Million EUR/yr	
Municipalities	12.1	2.0	24.1	295	6.7	0.6	46.1	2.4	1.3	575	1.1
Private Sector	9.9	2.0	19.3	206	4.6	0.4	64.3	3.3	0.9	342.4	0.7
Industry	35	3.0	106	1557	22.2	0.8	235	7.7	1.8	11806	2.5
Energy sector	1.2	1.6	1.9	55.9	0.4	0	41.4	0.7	0	111.2	0.1
<b>TOTAL</b>	<b>58.2</b>	<b>2.6</b>	<b>151.3</b>	<b>2115</b>	<b>33.9</b>	<b>1.8</b>	<b>387</b>	<b>14.1</b>	<b>4</b>	<b>12834</b>	<b>4.4</b>

Figure 13: Summary report on heat-, electricity- and water saving potentials in 3 274 energy audited objects reported during years 1992-2000. (Source: Motiva, 2001)

Energy audits are a substantial part of the voluntary Energy Conservation Agreements between the Ministry of Trade and Industry and different sectors. The majority of the Energy Saving Agreements is valid until year 2005. The voluntary agreements offer the public and private sector an effective way to improve energy efficiency, to reduce environmental pollution and to save energy costs, and are at the same time an important policy tool for Government in implementing the national Energy Strategy. Through the Energy Saving Agreements conducted with different sectors, it is expected to achieve an average annual saving potential of 11 TWh total. Half of that will be realized by end of year 2010.

Until end of year 2000, Energy Saving Agreements were signed by the following sectors:

□ **Public Sector**

The Agreement covers 45% of municipalities' building stock and 35% of the Finnish population.

In addition to the municipalities' Energy Saving Agreements, the Real Estate Department and Real Estate Units of the State participate in a voluntary co-operation programme with similar goals, covering more than 95% of government building stock.

□ **Industry**

The Agreement covers 75% of industrial energy consumption.

□ **Energy Sector**

The Agreement covers 80% of electricity production, 60% of electricity distribution, and 60% of district heating sales.

□ **Estate- and Building Sector**

The Agreement covers 20% of the branch activities.

□ **Traffic- and Transport Sector**

The Agreement covers 10% of vehicles belonging to the members of the Finnish Lorry Association SKAL.

#### □ Oil Industry

Figure 14 summarizes the implementation path of voluntary Energy Saving Agreements in municipalities.

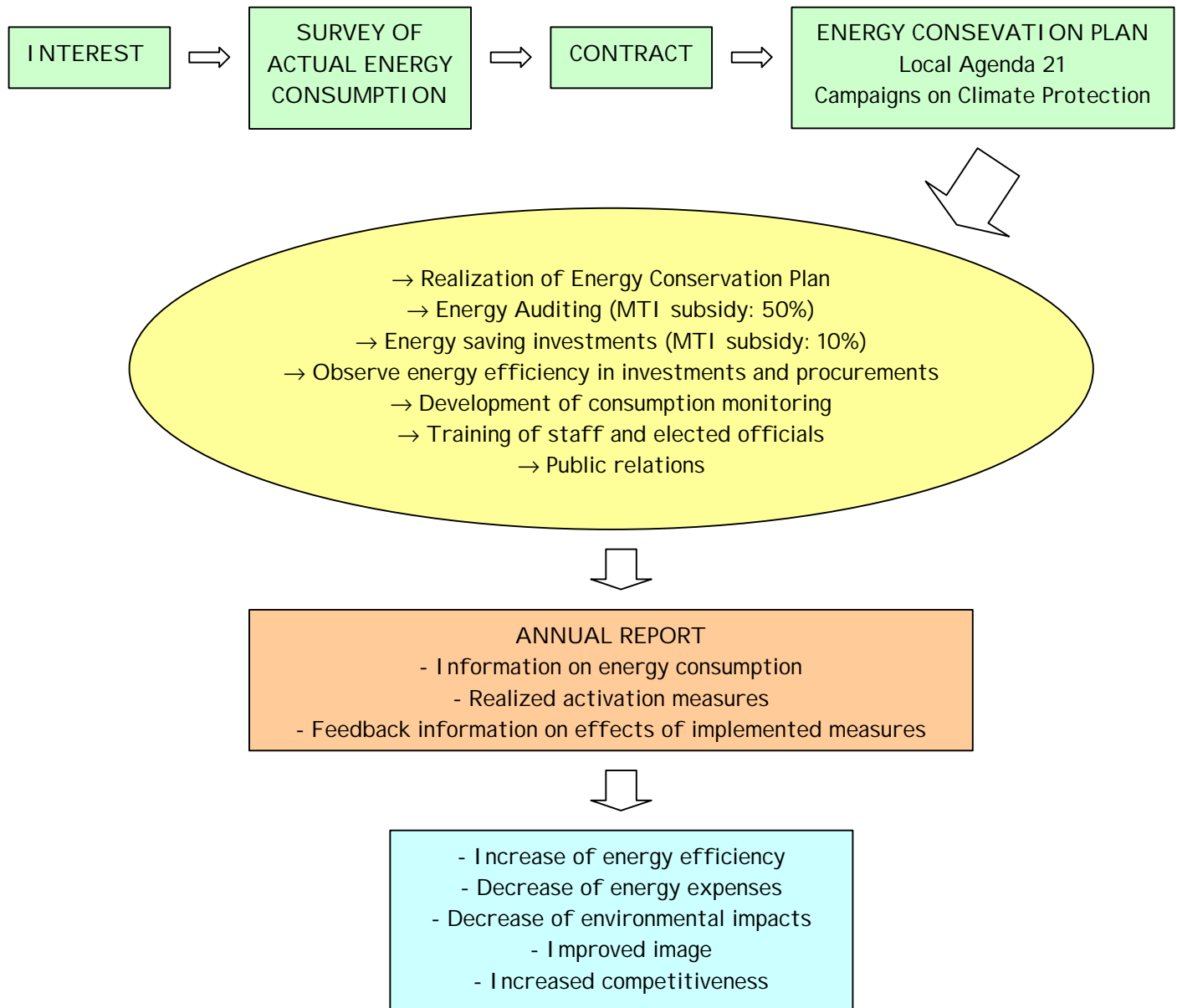


Figure 14: Schematic overview on the implementation of voluntary Energy Saving Agreements on Local government level.

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