

## Action plan for fostering energy refurbishment of heritage buildings





## Table of content

General information .....	2
1. Policy Context .....	4
1.1 Policy instruments .....	4
1.1.1 Operational programme competitiveness and cohesion 2014 – 2020.....	4
1.1.2 Development strategy of Istrian Region until 2020.....	5
Development strategy of Istrian Region until 2020 is the most important regional policy instrument for the future development of the Istrian region. ....	5
1.1.3 Sustainable action plan of City of Buje .....	5
1.1.4 Sustainable action plan of City of Novigrad .....	5
1.1.5 Joint SECAP .....	6
1.2 Regional background analysis .....	6
Action plan – implementation framework.....	7
Action I: Establishment of framework for systematic approach to process of energy refurbishment of heritage buildings in Istrian region .....	8
1.a Energy refurbishment of public heritage buildings.....	10
1.b Fostering innovation in heritage building refurbishment process through introduction of new technologies in particular ones related to use of blue energy.....	13
Action II: Local synergies through joint actions.....	15
Action III: save@work ISTRIA.....	18
Action IV: Kids can do it! .....	22

## General information





## Istrian region action plan



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## 1. Policy Context

The Action Plan aims to impact:



- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

Name of the original policy instrument addressed: Operational programme competitiveness and cohesion 2014 - 2020

Name of the additional policy instruments addressed:

1. Development strategy of Istrian Region until 2020
2. Sustainable energy action plan of City of Buje
3. Sustainable energy action plan of City of Novigrad

### 1.1 Policy instruments

During project implementation, and due to difficulties in influencing original policy instrument, IRENA and Istrian region decided to introduce three new policy instruments that they are going to try to influence in order to achieve goals initially set by project SUPPORT. Two of those instruments have local character:

- Sustainable energy action plan of City of Buje
- Sustainable energy action plan of City of Novigrad

And one of them is regional one:

- Development strategy of Istrian Region until 2020

Nevertheless, this document is still trying to influence original policy instrument, Operational programme competitiveness and cohesion 2014 – 2020, which remains its focal point of interest.

#### 1.1.1 Operational programme competitiveness and cohesion 2014 – 2020

The policy instrument is the most important tool to promote energy efficiency of public sector in Croatia. Targeted specific objective contributes to the achievement of the obligation stemming from Directive 2012/27/EU, to renovate (in terms of EE) 3% of the total floor area of public buildings per year. Investment priority Investment priority 4c "Supporting energy efficiency, smart energy management and renewable energy use public infrastructure, including in public buildings, and in the housing sector" as selected as one best suited to the overall goals of project SUPPORT.





During project implementation, IRENA, CEI and later Istrian region, faced difficulties in attempts to influence the policy instrument as the calls for funding based on it were not well aligned with regional objectives. Calls for funding differ from the policy instrument in a way that they narrow the field of application.

### 1.1.2 Development strategy of Istrian Region until 2020

Development strategy of Istrian Region until 2020 is the most important regional policy instrument for the future development of the Istrian region.

This policy instrument is managed by Istrian region. Within framework of this action plan, IRENA and Istrian region will target:

- Objective 3: Strengthening Infrastructure, Environmental Protection and Sustainable Space Management and Resources.

and

- Development Priority 3.1. Encouraging energy efficiency and the application of renewable energy sources

The influence of policy instrument will be made on two levels:

1. By fostering its implementation through development of new actions. This is specifically related to the activity planned by the policy instrument: “education of workers for construction of energy efficient buildings”
2. By changing the policy instrument. Policy instrument doesn't have heritage buildings as specific topic within its framework. This topic along with proscribed methodology for their energy refurbishment will be added to the policy instrument.

### 1.1.3 Sustainable action plan of City of Buje

Document contains set of measures with identified financing mechanisms that are to be adopted in order to reach the targets set. Measures such as envelope insulation, RES use, public lightning optimization are mentioned, but with no clear link to the micro location specific characteristics which should be essential for such document. Contrary to that, document promotes generic measures with questionable real value to the community. Public buildings and buildings in general are identified as sector with largest carbon footprint.

### 1.1.4 Sustainable action plan of City of Novigrad

Long-term goals of the policy instrument are to make Novigrad-Cittanova an energy efficient city and to make its citizens responsible in the fields of energy saving and environmental protection. Similar to policy instrument of City of Buje, the document list potential measures and financing mechanisms planned to be adopted. Measures are again generic with no real connection to specific locality and thus hard to implement.



### 1.1.5 Joint SECAP

One of the actions of this action plan is replacement of SEAPs of cities of Buje and Novigrad with new policy instrument, SECAP that will include both cities and their neighboring municipality of Brtonigla. This document will resolve all the problems evident in the previous ones, especially ones related to the localization of proposed measures. New policy instrument will foster cooperation between communities in order to create synergies, especially in infrastructural projects with common benefits for the area.

## 1.2 Regional background analysis

In order to explain the rationale of actions development, only fragments of RBA will be presented here. Full RBA is annexed to this document (ANNEX I). In this section, only SWOT analysis will be presented.

SWOT analysis is presented as main tool to identify topics that need to be targeted by this action plan.

STRENGTHS	WEAKNESSES
Multilevel energy planning – National, regional local	Large number of small communities
Overall good quality of infrastructure especially electric energy sector	Limited technical capacities of public sector
Obligatory energy monitoring online tool (ISGE) for all public buildings	Overall lack of technical capacity, especially in RES use field
Involvement in interregional initiatives	Lack of regional RES use good practices
Great experience in implementation of EE measures in public and private sector	Limited financial capacity
Clear structure of calls for funding	Lack of clear regulation, especially in terms of RES energy production
	Large number of buildings do not clear ownership structure
	Lack of responsibilities of public buildings employees
OPPORTUNITIES	THREATS
Favorable climate conditions especially for large uptake of PVs	Shift in methodology of project financing – financial instruments instead of grants
Prevailing industry (tourism) favors RES	Favoritism of certain technologies in grant schemes
Significant number of buildings need refurbishment	No clear incentive for second phase of projects – after initial refurbishment
School curriculum is undergoing adjustment on national basis	Negative demographic trends
Overall sentiment towards RES and EE measures is improving partially due to evident climate changes	Large segment of building is not well suited to current model of refurbishment
Education for public building employees	Resistance to changes

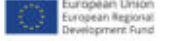
Three key issues were extracted from the SWOT analysis:

1. Lack of technical capacity in small communities
2. Large number of heritage buildings with no clear strategy of intervention
3. Behavior of employees in public buildings





## Istrian region action plan



## Action plan – implementation framework





## Action I: Establishment of framework for systematic approach to process of energy refurbishment of heritage buildings in Istrian region

Heritage buildings represent significant part of total and public building stock in Istrian region. Standardized methods and approaches are not suitable to these buildings and because of that, they have been left out of the current funding scheme of the Operational programme competitiveness and cohesion 2014 – 2020. Separate calls for funding of heritage buildings energy refurbishment is announced for 2019 and Action I and its subactions are going to influence Operational programme by:

- improving its implementation within region through preparation of applications for funding

In addition, this action is going to influence Development strategy of Istrian Region until 2020, Sustainable energy action plan of City of Buje and Sustainable energy action plan of City of Novigrad by changing the instruments. Energy refurbishment of heritage buildings as specific priority is going to be added into Development strategy of Istrian Region until 2020 and in Joint SECAP of cities of Buje and Novigrad and municipality of Brtonigla that is going to replace the existing two documents.

### Exchange of experience benefits:

Heritage buildings more often than not require one off solutions that are seldom easily replicable in whole. Because of this, IRENA and later Istrian region started the process of identification of fragments, elements, approaches and processes that could later constitute some kind of database from which certain elements could be pulled and combined in order to resolve particular demand imposed by specific building being discussed.

Multitude of exchange of experience activities were beneficial for definition of this action with main ones being:

1. *staff exchange organized on Malta in March 2019*
2. *good practice "Ensuring the energy sustainability from renewable sources for 4 buildings of public institutions"*
3. *staff exchange organized in Sweden in March 2019*
4. *and good practice "Aprilia Innova – Local Urban Development Plan"*

As Malta has more restrictive rules than Croatia, IRENA asked GRC to identify examples of heritage buildings refurbishment that included energy refurbishment. GRC proposed two projects:

- refurbishment of Xrobb I-Għaġin Sustainable Development Centre
- refurbishment of Malta Stock Exchange

It was decided that study visit to both of the sites is going to be arranged. The visiting party from Istrian region consisted from representatives of IRENA and Istrian region as project partners and:

- representative of regional conservation office
- representative of only national park in Istrian region (National park Brijuni, Natura 2000 site)
- representative of port authority of City of Rovinj







During this activity, several important aspects of approach to heritage buildings refurbishment process became apparent:

- *Building has a life of its own* and to certain extent it is essential to allow its users to use it in accordance with current trends and technology possibilities.
- *These buildings have specific value* that goes beyond the general principles embedded into regulations related to implementation of energy efficiency agendas.
- *It is essential to approach to each building as to unique entity.* It is quite possible that time spent for developing solution will not be of value for any other building approached afterwards.
- *In relation to energy efficiency, different ruler ratio needs to be used,* as the building is integral parts of its surroundings, surroundings should be seen as integral part of the building.

Good practice proposed by ALEA “Ensuring the energy sustainability from renewable sources for 4 buildings of public institutions” envisaged production from RES as methodology for reduction of primary energy consumption. Xrobb I-Għagin Sustainable Development Centre uses wind turbines as buildings energy source. Heritage buildings in Istrian region are mostly situated in densely populated urban areas so IRENA asked GRC to try to identify good practices of close to shore blue energy use facilities in Malta.

- FLASC pilot facility in port of Valletta.

FLASC is a novel energy storage concept suitable for integration with offshore renewable energy sources. The facility was presented as possible “carrier” for RES based energy production facility of heritage buildings in coastal areas. Since this is a patented technology, IRENA started the discussions with University of Malta about procurement of feasibility study and technical designs for facility in Istrian region.

Use of geothermal energy via heat pumps is considered to be one of the most suitable solutions for energy refurbishment of heritage buildings. There is potential environmental risk that can be attributed to possibility of toxic antifreeze leakage (glycol or propylene glycol is used). IRENA found good practice called “The sea warms a nursing home at Ringö” on Interreg Europe website. Istrian region contacted ESS to inquire about the possibility to visit the facility and explore the possibility for adoption of such solution. The visit was not possible at the moment so ESS proposed visit to kindergarten near Kalmar that uses same technology. This activity constituted part of second staff exchange. The visiting party from Istrian region consisted from representatives of IRENA and Istrian region as project partners and:

- representatives of cities of Pula and Buje and municipality of Vrsar.

“Aprilia Innova – Local Urban Development Plan” as an example that showcases equality of EE and RES use as it compares them on the base of primary energy consumption reduction.

All of these experiences and solutions were combined in order to draft Action I.

This is a complex action so in order to monitor it more easily, it is divided into two subactions:

- 1a: Energy refurbishment of public heritage buildings
- 1b: Fostering innovation in heritage building refurbishment process through introduction of new technologies in particular ones related to use of blue energy



## 1.a Energy refurbishment of public heritage buildings

Sub-action proposes refurbishment of public buildings with different characteristics, differing intervention level needs and in different preservation state. The main goal of this action is to kick start the process of reassessment of the role and future of heritage buildings within region and ensure its visibility. Everything learned was used to define action unifies two concepts often viewed as opposing: Energy efficient and visually preserved heritage building.

Refurbishment of three public buildings is envisaged by this action:

- Kindergarten Radost, Poreč
- City of Novigrad main administration building
- Hospital Martin Horvat, Rovinj

Implementation workplan (Action 1a):		
Establishment of regional database of good practices through energy refurbishment of public heritage buildings		
	Activity	Cost
1	<p>Public procurement for selected heritage buildings refurbishment designing process. Public procurement is to be undertaken exclusively for two buildings:</p> <ul style="list-style-type: none"> <li>- Kindergarten Radost, Poreč</li> <li>- City administration building, Novigrad</li> </ul> <p>Technical documentation of energy refurbishment of Martin Horvat Hospital, Rovinj was developed in 2017 and 2018 and it was funded by IRENA and the hospital.</p>	1.000,00 €
2	<p>Development of technical documentation of energy refurbishment through joint action of different local/regional authorities under supervision of IRENA.</p> <p>Joint action is performed by a team constituted through action 2, activity 1. Team will consist from employees of Cities of Poreč and Novigrad, public company Parentium d.o.o. and Istrian health care institutions which will share and combine their specific skill set in order to create team of experts unavailable in singular communities/institutions.</p>	25.000,00 €
3	<p>Analysis of technical solutions, proposed measures ranking, cost benefit analysis and selection of measures that should be implemented even without access to grants (either due to necessity or short payback period)</p>	10.000,00 €
4	<p>Preparation of documentation for applying to calls for funding organized under Operational programme competitiveness and cohesion 2014 - 2021, Call 4c1.3 'Energy renovation of buildings and the use of renewable energy sources in the public institutions that perform activities in education sector and Call 4c1.4 'Energy renovation and use of renewable energy sources in public sector buildings</p>	4.000,00 €
5	<p>Execution of works</p>	2.200.000,00 €

Involved actors	Activity involvement				
	1	2	3	4	5
IRENA					
Conservation Department in Pula for the Istrian region					
City of Poreč					
Kindergarten Radost, Poreč					
Parentium d.o.o.					
City of Novigrad					
Martin Horvat Hospital, Rovinj					
Port authority of City of Poreč					
Ministry of the sea, transportation and infrastructure					
Croatian waters					
Istrian region					
Financing sources	Activity				
	1	2	3	4	5
IRENA - Interreg MED project ENERJ (ERDF funds)					
City of Poreč (own budget)				Kindergarten Radost, Poreč	Kindergarten Radost, Poreč
City of Novigrad (own budget)				City administration building, Novigrad	City administration building, Novigrad
Istrian region - Interreg MED project ENERJ (15% partners' contribution)					
Istrian region (own budget)				Martin Horvat Hospital Rovinj	Martin Horvat Hospital Rovinj
Martin Horvat Hospital Rovinj (own budget)				Martin Horvat Hospital Rovinj	Martin Horvat Hospital Rovinj
Operational programme competitiveness and cohesion 2014 - 2020, Call 4c1.3 'Energy renovation of buildings and the use of renewable energy sources in the public institutions that perform activities in education sector				Kindergarten Radost, Poreč	Kindergarten Radost, Poreč
Operational programme competitiveness and cohesion 2014 - 2021, Call 4c1.4 'Energy renovation and use of renewable energy sources in public sector buildings				City administration building, Novigrad/Martin Horvat Hospital Rovinj	City administration building, Novigrad/Martin Horvat Hospital Rovinj
Commercial bank loan				Martin Horvat Hospital Rovinj	Martin Horvat Hospital Rovinj



Performance indicators		Number
1	Set of technical documentation for energy refurbishment of heritage buildings	2
2	Submitted application for structural funds use (Operational programme competitiveness and cohesion 2014 - 2020)	3
3	Completed energy refurbishment of public buildings	3
4	Reduction of CO2 emission and primary energy consumption (per building)	50%

Timeline of activities											
Year	2019			2020				2021			
Quarter	2	3	4	1	2	3	4	1	2	3	4
Activity	1										
	2										
	3										
	4										
	5										



## 1.b Fostering innovation in heritage building refurbishment process through introduction of new technologies in particular ones related to use of blue energy

Sub-action proposes introduction of blue energy technologies as detached facilities that can offset negative environmental effect of nearby heritage buildings. Additionally, through activity 2, sub-action promotes “out of the box” and “one-off” design principles showcased by case of Malta stock exchange refurbishment solution.

Implementation workplan (Action 1b)			
Fostering innovation in heritage building refurbishment process through introduction of new technologies in particular ones related to use of blue energy			
Activity			Cost
1	Development of feasibility study and technical documentation for installation of FLASC technology in port of Vrsar. End use of the facility will be determined through feasibility study.		25.000,00 €
2	Development of technical documentation for use of small scale sea water based turbine in Kindergarten Radost, Poreč		To be financed as part of Action 1a, activity 1
3	Installation of thermotechnical system based on use of blue energy in Kindergarten Radost, Poreč (only outer installation and dislocated engine room).		30.000,00 €
Involved actors		Activity involvement	
		1	2
		3	
IRENA			
Conservation Department in Pula for the Istrian region			
City of Poreč			
Municipality of Vrsar			
Port authority of City of Poreč			
Parentium d.o.o.			
University of Malta			
HEP d.d.			
Istrian region			
Financing sources		Activity	
		1	2
		3	
IRENA - Interreg MED project MAESTRALE (ERDF funds)			
IRENA - Interreg MED project ENERJ (ERDF funds)			
IRENA - Interreg Italy - Croatia project COASTENERGY (ERDF funds)			
Istrian region - Interreg MED project MAESTRALE (15% partners' contribution)			
Istrian region - Interreg MED project ENERJ (15% partners' contribution)			
Istrian region - Interreg Italy - Croatia project COASTENERGY (15% partners' contribution)			



Performance indicators		Number
1	Technical documentation for installation of blue energy based facility in Istrian region	2
2	Blue energy use facility	1

Timeline of activities										
Year		2019			2020				2021	
Quarter		2	3	4	1	2	3	4	1	2
Activity	1									
	2									
	3									





## Action II: Local synergies through joint actions

Administratively, the Istrian region is divided in 41 territorial units of local self-government - 10 cities and 31 municipalities. Region has population of 206.344, and almost 28% of the number accounts to City of Pula as largest city in Istrian region. Remaining population resides in small communities of under 15.000 inhabitants (City of Poreč is only exception with 16.696). Regional background analysis identified lack of technical capacity in such small communities as one of key obstacles for carrying out energetic projects, especially more complex ones such as refurbishment of heritage buildings.

The idea and methodology of overcoming this obstacle was born out of fragments of different exchange of experience activities. It was decided that it was necessary to increase level of technical capacity of community through organization of joint actions of neighboring communities.

Action II is going to influence Development strategy of Istrian Region until 2020, Sustainable energy action plan of City of Buje and Sustainable energy action plan of City of Novigrad. Cooperation between different regional and local authorities in energy based projects is one of the priorities envisaged by Development strategy of Istrian Region until 2020. Same kind of cooperation will be additionally fostered in areas of cities of Buje, Novigrad and municipality of Brtonigla. This cooperative model will be established through creation of new policy instrument, Joint SECAP of cities of Buje and Novigrad and municipality of Brtonigla that is going to replace the existing two documents.

### Exchange of experience benefits:

The activity is partially derived from several exchange of experience activities and then adapted to specific regional context:

1. *presentation "Central Purchasing and contracting of Spanish Federation of Municipalities and Provinces" by FEMP during interregional seminar in Seville*
2. *presentation "GreenPowerGrid" by Fraunhofer ITWM and Die Stadtwerke Speyer (SWS) during interregional seminar in Seville*
3. *presentation "Energy management on municipal level in Rhineland-Palatinate" by EARLP and VG Jockgrim during interregional seminar on Gozo later also presented in*
4. *good practice "Energy Efficient Municipalities" by EARLP.*

Joint actions would be implemented either by ad hoc teams (formed for specific action) or by permanent associations formalized through production of common policy instrument (Joint SECAP).

Piloting both ad hoc team and permanent association is provisioned by this action.

Ad hoc team is organized exclusively to perform action 1a.





## Istrian region action plan



The main actors are cities of Novigrad and Poreč and Istrian health care institutions which enter the team in order to jointly work on refurbishment of three buildings that they own.

Idea to create a joint team to alleviate issue that is lack of technical capacity shared by all three entities was taken from good practice “Energy Efficient Municipalities”.

Joint actions performed through permanent associations constitutes is second activity of this action. Cities of Buje and Novigrad along with municipality of Brtonigla will join their resources in order to create new policy instrument for the area – Joint SECAP. Using experience gained from “GreenPowerGrid”, Joint SECAP will promote creation of RES based micro grid shared by three communities. The document will also promote joint public procurements based on the methodology transferred from good practice “Central Purchasing and contracting of Spanish Federation of Municipalities and Provinces”. This activity will be coordinated and monitored by IRENA which will use these communities and their experience in a way similar to one EARLP showcased in good practice “Energy Efficient Municipalities”, as nucleus that is formed in order to be spread across region.

Implementation workplan (Action 2)		
Local synergies through joint actions		
Activity		Cost
1	Establishment of joint team that will monitor the process of planning, designing and implementation of measures related to refurbishment of buildings. Team will consist from employess of Cities of Poreč and Novigrad, public company Parentium d.o.o. and Istrian health care institutions which will share and combine their specific skill set in order to create team of experts unavailable in singular communities/institutions. This subaction is shared with Action 3 – Raising of capacity in small communities through joint actions, in terms of rationale and formation. Composition of the team is adjusted to specific task provisioned by subaction 1a. Establishment of joint team is supervised by IRENA.	1.000,00 €
2	Creation of joint sub-regional policy instrument for neighbouring cities of Novigrad and Buje and municipality of Brtonigla.	34.000,00 €
Involved actors	Activity involvement	
	1	2
IRENA		
City of Novigrad		
City of Poreč		
City of Buje		
Municipality of Brtonigla		
Parentium d.o.o.		
Istrian health care institutions		
Financing sources	Activity	
	1	2
IRENA - Interreg MED project ENERJ (ERDF funds)		
IRENA - Interreg Italy - Croatia project Joint SECAP (ERDF funds)		
IRENA - Interreg MED project ENERJ (own funds)		
IRENA - Interreg Italy - Croatia project Joint SECAP (own funds)		





Performance indicators		Number
1	Common policy instrument for area of cities of Novigrad and Buje and municipality of Brtonigla	1

		Timeline of activities									
Year		2019			2020				2021		
Quarter		2	3	4	1	2	3	4	1	2	
Activity	1										
	2										





## Action III: save@work ISTRIA

*"The first 15% of Energy savings can be done without paying one EUR"*, sentence introducing one of the presentations EARLP made during Interregional seminar in Rovinj is the driving rationale of this action. IRENA, as ISGE administrator for all the public buildings owned and managed by Istrian region, has long been aware of the negative impact that employee behavior can have on the energy performance of buildings.

This was confirmed during multitude of energy audits conducted by IRENA in last couple of years. This negative effect is especially harmful in case of newly refurbished buildings which rarely, if ever, perform in accordance to refurbishment projections and, because of that, quite often induces negative perception of the whole energy refurbishment process. The question is, how to influence these behavioral patterns especially in public buildings where it seems that the gap to be bridged in terms of energy efficiency is quite higher than in private ones? If possible, it would be highly beneficial, especially as it would offer a non-intrusive alternative for energy refurbishment of buildings that have restricted potential for physical intervention. Even if partial, when number of these buildings in Istrian region is taken into account, that kind of solution would ensure significant reductions in terms of both energy consumption and emissions.

This action has special relevance for the regional conservation office as it offers new perspective to energy saving in buildings, especially ones inhibited by their conservation status. Because of this, regional conservation office is going to be included in all activities in order to further promote the practice.

Action II is going to influence Development strategy of Istrian Region until 2020, Sustainable energy action plan of City of Buje and Sustainable energy action plan of City of Novigrad. Model of fostering reductions of energy consumption through behavioral changes will be included into Development strategy of Istrian Region until 2020 and , Joint SECAP of cities of Buje and Novigrad and municipality of Brtonigla as possible implementation measure.

### Exchange of experience benefits:

Even if the problem is long standing and from the start of the project implementation the idea that action related to it needs to be included in the action plan, idea how to do it did not exist until the Alba Iulia interregional seminar. During one of the focus groups, ESS presented their experience with save@work to IRENA. The practice was ideally suited to be directly transferred so ESS sent detailed instructions to IRENA which started the process of regional dissemination of the idea. ESS was asked to present the practice during Interregional seminar in Gozo to other partners and stakeholders as it seemed that the practice is ideal for implementation across partnership. Later, practice was published on the projects' website and both IRENA and Istrian region decided that second staff exchange in Sweden





## Istrian region action plan



should be organized in order to obtain information from entities that were directly involved in save@work project. The visiting party from Istrian region consisted from representatives of IRENA and Istrian region as project partners and:

- representative of City of Pula
- representative of City of Buje
- and representative of municipality of Vrsar.

These stakeholders were selected as they've expressed their willingness to participate in action save@work ISTRIA that is to be organized during phase 2 of the project.

Save@work ISTRIA is action almost completely transferred from one of the best practices presented during the 1<sup>st</sup> phase of the SUPPORT project. Involvement of several different municipalities is foreseen by directly involving their buildings in planned activities in order to set a good example and to show other public communities and the citizens that the public administration is always looking to take that extra step when energy efficiency and environmental protection is concerned. The idea is to organize a competition between these buildings that will measure how much energy can be saved by influencing the behavior of their employees, just like it has been done in the original save@work project. There will be no investments since the main goal is to monitor the impact of employee behavior on energy savings. Energy managers will be appointed and will conduct onsite inspection to see how well employees are doing in each building, they will monitor the progress and inform all involved personnel about the action, its scope and the progress made. They will also be tasked with constantly adjusting the process in order to find best possible approach suited to specific building/set of employees. Small changes done in the behavior of the employees will be fostered in order to have larger cumulative effect size of which should serve as invitation to other communities to join the action. The cities or municipalities that have currently selected one of their buildings to be involved in the action are: City of Buje, City of Buzet, City of Labin, Municipality of Vrsar and the Region of Istria (building located in Pazin).

Since all public buildings in Croatia have obligation to monitor their energy and water consumption through ISGE online platform, comparing the results will be easy. On the basis of recommendation of ESS, it was decided that average consumption for the last three years will be used as base consumption. Each building stimulates change of employees behavior in order to compete against its own average and against other buildings included in the competition. Complete comparing methodology that uses degree days will be transferred from save@work good practice. There is only one modification that will be made during implementation of save@work ISTRIA. As it was mentioned earlier, monitoring of buildings that underwent energy refurbishment process often shows unsatisfactory results that substantially differ from projections. Because of this, one building in City of Buje that is going to be refurbished by the end of 2019 is going to be included in the competition. This buildings' performance is not going to be compared to its last three year average, but to consumption projected by refurbishment technical documentation. Its goal will be to be as close to that projection as possible.

Cities of Buje and Novigrad and municipality of Brtonigla will include save@work in Joint SECAP as permanent activity. At the end of initial competition, efforts will be made to further disseminate its





### Istrian region action plan



effects in order to foster adoption of the action by other users thus additionally contributing to actions' performance indicator, reduction of energy consumption and CO2 emission.

Implementation workplan (Action 3)				
save@work ISTRIA				
Activity				Cost
1	Establishment of methodological framework for introduction of save@work good practice into Istrian region			2.700,00 €
2	save@work competition			5.000,00 €
3	Inclusion of save@work into Joint SECAP of Cities of Buje and Novigrad and municipality of Brtonigla as permanent activity			To be financed as part of Action II, activity 2
4	save@work competition promotional kit – development of set of materials (brochure, video etc.) that will be used to promote the continuation and expansion action across region			2.000,00 €
Involved actors		Activity involvement		
		1	2	3
IRENA				
Conservation Department in Pula for the Istrian region				
City of Buje				
City of Buzet				
City of Labin				
Municipality of Vrsar				
Istrian region				
Financing sources		Activity		
		1	2	3
IRENA				
Istrian region				
IRENA - Interreg Italy - Croatia project Joint SECAP (ERDF funds)				
IRENA - Interreg Italy - Croatia project Joint SECAP (own funds)				



Performance indicators		Number
1	Average reduction of energy consumption and CO2 emission in involved buildings	15%

Timeline of activities									
Year	2019			2020				2021	
Quarter	2	3	4	1	2	3	4	1	2
Activity	1								
	2								



## Action IV: Kids can do it!

“Lack of technical capacity” was the common denominator of all issues troubling process of large scale uptake of buildings’ refurbishment process in Istrian region identified in regional background analysis. This problem manifests itself on several levels:

- Regional and local authorities during process of preparation, implementation and monitoring of such projects
- Private companies and especially SMEs in ability to perform more complex works and even to employ sufficient number of adequate employees
- Public buildings in lack of personnel able to monitor and maintain the installed systems.

Action “Kids can do it” is envisaged in order to resolve issues of the latter two by providing new employees with specific skill sets that are severely lacking in the region.

Action II is going to influence Development strategy of Istrian Region until 2020, more specifically its activity: “education of workers for construction of energy efficient buildings”.

### Exchange of experience benefits:

During exchange of experience with regional stakeholders, deficits of labor market in Istrian region became apparent. SMEs, especially in construction and HVAC sector are having serious difficulties in acquiring new employees in period of extensive growth, at least in terms of demand, of the sector. Public buildings are facing similar problems with lack of employees capable of carrying tasks of maintenance and system monitoring, especially when newer systems that use RES are concerned.

During Interregional seminar in Rovinj EARLP presented non-technical measures that they are carrying out within their region.

Two of such practices were presented:

- **Training courses for janitors**
  - To know how to use the technical systems devices in public buildings
  - To identify saving opportunities
- **Holzbacluster**





## Istrian region action plan



- Knowledge and technical advice in the field of using wood as a regional building material, providing help in applying for ERD-funding (2007-2013)

The first presentation, “Training courses for janitors”, influenced development of action Kids can do it! Initially, IRENA wanted to transfer the activity in more or less original form and such idea was presented to several communities. Initial contacts were made with cities in which IRENA had some previous experiences with refurbishment of public buildings. One of them was City of Buzet. Kindergarten of City of Buzet was refurbished in common effort by Istrian region and IRENA through IPA Adriatic CBC project Alterenergy. Kindergarten was equipped with highly complex RES based system which proved to be hard to maintain and monitor without specialized employee. The problem with transferring “Training courses for janitors” lied in the fact that even if this is a 1.100 m<sup>2</sup> building with more than 300 users, it had no janitor. Similar problem was identified in many other kindergartens and schools across the region, some had no janitor, some were sharing it with other buildings. Because of this, many systems, especially more complex HVAC systems, are poorly managed and left to deteriorate.

With this in mind, IRENA and Istrian region decided to adjust the concept and keep the education part, but direct it toward pupils of technical high schools that could find interest in these jobs. Set of highly practical educational activities is planned in order to significantly boost regional technical capacity.

Action envisages annual refurbishment of one smaller public building through work of high school students. All activities ranging from refurbishment designing to physical works are to be carried out by students under supervision by in field experts. Depending on their educational course, students are participating in different activities:

- HVAC, thermo technical, electric, construction system designing
- HVAC, thermo technical, electric, construction works

Prior to start of activities, students will undergo series of theoretical and CAD drawing classes. Refurbishment activities will be carried out under supervision of authorized contractor. All works are going to be carried out during school hours exclusively reserved for practical education so they will not interfere with regular educational process.

Students from High school Buzet will be involved in series of regional study visits aimed at showcasing different solutions of RES use. Four study visits will be organizing, each for five students which will later present the solution visited to non-participating ones.

After completion of refurbishment process, students (involved school) will be expected to permanently monitor the building that is refurbished.

In order to foster the adoption of the action across the region, students involved in it will present the work that was done to students of four other high schools.

Each partner has specific role in the action:

- IRENA will organize all the activities





## Istrian region action plan



- Istrian region, as owner of large building stock will candidate a building suitable for refurbishment through this kind of workshop.

This action is planned as permanent annual action that is going to be continued even after completion of phase 2 of project SUPPORT. This action plan includes first such action. Building that is going to be refurbished by use of this methodology is Health care institution of City of Motovun. This is a 250 m<sup>2</sup> building owned by Istrian region. The building is in poor condition so detailed refurbishment is envisaged. Refurbishment will be performed by students of closest technical high school, one in City of Buzet. Works on hydro insulation, windows change, envelope insulation, roof change and insulation, HVAC systems and PVs installation is foreseen. In order to enable same students to perform system monitoring after the completion, it was decided that 2<sup>nd</sup> and 3<sup>rd</sup> class students will be included in the activities. Since these students are minors, strict supervision by certified experts is required.

Implementation workplan (Action 4)						
Kids can do it!						
Activity						Cost
1	Preparation activities - RES use and EE lectures, system designing and CAD drawing lectures					10.500,00 €
2	On site lectures and works - geothermal exchanger installation					14.800,00 €
3	On site lectures and works - thermotechnical system, electro installation and automatization and monitoring system					85.000,00 €
4	On site lectures and works - construction activities, envelope insulation, changing windows/doors					125.000,00 €
5	Study visits (Four study visits for five students each showcasing different RES use technical solutions)					1.000,00 €
6	Regional road show (students' presentations of completed activities in four high schools in Istrian region)					1.000,00 €
Involved actors		Activity involvement				
		1	2	3	4	5
IRENA						
High school Buzet						
High school Buje						
Thermo technical, electro system design SMEs						
Construction and installation works sector SMEs						
Health care institution Motovun						
HEP d.d.						
Financing sources		Activity				
		1	2	3	4	5
IRENA - (own funds)						
Operational programme competitiveness and cohesion 2014 - 2021, Call 4c1.4 'Energy renovation and use of renewable energy sources in public sector buildings						
Istrian health care institutions (own funds)						





Performance indicators		Number
1	Number of high school students with increased technical capacity	40
3	Reduction of primary energy consumption and CO2 emission in Health care institution Motovun	80%

Timeline of activities									
Year	2019			2020				2021	
Quarter	2	3	4	1	2	3	4	1	2
Activity	1								
	2								
	3								
	4								
	5								
	6								





## Istrian region action plan



## Action plan endorsement

Once finalized, this action plan is going to be endorsed by:

- Istrian region
- City of Buje
- City of Novigrad
- Municipality of Brtonigla
- Other local authorities in Istrian region that participate in various actions of the action plan
- Regional conservation office

Ministry of construction Ministry of Construction and Physical Planning and The Ministry of Regional Development and EU Funds will be asked to provide letter of endorsement.

