



EU4Energy



Covenant of Mayors for Climate & Energy – Eastern Partnership





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Introduction – Energy Agency KSSENA



Was established in 2006 within the framework of the Intelligent Energy Europe (IEE) programme, with its main founders:

- Municipality of Velenje (MOV),
 - Municipality of Celje (MOC),
 - Municipality of Slovenj Gradec (MOSG),
 - Public Utility Company Velenje (KPV)
- Experiences: EU, Slovenia, Croatia, BiH, North Macedonia, Serbia, Ukraine

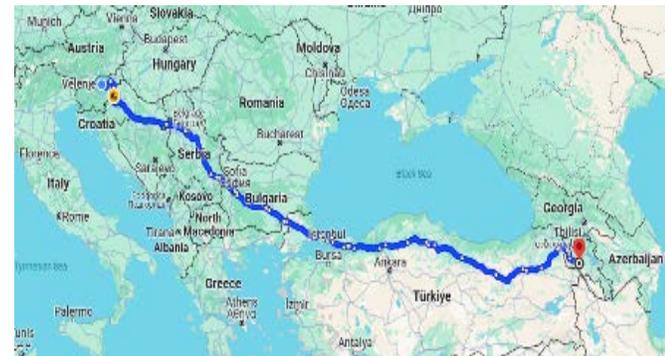
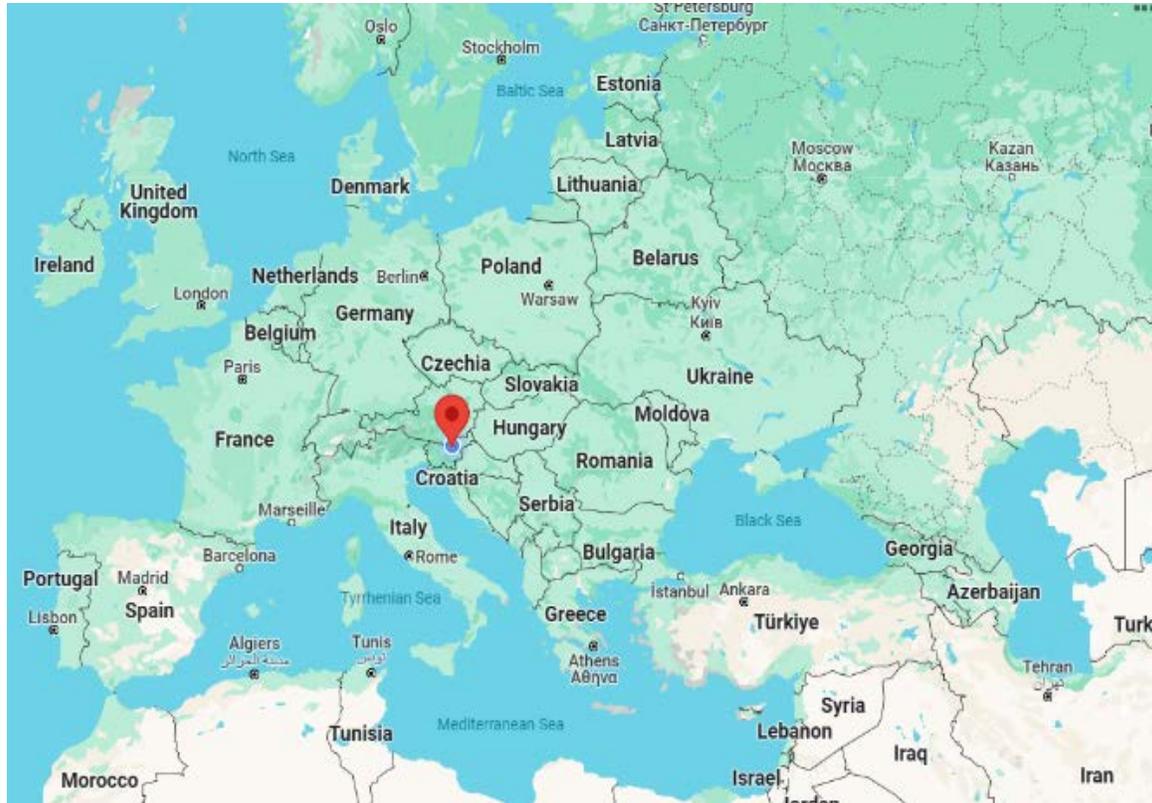
Number of employees : 13





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Introduction





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Introduction



ECOLOGICAL REVOLUTION – ENVIRONMENTAL RESTORATION

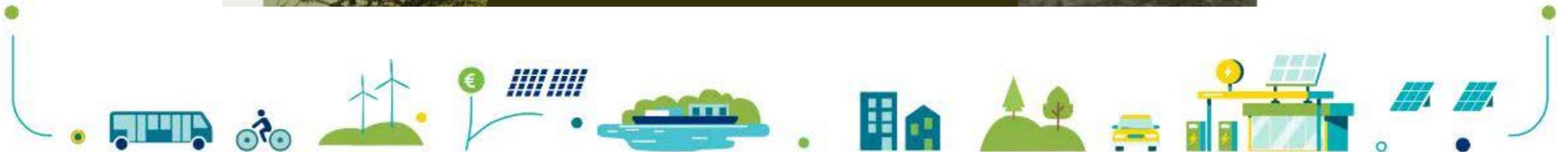
FROM BLACK TO GREEN AND BRIGHT.

The mining of coal severely damaged and polluted the valley.

Dissatisfaction of the people lead to organizing ecological protests 30 years ago.

As the result effective action of local communities and enterprises were taken.

 VELENJE BECAME A GOOD EXAMPLE OF SUCCESSFUL ENVIRONMENTAL RESTORATION IN THE EUROPEAN AREA.





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Introduction



Water playground
Free of charge



Mass events
Splash - adrenaline jumps on a 9.5 m long wet slide



A pool for children



Deck chair for disabled guests
Allows you to move around different terrains and swim in the water

Velenje's beach for the fifth time in a row the best natural bathing area in Slovenia!





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Content



- **PART 1:** Municipal Energy Management, Demand side, Reporting, Monitoring and Verification
- **PART 2:** Municipal Energy Management Cycle: definition, commitments, structure, how to start, action plan, implementation
- **PART 3:** Energy Management Information System: concept, tools, digitalization
- **PART 4:** Municipal Energy Management in EU: case study Slovenia, Croatia and Austria





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Part 1



The concept of Municipal Energy Management System (EMS), Demand Side Energy Management and Monitoring Reporting and Verification (MRV)





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Global warming and Climate Changes



The average global temperature is today 0.95 to 1.20 °C higher than at the end of the 19th century. Scientists consider an increase of 2°C compared to pre-industrialised levels as a threshold with dangerous and catastrophic consequences for climate and the environment.



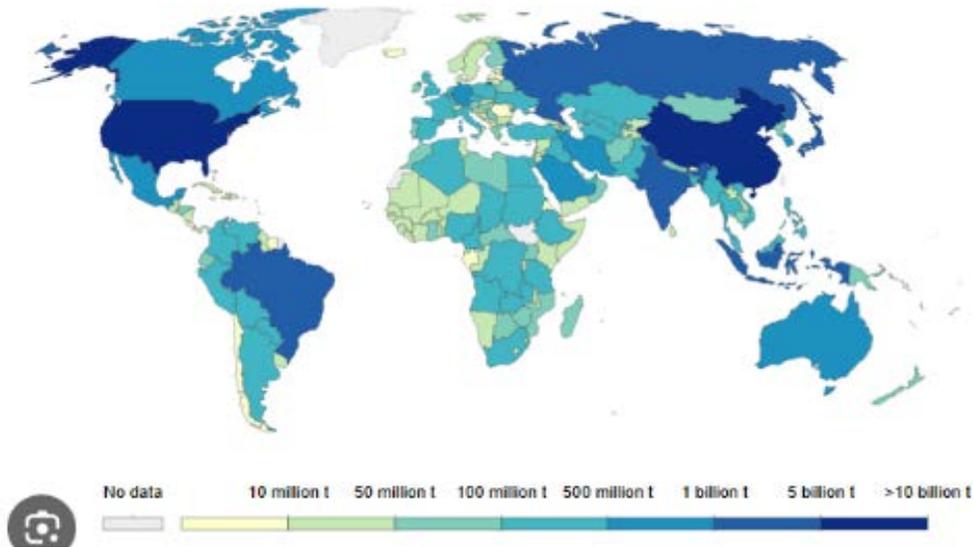


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Global warming and Climate Changes And Paris Agreement



What does a temperature increase of 2°C degrees actually mean compared to pre-industrialised levels?



Climate change will affect everyone. Photo by Lisa Gonzalez for the Guardian





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Global warming and Climate Changes



Why do we need to take action when global polluters contribute much more to pollution?

- Reduce costs
- Improve the local environment
- Increase energy independancy
- Enhance living comfort





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EU Green Deal



The European Green Deal is a package of policy initiatives, which aims to set the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050:

- Fit for 55: The Fit for 55 package aims to translate the climate ambitions of the Green Deal into law.
- European climate law:** The European climate law regulation turns the political ambition of reaching climate neutrality by 2050 into a legal obligation for the EU. By adopting it, the EU and its member states committed to cutting net greenhouse gas emissions in the EU by at least 55% by 2030, compared to 1990 levels.
- EU strategy on adaptation to climate change:** the strategy outlines a long-term vision for the EU to become a climate-resilient society that is fully adapted to the unavoidable impacts of climate change by 2050
- A just transition:** *The EU has introduced a just transition mechanism to provide financial and technical support to the regions most affected by the move towards a low-carbon economy.*
- EU biodiversity strategy for 2030; Farm to fork strategy; European industrial strategy; Circular economy action plan,...**





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The Role of Local Authorities



- The European Union and national governments need strong local energy-related public services to drive the climate transition. Decarbonising cities requires the involvement of many different stakeholders and touches upon various sectors. This is especially true for the built environment, **which is a hyper-local matter**
- Buildings represent around 40% of energy consumption in the European Union. In addition, 80% of the existing building stock will still be there in 2050.
- Local governments are expected to play a crucial role in these renovations, leading by example. For instance, in Article 6 of the proposed recast Energy Efficiency Directive, local authorities are expected to renovate at least 3% of their public building floor area.
- Decarbonising the built environment goes beyond public buildings. Around 97% of the buildings in the EU need to be upgraded to achieve the 2050 climate neutrality goal .

Source: [The study - More local staff for the Climate \(localstaff4climate.eu\)](https://localstaff4climate.eu)





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The Role of Local Authorities



Municipal Energy Management System (EMS)

- Building stock
- Street lighting
- Public transportation, mobility
- Challenges: base data (building stock and street lamps cadastre), data on energy consumption, financing (budget limitations), lack of human capacity,...

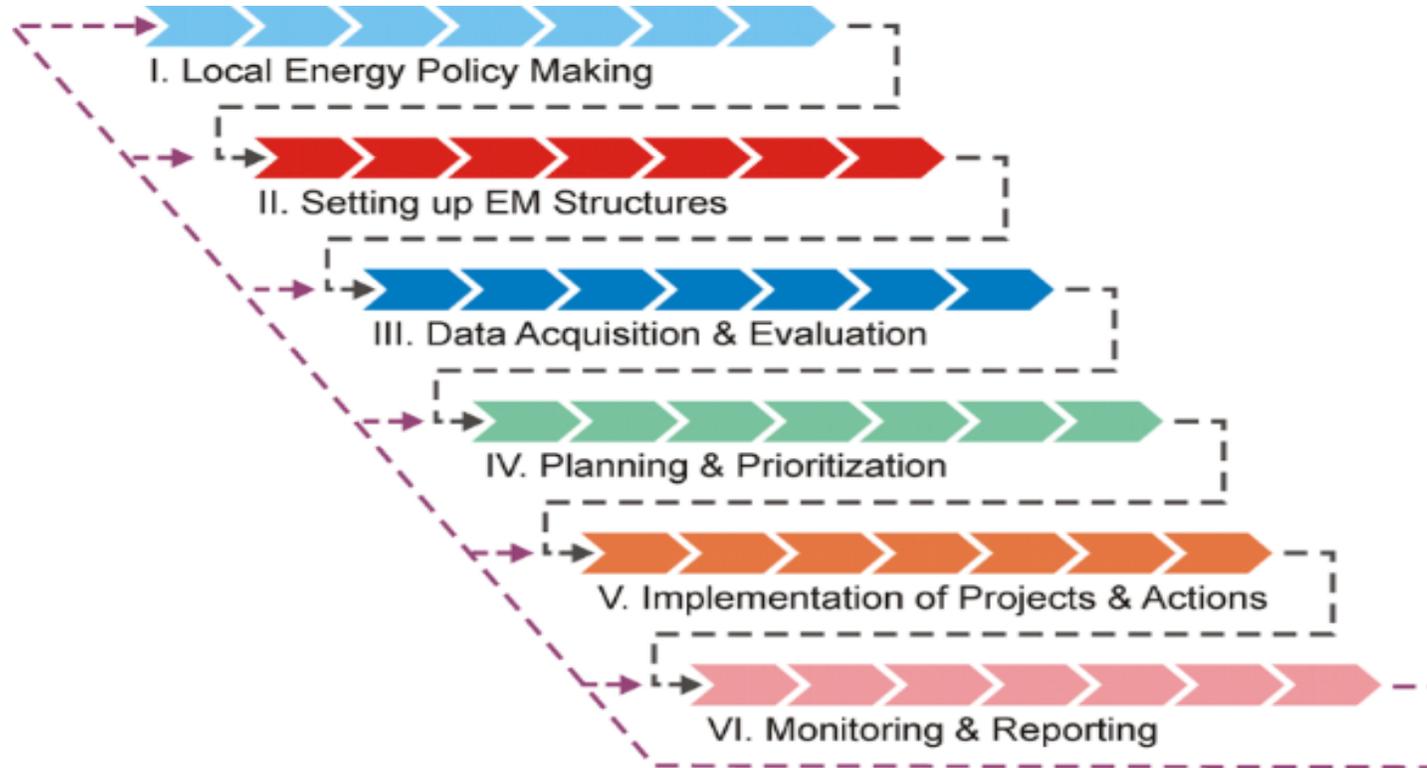
Source: [The study - More local staff for the Climate \(localstaff4climate.eu\)](http://localstaff4climate.eu)





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Elements of Municipal Energy Management System





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Set up a Municipal Energy Management System



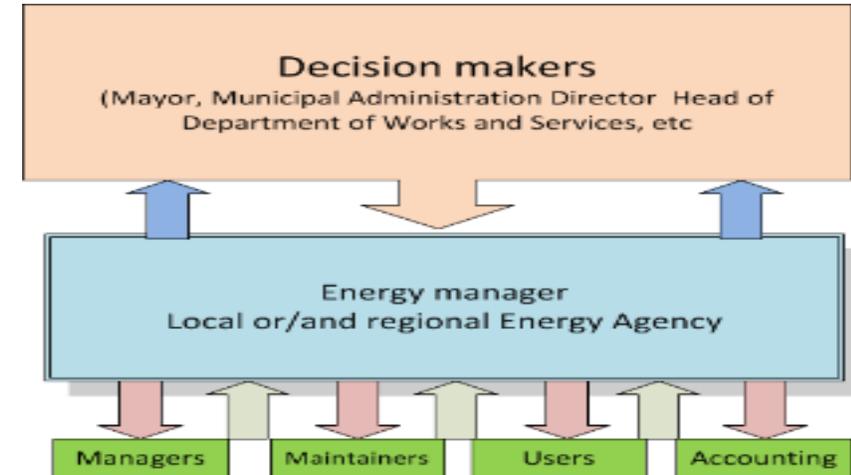
Adequate administrative structures in municipalities:

- Energy manager (internal or external expert organization);

Energy manager has specific hierarchic position

- Direct communication with top management as well as with operational services.: Mayor, Head of Departments, Head of Mayor's office, etc;

- Cooperation with Department of Economy and Finance (possibilities of investments, budget, etc)





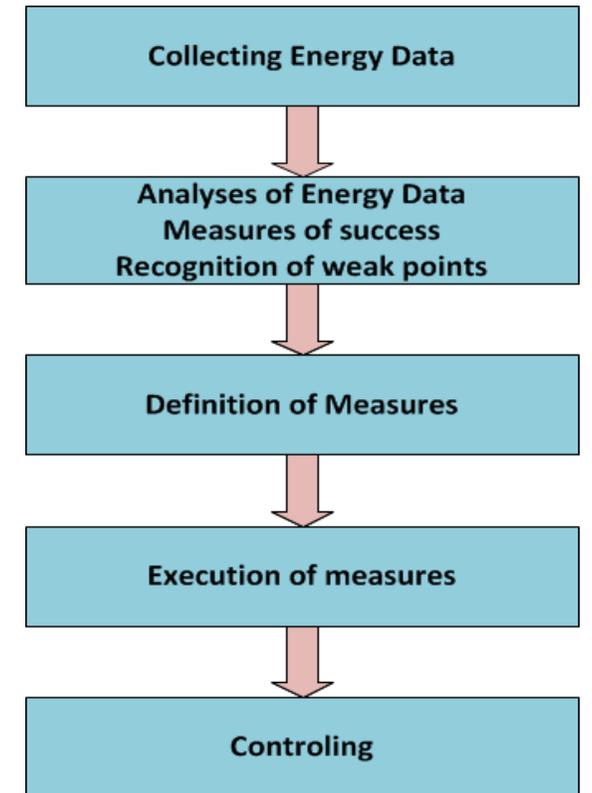
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Set up an Energy Management System



Role of the energy manager – TASKS

- Analyses of energy supply, consumption and costs (Secure, stable and quality of energy)
- Energy audits
- Preparation of RES and RUE measures (Energy Action plan);
- Communication between decision makers, head of municipal departments, maintainers, accouters, etc;
- Measurement and reporting of the impacts;
- To create long-term strategy on energy management;
- Monitoring and verification - **Energy bookkeeping**
- Education, motivate and raise the awareness of all employees.





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Results of Energy Management System implementation



- Energy, CO₂ and money savings
- Organized systems of investments – best value for money by meanings of savings
- Better living and working conditions
- Easier implementation of legislation and other obligations (planning scenarios)
- Good data to search for new financial sources (PPP, EIB, EC,...)
- People cooperate because they understand**





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PHASES:

Municipal Energy Management System



1 Systematic acquisition of energy data

Building stock - creating building stock of buildings owned by municipality

Energy data - collecting data in regular time intervals, preferably by software - energy bookkeeping.

Preliminary analysis and energy audits

Accurate and correct data collection is a baseline for all the later processing and calculations of EE and RES implementation

2 Processing and analyzing energy data

Analysis of energy data reveals opportunities for:

- understanding patterns
- improvement in buildings (reports, templates, calculations)

3 Implementation and action:

- selection of concrete measures
- feasibility studies Better living and working conditions
- financial and economic analyses Good data to search for new financial sources (PPP, EIB, EC,...)
- implementation
- monitoring & verifying





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Municipal Energy Strategies



EU countries obligations: The National Energy Efficiency Action Plans are based on requirement laid down in Article 24(2) of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, whereby all Member States of the European Union must submit such plans, doing so by 30 April 2014 in the first instance, and then every three years thereafter.

Municipalities:

- **Slovenia:** Local Energy Concepts (LEK)
- **EU Covenant of Mayors:** Sustainable Energy and Climate Action Plan SE(C)AP

SECAP is an action plan for sustainable energy and climate change that every municipality should have.

- The action plan is the key document which shows how the Municipality will reach its vision and target.
- The plan includes an assessment of the current situation, i.e. a Baseline Emission Inventory for the climate mitigation part and a Risk and Vulnerability Assessment for the adaptation part (mitigation and adaptation)
- It clearly identifies goals and targets and the measures planned together with time frames, assigned responsibilities and estimated impacts.





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Monitoring and Reporting – in general



Monitoring

According to the [Commission Implementing Decision \(EU\) 2019/1372](#) of 19 August 2019 implementing the INSPIRE Directive, **EU Member States have to monitor the implementation and use of their infrastructures for spatial information and to report to the Commission.**

Monitoring indicators shall be calculated using the metadata of the spatial data sets and the spatial data services that are published by Member States through the discovery services. Member States shall make all results of monitoring accessible to the public on the internet or using other appropriate means of telecommunication.

Reporting

No later than 31 March every year Member States shall update, if necessary, and publish a summary report. According to the same Decision, Member States should only report on those aspects of their spatial information infrastructure that have changed since the submission of the last report.

Source: [Covenant-reporting-guidelines-EN-final.pdf](#) ([europa.eu](#))





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Monitoring and Reporting - SECAP

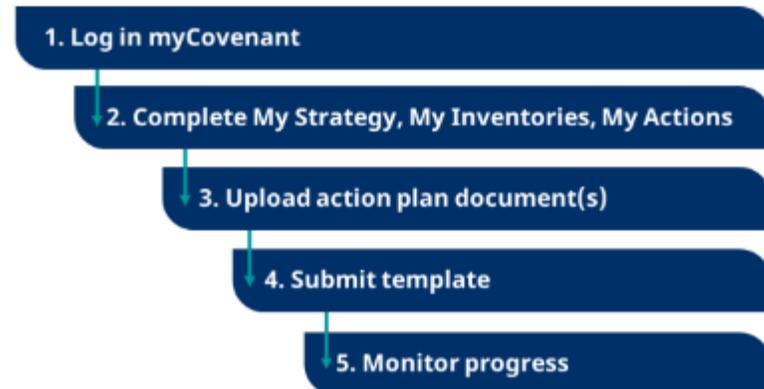


Monitoring in the framework of Covenant of Mayors

- A monitoring report every two years after the action plan's submission date.
- Covenant of Mayors reporting platform – MyCovenant: *The Covenant framework allows signatories to collect and analyse data in a structured and systematic manner and serves as a basis for good climate and energy management and for tracking progress in implementation.*

Step-by-step reporting

The step-by-step reporting and monitoring process for all Covenant signatories is presented below:



Source: [Covenant-reporting-guidelines-EN-final.pdf \(europa.eu\)](#)





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Monitoring and Reporting



Monitoring in the framework of Covenant of Mayors – SECAP

Eligibility criteria – the minimum requirements

- The action plan must be approved by the Municipal Council or an equivalent body.
- The action plan must clearly specify the Covenant mitigation target (i.e. at least 40% CO₂ emission reduction by 2030) and adaptation goal.
- The action plan must be based on and include the results of a comprehensive Baseline Emission Inventory (BEI) and Climate Risk &
- The BEI must cover the key sectors of activity (at least three out of four key sectors).

Source: [Covenant-reporting-guidelines-EN-final.pdf \(europa.eu\)](https://ec.europa.eu/eu4energy/en/covenant-reporting-guidelines-en-final.pdf)





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Monitoring and Reporting



Monitoring in the framework of Covenant of Mayors – SECAP

Eligibility criteria – the minimum requirements

MyCovenant must be completed correctly, and the data reported must be coherent and complete.

The BEI must cover the key sectors of activity (at least three out of four key sectors).

For mitigation, the action plan must cover the key sectors of activity (Municipal buildings, Tertiary buildings, Residential buildings and Transport) (at least two out of three selected key sectors), including, at least 3 key actions.

The RVA must identify the most relevant climate hazards and vulnerable sectors

For adaptation, the action plan must include a set of actions, including, at least 3 key actions

Source: [Covenant-reporting-guidelines-EN-final.pdf \(europa.eu\)](https://europa.eu/covenant-reporting-guidelines-en-final.pdf)





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Monitoring and Reporting



	Registration	Action plan		Monitoring	
	Year 0	Within 2 years	Within 4 years	Within 6 years	Within 6 years
My strategy	o	✓	✓		✓
Action plan documents upload	o	✓	o		o
Emission inventory	o	✓ (BEI*)	o		✓ (MEI*)
Risk & vulnerabilities assessment	o	✓	✓		✓
Mitigation actions	o	✓ (min. 3 key actions)	✓		✓
Adaptation actions	o	o	✓ (min. 3 key actions)		✓
Energy poverty actions	o	o	✓ (min. 1 key action)		✓

Table 1 Frequency of reporting

Legend: ✓ Mandatory | o Optional

BEI = Baseline Emission Inventory; MEI = Monitoring Emission Inventory

Source: [Covenant-reporting-guidelines-EN-final.pdf \(europa.eu\)](https://europa.eu)





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Implementation of energy monitoring in Slovenia



Regulation on Public Sector Energy Management (Official Gazette of the Republic of Slovenia, No. 52/16) – hereinafter Regulation

Provides that obliged persons (public buildings managers) are obliged to report on:

- annual energy consumption and energy costs;
- technical characteristics of the building;
- planned and implemented measures to increase energy efficiency and the use of renewable energy sources in public buildings.

1. The objective of the regulation is to establish and implement an effective energy management system in public buildings, thus giving an example to the private sector in the area of efficient energy use.
2. The Ministry of Infrastructure has prepared a web application for reporting entities under the Regulation.





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Reporting on energy use of public buildings



Highlights of the Regulation in the field of efficient use of Energy EEU and renewable energy sources RES:

Article 6 (energy accounting)

Building manager must at least once a year, enter the following information:

- planned and implemented measures to increase energy efficiency and the use of renewable energy sources.

Article 7 (measures to increase energy efficiency and the use of renewable energy sources)

These measures are:

- measures to meet the minimum energy performance requirements of buildings as defined by the regulation governing the efficient use of energy in buildings;
- organizational measures for more efficient use of energy;
- maintenance measures.





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Reporting on energy use of public buildings



Highlights of the Regulation in the field of efficient use of Energy EEU and renewable energy sources

RES:

Article 7 (measures to increase energy efficiency and the use of renewable energy sources)

Organizational measures are:

- awareness raising and education activities for building users,
- introduction of proper natural ventilation and proper illumination
- performing energy audits of the building, and
- similar measures for more efficient use of energy.

Maintenance measures shall mean carrying out regular maintenance of buildings in accordance with the regulations governing the construction of buildings in order to maintain or improve the level of energy efficiency of buildings, determined by the regulation governing the efficient use of energy in buildings.





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Reporting on energy use of public buildings



Highlights of the Regulation in the field of efficient use of Energy EEU and renewable energy sources

RES:

In terms of increasing energy efficiency and the use of renewable energy in buildings, the Regulation therefore highlights periodic reporting on:

- Use of energy and energy sources
- Energy costs
- The technical characteristics of the building and energy systems
- Planned and implemented measures with emphasis on organizational measures (awareness raising, education, energy audit, ...) and maintenance measures (regular maintenance of buildings and systems, ...)





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Reporting on energy use of public buildings



Demand side: The use of energy and energy sources:

The use of energy and energy sources is assessed with reasonable accuracy from the data, accounts or measurements covered (SIST EN 15603).

Continuously measured energy sources (electricity (or power), gas, district heating and cooling, local district heating)

- The use of energy / energy source is the difference between the reading at the end and at the beginning of the measuring. In the case of continuously measured energy sources, the most common use of accounts is to estimate the amount of energy / energy consumption.

Liquid fuels in tanks (fuel oil, LPG)

- In most cases, the use of energy is still assessed on the basis of account data (quantity, type of energy source). A reliable estimate of the energy consumed is possible if the level of fluid in the tank is available at the beginning and at the end of the measuring period.

Solid fuels (coal, wood fuels, ...)

- The same as for liquid fuels. A reliable estimate of the energy consumed requires information on the quantity (mass, volume, humidity ...) at the beginning and at the end of the measuring period.





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Reporting on energy use of public buildings

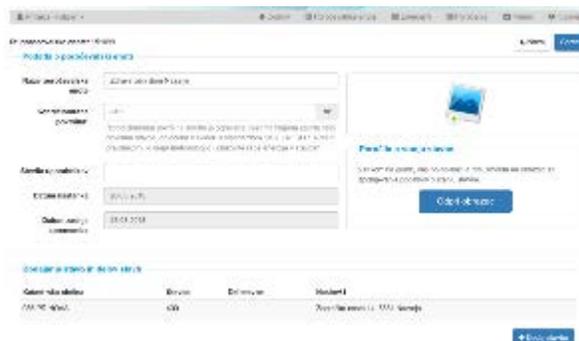


Digitalization: On time monitoring of energy use vs. overwriting of energy bills:

Article 6.:

Energy accounting (or bookkeeping) is a system for collecting and monitoring data on energy use in a building or an individual part of a building and is run as a digitalized database based on the identification code of a building or part of a building.

The ministry responsible for energy (Ministry of Infrastructure) manages the digitalized collection of energy accounting data.



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURO

UPRAVLJANJE Z ENERGIJO
V JAVNEM SEKTORJU

Novi poravnanci energije

SI poravnanci energije	Naziv poravnalca energije	NO / vr. stanja / št. čisto stanja	Nov. poravn. št. sporočilov	Časovni nastanek	Datum uveličitve
151046	Združeni d.o.o. NAJMA	900430	670	26. mar. 2018	
153732	Pančičeva Bole in vrtac Šišmari ob Dru.	900634	130	26. mar. 2018	
143275	Družina Bole in glasbeni Bole Načaka	900640	241	22. mar. 2018	
143685	Vrtac Načaka	900631	276	21. mar. 2018	





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Reporting on energy use of public buildings



Web application for reporting under the Regulation:

Registration:

The user needs to have a **valid digital certificate** for one of the recognized digital certificate issuers for registration in the system.

Before applying to the application, the user must complete a registration process, which is carried out in accordance with the special instructions (notice) of the Ministry of Infrastructure.

After the digital certificate has been obtained, the building manager must provide the digital **certificate number** on the received form and send it to the Ministry of Infrastructure.

A **user name and password** for accessing the application is assigned to the individual building manager/administrator.

The application normally works in all standard Internet browsers: Internet Explorer, Mozilla Firefox, Google Chrome.





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Measurement and Verification of savings



International Performance Measurement and Verification Protocol (IPMVP) Issued by EVO



Measurement and Verification (M&V) is the process of planning, measuring, collecting and analyzing data for the purpose of verifying and reporting energy savings within an individual facility resulting from the implementation of energy conservation measures (ECMs). **Savings cannot be directly measured, since they represent the absence of energy use.** Instead, savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions.

Source: EVO [<https://evo-world.org/en/>]





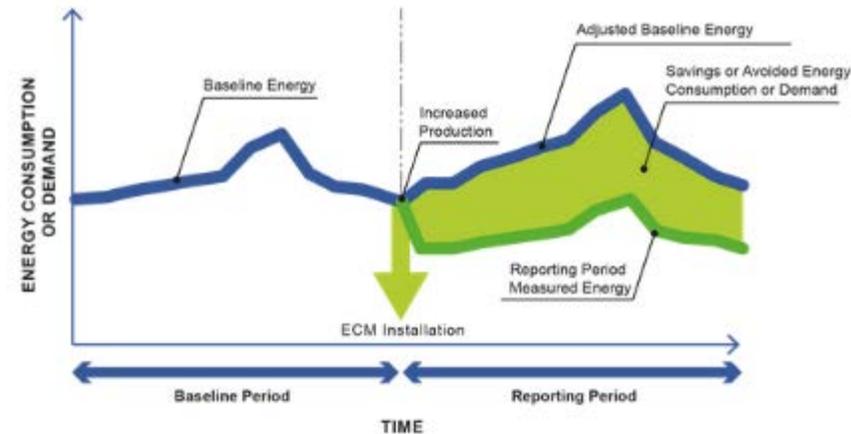
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Measurement and Verification of savings



International Performance Measurement and Verification Protocol (IPMVP)

Savings = (Baseline Period Energy – Reporting Period Energy) ± Adjustments



Source: EVO [<https://evo-world.org/en/>]



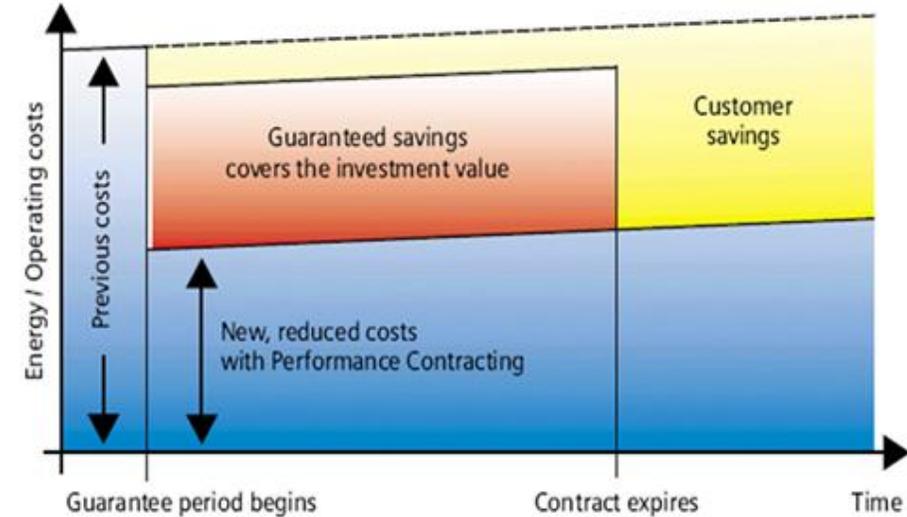
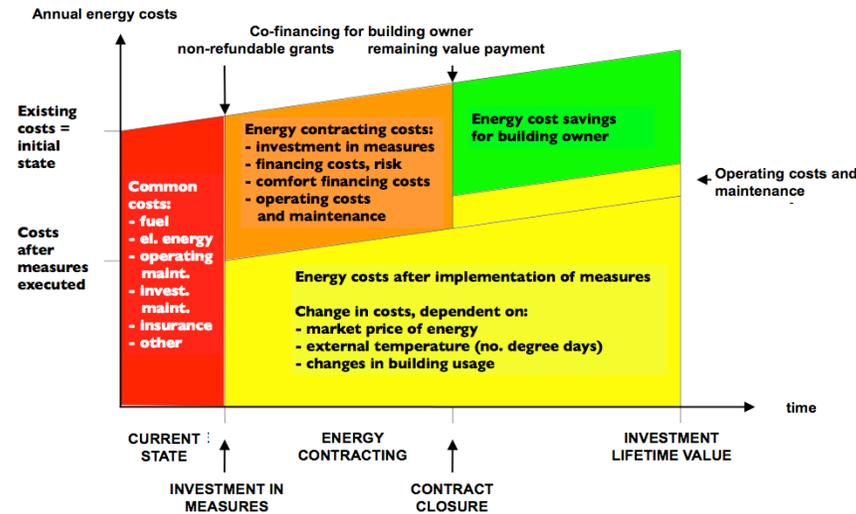


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Measurement and Verification of savings



The **ESCO** (or other Energy Company) has to provide a proof of saving based on energy bills for the contract buildings. It has to determine the adjusted net amount of saving actually achieved. The settlement method is analogous to that for baseline determination.





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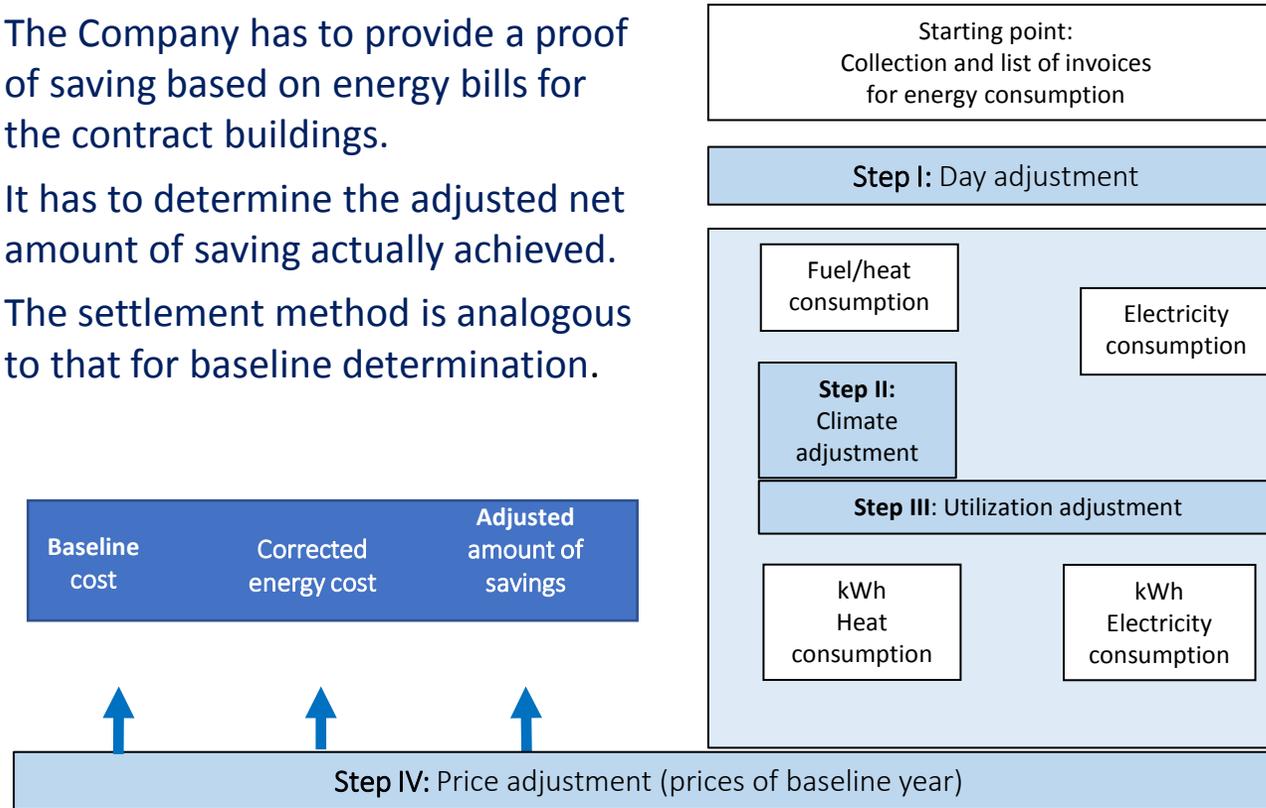
Energy preformance contracting



The Company has to provide a proof of saving based on energy bills for the contract buildings.

It has to determine the adjusted net amount of saving actually achieved.

The settlement method is analogous to that for baseline determination.



Source: EnPCINTRANS [<https://www.enpc-intrans.eu/language/en/project/>]





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Measurement and Verification of savings



Step I: Day adjustment

First, the energy consumption from different bills and meters are allocated to the settlement period (usually a calendar year) to adjust for different numbers of days.

Step II: Climate adjustment

In accordance with existing technical standards (e.g. German VDI 2067) the annual climate is characterized for example as the sum of the degree days.

This has to be defined in the contract as the reference value for the adjustment for the reference year. The current annual sum of the degree days is then used to adjust the heat consumption (space heating share, e.g. 90% in schools) for the respective settlement period.

Source: EnPCINTRANS [<https://www.enpc-intrans.eu/language/en/project/>]





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Measurement and Verification of savings



Step III: Utilization adjustment

If the utilization changes in a contract building, related changes of energy demand are to be determined and assessed under cost aspects. The client has to give notice in due time of any change of use.

Methods of calculation for the most common changes in usage can be provided with the contract or the assessment is done based on existing technical rules and standards.

If applicable the EPC contract should also contain appropriate calculation rules to account for changes of energy sources, or the use of CHP units in the settlement.

Step IV: Price adjustment (prices of baseline year)

Finally, the energy costs of the respective settlement year are calculated from adjusted consumption values of the supply bills and fixed reference prices

Source: EnPCINTRANS [<https://www.enpc-intrans.eu/language/en/project/>]





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Measurement and Verification of savings



$$\text{Baseline cost} - \text{Corrected energy cost} = \text{Adjusted amount of savings}$$

- The energy costs of the settlement year determined in the above listed four steps are deducted from the baseline.
- The difference between the two is the objective energy cost saving achieved in the settlement year.
- The values have to be determined for each individual building.
- After summing up the values for all buildings, the total remuneration is determined as the sum of basic remuneration for the guaranteed saving achieved and (if achieved) the proportional bonus remuneration for saving beyond the obligation.

Source: EnPCINTRANS [<https://www.enpc-intrans.eu/language/en/project/>]





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EU background to energy efficiency



Energy efficiency – targets, directive and rules

The 2012 directive, as amended in 2018, sets rules and obligations for the EU’s 2020 and 2030 energy efficiency targets

Energy Performance of buildings

Making buildings more energy efficient will contribute significantly to the EU achieving its energy and climate goals

Cogeneration of heat and power

The EU promotes cogeneration in order to improve energy efficiency in Europe

Energy label and eco-design

EU labelling and ecodesign rules promote more energy efficient products, helping consumers to save energy and money

Financing energy efficiency

Mobilising private financing for energy efficiency investments

Heating and cooling

The EU has launched a heating and cooling strategy to address the large amount of energy used by the building sector and by industry





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Legal background



DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2012 on energy efficiency:

Article 5, section 7

Member States shall encourage public bodies, including at regional and local level, and social housing bodies governed by public law, with due regard for their respective competences and administrative set-up, to:

- adopt an energy efficiency plan, freestanding or as part of a broader climate or environmental plan, containing specific energy saving and efficiency objectives and actions
 - put in place an energy management system, including energy audits, as part of the implementation of their plan
- use, where appropriate, energy service companies, and energy performance contracting to finance renovations and implement plans to maintain or improve energy efficiency in the long term.





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Legal background



EED 2012/27/EU as adopted by the Energy Community states in paragraph 1:

... from 1 December 2017, 1% of the total floor area of heated and/or cooled buildings owned and occupied by its central government is renovated each year to meet at least the minimum energy performance requirements that it has set in application of Article 4 of Directive 2010/31/EU, as incorporated and adapted by the Ministerial Council Decision 2010/02/MC-EnC.

The 1% rate shall be calculated on the total floor area of buildings with a total useful floor area over 500 m² owned and occupied by the central government of the Contracting Party concerned that, on 1 January of each year, do not meet the national minimum energy performance requirements set in application of Article 4 of Directive 2010/31/EU, as incorporated and adapted by the Ministerial Council Decision 2010/02/MC-EnC.

That threshold shall be **lowered to 250 m² as of 1 January 2019.**





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Legal background



New Energy Efficiency Directive published in 2023

The new, recast [Energy Efficiency Directive \(EU\) 2023/1791](#) (Changes from the previous directives 2018/2002 and 2012/27/EU include the following) **includes the following:**

- establishing an EU legally-binding target to reduce the EU's final energy consumption by 11.7% by 2030 (relative to the 2020 reference scenario).
- increasing annual energy savings from 0.8% (at present) to 1.3% (2024-2025), then 1.5% (2026-2027) and 1.9% from 2028 onwards. That's an average of 1.49% of new annual savings for the period from 2024-2030.
- obliging Member States to prioritise vulnerable customers and social housing within the scope of their energy savings measures.
- introducing an annual energy consumption reduction target of 1.9% for the public sector as a whole.
- extending the annual 3% buildings renovation obligation to all the levels of public administration.





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Legal background



New Energy Efficiency Directive published in 2023

The new, recast [Energy Efficiency Directive \(EU\) 2023/1791](#) (Changes from the previous directives 2018/2002 and 2012/27/EU include the following) **includes the following:**

- introducing a different approach, based on energy consumption, for business to have an energy management system or to carry out an energy audits.
- bringing in a new obligation to monitor the energy performance of data centres, with an EU-level database collecting and publishing data.
- promoting local heating & cooling plans in larger municipalities.
- progressively increasing the efficient energy consumption in heat or cold supply, also in district heating.





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Legal background in Slovenia



This obligation has been transposed into Slovenian legislation with the Energy Act EZ-1, which in Article 324 requires from public entities to **establish a system of energy management in the public sector.**

This system includes:

- set annual and long-term goals of energy efficiency and energy consumption,
- preparation of the action plan of measures to achieve the objectives,
- appointment of an energy manager,
- regular collection of data on energy and water consumption - energy accounting (or bookkeeping),
- verification of objectives, reporting on the achievement,
- information and awareness of users.





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Thank you!

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