

D4.7 EXECUTIVE SUMMARY OF NATIONAL ROADMAP - CROATIA

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PROJECT SUMMARY

Achieving the European Union's 2020 **energy efficiency** targets and at the same time reducing its dependency on energy imports is a huge task that requires **innovative approaches and tools** – such as the ones Trust-EPC-South wants to provide.

The **Trust-EPC-South** project aims to **unleash the market's potential** for private **Energy Efficiency Investments (EEI)** in **Southern Europe** by developing new financial instruments which are backed by an established rating methodology. These instruments shall not only allow tearing down barriers in energy efficiency investments through a standardized methodology, further they shall support energy service companies (EPC Providers) and link to the financial markets.

Trust-EPC-South, a project **financed by the European Union's Horizon 2020 programme**, poses itself the ambitious objective to support companies that operate in the energy services sector in **Portugal, Spain, France, Italy, Croatia** and **Greece**. The project consortium, led by the Spanish firm CREARA, is composed by interdisciplinary experts representing the participating countries and by the international non-profit organization "Green Rating Alliance"; the partners are united by the common intent to **stimulate investments in the target markets**, which are offering great opportunities for energy efficiency as well as energy performance contracting.

SCOPE

National Roadmap represents the guide to remove barriers and encourage the development of the energy efficiency market with focus on the private service sector in the Republic of Croatia. The Roadmap aims to elaborate the implementation steps and define the timeframe for achieving the estimated potential and represents an initial step in accelerating the development of EPC's.

First and foremost, the guide is intended for the relevant ministry, but also for all the other market stakeholders. For potential customers in the segment of understanding the concept of the EPC, complexity on the one hand, and on the other hand the advantages of the business model. For service providers (ESCO companies) it shows the expected time and implementation process, creating the conditions for quality market positioning and giving an expected look at the future of the business. Financial institutions are always interested in expanding the range of their products, especially involved in specialized niches of the future market in significant expansions. And from the standpoint of financial institutions, it is necessary to make preparatory steps to maximize market share and necessarily open new financing options. However, the greatest impact is expected to be seen with relevant state bodies and ministries.

The goals (Republic of Croatia) are clearly stated in various strategic, program and planning documents. In addition to clearly stated goals, such as environmental protection and reduced energy consumption, the development of the EPC market has led to improved economic and business indicators. In addition, goals are achieved with the minimal involvement of state bodies, thus shifting the focus of activity to other social needs.

EPC MARKET IN CROATA

Key characteristics

The energy services market is only in the initial stages of development. An increase has been observed in recent years, especially from the aspect of market stakeholders. However, with the exception of HEP ESCO, most of the market companies have emerged recently and take on initial positions and, in large part, expect significant market development.

HEP ESCO has implemented more than 100 energy services projects in industry, power generation and the public sector (building and public lighting). The implemented contracts have fixed cash repayments, in most cases without any guaranteed savings. Less companies have experience with energy efficiency savings contracts (EPCs), all in the industry sector, with a total of less than five contracts so far. Two contracts in the service sector were implemented in Slovenia by a company operating in Croatia and Slovenia. Businesses in the industrial sector often combine contracts and energy supply contracts (ESC). The energy efficiency agreement most commonly implements one energy efficiency measure with a relatively short duration and a high level of financial viability. In some cases, contracts have no justification because they represent relatively simple actions such as the replacement of lighting or a boiler that can be implemented individually by customers. However, the main advantage is the benefit of off-balance financing. ESCO projects (on energy services) finance the implementation of more energy efficiency measures over a longer period, involving all segments - industry, the public sector that includes buildings and public lighting, and in the smallest part the private sector of services.

Energy service providers usually have between 5 and 20 employees with, if needed, the use of external experts. The typical energy efficiency contract has a value of around HRK 3,500,000 with a contract duration of between 5 and 10 years (an average of 7 years). Typical projects are concerned with the reconstruction of central heating and cooling systems, replacement of lighting and the implementation of renewable energy sources.

There is clear message that EPC providers, today, are not interested in projects in private tertiary sector, opting for industry and public lighting. However, they are interested in public tertiary sector (public buildings) seeing this as opportunity for market growth. Likewise, potential private clients (building owners) are not inclined using EPC's to increase energy efficiency, preferring self-financing.

Market potential

Through the reconstruction of commercial non-residential buildings, the private sector can reduce energy consumption by 743.4 GWh by 2020, with estimated investment costs in the amount of 3.2 billion by 2020. The annual energy savings are estimated at 430 million HRK in 2020¹. The potential of EPC market is significantly lower than the overall potential of the services sector, especially considering the possibility of self-financing measures, the impact of energy costs on total business, the risk of potential customers, and the availability of funding. Relevant research of the potential has not been made, but from the available data it is possible to estimate the potential of the market if the specifics of each segment are taken into consideration. The EPC market in the private tertiary sector is optimistically estimated from 300 to 600 million HRK in the period up to 2020.

¹ The program of energy renovation of commercial non-residential buildings for the period 2014 - 2020

What can, at this point, be considered as a significant development of the market is reaching the lower limit (300 million HRK) by the end of 2020. On average (2018, 2019 and 2020) it is possible to realize projects of a 100 million HRK value per year, which, with the average of 3,000,000 HRK per project, which amounts to approximately 30 projects per year. The following table presents the goals of market development by 2020. The greater market development follows the implementation of proposed measures and time-dynamics of the effects on stakeholders.

Table 1 Possible market potential

Year	EPC market value [HRK]	Number of projects	Average value per project [HRK]
2018.	45 000 000	10	4 500 000
2019.	105 000 000	30	3 500 000
2020.	150 000 000	60	2 500 000
Total	300 000 000	100	3 000 000

Market challenges

Table 2 Suggested potential solutions to eliminate roadblocks for EPC projects in Croatia

Roadblock	Potential solution
Availability of financing	EPC providers see this as one of major roadblocks. The level of risk is determined for EPC provider and client separately by the banks. Financing is not project based and banks tend to use additional safeguard conditions as mortgage. Mentioned solutions would contain guarantee fund to stimulate project financing, independent technical and economical agency trusted by the banks and clients to reduce the calculated risk and clearer legislation or instructions from the government to provide easier administration.
Low energy prices	Low energy prices, compared in absolute value to other EU countries, have an effect of prolonging contracts. As a solution, EPC providers tend to invest in buildings and processes that have high energy consumption, targeting, in absolute value, high energy cost savings. Whith this approach smaller project are not interesting and are left for potential clients to invest themselves. Solution that has been mentioned by some companies is additional taxation of energy to increase unit prices.
Lack of knowledge and trust	Most of the barriers for the development of the market potential are all somehow related to the lack of trust. The longevity of contracts wouldn't be an issue if customers had confidence on the results of the project. Independent technical and economical agency trusted by the banks and clients and/or calculation tool was mention as a potential solution.
Potential client believe that they can implement energy efficiency measures themselves	When financing is not an issue for potential client, energy efficiency measures are implemented as an in-house project. In this situations EPC providers tend to convince potential clients that off the books financing offers greater flexibility for future planned non-energy related projects. Only, fully developed market and standard business practice can eliminate this roadblock.

Roadblock	Potential solution
Market insecurity	Economic crisis has scared many of the companies and potential investments, and they see EPC as an investment, are carefully studied and picked for realization. Economic recovery will stabilize the market for the increase in investment activity.
EPC is not interesting for companies that do not own the building that they are using	Companies that rent buildings are not interested in EPC solutions even if they are paying for the energy costs (not included in rent). That companies have stated that building owner has to be stimulated or compelled by governmental policy to implement EE/RES measures.
Lack of trained and well-versed personnel	Introduction of internationally (EU) verified and approved training programs (preferably EU supported)
High transaction costs	Improvements of legal and regulatory framework and introduction of guarantee based schemes
Lack of guarantees	Top – up alternative investment funds and schemes providing risk mitigation products (preferably EU/government supported)
Lack of clear regulatory and contractual rules	Standardization of rules and procedures and introduction of publicly supported pilot projects

TRUST-EPC-SOUTH RECOMMENDATIONS

Through the dialogue with market stakeholders, primarily discussions within national platforms four measures have been defined and formulated, as shown in the following table. Alongside the list of measures, barriers are presented that are at least partially addressed by the defined measures.

Table 3 Identified measures

Identified measure	(Partly) addressed barriers
Improvements of legal and regulatory framework	Lack of knowledge and trust High transaction costs Availability of financing
Availability of implementation documents and key documentation	Availability of financing Lack of knowledge and trust Potential client believe that they can implement energy efficiency measures themselves Lack of trained and well-versed personnel High transaction costs Lack of clear regulatory and contractual rules
Education of potential clients (and other market actors)	Availability of financing Lack of knowledge and trust Potential client believe that they can implement energy efficiency measures themselves EPC is not interesting for companies that do not own the building that they are using Lack of trained and well-versed personnel
Guarantee fund	Availability of financing Lack of knowledge and trust High transaction costs Lack of guarantees Lack of clear regulatory and contractual rules

NATIONAL ROADMAP

Long-medium term targets

The goals are clearly stated in various strategic, program and planning documents. In addition to clearly stated goals, such as environmental protection and reduced energy consumption, the development of the EPC market has led to improved economic and business indicators. In addition, goals are achieved with the minimal involvement of state bodies, thus shifting the focus of activity to other social needs. Long term target is for EPC model to become dominant when implementing energy efficiency measures and installation of renewable energy sources.

Measures and action plan for the national market

Four measures have been identified for unlocking full market potential:

- Improvements of legal and regulatory framework
- Availability of implementation documents and key documentation
- Education of potential clients (and other market actors)
- Guarantee fund

Improvements of legal and regulatory framework

Legal framework allows for ESCO projects, with limitations in ESCO model application for public buildings. Legal framework that (indirectly) defines and regulates elements relevant to ESCO market comprises of following legal acts:

- Energy Efficiency Act (OG 127/14)
- Ordinance on system for monitoring, measurement and verification of energy savings (OG 71/15)

Although legal framework allows ESCO (EPC) projects, there are definitions, restrictions and vagueness that introduces unnecessary risks to the market. In general, Energy Efficiency Law needs some degree of liberalizations and clarifications (mainly concerning tax). On the other hand, methodology for monitoring, measurement and verification has to be widened to include IPMVP.

Availability of implementation documents and key documentation

Library of knowledge, a reference point is needed as a tool to promote EPC business model and explain the concept. Proposal is to create a website where all documentation related to EPC's will be available. Of the key documentation, it is particularly emphasized:

- An example of energy performance contract.
- Examples of technical annexes with methods of measurement and verification of savings for various energy efficiency measures and their combinations.
- Documentation intended for potential clients with clarification of concepts and business model.
- Documentation intended for financial institutions with clarification of concepts and business model.
- Documentation intended for energy service providers.
- Reference to legal regulation with clarifications and explanations.

Education of potential clients (and other market actors)

Education is key to popularizing a business model and increase trust. Currently the fastest and most complete option is to provide workshops, online education materials, including the digital availability of lectures and literature from the lecture and information leaflet through the Croatian Chamber of Economy and the Croatian Chamber of Trades and Crafts. The aim is to provide members of the Chambers with basic information on the business model.

Guarantee fund

In co-operation with financial institutions, HAMAG BICRO has been developing warranty schemes for companies for years. In the Financial Perspective 2014-2020. HAMAG BICRO has, so far, developed models of individual warranties for programs and have submitted a public call to financial institutions. Additionally, HAMAG BICRO participated in the pilot project Energy Efficiency Promotion, which co-financed consultancy services in the total amount of HRK 1.2 million from March to November 2013. One applicant could receive a maximum of 70 000 HRK and co-funded up to 75% of eligible project costs. The Guarantee Fund can also be established in the Environmental Protection and Energy Efficiency Fund, but HAMAG BICRO has more experience and easier implementation.

The existence of a guarantee by HAMAG BICRO will affect the acceptance of more risky business entities (projects) and bring distortion to the market competition. Namely, the attention of credit institutions in granting loans may be lower because of the existence of a guarantee for the repayment of approved loans, especially because financial institutions do not have the expertise to assess the technical risks of energy efficiency projects. Hence, the guarantee should not relate to 100% non-compliant obligations of the energy service provider (it is proposed up to 49%).

Action plan

Table 4 Action plan

Measure	Activity	Implementing organization	Priority level	Financing mechanisms	Timeline					
					H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020
Improvements of legal and regulatory framework	Changes to Energy Efficiency Act	Ministry of Environment and Energy	+	-						
	Changes to Ordinance on system for monitoring, measurement and verification of energy savings	Ministry of Environment and Energy	++	-						
	Other legislation	Ministry of Environment and Energy / Other	+	-						

Measure	Activity	Implementing organization	Priority level	Financing mechanisms	Timeline					
					H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020
Availability of implementation documents and key documentation	Web page development	Ministry of Environment and Energy or assigned institution (Environmental Protection and Energy Efficiency Fund)	+++	National funding						
	Documentation development	Ministry of Environment and Energy or assigned institution (Environmental Protection and Energy Efficiency Fund)	+++	National funding / EU funding						

Measure	Activity	Implementing organization	Priority level	Financing mechanisms	Timeline					
					H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020
Education of potential clients	Curriculum development	Ministry of Environment and Energy or assigned institution	++	National funding / EU funding						
	Development of educational materials	Assigned institution by Ministry of Environment and Energy	++	National funding / EU funding						
	Training and education	Assigned institution by Ministry of Environment and Energy with the help of Croatian Chamber of Economy and the Croatian Chamber of Trades and Crafts	++	National funding / EU funding						

Measure	Activity	Implementing organization	Priority level	Financing mechanisms	Timeline					
					H1 2018	H2 2018	H1 2019	H2 2019	H1 2020	H2 2020
Guarantee fund	Preparations to establish Guarantee fund	Relevant ministries (economy, finance, construction, energy)	++	National funding / EU funding						
	Establishment of Guarantee fund	HAMAG (FZOEU)	++	National funding / EU funding						

PROJECT COORDINATOR

Creara



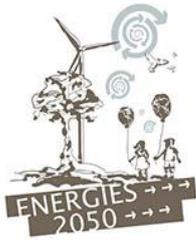
CROATIA

Energetski institut Hrvoje Požar



FRANCE

ENERGIES 2050



Green Rating Alliance



GREECE

Technical University of Crete



TECHNICAL UNIVERSITY OF CRETE (TUC)
SCHOOL OF ENVIRONMENTAL ENGINEERING
RENEWABLE AND SUSTAINABLE ENERGY
SYSTEMS LABORATORY

ITALY

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