

# The key role of competence development in energy efficiency policy implementation

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## Abstract

A multitude of measures are required to ensure that energy efficiency is realized throughout the society. One of the key prerequisites is energy efficiency competence.

Government's Decision on Energy Efficiency in February 2010 is based on energy efficiency committee's proposed measures commissioned by Ministry of Employment and the Economy. The measures will be launched in phases by 2020, with the aim of launching most of them in 2011. The objectives require a variety of effective measures and improved energy efficiency competence but also cross-disciplinary approach, broad-mindedness, foresight, and change in behaviour and values throughout the society. Competence is challenged in all sectors and levels of the society.

Measures toward energy efficiency competence are being launched by different stakeholders both in public and private sector. National core curricula for general and vocational education are being renewed and vocational and higher education institutions offer new programmes emphasizing energy efficiency. Life-long learning has become essential for today's workforce. The fastest measures to improve competence of the professionals are needed in work places. Several training initiatives and applications are already being carried out. Energy efficiency expert apprenticeship-type training for technical professionals with higher education has started in several technical universities. Construction sector has taken an active role and is, with the support of sector ministries, cooperating with education providers to improve their workforce's competence.

Service sector has introduced a new form of training so that their staff would meet new qualifications.

The challenge to ensure competence of the work force is great since competent educators are also needed in all sectors requiring a sizeable input both from private and public sector. Along with formal education in different levels and specific training of the workforce, there's also need for general knowledge and understanding of energy efficiency and its importance in the society.

## Introduction

The Finnish Government approved a new climate and energy strategy for the country in November 2008 with ambitious targets including detailed insights into climate and energy policy measures up to year 2020. According to the strategy the European Commission's proposed objectives regarding emissions reduction, promotion of renewable energy, and enhancing the energy efficiency, can only be attained with new, ambitious climate and energy policy measures.

The strategic objective set calls for halting the growth of energy end use. That means that energy end use efficiency must be increased by approximately 37 TWh (i.e. 11 %) by 2020, compared to the position if no new measures for increased energy efficiency were taken. Accordingly, the efficiency of electricity consumption must be increased by about 5 TWh. The longer-term vision aims to a further decrease in final energy consumption by 2050 of at least one third from the level of 2020.

In April 2008, the Ministry of Employment and the Economy (MEE) set up a broad-based committee to prepare energy saving and energy efficiency measures to meet the targets set

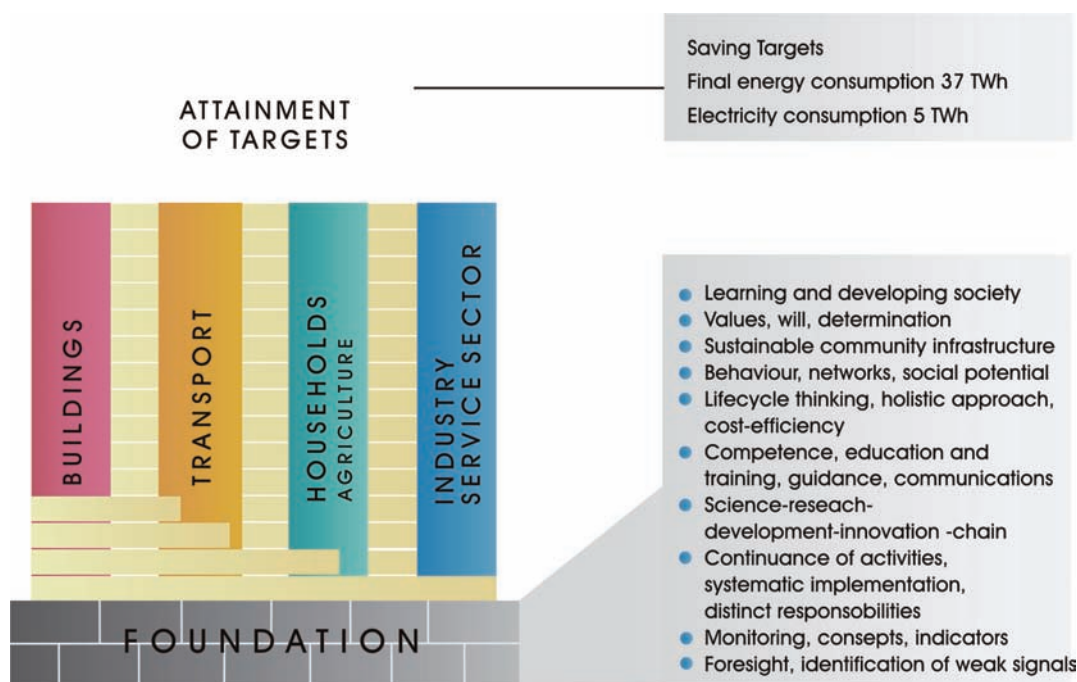


Figure 1. Foundation for energy efficiency activities.

in the long-term climate and energy strategy. The committee was, within one year's period, to assess and propose energy saving and energy efficiency measures necessary for various sectors in order to achieve the objectives, and suggest steering means by which to implement the measures. The proposed measures of this energy efficiency committee in addition to the targets for increased energy efficiency and policy lines of the climate and energy strategy, would form an overall energy saving and energy efficiency action plan. The main focus of the committee's work was in sectors not covered by the emissions trading scheme. (Ministry of Employment and the Economy, 2009)

The committee set up four sector-specific subcommittees to make concrete proposals for measures in their areas of operation. The subcommittees were for the sectors of buildings, transport, households (including education and agriculture), and industry and service sector. A fifth subcommittee, the organisation subcommittee, was set up to prepare the view on the organisation of state-implemented energy saving and energy efficiency measures in Finland. The committee and the subcommittees heard outside experts during their work. Altogether 130 people took actively part in the work.

The committee gave its report in June 2009. The report describes nearly 125 new or notably expanded energy saving and energy efficiency measures. According to the report, the set objectives can only be achieved by a combination of the proposed measures, and all the measures are necessary in order to reach the targets. Most measures will require further preparation before they are ready for implementation. At the same time along with energy saving and efficiency aspects, also other impacts will also be taken into account. Cost-efficiency was the key factor in the planning and implementation of measures. (Ministry of Employment and the Economy, 2009)

In February 2010, the Government passed a government decision on intensifying measures to enhance energy-efficiency

in the next few years. The Action Plan, to be implemented in 2010–2020, is based on the report by the Energy Efficiency Committee, with the aim at reaching the objectives set in the long-term climate and energy strategy. The measures included in the decision extend until 2020, but the main emphasis is on measures due for implementation in 2010–2011. (Ministry of Employment and the Economy, 2010)

The measures to enhance energy efficiency competence include consumer awareness raising and advice but also strong cross-disciplinary approach, broad-mindedness, foresight, and change in behaviour and values throughout the society. Energy efficiency vocational skills and competence are essential in all sectors and levels of the society. (Ministry of Employment and the Economy, 2010)

### Energy efficiency competence development

According to the government decision on energy efficiency the society as whole must undergo a fundamental change. Implementation of individual measures is not enough to meet the challenging objectives. There must be a range of conditions in place in order to attain the objectives: a foundation of measures. They are the broad-based and far-reaching foundation for all activities.

All the clusters of issues leading to better understanding of the importance of energy efficiency and developing the vocational skills and competence include elements to that direction, but the special weight is on the following:

- At its base, learning and developing society underpinned by values and strong will, making determined progress towards the targets.
- Behaviour and networks affecting it are of great importance with a view to the actions taken – social potential for energy efficiency is established.

- Maintaining expertise and developing it continuously by means of education, counselling and communication is an essential part of any activity.

(Ministry of Employment and the Economy, 2010)

#### PRIORITY AREAS OF ENERGY EFFICIENCY COMPETENCE

The government decision on energy efficiency determines the priority areas to improve competence in energy efficiency derived from the cluster of issues proposed by the energy efficiency committee:

- Including energy efficiency in the education programmes of educational institutions at all levels as part of education on climate change and the promotion of sustainable development.
- Ensuring the integration of energy efficiency and energy conservation skills in vocational additional and supplementary training in various fields.
- Maintaining expertise and developing it continuously by means of education, advice and communication as an essential part of any such activity.

Several measures have been launched already but those aiming to improved competence require longer preparation for actual systematic implementation. Consumer awareness raising and advice provision activities have been started through pilot projects throughout the country in the beginning of year 2010. The pilots lead the way to systematic organisation of consumer energy advice through national coordination centre.

#### EDUCATION FORMS THE BASIS

The key characteristics for Finnish education are quality, efficiency, equity and internationalisation. Education is regarded as the key to competitiveness. On national level the current priorities include raising the level of education and upgrade competencies among the population and the work force, im-

proving the efficiency of the education system, and enlarging adult learning opportunities. (National Board of Education, 2010)

Energy efficiency is integrated in all levels of education, from primary schools to universities. The core curricula of compulsory education already include sustainable development aspects, but still more weight in energy efficiency and impacts of energy consumption is needed at all levels. In continuing studies and vocational education energy efficiency issues appear mostly in those fields directly involved with energy.

Within basic and general upper secondary education the Finnish National Board of Education, responsible for drawing up the national core curricula, has started the renewal of core curricula for primary and upper secondary schools. The emphasis on energy, environmental and sustainable development issues in all levels is likely to be increased from the current level. Several European and national projects promoting energy efficiency in schools offer practical tools and examples how to integrate energy saving in different school subjects both in class room work and in monitoring and managing school's energy use. Learning by doing is becoming an integral part of energy education.

#### Vocational education meets the needs of the labour market

The National Board of Education has carried out a massive renewal within the framework for vocational qualifications and competence-based qualification during the past three years. The work has been done through national education and training committees with representation of sector authorities, employers' organisations, trade unions and student unions, tripartite bodies in each occupational field established by the Ministry of Education for three-year terms to develop vocational education and training. Energy efficiency and sustainable development have been integrated in the core curricula in all occupational fields in relation to their impact in energy use. Locally the curricula are approved and implemented by boards of education providers.

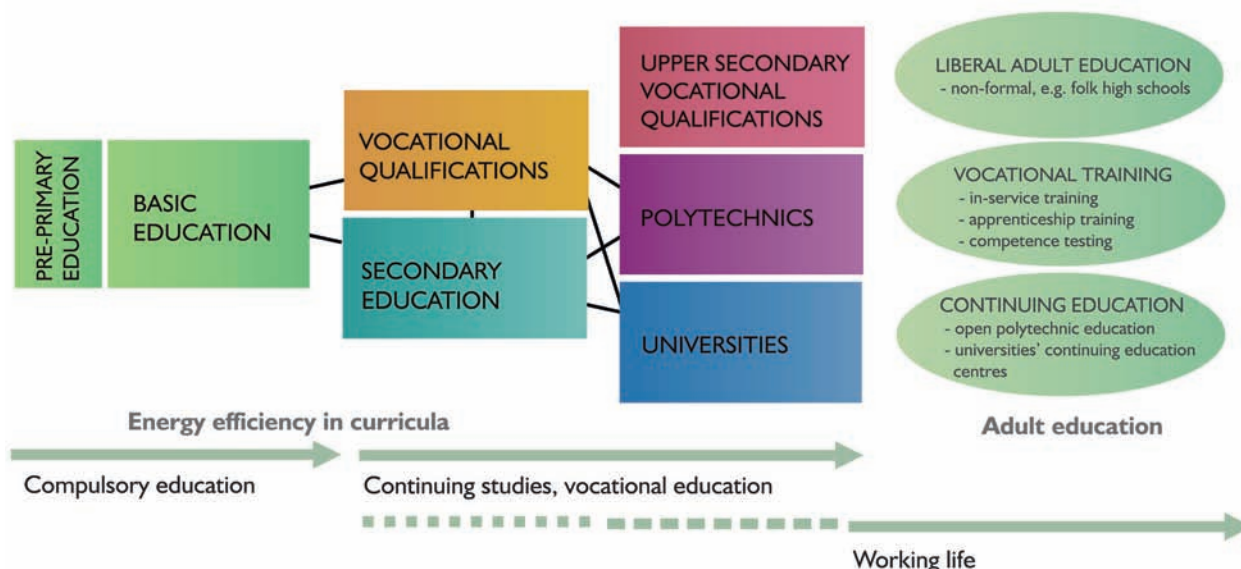


Figure 2. Finnish education system and energy efficiency therein.

Higher education is provided in universities and polytechnics (i.e. universities of applied sciences). Polytechnics give professionally oriented education and train professionals to meet the labour market and regional development needs. Several polytechnics have recently started new programmes emphasizing energy efficiency in different vocational fields. They also organise special training courses with apprenticeship-type training in cooperation with local authorities and companies to meet the urgent needs in their area. Training supply is well meeting the demand of working life as the courses are quite popular among workforce.

Universities are autonomous in provision of fields of education and provide energy education in different fields as degree programmes and post-graduate studies. Energy issues are today included also in the sustainable development teaching given as part of teacher education, which in Finland is a university-level programme for all teachers throughout the education system.

### TRAINING OF THE WORKFORCE

Life-long learning has become part of today's workforce. In order to improve energy efficiency competence of professionals measures are needed in work places. Their competence development and upgrading in energy efficiency leads in faster results as the measures toward energy efficiency need to be taken now. Several training initiatives and applications are already being carried out.

### Construction sector taking an active role

Construction sector for one is actively investing in energy efficiency competence development. Sector ministries, ministry of education and ministry of the environment (responsible for housing, building and planning) have taken an active role in support to secure the competence of the work force. Securing high quality of construction industry requires competent workforce and capability to adopt new operational models. The construction industry cooperates with education providers to ensure that teaching contents and methods are updated to meet the demand, and to improve the on-the-job-learning period of training programmes. (Ministry of the Environment, 2010.)

Buildings Regulations Department of the city of Oulu in northern Finland presents a good example of well managed energy efficiency work within buildings regulations issues. The Buildings Regulations Department in cooperation with University of Oulu Department of Architecture and Oulu University of Applied Sciences have started one-year continuing training of energy efficiency for building professionals, like architects, engineers, and planners in construction sector. Training consists of series of lectures, study tours, business contacts and on-the-job-learning. The training course provides qualified professionals for energy efficiency tasks for local industry and service sector. (City of Oulu, 2010.)

### Technical universities training energy efficiency experts

Three technical universities have in cooperation started energy efficiency expert apprenticeship-type training for technical professionals with higher education at the end of 2010. The one-year training constitutes of a series of lectures and apprenticeship-type training in their work place. Training

is offered to professionals working in engineering and consultant companies providing services to municipalities and industry.

### Industry and service sector investing in training and guidance

Companies in industry and service sector identify the competitive edge of energy efficiency competence in their business. The energy efficiency agreement parties are, as part of implementation of the agreement, training their staff also on green procurements in addition to energy efficiency aspects of their core business (Motiva Oy, 2010). Sector specific energy efficiency training and guidance is given to small and medium-sized companies throughout Finland.

A major hard-ware store chain is investing in energy efficiency training of their sales personnel. Also, a household appliance retail chain has in cooperation with a training institute carried out "energy passport" training concept constituting training and related test on energy aspects of appliances. All the sales people of the retail chain have been trained and passed tests. The energy passport training concept is part of the company's development programme. The concept will be multiplied and adapted to other household appliance retailers too.

### AWARENESS RAISING AND NON-FORMAL EDUCATION

In addition to formal education and training of the work force there's also need for general knowledge and understanding of energy efficiency and its importance among the consumers. Several organisations throughout country provide advice to consumers on energy saving and energy efficiency. Ministry of employment and the economy has appointed Motiva as national coordinator of consumer energy advice. The aim is to develop a permanent system to provide consumers with advice on energy-related matters. The system is being developed based on the experiences of past and current experiences of energy advice pilot projects and the similar systems in other European countries. (Motiva Oy, 2010.)

Liberal adult education providers organise courses on variety of topics (e.g. cooking, housekeeping, renovation, travel), where they include also energy saving issues. Several civic organisations are active in provision of guidance, training courses and practical tips to better energy efficiency.

### Assessment of the measures

A variety of measures are already being taken and more are under development. The impact of measures will be gradual and therefore continuous effort must be invested in their implementation. Those measures targeted for implementation in the latter part of the decade are already underway in development process. Examples and pilots of current measures and their compatibility must be monitored to ensure that all measures taken are effective both economically and in terms of energy efficiency.

Estimation is that measures proposed by the Energy Efficiency Committee will add up in achieving the 37 TWh (i.e. 11 %) objective in 2020 set in the climate and energy strategy. Moreover, there are a number of measures for which no conservation figures can be calculated. Using average emission coefficients for calculations, the energy saved is equivalent to over



9 million tons of carbon dioxide in 2020. It is estimated that the early phase measures will amount to approximately one half of the estimated total impact by the end of 2011. (Ministry of Employment and the Economy, 2010.)

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