

CROATIA

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Background

National context, strategy, key measures and results in 2021

- **General strategy:** Alternative measures + EEOS
- **Baseline annual Final Energy Consumption¹** (averaged over 2016-2018): 6,803.8 ktoe/year (source: [NECP](#) – Annex II)
- **Cumulative energy savings target for 2021-2030: 4,313.6 ktoe** (source: [draft NECP update](#))
- **Expected total annual energy savings in 2030: 932.1 ktoe/year** (source: [draft NECP update](#))
- **Achieved new annual savings (all measures) = 70.2 ktoe/year in 2021, 47.1 ktoe/year in 2022, 57.7 ktoe/year in 2023** (source: NECPR2025),

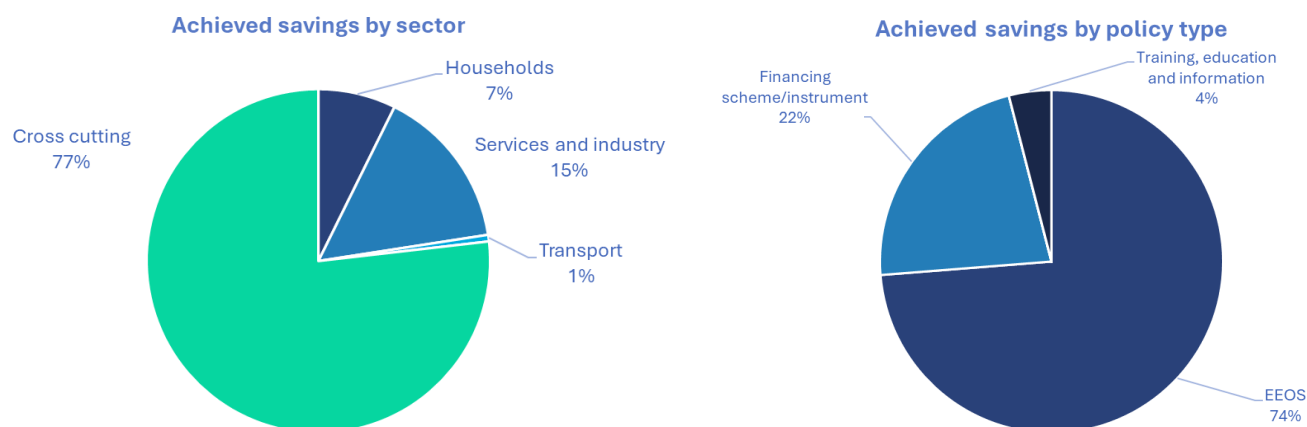
% of new annual savings vs. baseline energy consumption = 1.03 % in 2021), 0.8% in 2023

slow start: many policy measures were only adopted in 2021, while projects started to generate savings in the following years; EEOS heavily relies on short lifetime measures, which might require to compensate with more savings in next years

¹ For more details about trends in energy consumption and energy efficiency, see the country profiles by ODYSSEE-MURE: <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles>



- **Distribution of annual savings achieved in 2021**



Source: own graph from data available in NECPR2025

The graphs above illustrate the distribution of new annual energy savings by sector and policy type. The cross-cutting measures include the Energy Efficiency Obligation Scheme (EEOS), which encompasses various actions carried out by obligated parties across multiple sectors. A more detailed breakdown of individual EEOS actions is provided in the next section. Croatia's alternative policy measures (AM) primarily consist of grant-based financing schemes that support energy renovation in buildings and the implementation of energy efficiency measures in industries. The third policy type shown in the graphs falls under informational measures, specifically a comprehensive energy management system that includes ongoing educational activities for public sector employees. However, the reported savings for this measure remain preliminary estimates.

- **Top5 policy measures (based on annual savings in 2021)**

Name of the measure	Sector	Policy type	% savings in 2021
Energy Efficiency Obligation Scheme	Cross-cutting	Regulatory	76.8
Programme for energy renovation of family houses	Households	Financing scheme	6.1
Programme for energy renovation of public sector buildings	Services	Financing scheme	5.7
EE and RES in manufacturing industries	Industry	Financing scheme	5.2
Energy Management System in the public sector	Services	Training, education and information	4.2

Key points, changes vs. 2014-2020 and other recent developments

Croatia's energy savings targets under Articles 7 and 8 of the Energy Efficiency Directive (EED) increased significantly for the 2021–2030 period compared to 2014–2020. An analysis of achievements from 2014 to 2020 showed that the Energy Efficiency Obligation Scheme (EEOS) delivered greater savings than Alternative Measures (AM). As a result, legal changes introduced in 2021 adjusted the contribution shares of EEOS and AM from 50:50 (2014–2020) to 70:30 (2021–2030). However, the situation changed due to the COVID-19 pandemic, earthquakes, and the energy crisis, which significantly impacted energy markets. At the same time, new funding from the Recovery and Resilience Fund and RePowerEU was directed towards energy efficiency improvements, primarily through energy renovation programs for public and residential buildings. These programs became the most important AM for achieving Article 8 targets. Approx. 2 billion € will be invested in energy renovation of buildings, bearing in mind that the large share of that

investments are needed for restoration of buildings damaged in 2020 earthquakes. Consequently, the updated National Energy and Climate Plan (NECP) and legal framework amendments restored the EEOS and AM contribution shares to 50:50.

However, it is important to highlight that AM had a slower start, as 2021 was primarily dedicated to programme design, with implementation beginning in 2022. This explains the significant imbalance in annual savings achieved in 2021, as shown in the table above. When examining the cumulative savings for the 2021–2023 period, the contribution of policy measures changes significantly. In addition to the delayed start of AM, this shift is also due to the EEOS focusing on simpler actions with short lifetimes of one to two years. Therefore, it is worthwhile to highlight the top five policy measures based on cumulative savings, as shown in the table below.

- **Top5 policy measures** (based on cumulative savings in 2021-2023)

Name of the measure	Sector	Policy type	% savings in 2021-2023
Energy Efficiency Obligation Scheme	Cross-cutting	Regulatory	50.6
Programme for energy renovation of family houses	Households	Financing scheme	24.0
Programme for energy renovation of public sector buildings	Services	Financing scheme	6.1
EE and RES in manufacturing industries	Industry	Financing scheme	15.6
Energy Management System in the public sector	Services	Training, education and information	1.2

Focus on energy poverty

- **Energy poverty in the country:** 12.2 % of the households, which equals to 175,124

The share of households in energy poverty is determined using the indicators from EU-SILC survey data (Statistics on Income and Living Conditions) and using the average data as determined in the Article 8(3) EED (source: [final NECP update](#))

- **Energy poverty target (Article 8(3) EED):** not mentioned in the final NECP update
- **Art.8 policy measures targeting energy poverty:**

Name of the measure	Policy type	% savings in 2021 (2023)	% 'energy poverty' savings in the measure
UET-9 Adoption and implementation of the Energy Poverty Reduction Program and the Mobility Poverty Reduction Program	Information Financing scheme	/	/
UET-10 Implementation of the Program for Combating Energy Poverty, which includes the use of renewable energy sources in residential buildings in assisted areas and areas of special state concern for the period until 2025	Financing scheme	/ (0.37%)	/ (100%)
ENU-4 Energy renovation program for family houses	Financing scheme	6.39% (12.37%)	3.36% (0.23%)

Source: final NECP update, NECPR2023, NECPR2025

Notes:

1) Measure UET-9 has not been yet adopted, hence its effects could not be determined.

2) Measures UET-10 started to deliver energy savings in 2023, hence data are given for this year, in line with NECPR2025. The % provided represents the share of savings generated by UET-10 in total annual savings achieved in 2023 by all implemented measures. UET-10 is completely focused on energy poverty (i.e. social housing, with citizens at risk of energy poverty as residents in the renovated multiapartment buildings); hence the share of 'energy poverty' saving is 100%.

3) The family house renovation programme includes a dedicated component for citizens at risk of energy poverty, providing 100% financing for energy efficiency upgrades in homes they own and occupy. The column before the last shows the contribution of the whole programme to overall new annual energy savings achieved in 2021 and 2023. The last column shows the portion of the programme's savings specifically related to energy poverty measures in each year. The decrease of the contribution is the result of the fact that the public call for citizens at the risk of energy poverty was lastly announced in 2020, with projects being implemented dominantly in 2021. In the meantime, there were new public calls for energy renovation of family homes for citizens not at risk of energy poverty, hence the increase in the overall contribution of the programme.

EEOS – Energy Efficiency Obligation Scheme

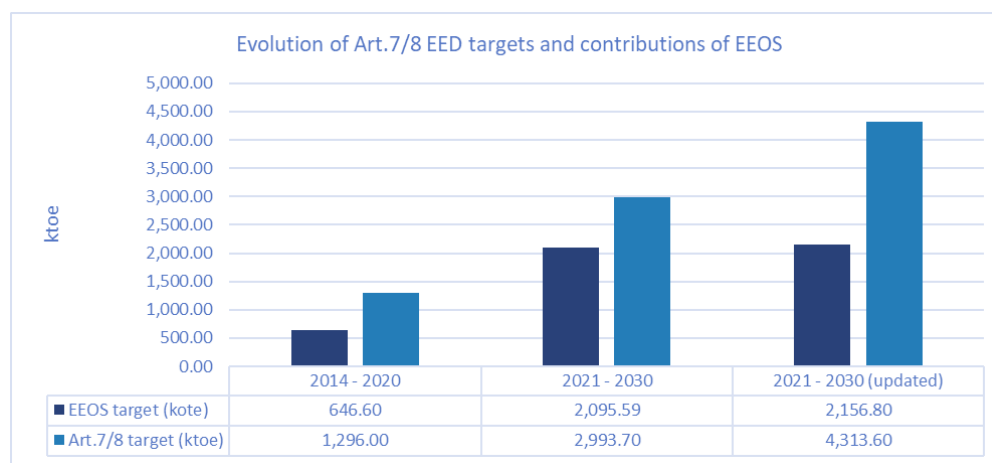
History

Starting year: 2019 (with eligibility of savings from 2014)

Latest revision: 2025 (updated targets for period 2021-2030 based on new EED and updated NECP)

Cumulative energy savings reported to Art.7 EED for 2014-2020: 595.5 ktoe (i.e. 46 % of Croatia's cumulative savings for 2014-2020, which was 1,296 ktoe)

Current target: 2,156.8 ktoe (2021 -2030) **Expected contribution to 2021-2030 obligation for Art. 8 EED:** 50 %



Key actors and roles

Public authorities: The Ministry of Economy is responsible for adopting the regulatory framework related to the EEOS. Within the Ministry, the National Energy Efficiency Authority is responsible for the overall management of the EEOS. Annually, the Authority issues the decisions on obligatory annual savings (calculated based on the average sales in year x-2), the decisions on achieved annual and cumulative energy savings (based on the control of reported savings by the OPs) and reports on the achievements in line with the requirements of the EE Act. It also manages the monitoring and verification platform for energy savings (SMiV).

In case of non-compliance, the Ministry issues the decision for the OP to pay a fee to the Environmental Protection and Energy Efficiency Fund. The Fund is obliged to use the gathered

Obligated parties: OPs are energy suppliers of electricity, natural gas, heat and oil products. Since 2021, suppliers with annual sales higher than 50 GWh are OPs, while those with lower annual sales are exempted from the obligation.

There were 43 individual OPs in 2023, however some of them are part of the same integrated companies, hence are treated as one OP, reducing this number to 37. The largest number of OPs are gas suppliers (44%), followed by oil products' suppliers (37%), electricity (12%) and heat suppliers (7%).

Around 50% of the total annual obligation is on oil products' suppliers, with around 50% being the obligation of one company. A similar situation is in electricity, where around 88% of the obligation is on one company, while in the

financial means to co-finance alternative measures.

gas sector, around 37% of the obligation for that sector rests on one company.

These three companies carry together around 57% of the total obligation and is a clear reflection of the energy markets in Croatia.

Other key stakeholders: OPs may purchase savings from any third party, including energy service providers (see 'Flexibilities' below).

Target setting and allocation

Size: The EEOS target is based on the overall Art.8 target and the estimated expected contribution of alternative measures (as of 2025, the contribution of EEOS is 50%).

Metric: Annual final energy savings and lifetime cumulative final energy savings (with decrease of savings during the lifetime).

Period: Annual targets for OPs are determined each year and the cumulative target for 2021-2030 is determined for each OP in 2021, based on the sales in the period 2016 - 2018 and EED methodology.

Scope: The annual target of each OP is based on the sales in the year x-2 and a savings rate of 0.8%; possible exemptions for the baseline (sales to ETS facilities, to district heating systems or for auxiliary services in the power system, including electric vehicle charging).

Allocation rules: Annual target determined according to annual sales in the year x-2

Sub-target related to energy poverty: No

Other sub-target(s): No

Eligible actions

Eligible sectors: All end-use sectors

Eligibility criteria: All energy efficiency actions which lead to final energy savings are considered eligible, given that savings are determined by the authorised expert.

Possibility to cumulate EEOS with incentives from other schemes: No, if these schemes are determined as alternative policy measures under Art.8 EED; otherwise yes.

Standardised actions or methods: Defined in the Ordinance on Monitoring, Measurement and Verification of Energy Savings (last updated in 2023); there are 31 standardised actions with defined calculation methods.

Non-standardised actions: Non-standardised actions are allowed, but energy savings calculation methods must be clearly elaborated in a study (elaborate) on energy savings, which must be prepared by authorised experts (licensed design engineers or energy auditors); in these cases, mostly metered data and IPMVP principles are used, but are not prescribed as obligatory.

Other eligible actions or programmes: No

Incentives (including about tackling energy poverty) and restrictions

Uplifts / bonus related to energy poverty or priority group(s): Yes. Obligated parties may increase their achieved savings from a specific action, if that action is performed in areas under special state care, i.e. underdeveloped areas (10%), to vulnerable customers (20%), or a combination thereof (30%).

Caps / maximum limits: No.

Flexibilities

Trading: Bilateral

Banking and borrowing: Both allowed

Obligated parties may purchase savings from any third party, including energy service providers. For that purpose, energy savings must be determined in a study (elaborate) on energy savings, which must be prepared by an authorised expert (licensed design engineers or energy auditors). The authorised expert calculates energy savings and is obligated to attach all the evidence that proves that the measures have been implemented, as well as the input data used for the energy savings calculation. Authorised experts are responsible for the validity of data and savings and guarantees them with their signature.

There is no organised market for energy savings, and trading occurs on a bilateral basis. Banking and borrowing is allowed – the Ordinance on Monitoring, Measurement and Verification of Energy Savings prescribes that the new annual energy savings achieved in a given year can be presented by the OPs as if they were achieved in any of the four previous or three following years within the same cumulation period, taking into account the lifetime of the measure.

Buyout price / substitution fee: Allowed.

OPs may fulfil their savings obligation, in whole or in part, as a contribution to Environmental Protection and Energy Efficiency Fund. The fee is prescribed by the Act on Energy Efficiency and is corrected annually for inflation (between 2021 and 2024, the annual fee rose from 0.1593 €/kWh to 0.1963 €/kWh). There are no limits to the use of this fee, as it is rather high. Namely, the same fee is used as a mandatory penalty to the obligated parties that have not fulfilled their annual obligation. OPs usually fulfil their obligation by their own actions or purchase of energy savings, hence the payments to the Fund are rare.

Evaluation, Monitoring & Verification

Materiality requirements: The input values used in calculation formulas, as well as proof that the action is implemented, are mandatory and part of obligatory study (elaborate) on energy savings. All actions must have material proof of implementation. The Ordinance on Monitoring, Measurement and Verification of Energy Savings prescribes for each standardised measure what evidence needs to be delivered.

Additionality requirements: Additionality is ensured through the Ordinance on Monitoring, Measurement and Verification of Energy Savings where, for standardised measures, reference values and minimal values, where appropriate, are prescribed.

Calculation methods: The Ordinance on Monitoring, Measurement and Verification of Energy Savings defines bottom-up methodologies for the calculation of energy savings from different eligible actions. These are based on the use of reference values for well-known typical, individual

actions (standardised measures), i.e. the deemed savings approach is used. However, the Ordinance prescribes that, whenever possible, real project-specific data are used as an input in defined calculation formulas (scaled savings). In practice, this provision is widely applied, as independent experts calculate savings using inputs from relevant project documentation. For non-standardised actions, calculation methods need to be elaborated by the authorised expert. They are usually based on engineering estimates (scaled savings) and, when appropriate, metered data (especially in case of large-scale industrial projects) (measured savings).

Reporting and validation: OPs are obligated to report on achieved savings by 15th February of the current year for the previous year. The reporting is enabled through the IT platform for M&V (SMiV). For each action reported, the study (elaborate) on energy savings, prepared by authorised expert independent from OP and containing all evidence about the implementation of the action, must be submitted. Energy service providers are also required to report to SMiV on actions they have implemented and have transferred (sold) to the OPs.

Online platform to report actions: Yes **Automatized checks:** No

Progress monitoring: The Ministry checks the achievement of annual targets for OPs and issues the decision on the new energy savings achieved (accepted). This is done annually. The Ministry also monitors the contribution to the cumulative energy savings for each OP. Their cumulative targets are set for the period 2021 - 2030 and the Ministry informs them each year on the current level of achieved cumulative energy savings. The IT system for M&V (SMiV) does not have a feature for progress monitoring. However, OPs may see the whole list of their measures reported to SMiV, with amounts of annual and cumulative savings, for their own monitoring purposes.

Other verifications and controls: the OPs must submit a study (elaborate) on energy savings for each reported action. The aim of the study is to provide independent verification of implementation and savings. This way, a first level verification and control are transferred to authorised experts. The Ministry checks the consistency of savings declared in the study and reported in SMiV and provides the final approval of savings. No onsite verifications are performed by the Ministry, just the administrative verification as explained.

Data on verification and controls: The number of actions reported in SMiV by OPs and verified by the Ministry varies from year to year. On average, 300 sets of energy efficiency improvement actions are reported annually by OPs and approved by the Ministry.

Evaluation(s) of the scheme: According to the Act on Energy Efficiency, the Ministry prepares the annual report on the progress in the achievement of national energy efficiency targets, which should also contain the analysis of the savings achieved within the EEOS. The latest such analysis has been done for NECP reporting in 2023 and 2025.

Penalties

For missing target: 0.1963 €/kWh (2024) **Full discharge:** Not defined

The fee is prescribed by the Act on Energy Efficiency and is corrected annually for inflation (between 2021 and 2024, the annual fee rose from 0.1593 €/kWh to 0.1963 €/kWh). There is no difference between the fee and the buyout price.

Other penalties or sanctions: Under the Act on Energy Efficiency, OPs face penalties for two types of non-compliance: failure to report achieved savings by February 15 of the following year

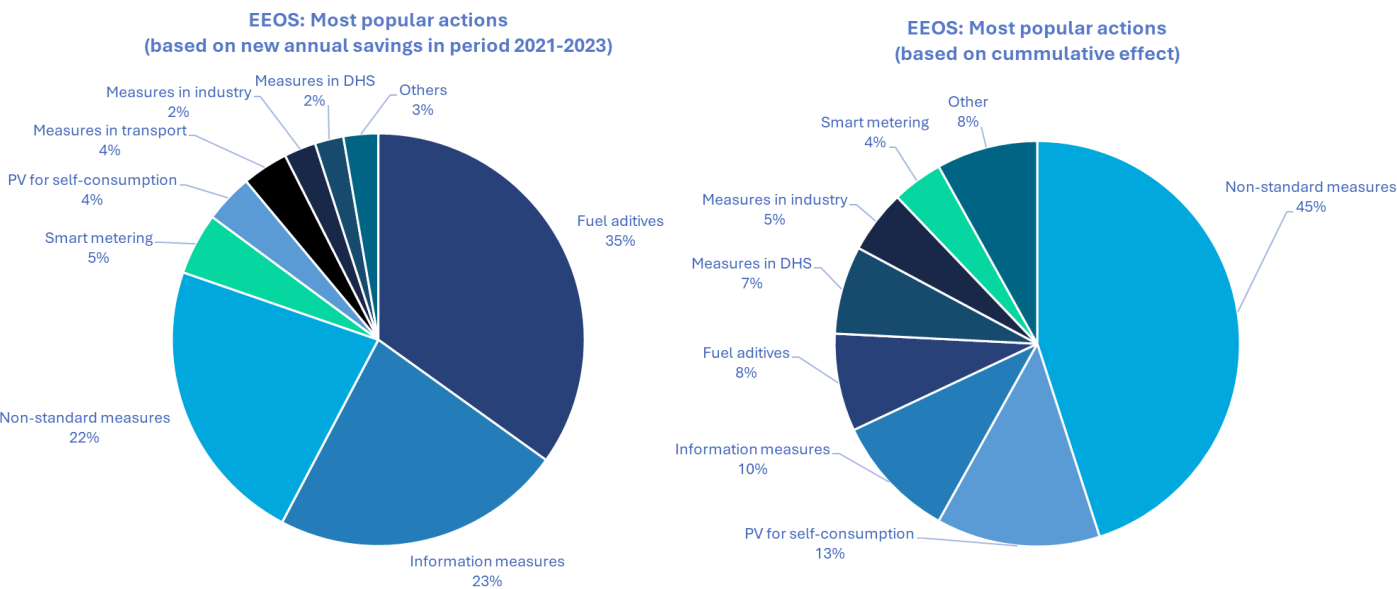
and failure to pay the required buyout fee if they do not meet their annual savings obligation. These penalties, distinct from the buyout fee itself, apply to both the legal entity and the individual responsible within the organization.

Data on penalties or sanctions: No penalties have been applied so far.

Key results

Most popular actions

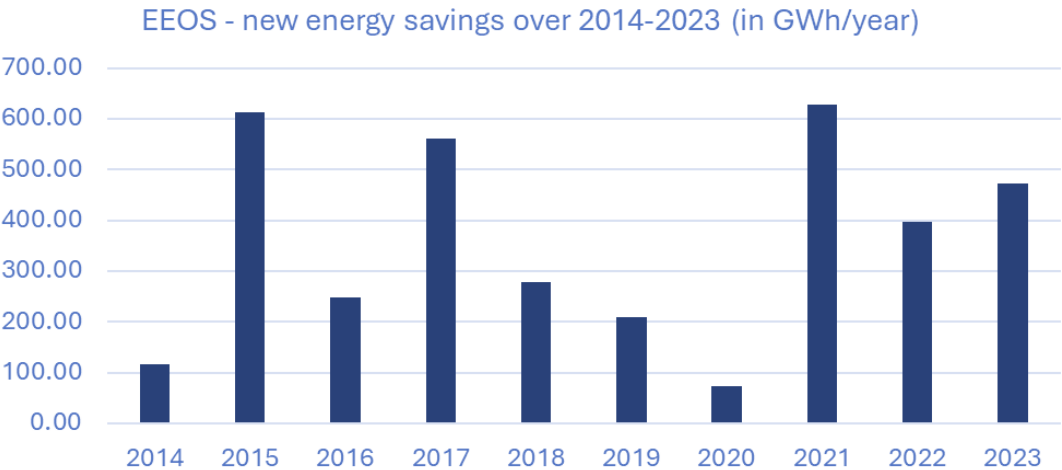
(note: the first graph below presents the contribution of individual actions to achievement of annual savings in the three-year period 2021-2023 – two dominant measures are fuel additives to gasoline and diesel and information provision to final customers; both measure have short lifetime, one and two years respectively; hence the second graph demonstrates the contribution of these actions to the cumulative energy savings)



Source: own graph from data available in SMiV

Energy savings achieved

(note: data below are in the unit of the scheme, GWh, data reported to Article 8 EED can be found in the first page of this factsheet)



Source: own graph from data available in SMiV

Average savings lifetime: 13,5 years (based on data for actions implemented in period 2021-2023)

The graph above shows savings in the years when the actions were implemented. Owing to the banking and borrowing flexibility, the years in which savings were presented by OPs may differ.

Cost effectiveness

OPs report their EEOS action costs in SMiV, but the data are not fully reliable as exact cost reporting is not mandatory. Available data suggests OPs invested approximately €221 million in 2021-2023, averaging €74 million annually. Estimated annual energy savings from these actions total 460 GWh, leading to 6,200 GWh over their lifetime. The cost-effectiveness ratio is 3.55 eurocents/kWh (lifetime savings) or €0.16/kWh (first-year savings). However, actual costs may be higher owing to incomplete reporting and missing administrative and transaction costs.

Sources

System for Monitoring and Verification of Energy Savings (SMiV):

https://smiv.mzoe.hr/GIZ_MVP/Pages/Login/LoginUsernamePassword.aspx?RedirectUrl=%25GIZ_MVP/Insurance/Pages/EEPPolicyPlansView.aspx (restricted to registered users only)

4th National Energy Efficiency Action Plan for period 2022-2024, Ministry of Economy (2022), available at: <https://mingo.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-energetiku-1999/strategije-planovi-i-programi-2009/2009>

Alternative measure – Programme for energy renovation of public sector buildings

History

Starting year: 2014

Latest revision: 2022

Current implementing period: up to the end of 2030

Based on the Long-Term Strategy for the Renovation of the National Building Stock until 2050 and the Construction Act, Croatia has been developing and implementing building renovation programs since 2014. These programs focus on residential buildings (single-family houses and multi-apartment buildings) as well as the public sector.

The Energy Renovation Program for Public Sector Buildings has had three phases: 2014–2015, 2016–2020, and the current phase extending to 2030. The latest edition was prepared in 2021/2022, covering the period until the end of 2030. It was adopted by the government in 2022 and is currently being implemented with funding secured from the Recovery and Resilience Facility (RRF) and the European Regional Development Fund (ERDF).

Cumulative energy savings reported to Art.7 EED for 2014–2020: 61.8 ktoe (i.e. 4.8 % of Croatia's cumulative savings for 2014–2020, which was 1,296 ktoe)

Expected contribution to 2021–2030 obligation for Art. 8 EED: 5.15 % of Croatia's target

The program's contribution to Article 8 of the EED targets is not substantial; however, its implementation is essential for achieving the targets set under Articles 5 and 6 of the EED. As a result, its overall significance within the energy efficiency policy framework is considerable. Furthermore, many public buildings sustained severe damage during the 2020 earthquakes. Their reconstruction now serves as a showcase for the Build Back Better principle, incorporating comprehensive renovation solutions.

Design and features

Type of policy measure: Financing scheme

Target sector / group: public sector

Key actors and roles: The **Ministry of Physical Planning, Construction, and State Assets** is responsible for preparing the renovation program. In this task, it collaborates with other state bodies, particularly those overseeing the use of EU funds. During the 2014–2020 period, the subsidy scheme was primarily funded through the ERDF, with some national funding. The Ministry implemented the scheme with technical support from the **Environmental Protection and Energy Efficiency Fund**. Additionally, the ESCO model was introduced, with the **Croatian Real Estate Agency** serving as the implementing body and receiving grant support from the Fund.

In the current implementation period, the subsidy scheme is funded through the RRF, along with the Solidarity Fund for buildings damaged in the 2020 earthquakes. The Ministry is now solely responsible for its implementation. The RRF is also being used to support the ESCO model for energy renovation of public sector buildings, which continues to be implemented by the Croatian Real Estate Agency.

The **Ministry of Economy** is responsible for Monitoring and Verification (M&V).

Eligible participants: Public sector entities are eligible to participate in the programme. This includes government bodies, local and regional self-government units, and public institutions.

Eligible action types: The programme focuses on comprehensive energy renovation measures aimed at enhancing energy efficiency and reducing consumption in public sector buildings. Key actions include:

- **Building Envelope Improvements:** Upgrading insulation, windows, and doors to minimize energy loss.
- **Heating, Ventilation, and Air Conditioning (HVAC) Systems:** Modernizing systems to more energy-efficient models.
- **Lighting Systems:** Replacing outdated lighting with energy-saving alternatives.
- **Renewable Energy Integration:** Incorporating renewable energy sources, such as solar panels, to reduce reliance on non-renewable energy.

A fundamental requirement for these actions is achieving a minimum reduction of 50% in energy demand for heating compared to the annual energy consumption prior to renovation. This criterion ensures implementation of ‘energy efficiency first’ principle and that the renovations lead to substantial energy savings.

Financial incentives: The program offers grants for public sector building renovations based on complexity: 60% for integral renovation (multiple efficiency measures, obligatory on the building envelope); 80% for deep renovation (envelope and technical system upgrades, achieving also 50% savings in primary energy); and 80% for comprehensive renovation (integral or deep renovation plus fire safety, indoor climate improvements, and seismic reinforcement). The same grant rates apply for supervision services, while 85% (integral and deep) or 100% (comprehensive) grant rate is available for energy performance certificate before and after renovation, project design documentation, project management and visibility.

Relevance to tackling energy poverty or supporting priority groups

No link with tackling energy poverty, nor specific priority groups.

Evaluation, Monitoring & Verification

Materiality provisions: The grant scheme helps public sector entities renovate buildings with minimal budget impact. The ESCO model ensures that a private partner covers the initial investment, with guaranteed energy cost savings throughout the energy performance contract. The program addresses key barriers to energy efficiency in the public sector, including financing limitations and capacity shortages, by providing grants for project preparation and management, particularly by encouraging the ESCO model.

Additionality provisions: Energy performance after renovation must meet higher standards, which is ensured by the requirement of at least 50% reduction in heating demand.

Calculation methods: Scaled savings – data from each implemented action (renovation project) are available from design documentation and used for calculation of energy savings based on standardised formulas, given in the Ordinance on Monitoring, Measurement and Verification of Energy Savings.

Online platform to collect data: yes

Automatized checks: no

Verifications and controls: Within the grant scheme, each project is being closely monitored, and grant payments are conditioned to the fulfilment of prescribed requirements - proof that actions have been undertaken, documentation with input values for saving calculations as well as on-site checks are standard procedure within the grant scheme. These controls are performed by a designated body (the EE Fund in period until 2020, the Ministry of construction for the RRF scheme since 2021).

Data on verification and controls: The number of controlled projects varies annually, depending on their implementation stage and related grant scheme procedures.

Progress monitoring or reporting: According to the Energy Efficiency Act, the Ministry of Economy prepares the annual report on the progress in the achievement of national energy efficiency targets, while the Ministry of Construction is obligated to provide data on achievements of the energy renovation programmes' implementation. The latest such analyses have been done for NECP reporting in 2023 and 2025.

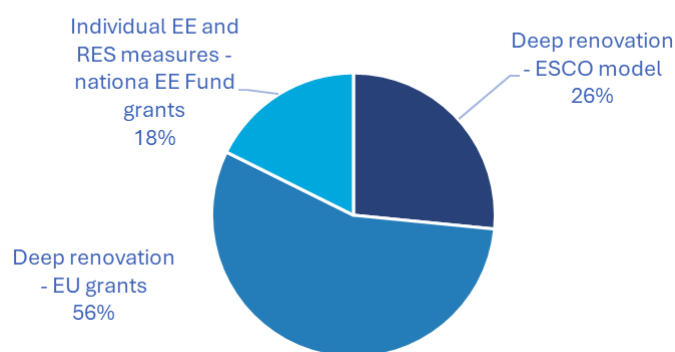
Evaluation(s) of the scheme: The scheme implemented since 2021 will be evaluated as part of the RRP implementation review and funding usage assessment. Additionally, schemes from 2014 onward will undergo ex-post evaluation under the Better Regulation framework, focusing on performance, process, and impact. The final results were expected by April 2025.

Key results

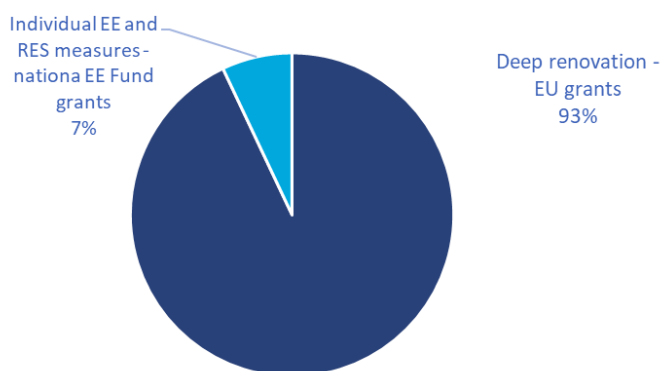
Most popular actions

For public sector buildings deep renovation is promoted by using EU funding and ESCO model. On the other hand, national funding from EE Fund support individual measures as well. The graphs below show distribution of achieved savings according to support model in period 2014-2020 and 2021-2023.

Public buildings' renovation: Most popular actions
(based on new annual savings in period 2014-2020)



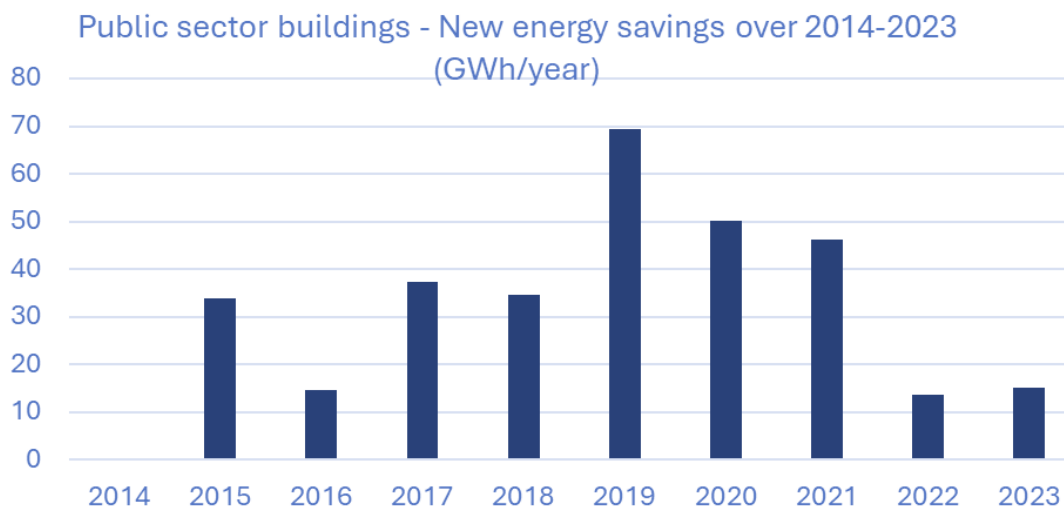
Public buildings' renovation: Most popular actions
(based on new annual savings in period 2021-2023)



Source: own graph from data available in SMiV

Energy savings achieved

(note: data below are in the unit of the policy measure, GWh; data reported to Article 8 EED can be found in the first page of this factsheet)



Source: own graph from data available in SMiV

Average savings lifetime: 14.78 years (based on data for actions implemented in period 2021-2023)

Graph represents the saving in a year when action has been implemented. In period 2014-2020, the majority of savings comes from ESCO projects or projects co-financed from ERDF. The later were still implemented throughout 2021. In new period, support was dominantly provided for RES measures from national EE Fund. In 2023, some of the major post-earthquake renovation projects were finalised, using the funding from RRF.

Cost effectiveness

The Programme for energy renovation of public sector buildings rests on the use of national and EU funding dominantly in the form of grants to reduce the burden on the budgets of state and local administration entities.

In the period 2014-2020, approx. 40 million € was ensured from the national sources, i.e. EE Fund, to grant support for public sector entities implementing energy renovation based on ESCO model. These renovation projects have brought 256 GWh savings over their lifetime. The cost-effectiveness ratio of the policy measure would therefore be 15.63 eurocents/kWh saved considering lifetime savings. Since grants amounted to 40% of investment, the cost-effectiveness ratio from beneficiaries' viewpoint would thus be 23.44 eurocents per kWh saved over the action lifetime. In the same period, 194 million € was used from ERDF in form of grants, with achieved cumulative savings of 719 GWh resulting in cost-effectiveness ratio of the policy measure 26.98 eurocents/kWh saved considering lifetime savings and from beneficiaries' viewpoint 44.97 eurocents per kWh saved over the action lifetime, as grant rates were higher.

For period 2021-2023, the distinction must be made between RES-based projects supported by the EE Fund and complex post-earthquake renovation projects. For the former, the cost-effectiveness of policy measure is 1.84 eurocents/kWh saved considering lifetime savings. This high cost-effectiveness is the result of much lower investment costs needed to upgrade the building systems than to deeply renovate the buildings, which always includes intensive construction works on the building envelope as well as long lifetimes of these actions. Taking into

account the grant rate of 40%, the cost-effectiveness from beneficiaries' viewpoint is 2.76 eurocents per kWh saved over the action lifetime. However, prioritization of this measure should align with the energy efficiency first principle, meaning these measures should only be applied to energy-efficient buildings with low energy demand (higher energy classes). For the post-earthquake renovation projects, determination of the cost-effectiveness in the same manner would be seriously misleading due to huge investment costs that are only in smaller part related to energy renovation.

Sources

System for Monitoring and Verification of Energy Savings (SMiV): https://smiv.mzoe.hr/GIZ_MVP/Pages/Login/LoginUsernamePassword.aspx?RedirectUrl=%25GIZ_MVP/Insurance/Pages/EEPPolicyPlansView.aspx (restricted to registered users only)

Information from the Ministry of Physical Planning, Construction and State Assets: <https://mpgi.gov.hr/o-ministarstvu/djelokrug-50/energetska-ucinkovitost-u-zgradarstvu/energetska-obnova-zgrada-8321/energetska-obnova-zgrada-javnog-sektora/3796>

Programme for energy renovation of public sector buildings until 2030: <https://mpgi.gov.hr/o-ministarstvu/djelokrug-50/energetska-ucinkovitost-u-zgradarstvu/strateski-dokumenti-programi-i-projekti/program-energetske-obnove-zgrada-javnog-sektora-za-razdoblje-do-2030-godine/14470>

Madžarević, V., Hartman, V. (2024). [Croatia's programme for public buildings renovation](#). Presentation at the first Dialogue Meeting of streamSAVE Plus, October 2024.



Interview with Ognjen Vidaček, Head of the Service for energy efficiency and new technologies, Ministry of Economy

What is the general approach in Croatia to delivering the higher energy savings obligation for 2024-2030?

Achieving the new, higher targets will be challenging, requiring a balanced policy mix to ensure savings without overburdening OPs or raising costs for end-users.

To address this, we will monitor and report savings from all publicly funded programs (national and EU) classified as AMs under Article 8 EED.

Consequently, the EEOS target share has been reduced from 70% to 50%, maintaining OPs' obligations at the same level as before this overall national target's increase.

At the same time, the expectations from AMs are significantly higher. However, we find this justified as there are significant EU funding sources available for stimulating EE improvements (RRF, RePowerEU, Modernisation Fund, ESIF). These funds will be dominantly used for energy renovation of buildings and for EE improvements in the industry. Both actions have high and long-term energy savings, with significant cumulative effect.

Financial support from national sources, in particular Environmental Protection and Energy Efficiency Fund, will also be utilised.

What is the approach of Croatia to deliver energy savings among target groups, and especially for priority groups (cf. Article 8(3) EED)

Under EEOS, OPs can administratively increase savings by 10-30% for actions benefiting priority consumers (vulnerable and energy-poor households in special state care areas). However, this incentive is underutilized. Still, the provision will remain in legislation.

Citizens at risk of energy poverty will be primarily supported through AMs, as outlined in the NECP. Two key policies include 100% financing for the energy renovation of family houses for energy-poor households and for social housing (multi-apartment buildings) in special state care areas.

Additionally, Social Climate Plan has been in preparation by the Ministry of Environmental Protection and Green Transition. Part of the available funds will be used for energy efficiency improvements as an instrument for the fight against the energy poverty.

The new Energy Efficiency Directive includes provisions in its Annex V to progressively exclude energy savings from new fossil fuel technologies (for achieving the Article 8 target). Will these new provisions have implications on the policy measures reported by Croatia?

Croatia does not expect a major impact, as subsidies for new fossil fuel technologies in buildings have already been discontinued. Additionally, industrial decarbonization trends generally favor non-fossil solutions. Therefore, these changes are unlikely to significantly affect Croatia's reported policy measures.

What would be the main points you would like to highlight about implementation and achievements in recent years?

The current EEOS framework is based on new annual savings targets for OPs, which are set annually by the Ministry. These targets are determined based on the energy sold to end-users two years prior. While cumulative targets are set for OPs for the entire 2021–2030 period as well, the primary focus remains on annual savings. This has led to the implementation of ‘quick fixes’—simple and cost-effective measures with short lifetimes and limited cumulative impact.

Only recently, with a stronger emphasis on cumulative savings introduced by amendments to the EE Act, have OPs begun to grasp the full scope of their task. However, their capacity to meet these targets is limited. OPs that are part of vertically integrated companies have more opportunities and are even able to develop new business models aligned with EEOS requirements. In contrast, smaller OPs – particularly suppliers of oil products and natural gas – struggle to find viable ways to achieve their cumulative targets.

One effective solution some have adopted is purchasing savings from third parties. These savings typically originate from complex industrial energy efficiency projects, which offer both high annual and cumulative savings.

What would be the main challenges you see for the coming years?

Moving forward, facilitating the development of a robust energy savings market will be a key

priority. Additionally, improving the monitoring of all actions under AMs is essential to accurately capture savings and, in turn, reduce the burden on OPs.

A lack of clarity regarding the new ETS for buildings and transport is another challenge, particularly in defining the boundaries between energy-saving actions under these two systems. OPs require full transparency on this issue to effectively plan their business strategies. Likewise, policymakers need clarity to assess whether maintaining both schemes is feasible from the perspective of OPs and end-users alike.

If you could go back in time, what would you do differently?

If I could go back, I would place greater emphasis on cumulative savings earlier. The initial focus on annual targets led to quick-fix measures with limited long-term impact. A more balanced approach from the start could have driven deeper energy efficiency improvements.

I would also encourage clearer guidance and earlier support for OPs, especially smaller ones, to help them explore compliance options like third-party savings purchases sooner.

Lastly, simplifying administrative procedures for AMs and EEOS reporting, along with implementing more functional and user-friendly IT systems from the start, would have made the system more efficient for all stakeholders.



Interview with Diana Horvat, Head of Sector for Energy Efficiency in Buildings, Ministry of Physical Planning, Construction and State Assets

Have there been changes in Programme for energy renovation of public sector buildings in recent years? (if so, what would be the main ones?)

Croatia has started renovating its public buildings in 2014, when the first programme has been adopted by the Government. At that time, we have put ESCO model in place to deeply renovate the most complex public buildings (e.g. hospitals). That was a strategy to fulfil the requirements of EED, both for energy service market development and for mandatory renovation of central government buildings. In period 2016-2020, the focus was on the use of ESI funds (ERDF) in form of investment grants to the public sector entities. 2020 earthquakes brought new challenges but also opportunities to build back better the damaged public buildings, with the combined funding from Solidarity fund and RRF. But, apart from damaged buildings, we have enabled the use of RRF for energy renovation of other, non-damaged public sector buildings. And with the RRF support, we are continuing to provide investment grants in a traditional implementing model but we have put the ESCO model back to the agenda as well.

I have to emphasise one constant feature of this Programme – we always require renovations to at least reduce heating demand of the building by 50% in comparison with situation before renovation – this is a constant minimal requirement. Support is differentiated according to the complexity of the renovation – the deeper it is, the higher grant rate may be obtained.

Did you see an impact of the energy prices crisis on the Programme? (e.g. in terms of budget, participation, ...)

The crisis mainly affected the ESCO model by increasing risk perceptions due to price instability. However, government regulations kept energy prices relatively stable, limiting the impact. The biggest challenge has been the surge in construction and equipment costs, driven by global trends and workforce shortages, especially for post-earthquake renovations.

What could be bottlenecks or drivers that could hinder or support the achievement of higher results?

Many earthquake-damaged buildings are large public buildings, often protected as a significant culture heritage. The damage made was also a huge driver for comprehensive renovation of such buildings. We have insisted that all public buildings are not only brought to their initial state but that their energy performance is improved, along with structural and seismic safety. There are still many projects in implementation, and we are now facing deadlines for the use of RRF, that due to the lack of workforce may be prolonged. The most important bottlenecks are the insufficient construction industry capacities and high investment cost.

Are there specific provisions to ensure the quality of the actions implemented?

Yes, ensuring quality is crucial in the publicly funded projects. All projects undergo mandatory construction supervision and on-site inspections by the implementing body to

confirm they meet design and performance requirements.

How were the priority groups (or eligibility criteria) defined?

The Programme for energy renovation of public sector buildings itself does not deal with priority groups, i.e. vulnerable customers and citizens at risk of energy poverty. However, we as a country, have identified that there is still significant number of multi-apartment buildings in which individual lots are owned by the state and that are used to provide social housing for socially vulnerable citizens. Therefore, we have

started a separate programme providing 100% grants to refurbish such buildings situated in assisted areas and the areas under the special state care.

If you could go back in time, what would you do differently?

We are proud of our progress and plan to continue. However, we now see the need for stricter renovation obligations across the entire public sector, aligning with Articles 5 and 6 of the EED.