



European Construction Sector Observatory

Policy measure fact sheet

Estonia

Public Sector Building Renovation Project

Thematic Objective 3

November 2019



In a nutshell

Implementing body	Ministry of Finance & Riigi Kinnisvara Aktsiaselts - RKAS (Estonian State Real Estate Ltd)
Key features & objectives	A national project to make public buildings more energy efficient. Delivery of 543 public building renovation projects across Estonia.
Implementation date	2010-2013
Targeted beneficiaries	State & local administration, municipalities (Education, Government Offices, Health, Public buildings)
Targeted sub-sectors	Public sector
Budget (EUR)	165.65 million ¹
Good practice	★★★★☆
Transferability	★★★★☆

Since the restoration of independence in 1991, the building sector has been among the main priorities for energy efficiency policy in Estonia². Although most policy measures were directed mainly towards the increase of energy efficiency in private households³, the available funds from emissions trading under the Kyoto Protocol were redirected towards renovation of public buildings across the country⁴.

Estonia ratified the Kyoto Protocol in 2002⁵. In the line with that protocol, the Government subsequently approved the National Programme for Reducing Greenhouse Gas Emissions in 2004⁶, with the aim of reducing emissions between 2008 and 2012 by 8%, compared to 1990, which was taken as a base year⁷.

To achieve this aim, in tandem with the use of the Joint Implementation Mechanism⁸, the Government decided to sell the excess of Assigned Amount Units (AAUs) and invest the profit in national environmentally-friendly projects through the Green Investment Scheme (GIS) in 2009. Whereas the Joint Implementation (JI) is a 'project-

based mechanism' that provides parties with a cost-efficient means to reduce greenhouse gas emissions, Emissions Trading (ET) does not achieve real reductions in emissions. Instead, ET enables Estonia to meet its reduction obligations by trading emission units with other countries⁹.

According to the Kyoto Protocol, an Assigned Amount Unit (AAU) transaction under the Green Investment System (GIS) is a combination of international emissions trading and greening investments, which involve the implementation of green projects in the seller country using the proceeds of the AAU sale. Greening activities are not covered by any international regulation. Instead, they take the form of a contractual obligation of the seller country vis-à-vis the buyer country to fulfil certain conditions set forth in their GIS agreement¹⁰.

Between 2010 and 2013, the Estonian Ministry of the Environment negotiated and signed 22 AAU Sale and Purchase Agreements (SPA) with several countries¹¹. In total, Estonia concluded seven agreements with Austria, Spain and Luxembourg, and 15 agreements with different Japanese companies, with a total revenue of EUR 392.6 million¹².

The revenue generated from the sale of surplus AAUs was invested in the following environmentally-friendly projects in Estonia:

- Building renovations (including thermal renovations);
- Efficient and environmentally benign transport;
- Development of wind energy farms;
- Efficiency improvements and the wider use of renewables in the district heating sector¹³.

The Public Sector Building Renovation Project proved to be particularly successful, due to the high number of public buildings (543) across the country that were renovated within a short period of time (4 years), and the overall reduction in energy consumption and CO₂ emissions that was achieved.

The total floor area of public sector buildings in Estonia covers more than 9 million square metres.

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That equates to more than 6.7% of the total floor area of all buildings in the country. In addition, the maintenance and operational costs associated with the use of public buildings account for a significant share of the state budget¹⁴. Public building renovations provided a good opportunity to reduce their overall energy consumption and their maintenance costs¹⁵.

Public Sector Building Renovation Project

Although the project produced very positive results, there are some aspects that should be evaluated to inform future projects, such as sustainability in renovation projects, the value of energy certificates and the need for comprehensive and comparable data management on building renovations.

1.

General description

The renovation of public buildings was planned to be carried out between 2010 and 2013. To select public buildings for renovation, a detailed catalogue of planned projects and programmes was developed. It included the corresponding number of AAUs to be sold in order to finance each programme/project type¹⁶.

All renovation planning aspects, including implementation schedules, were determined by Sale and Purchase Agreements (SPAs). In July 2010 the first SPA was concluded with the Japanese Sumitomo Mitsui Banking Corporation. That SPA subsequently enabled the energy efficient renovation of public buildings such as schools, kindergartens, hospitals, and government and municipal buildings¹⁷.

The Public Sector Building Renovation Project was designed in accordance with the Conditions and Procedures for the Use of Proceeds from the National Emission Allowance Trading Scheme¹⁸.

For each renovation, a list of activities was proposed. Each list was accompanied by a brief description of the proposed work, the project implementation timetable and a detailed cost estimate¹⁹.

Up to 100% of eligible costs were covered, including:

- Insulation;
- Replacement of doors and windows;
- Heating and ventilation system upgrades;
- Use of new environmentally-friendly technical systems: ground and air heat pumps; solar panels; remote automated systems and others;
- Service-related costs such as construction studies and expertise, and design and supervision;

- Essential other costs that are intricately linked to the overall investment, including management, finance, etc²⁰.

All beneficiaries were required to fulfil a number of conditions during the implementation phase:

- To implement the project within the deadlines and to the extent specified in the investment plan;
- To submit to the Ministry or its designated auditor or other person all required information, documents and reports;
- To provide the Ministry, or a person designated by the Ministry, with access to the buildings covered by the project so that they may verify the progress of the renovation work, its consistency with the investment plan, achievement of the energy saving objectives, and the correctness of the works' accounts;
- To pay back any non-eligible costs;
- To provide information on the annual energy consumption of the renovated building by the end of each year during the eligibility period²¹.

All public building renovation work was done in adherence with Estonian Regulations on the Minimum Energy Performance Requirements for Buildings (Energiatõhususe miinimumnõuded), which was reinforced in 2009²².

Based on these regulations, several norms had to be applied to all renovation activities in order to increase energy efficiency. First, as a rule, heat transmission within the building envelope cannot exceed the value of 0.5 W/(m²·K). Second, heat transmission through the outer shell (envelope) of the building must be 1.0 W/(m²·K) or lower (calculated per floor space of heated rooms). Third, for small houses, the maximum heat transfer values for the building shell are fixed, especially for public buildings, and the impact of internal indirect sources of heat may play an important role²³.

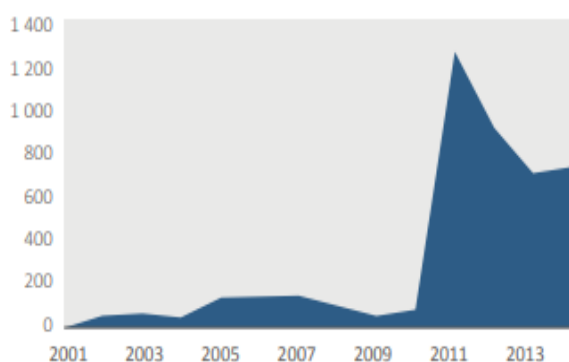
2.

Achieved or expected results

All procurement procedures related to project implementation were organised by RKAS (Riigi Kinnisvara Aktsiaselts / Estonian State Real Estate Ltd) – the agency that co-implemented the project in collaboration with the Ministry of Finance.

Figure 1 shows the number of procurements organised by RKAS. 2011 was the busiest year for the agency, which oversaw 1,200 public procurements. That is 500 procurements more than the agency had organised throughout the first ten years of its operations²⁴.

Figure 1: Number of procurements



Source: RKAS Annual Report, 2014²⁵

A total of 543 contracts were awarded to service the renovation of public buildings in Estonia, as a result of the procurement procedures. 86 applications were accepted in 2010, 404 were accepted in 2011 and 53 were accepted in 2013²⁶.

To manage the increasing workload, RKAS developed its asset management control and electronic procurement systems²⁷. To prepare the necessary project documentation on energy efficiency, RKAS actively cooperated with Tallinn University of Technology and other higher education institutions in Estonia²⁸.

Over the course of the project, 543 public sector buildings were renovated across Estonia. As shown in Table 1, nearly half of the renovations were carried out on educational buildings, such as

schools or kindergartens, followed by government buildings.

Table 1: Total Number of Renovated Buildings 2010-2013

Building type	Total number of renovated buildings
Schools and kindergartens	224
Government buildings	147
Cultural buildings	71
Social houses	50
Healthcare establishments	25
Other public sector buildings	26
Total	543

Source: ODYSSEE – MURE, 2016²⁹

Table 2 lists the number of renovations conducted per county and year. Almost half of all of the buildings renovated are located in Estonia's three largest counties, in terms of population: Harju, Ida-Viru and Tartu. However, renovation activities were well balanced across different regions and towns in Estonia.

Table 2: Number of renovations per county and year

Counties	2011- 2012	2013	Totals
Harju	120	12	132
Ida-Viru	63	6	69
Tartu	50	2	52
Pärnu	34	4	38
Lääne-Viru	30	5	35
Hiiu	9	2	11
Lääne	26	2	28
Jõgeva	25	1	26
Saaremaa	21	5	26
Järva	23	2	25
Rapla	20	4	24
Valga	22	1	23
Viljandi	17	2	19
Võru	14	3	17

Counties	2011- 2012	2013	Totals
Põlva	14	2	16
Other	2		2
Totals	490	53	543

Source: Roos, 2019³⁰

The nature of the renovation activities implemented varied from one project to another. As a consequence, the renovation cost per building also varied, and in some cases, by a large margin.

The variety of projects implemented ranged, for example, from a large-scale EUR 5.9 million renovation of a university library to a small-scale EUR 1,500 renovation of a small forestry centre. Overall however, the average renovation cost was estimated to be EUR 254,000 per building³¹.

Regardless of the complexity of some projects, all renovation works were performed on time, as specified in the sales contracts. Most renovation activities took two years to complete, with the exception of public buildings that were selected for renovation in 2013. Those buildings were renovated within one year³².

Table 3 shows the energy saving and emission reduction achievements of the Public Sector Building Renovation Project.

As a result of the project, the renovated public buildings were estimated to achieve annual energy savings of 45 GWh (13.3%). However, the actual savings recorded in 2013 were 59 GWh (212.4 TJ). The renovation work has therefore

achieved a 17.5% reduction in the total energy consumption of those public buildings³³.

The reduction of CO₂ emissions was an estimation based on the amount of saved energy and average emission coefficients to produce heat and electricity.

By 2013, the project had achieved an annual reduction in CO₂ emissions, in relation to the energy saving of 59 GWh, equivalent to 36.2 thousand tonnes of CO₂eq³⁴. The renovation work has therefore achieved a 16.3% reduction in the total CO₂ emissions equivalent for those public buildings.

Table 3: Energy Saving and Emission Reduction

Year/Savings	Energy/GWh	CO ₂ / kt CO ₂ eqv.
2009	338	222.0
2013	279	185.8
Saving	59	36.2
Saving %	17.5%	16.3%

Source: Roos, 2018³⁵

Overall, the project has achieved considerable success, completing the renovation of 543 public buildings in just four years, delivering significant energy savings and CO₂ emissions reductions, and making a substantial contribution to Estonia's climate and environmental commitments and targets.

3.

Perspectives and lessons learned

The implementation and outcomes of the Public Sector Building Renovation Project can be regarded as highly successful, given the total number of building renovations that have been completed across the country within a short period of time. Three major achievements stand out. First, renovated buildings are more energy efficient and, therefore reduce CO₂ emissions. Second, renovated buildings have reduced maintenance costs that require less money from the state and municipal budgets. Third, renovation activities have provided an additional boost to the construction industry in the post-financial crisis years in Estonia³⁶.

There are, however, a number of issues that should be evaluated prior to launching future projects, such as the sustainability of renovation projects, the use and value of energy certificates, and the need for comprehensive and comparable data management on renovated buildings.

Government measures on energy efficiency have mainly concentrated on building renovations, without placing enough emphasis, in some cases, on the need for sustainable building renovations. Although the Estonian state audit on the renovation of public buildings was not conducted until 2018, the Estonian National Audit Office did raise some concerns about sustainability issues in 2012. They noticed that in the case of some school renovation projects, “the choice of these sites was not determined by the sustainability of the schools, but primarily by the projected energy savings and the expected reduction in CO₂ emissions from the projected savings³⁷.”

Similarly, in 2018, the Estonian National Audit Office concluded that, especially in the case of municipal governments that seek support from the state for public building renovations, the issue of sustainability needs to be taken seriously. “When planning investments for renovating buildings, local governments should first decide which

buildings they plan to use in the long term, and optimise the use of the buildings before making any investments³⁸.”

The lack of energy performance certificates issued is another issue. This was the case in many instances, even if renovation activities followed the Regulation of the Government Minimum Requirements for Energy Performance of Buildings. To date, only 62% of Estonian public buildings have energy efficiency certificates³⁹. According to the National Audit Office, “many public buildings have no energy performance certificates and their energy consumption and condition are unknown⁴⁰.” In the case of local government buildings, 49% of those buildings do not have the energy performance certificate required for the assessment of energy consumption. That means that the energy consumption and energy efficiency of these buildings are unknown quantities⁴¹.

A comprehensive overview of the energy consumption and condition of public buildings, based on comparable indicators in Estonia is also missing. For example, many buildings with energy performance certificates are not energy efficient⁴². Based on a study prepared for DG CLIMA, the assessment of outcomes of energy efficiency measures has not been developed in Estonia. There are no nationally applicable indicators to allow the measurement of energy efficiency in different sectors. The assessment of measures and programmes is done on a case-by-case basis, using expert opinions and the methods developed by the Commission⁴³.

The Estonian National Audit Office points out that existing data in the State Property Register does not allow for a comprehensive overview of building conditions across the entire public sector. This data is needed to support informed decision-making on building renovations, reconstruction and financing⁴⁴.

4.

Conclusion and recommendations

The completion of 543 public building renovation projects over a 4-year period and the achievement of significant energy savings and CO₂ emissions reductions are evidence that the Public Sector Building Renovation Project was highly successful.

In addition to reducing the energy and carbon footprint of a large number of public buildings across Estonia, the project has also delivered other important benefits. The renovation work has helped to lower the overall cost of maintaining those buildings in the long-term. The project has helped to provide a platform upon which to inform and motivate future renovation projects. It has highlighted a number of areas for improvement in relation to energy efficiency in buildings, which should lead to further development and progress. It also provided a boost to the domestic construction sector, at a time of rapid decline, in the years that followed the financial crisis.

To improve renovation activities in Estonia and to inform future plans and projects, in relation to public sector building renovations in particular, three main recommendations are suggested:

- Assessment standards should be further developed to improve renovation quality. In particular, energy certificates need to reflect the actual energy used and saved;
- Comparable indicators for energy efficiency in public buildings should be developed and used nationwide. Particular attention should be given to developing comparable data on the condition and energy efficiency of state and local government buildings. This would help to inform better decision-making;

- Energy audits should be implemented as an integral part of the project implementation lifecycle.

On a scale of 1 (low) and 5 (high) stars, the Public Sector Building Renovation Project is considered to be a 4-star 'good practice' measure.

This rating is based on the fact that the project was successfully implemented on time and as planned. It achieved substantial results in a short timeframe (543 renovations in 4 years) and it delivered important impact and benefits (energy savings, emissions reductions, lower maintenance costs). It is not quite a 5-star 'good practice' however, because there were a number of missing elements (sustainable renovation approach, effective use of energy certificates and audits, comparable indicators) which would have helped to maximise the impact and value of the project.

On a scale of 1 (low) and 5 (high) stars, the Public Sector Building Renovation Project is considered to be a 4-star 'transferable' measure.

The reasons for not awarding a 5-star rating are similar to the previous score on 'good practice'. Other countries may be particularly interested to learn how this project managed to successfully attract, select, fund/support and complete such a large and varied number of public building renovation projects in such a short timeframe. Indeed, if the improvements suggested in this section are already in place in another country or region, this type of project approach could potentially be used to achieve very sizeable results.

Endnotes

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