

ACTION PLAN

Final version

by
Hungarian Innovation and Efficiency Nonprofit Ltd. (Mi6)
Project Partner 6

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List of abbreviations used

Abbreviation	Definition
EDIOP- 4	The Hungarian policy instrument for SME level energy efficiency support (Economic Development and Innovation Operational Programme 2014-20, Priority 4)
EE	energy efficiency
GHG	green house gas
MA	managing authority
PI	policy instrument
RE	renewable energy
SECAP	Sustainable Energy and Climate Action Plan
SME	small and medium enterprises
VPPP	Virtual Power Plant Programme

Executive Summary

The purpose of the present Action Plan is to set out a framework of implementation toward achieving project objectives, i.e. to improve the Policy Instrument selected in the LOCARBO Interreg Europe project.

The Hungarian policy instrument selected in the LOCARBO project for further enhancement is the Economic Development and Innovation Operational Program 2014-20 (EDIOP) Priority.

The priority has a threefold objective structure based on and tied to thematic (energy efficiency), financial and regional categories. The national energy strategy aims at reducing the heating energy needs of Hungarian buildings by 30%. This goal is to be achieved by 2030 with the help of energy efficiency related programs complying with EU targets. This priority, matching the EDIOP main goal structure addresses the competitiveness of the business sector (SMEs) by supporting its energy efficiency and renewable energy production related investments.

The situation is special to Interreg, as the policy change has already been delivered in Phase 1 by the project partner via successfully influencing the policy instrument related scheme conditions and the renewal and re-issuing of the EDIOP-4 schemes. Therefore, Phase 2 of the LOCARBO project, i.e. implementation of the Action Plan needs to concentrate on monitoring the results of this policy change and grab all opportunities to introduce further improvements.

The action plan sets out 3 specific objectives, each of which is supported by 3 actions. The goal in each specific objective is to utilize MI6's added value to building a bridge and facilitate matchmaking between policy makers (supply) and market (demand) sides of the EDIOP-4 calls.

Strategic objective	Specific objective	Action
A. Increasing energy saving in the SME sector and realize 100,000 GJ actual energy saving	A.1 Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme <i>(demand side intervention)</i>	A.1.1 Raising awareness and collect and share good practices
		A.1.2 Engaging new target groups for indirect SME engagement (local, regional, transnational agents)
		A.1.3 Pilot actions for stakeholder group extension (electromobility, education, climate mitigation, international expansion, etc.)
	A.2 Further developing EDIOP Priority 4 <i>(supply side intervention)</i>	A.2.1 Monitoring stakeholder and market information on PI
		A.2.2 Collecting and sharing transnational practices with MA
		A.2.3 Providing proposals to MA scheme modification and management
	A.3 Monitoring the performance of the policy instrument <i>(match-making intervention)</i>	A.3.1 Monitoring co-funded projects and good practices, depositing their savings
		A.3.2 Creating an early warning system on PI funds absorption
		A.3.3 Maintaining a consultation platform for MA on PI status

The objectives and actions of MI6 in Phase2 of the LOCARBO project

The action plan details the key steps of implementing the action plan with the schedule of planned events, surveys and awareness raising actions as well.

A. Strategic approach

Background

The purpose of the Action Plan is to provide a framework of implementation toward achieving project objectives. The core activity of the Action Plan is to improve the Policy Instrument selected. Therefore, the Action Plan sets out to deliver results in relation to the improvement of the chosen Policy Instrument.

Subject

The Hungarian policy instrument selected in the LOCARBO project for further enhancement is the Economic Development and Innovation Operational Program 2014-20 (EDIOP) Priority 4. (hereinafter referred to as EDIOP-4).

The priority has a threefold objective structure based on and tied to thematic (energy efficiency), financial and regional categories. The national energy strategy aims to reduce the heating energy needs of Hungarian buildings by 30%. This goal is to be achieved by 2030 with the help of energy programs complying with EU targets. The priority, matching the EDIOP main goal structure aims to help the competitiveness of the business sector by supporting its energy efficiency and renewable energy production investments.

Considering the other goal structure (transforming a low-carbon economy) the main focus is the development and innovation in line with environmental goals. According to our research, energy efficiency is only a tertiary goal in at least one third of Hungarian companies, while they use 40% more energy during their operation than their western counterparts.

As a result of our previous research, an EDIOP 4 draft call for proposal was formulated in late 2015. With a total support of EUR 193,548,387. The call aimed at SME energy efficiency investment support. The call used a combined financing methodology with refundable (loan) and non-refundable parts for building energy efficiency and renewable investments. The program focuses on co-funding investments with an underpinned ROI only with the restriction that applicants are obliged to incorporate renewable energy sources in their project plans (with the exception of wind energy as it is not supported in the current state of the call).

History

Our organisation was responsible for providing the underlying research and assessment and drafting the concept and draft grant scheme for EDIOP-4 (addressing the support of SME building related energy efficiency and renewable energy investments) in the frameworks of an EU co-funded project in 2013-2015, before participating in LOCARBO. The project was well-accepted by the MA and concluded in 09.2015. In 03.2017 the MA published the scheme, but with different condition. We informed the MA as LOCARBO PP about concerns and offered help. Indeed, the call was not popular and the MA suspended it in 07.2017.

We approached the MA then, proposing that we review the scheme (based on knowledge collected in the LOCARBO knowledge exchange) to meet market demand. At a meeting on 22 August, with MA EDIOP-4 responsables, LOCARBO PP6 management and LLL representatives, we presented our first proposal to the MA and the MA accepted it.

In October-January we assisted the MA in transforming the PI, based on the transnational learning and consultation in LOCARBO and submitted a 110 page document with two new scheme proposals. It included strategic proposals (better balance between EE and RES, split of schemes), conditions (IRR, factors) finance and procedure issues. Proposals came from the international and national tasks carried out within LOCARBO.

The new EDIOP-4.1.1. scheme already opened on 31.10.2017 and EDIOP-4.1.2 opened in 02.2018. The MA letter of acceptance of our contribution (18.12.2017), states that the MA "taken on board insights, expert information and transferred market knowledge provided by the project partner in improving and changing the management and the strategic focus of the Policy Instrument and its corresponding scheme conditions".

Since their launch, the new schemes have been welcome by the market as being more relevant and matching to company needs than the previous ones. However, there is not enough information so far, to make reliable estimates on their performance.

This process relied mainly on policy learning and knowledge sharing and included preparatory LLL meetings, analysis and consultations with additional stakeholders and the Managing Authority. In our understanding, and in relation with the LOCARBO project, the driver for the MA to launch the scheme was twofold: first, international learning acquired through Project Partner consultations (TWT meetings and the MA Café in Durham with the Hungarian EDIOP MA participation), and second, the clear demonstration of the demand for EDIOP-4 investments relying partly on LLL feedback and partly on the regional analysis developed in the LOCARBO project.

We consider it a major milestone because with projects implemented as part of the grant scheme, market and stakeholder feedbacks allow the MA to introduce changes based on real project implementation experience and feedback. We closely monitor this process to provide consolidated and viable recommendations for the MA for further improvement of the policy instrument.

Stakeholders

Project stakeholders consist of many groups interested in facilitating energy efficiency actions:

Government organizations and their decision making bodies, as they have the means to implement policy instruments which will be created in the project. As government supports are a key in realizing energy efficiency investments, the following players are key in their roles:

Institutional level/regulatory partners

- Ministry for National Economy (NGM)
- Ministry of National Development (NFM)
- In the regional context the Hungarian Energy And Public Utility Regulatory Authority (MEKH) is the key and responsible partner for PI creation in the energy sector,

Public sector partners can be of help in the local implementation, communicating the regional attributes as they have a deeper insight to local matters, and they can help identifying key points of interests, where Policy instruments should take actions for maximum effect on energy efficiency.

These partners are

- local municipalities,
- city councils,
- government agencies relevant to energy efficiency,

NGOs and Non-Profit organizations provide also good options for establishing a deep spread stakeholder network, and communicating project goals and action items towards the target segments, who will be affected by the project results.

Main stakeholders formulating the core of the Local Living Lab for LOCARBO are:

1. Ministry of National Economy	2. National Sustainable Development Council
3. Ministry of National Development	4. Association of Climate Friendly Municipalities
5. Budapest Zoo	6. Association of environmental services and production companies
7. American Chamber of Commerce	8. Hungarian Electrotechnical Association
9. Audi Hungária Motor Ltd.	10. Hungarian Energy engineers' group
11. Bay Zoltán Applied Sciences Research Institute, Nonprofit- Ltd.	12. Hungarian Chamber of Engineers
13. Budapest University of Technology Building energy and building machinery Faculty	14. MAPASZ Innovativ Buildings' Association
15. Budapest University of Technology Faculty of mechanical Engineering	16. MATÁSZSZ
17. Corvinus University Budapest, Institute of environmental studies	18. University of Miskolc
19. Cothec Energetics Ltd. A partner company of COFELY- GDF SUEZ	20. Hungarian Trade Agency
21. Lorand Eotvos University, Economy and environmental psychology faculty	22. High School of Nyíregyháza
23. Energy management journal	24. University of Obuda
25. Energy management science association	26. Seed SME Development Fund
27. Metropolitan district heating company	28. Employee Association

List of stakeholders

As most large stakeholders can be involved in PI formulation and further improvement, it is vital to know that all city councils and all SMEs/business partners cannot and should not be involved in the core project tasks. They are considered out of scope in the context of rational project reach. However, their role is important.

Main objectives and impacts

As a survey carried out by MI6 disclosed in 2015, the Hungarian SMEs have 1349 GWh real energy efficiency potential in their building stock.

This means, that with a close to 50% government support on energy efficiency investments, the Hungarian SME sector can save a summarized (electricity and natural gas) energy efficiency consumption of 1,4 TWh/year, which is more than third of the identified theoretical potential.

However, to achieve this goal, a sum of EUR 375 million investment is required. (50% of which should come from EU and government support).

Our research came to the conclusion that following the changes of the government support parameters, the real energy efficiency saving potential and GHG emission rates are changing at a different rate. The latter is clearly based on which part of the energy efficiency savings come from electricity based or natural gas based investments (because of their different GHG effects).

As we have identified during our research, the close to 50% government support level is the key, as it makes possible the most effective use of invested equity by meeting SME financial expectations. Below this level, support intensity is not attractive enough. Above these investment levels the effectiveness degrades (to well known reasons of negative externalities, e.g. free-riding behaviour on government funds). At the 50% level however a **11,6 GWh/ bn HUF** invested effectiveness KPI can be achieved.

This rate also promotes an estimated 520 Mtons of GHG emission saving. Our research came to the conclusion that the GHG saving potential's dynamics are growing the most intensive between the 30-50% government support levels. However, the real to theoretical savings ratio is a bit better on the GHG side, as shown below:

At 50% support intensity (per unit efficiency is the greatest here, source: Mi6)

- Theoretical energy efficiency potential: 3672 GWh/year
- Real potential: 1349 GWh/year
- Theoretical GHG savings: 1217 MT/year
- Real GHG savings: 520 MT/year

At the level of 70% support intensity:

- Theoretical energy efficiency potential: 3672 GWh/y
- Real potential: 1780 GWh/y
- Theoretical GHG savings: 1217 MT/y
- Real GHG savings: 653 MT/y

At the level of 30% support intensity:

- Theoretical energy efficiency potential: 3672 GWh/y
- Real potential: 750 GWh/y
- Theoretical GHG savings: 1217 MT/y
- Real GHG savings: 348 MT/y

As Mi6 set out to guide investors and SMEs from the theoretical side of investments to a more real and achievable strategy, new motivations arise in the solely quantitative model. Qualitative factors must be assessed as well. These factors must be further researched in the future, and must be addressed to increase the per investment and per GHG unit effectiveness of all government support intensity segments.

The research has already validated that the energy efficiency potential and investment costs don't correspond proportionally along the line. The function is rather steep at the first intensity ranges and then slows its intensity like any parabolic function.

This shows lost efficiency along the line, where economic players are encouraged by the sole magnitude of government support, to find other means of using the excess money given.

This way our second main ambition is to assist in further improving a reasonable Policy Instrument which helps developing energy efficiency investment rates, promotes cost-efficiency (energy and GHG saved per investment related support unit) and at the same time does not alter or distort the market.

Supporting goals of the ambition are:

1. Accelerate and facilitate investments, which later can become best practices (in terms of project management-, technology used-, energy efficiency)
2. Start the leveraging effect of the government funds on energy efficiency investments and facilitate the start and uptake of market based financing models
3. Help accelerate the construction market
4. Sustainably save energy and GHG emissions in the coming years

The main goal is to increase energy savings and use of renewables, with the help of the following actions:

- Further stimulate energy efficiency investments with policy and business driven instruments
- Help realizing the 1349 GWh energy efficiency saving potential along with 520 Mt/y GHG potential
- Facilitate communication between stakeholders to ensure the success of the EDIOP priority 4, SME energy efficiency program
- Give advice on regional players how to ensure that feasible energy efficiency projects are born
- Socialize the knowledge to a wide basis through the Virtual Power Plant Program, also extending the program to a wider basis
- Help creating governmental and local PIs that support energy efficiency investments, but also offsets the free-riding effects in governmental funds

B. Vision, goals and results

According to our uptake in the application form of the LOCARBO project, and the table presented below, MI6 have multiple objectives to achieve in this project. As MI6 have already completed its main task (referring to the enhancement of a local policy instrument- EDIOP 4) at the time of writing the action plan, all objectives are designed to support the sustainability of the local policy instrument.

Goals and actions

Strategic objective	Specific objective	Action
A. Increasing energy saving in the SME sector and realize 100,000 GJ actual energy saving	A.1 Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme (Demand side intervention)	A.1.1 Raising awareness and collect and share good practices
		A.1.2 Engaging new target groups for indirect SME engagement (local, regional, transnational agents)
		A.1.3 Pilot actions for stakeholder group extension (electromobility, education, climate mitigation, international expansion, etc.)
	A.2 Further developing EDIOP Priority 4 (Supply side intervention)	A.2.1 Monitoring stakeholder and market information on PI
		A.2.2 Collecting and sharing transnational practices with MA
		A.2.3 Providing proposals to MA scheme modification and management
	A.3 Monitoring the performance of the policy instrument (match-making intervention)	A.3.1 Monitoring co-funded projects and good practices, depositing their savings
		A.3.2 Creating an early warning system on PI funds absorption
		A.3.3 Maintaining a consultation platform for MA on PI status

The objectives and actions of MI6 in Phase2 of the LOCARBO project

As it is with all market based operations, long term goals can be influenced on both the demand (local SMEs applying for EE support) and supply sides (local MA and policy makers running EDIOP 4) the two objectives represent these two sides of the market and our goal is to bring the stakeholders closer to each other to ensure the successful operation of our chosen policy instrument- EDIOP 4.

Objectives and specific objectives

Objective: Increase SME energy savings in the SME sector, as described on the earlier pages the main goal is to increase energy savings and use of renewables in the SME segment.

The main objective can be divided in to two specific objectives, such as:

- A.1** Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme (demand side intervention)
- A.2** Further developing EDIOP Priority 4 (supply side intervention)
- A.3** Monitoring the performance of the policy instrument (match-making intervention)

Specific objective A.1 refers to the MI6 contribution to the LOCARBO project results referred in the application form, while A.2 and A.3 supports the strategic aim of the main objective. All specific objectives are supported by a number of tools and actions, which are to be completed by MI6's operations.

A.1 Specific objective is supported by the following actions:

A.1.1 By running the Virtual Power Plant Programme MI6 already realized **2 TWh (around 7,2 PJ) energy savings** since its start in 2011. Since the LOCARBO project start in April 2016, around 283 GWh of energy savings were registered, 40% of which comes from SMEs, leading to 406,800 GJ primer energy saved. This means that large portion of the goal (at around 90,000 GJ) have already been achieved by the operation of the Virtual Power Plant programme, however, there are even more measures deployed to support this specific objective.

By running platforms indicated later on in A 1.2 and contacting relevant SMEs, MI6 can collect good local energy efficiency practises as well as formally recognise them at it's award ceremony. This gamification based social innovation leads to a multiplication of SMEs attracted by EE investment. After that, EE good practices are to be disseminated using all other climate platforms as well.

A.1.2 and A 1.3 New target groups with pilot actions

- A.1.2.1 Start awareness raising in relevant stakeholder groups
- A.1.2.2 Inclusion of new target groups
- A.1.2.3 Actions to bridge information gaps
- A.1.3.1 Pilot actions for newly identified stakeholder groups

The first three actions are to be carried out and planned to be achieved by taking up a representative role in local and county level climate platforms as well as Covenant of Mayors' related actions such as designing and planning local SECAPs (Sustainable Energy and Climate Action Plans. The company is planning to establish three county level climate strategy platforms at Békés, Fejér and Komárom-Esztergom counties. It plans to create the corresponding county level climate strategies as well.

Mi6 plans to continue its operations in this area, establishing contact with more than 200 local stakeholders composed of municipalities, government organizations and local SMEs. By using SECAP and climate strategy platforms as a main communication channel, awareness raising can be centralized and transferred to a large number of relevant SME stakeholders as well as new target groups, such as local SMEs underrepresented in policy making and EE actions.

Also, these platforms act as ideal channels for bridging information gaps, and providing useful support on future applicants in EDIOP 4 calls. Also, a rather detailed information about how they plan to apply for EDIOP 4 support and what their specific EE investment needs are, should be addressed in the calls.

By taking these actions around 100 new stakeholders are planned to be reached in medium term.

A.1.3. After the new stakeholder groups are identified during A.1.2 and its subtasks, MI6 plans to engage in new pilot actions to increase potential energy savings in multiple target segments, these are:

- Promoting electromobility in SMEs and municipalities, reducing transportation based CO₂ (both at companies and households – the promotioin of buying e-cars, and municipalities and companies to install new charging points to facilitate expansion and coverage)
- Local, municipality level CO₂ and other climate related GHG mitigation through municipality and county level climate and SECAP strategies
- Energy efficiency and renewable energy promotion in education: multiple programmes to promote energy saving and climate friendly life at an early age and inter-generations as well
- International expansion: Exporting the local good practices to other countries with similar SME and energy mix structure.

Our intentions concerning A 1.3 also strongly rely on expanding our international cooperation, in order to increase demand for energy efficiency all over Europe, using our Virtual Power Plant Programme (VPPP) methodology.

As a concrete step in this expansion, we are devoted to submit a joint Pilot Action Plan to the JS by the end of LOCARBO project Phase1, with the inclusion of LOCARBO project partners, Potenza, Durham, and ourselves with the possibility of further partners joining. The intent of the partners is to pilot VPPP methodology use in their local context, tailored to their local needs. In the case of Durham, the joint Pilot Action is planned to aim at the collection and recognition of EU funds-driven GHG emission decrease, while Potenza aims at using VPPP methodology in their SECAP and SECAP related emission decrease monitoring and linking it to the WeResilient programme.

The details and the final configuration of partners are to be elaborated in the coming months, with our professional coordination. In this process, we take the role of coordinating the preparatory actions and finalising the document to be submitted to JS at the Porto meeting the latest. Concerning implementation, we plan to provide the VPPP methodology and the professional support of our own experts (staff) throughout the entire process to provide a genuine interpretation of VPPP in this multi-country cooperation. Also, we plan to learn and adapt in Hungary the jointly established and piloted solutions that our partners will attempt to implement.

A 2 Further developing EDIOP Priority 4 (supply side intervention)

The specific objective is supported by the following actions

- A.2.1 Monitoring stakeholder and market information on PI
- A.2.2 Collecting and sharing transnational practices with MA
- A.2.3 Providing proposals to MA scheme modification and management

Due to the successful enhancement of EDIOP 4 calls by MI6, the head of MA commissioned the company to help with the daily operation of the programme: (see the attached letter of acknowledgement in Annex 3 as reference):

- Monitor the SME applications for funds in EDIOP Priority 4 calls
- Assess and measure the planned energy efficiency effects of projects proposed by applicants
- Give a feedback on overall energy efficiency savings regarding the national criteria undertaken in the 2020 operative programme.

As stated earlier, as a result of our successful operations, the main specific objective is to establish a monitoring system to help facilitate the uptake of energy efficiency support available for SMEs in Hungary, while further developing the policy instrument, **answering the needs of the demand side (SMEs) identified in the A.1 specific objective.**

On the other hand (through LOCARBO and other various projects) it is planned to gather best practices from other countries as well, to enrich the PI maker with different views on designing relevant calls for SME level applicants.

It is also a goal (A.2.3) to further develop the EDIOP 4 priority, by continuously assessing the market needs (as mentioned in objective A) and feeding information back to the policy maker as well.

A.3 Monitoring the performance of the policy instrument

The specific objective is supported by the following actions

- A.3.1 Monitoring co-funded projects and good practices, depositing their savings
- A.3.2 Creating an early warning system on PI funds absorption
- A.3.3 Maintaining a consultation platform for MA on PI status

To achieve this, during the course of implementation of the action plan, Mi6 sets out to have EDIOP 4 projects in line with the Virtual Power Plant Programme and aims to design a monitoring and auditing process similar to the programme's proceedings for the EDIOP-4 applicants. This way, applicants might be tracked directly in one system, as well as completed energy efficiency projects and their energy savings can be tracked.

During this specific objective, special actions are planned to be taken to establish a monitoring system for EDIOP 4 applications.

The system is envisaged to collect information about:

- Summarized financial support requirements for all applicants
- Summarized financial support requirements for successful applicants
- Summarized potential energy efficiency savings by all applicants
- Summarized potential energy efficiency savings by successful applicants
- Ratio on annual operational programme energy saving targets

The last point refers to an early warning system. MI6 plans to establish a system to spot obstacles and setbacks in the current EDIOP 4 application procedure, and content e.g.:

- Regulatory obstacles to implementation
- Underperforming applicants
- Energy saving potential above or below annual goals
- Fund absorption issues (it may consist of low number of potential applicants, difficult to reach call eligibility criteria or substitute calls in other OPs, which attract the target group)

The early warning system aims at identifying these key points if they arise and give appropriate answers for the MA partner and Policy Maker to solve situations such as those referred above.

All of the above mentioned actions are to be communicated on platform meetings (A.3.3) held regularly for bridging info gaps and feeding back market information to the MA.

Local context

As it is referred in the annex renewables have grown considerably in the last 6 years, however they are still far behind the fossil and nuclear sources (50+%) in terms of production. The most used sources are biomass and biofuels, while emerging energy sources, such as solar production is still low. Hungary has significant geothermal potential to be exploited better, moving on from the current district heat production to agriculture and electricity production (co- and trigeneration).

As a result of our previous research, an EDIOP 4 draft call for proposals was formulated in late 2015. With a total support of EUR 193,548,387, the call aims for SME energy efficiency investment support. The call uses a combined financing methodology with refundable (loan) and non-refundable parts for building energy efficiency and renewable investments. The program focuses on co-funding investments with an underpinned ROI only with the restriction that applicants are obliged to incorporate renewable energy sources in their project plans (with the exception of wind energy as it is not supported in the current state of the call).

Before the enhancement of EDIOP 4 instrument, a handful of malfunctions and faults were experienced in the instrument, such as:

- Gathered energy efficiency savings were lagging behind the set goals for the Operative Programme, at around 1/4th of the yearly plan
- Fund absorption was low with a low number of SME applying for the call
- The instruments calls were bogged down by unnecessary administrative burden which scared away potential applicants

As of at the time of writing of the Action Plan the EDIOP Priority 4 has already undergone a round of MA approved improvement by Mi6 in the context of the LOCARBO project. After the successful enhancement procedure, new challenges arise for the project partner which are connected to all three of the LCOARBO project thematic pillars:

- i. Services
- ii. Organizational Structures
- iii. Technological Solutions

In accordance with the Head of Managing Authority's letter of acknowledgement, the MA counts on MI6 for a further professional assistance with the follow-up of the EDIOP 4 policy instrument.

A direct link is apparent with the "Technological Solutions" thematic pillar of the LOCARBO project as well, as it is stated in specific objective A.2 and its corresponding actions, the best SME energy efficiency practises are to assessed, compiled and disseminated through various channels and actions, such as the Virtual Power Plant Programme annual award ceremony, or its knowledge base, as well as the county level climate strategy and SECAP multi- stakeholder platforms too.

The following table shows expected impacts of specific objectives and actions demonstrated earlier as well as it shows the local context background as well:

Objective/action	Short term impact	Mid term impact	Long term impact	Local context	Link to thematic pillar
A.1 Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme					
Overall results	Contribution to PI and Operational Programme goals	Operational Programme target savings achieved	Post 2020 period effect	EDIOP-4 improvement	I. Services
A.1.1 Raising awareness and collect and share good practices	40,000 GJ / year saved	Increased absorption of new EE technologies	Stable base for growth for investments in the renewable energy sector	Co-operative engagement with SMEs and other stakeholders	I. Services III Tech. Solutions
A.1.2 Engaging new target groups for indirect SME engagement (local, regional, transnational agents)	Increased absorption on current EDIOP-4 calls				
A.1.3 Pilot actions for stakeholder group extension (electromobility, education, climate mitigation, international expansion, etc.)	Increased absorption of new EE technologies in multiple stakeholder segments				
A.2 Further develop EDIOP-4					
A.2.1 Monitoring stakeholder and market information on PI	Better absorption of policy instrument funds	Reaching the energy saving goals set out in the OP for 2020.	The potential for better designed calls in the post 2020 planning period	cooperation with local SMEs	I Services II Org. structures
A.2.2 Collecting and sharing transnational practices with MA	Faster preparations for the post 2020 timeframe				
A.2.3 Proposals on scheme management	Better designed calls for the policy instrument, also larger energy saving potential due to better fund allocation.	New opportunities for SMEs top finance EE		Co-operative engagement with MA partner	
A.3 Monitoring the performance of the policy instrument					
A.3.1 Monitoring co-funded projects and good practices, depositing their savings	30.000 GJ/year saved	Increased absorption of new EE technologies	Better designed calls for the post 2020 programming period	Co-operation with local SMEs	I Services II Org. structures
A.3.2 Creating an early warning system on PI funds absorption	Increased absorption in current EDIOP-4 calls				
A.3.3 Maintaining a consultation platform for MA on PI status	More applicants for EDIOP-4				

Context level overview on the action plan items

C. Implementation procedure

MI6's action plan spans the whole implementation phase. There are two types of actions: continuous and recurring.

Continuous actions are to be evolved to integrate into MI6's core activities in the implementation phase, while recurring actions are done periodically to allow feedback and analysis opportunities compared to previous results.

The actions are following:

A.1 Specific objective: Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme (demand side intervention)

Actions:

- A.1.1 Raising awareness and collect and share good practices
- A.1.2 Engaging new target groups for indirect SME engagement (local, regional, transnational agents)
- A.1.3 Pilot actions for stakeholder group extension (electromobility, education, climate mitigation, international expansion, etc.)

To achieve a 100.000 GJ in energy savings, MI6 continues to operate the Virtual Power Plant programme to assess and audit SME energy efficiency and renewable energy investments. Building on the success of the 2018 year, two calls and two corresponding award ceremonies are planned per year, all of which are preceded by a month of auditory work on all SME applicants.

Tasks are going to be divided between participating stakeholders as follows:

- MI6: Programme management
- Business partners, SMEs: programme promotion, SME applicant acquisition
- Scientific partners: Energy management journal, energy management science association: Audit and monitor applications
- Managing Authority partner: Accept and validate energy efficiency results for applicants, formally acknowledge EE performance in the award ceremony.

On the other hand there will be two continuous activities closely tied to the VPPP core procedures. As municipalities and counties are planned to get awarded on the ceremony and MI6 is to become the platform manager for climate strategies and SECAP platforms in multiple regions, the company can closely monitor the execution of climate strategies and SECAP plans. As each strategy and plan contains suggestions and objectives on renewable energy and energy efficiency (seeking GHG mitigation targets) for the SME sector, the execution of such plans are closely monitored, and energy savings are acknowledged by MI6, thus another stream of energy savings contribute to the 100.000 GJ target.

On the other hand these platforms will be the main channels to communicate and start pilot actions, such as:

- Local electromobility programmes for SMEs and municipalities to reduce transportation related GHG
- Education programmes for local students based on climate friendly behaviour

Stakeholder tasks:

- MI6: Platform management and auditing and monitoring tasks on SME energy savings
- Local municipalities, councils: Execution of local climate strategy and SECAP plan, supporting SME energy saving investments.

There are annual awareness raising actions planned, closely tied to the aforementioned local climate and SECAP platform meetings. MI6 plans a recurring campaign to reach potential SMEs in two areas:

- General energy efficiency thoughts, best practices
- VPPP actions, how and where to apply, benefits.

The communication channel is twofold: An online campaign on the MI6 webpage and social media, sharing the best practices and facts about energy efficiency, and a meeting day at the local climate platform with presentations on the matter.

Stakeholder tasks:

- MI6: Campaign management, presentations
- Local councils, municipalities: Lead stakeholder at the event
- Business partners, scientific partners e.g: MATÁSZSZ, Audi Hungary, GET energy: Provide accurate best practice examples

A recurring online survey is also planned to assess SME EE investment needs and their opinion on the running EE support programmes. The online surveys are planned to repeat twice a year. Based upon answers new proposals are formulated by MI6 for the managing authority regarding new call opportunities and grant schemes fitting to the real needs of SMEs.

Stakeholder tasks:

- MI6: Monitoring action management, planning and implementation of monitoring and early warning systems
- Managing Authority Provide information on applications for the EDIOP-4 calls.
- Scientific partners: Methodology support

A.2 Specific objective: Further developing EDIOP Priority 4 (Supply side intervention)

Actions:

- A.2.1 Monitoring stakeholder and market information on PI
- A.2.2 Collecting and sharing transnational practices with MA
- A.2.3 Providing proposals to MA scheme modification and management

The actions consist of multiple tasks, each supporting the specific objective.

Bridging gaps is tied to the platform level actions, as they will be taking place on the local platform annual meetings, planned as the following: 2 presentations for awareness raising for new participants in the morning, and one “bridging the gap” workshop for existing partners, focusing on the information gaps in energy efficiency investment, and EDIOP-4 execution/application.

There are also actions to address applicant level issues and feedback info to the MA about them. : There are a number of stakeholder issues and questions anticipated to be appearing in the EDIOP-4 application period as well as a number of best practice energy efficiency solutions are expected to arise during the monitoring and audit process of EDIOP-4 applications.

Stakeholder tasks:

- MI6: Campaign management, presentations
- Local councils, municipalities: Lead stakeholder at the event
- Managing Authority Provide information and future plans on energy efficiency support and EDIOP-4

A.3 Monitoring the performance of the policy instrument(match-making intervention)

Actions:

- A.3.1 Monitoring co-funded projects and good practices, depositing their savings
- A.3.2 Creating an early warning system on PI funds absorption
- A.3.3 Maintaining a consultation platform for MA on PI status

A 3.1 and 3.2 actions are handled conjointly as they are part of supporting the monitoring system mentioned earlier. The monitoring system and the early warning system supports the EDIOP 4 programme management tasks of the managing authority, thus a short implementation project is planned to support the MA on developing the monitoring and early warning systems. Planning, testing and implementation are likely to take up about 40-45 days after which the monitoring actions run continuously.

Stakeholder tasks:

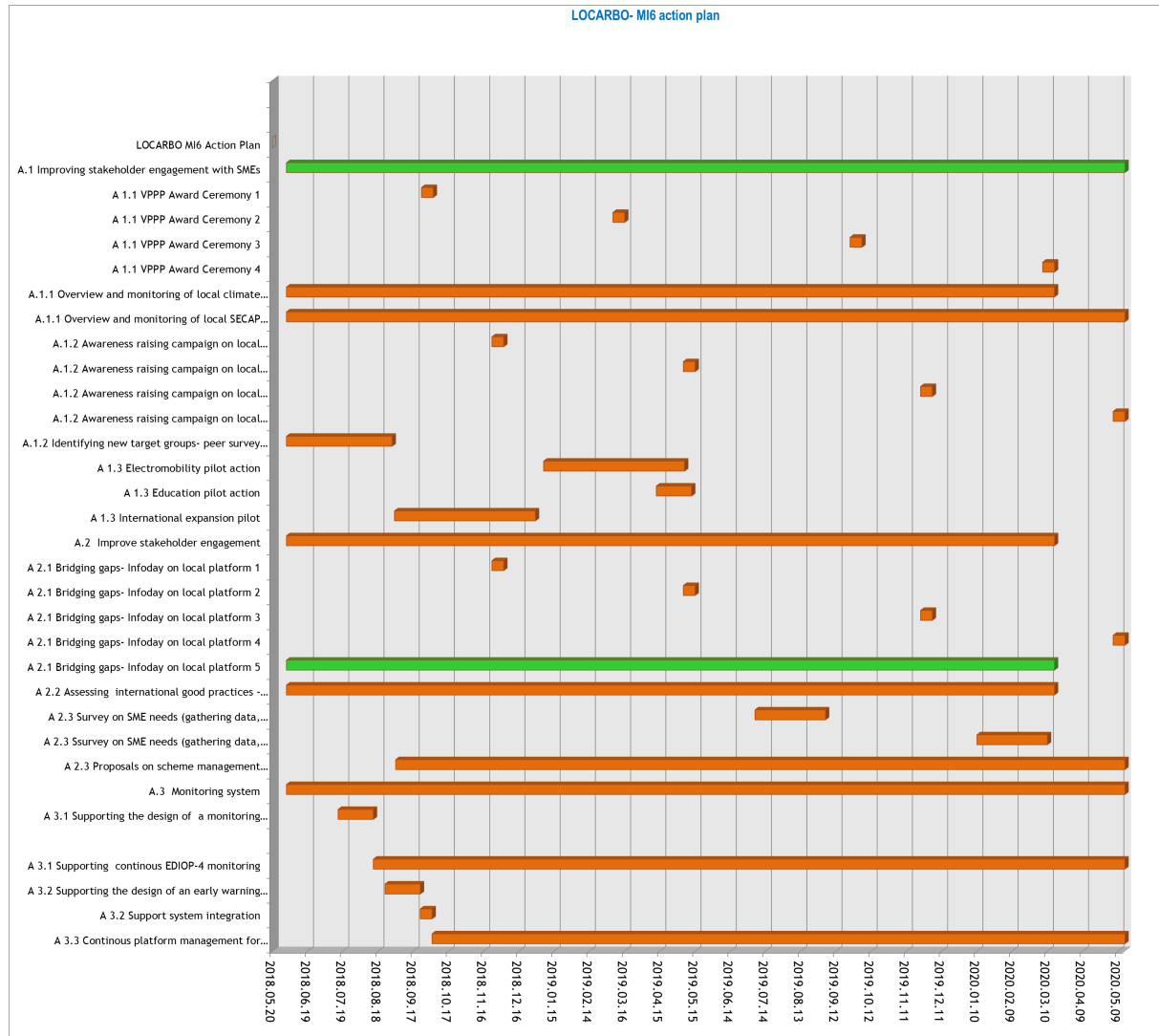
- MI6: Monitoring action management, planning and implementation of monitoring and early warning systems
- Managing Authority Provide information on applications for the EDIOP-4 calls.
- Scientific partners: Methodology support

The third part of the support actions is the monitoring of EDIOP-4 execution, which consists of monitoring and validating SME applicant EE investment, accounting energy savings and acknowledging best practices. As it is stated in the Head of the Managing Authority's letter MI6 is going to take up a leading role in monitoring EDIOP-4 results, thus all successful applications and their respective energy savings is planned to be counted towards the 100.000 GJ target.

Stakeholder tasks:

- MI6: Monitoring management
- Scientific partners: Energy management journal, energy management science association: Audit EDIOP-4 applications on the Energy Efficiency level
- Managing Authority partner: EDIOP-4 programme management. Accept and validate energy efficiency results for applicants, formally acknowledge EE performance in the award ceremony.

LOCARBO- MI6 action plan



D. Inputs analysis

For each activity, please identify the INPUTS resources and define whether you consider internal or external resources.

Action	Internal Resources (FTE)	Stakeholder resources (FTE)
A.1 Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme		
A.1.1 Raising awareness and collect and share good practices	2	1
A.1.2 Engaging new target groups for indirect SME engagement (local, regional, transnational agents)	3	2
A.1.3 Pilot actions for stakeholder group extension (electromobility, education, climate mitigation, international expansion, etc.)	3	4
A.2 Further develop EDIOP-4		
A.2.1 Monitoring stakeholder and market information on PI	2	1
A.2.2 Collecting and sharing transnational practices with MA	2	0
A.2.3 Providing proposals to MA scheme modification and management	2	2
A.3 Monitoring the performance of the policy instrument		
A.3.1 Monitoring co-funded projects and good practices, depositing their savings	4	3
A.3.2 Creating an early warning system on PI funds absorption	3	1
A.3.3 Maintaining a consultation platform for MA on PI status	3	2

Inputs analysis

E. Indicators and sources of verification

Please take note that the indicators defined in the following table are the results of all actions designed belonging to the specific objectives.

Result indicator	Indicator/Result	Share	Validation
Estimated amount of Structural Funds (from Growth & Jobs and/ or ETC) influenced by the project (92,957,776 EUR)	A.1.1.1 Number VPPP awards for successful EDIOP-4 applicants	177%	Managing Authority validated open financial resource for the next EDIOP-4 schemes improved via MI6 in the context of the LOCARBO project
	A 3.1.1 Sum of eligible support by successful EDIOP-4 applicants during EDIOP-4 monitoring done by MI6 (165,200,000 EUR)		

Policy indicator	Indicator	Share	Validation
Main action- undertaken solely by MI6			
Policy 6 Reduction of primary energy consumption in SMEs (GJ) target value: 100,000 GJ	A.1.1.2 Total energy saving in VPPP applicant SMEs- 2018-2020 (est. 80,000 GJ)	100%	VPPP yearly audit data, legitimised by scientific-academy level stakeholders (mentioned in the stakeholder table)
	A 3.1.1 Total energy saving in successful EDIOP-4 projects		Managing authority validated data on the execution of EDIOP-4 calls, MI6 EDIOP-4 monitoring and early warning system data
	A 1.3.1 Total energy saving realized in climate strategy platform member SMEs in the regions (est. 10.000 GJ)		MI6 monitoring data on Komárom- Esztergom, Békés and Fejér county climate platforms. Validated by scientific-academy stakeholders
	A 1.3.2 Total energy saving realized in SECAP platforms, SMEs in the region (est. 10.000 GJ)		MI6 monitoring data on various SECAP platforms. Validated by scientific-academy level stakeholders

List of indicators and their respective actions supporting them

F. External conditions assessment

The following table Specific objective A.1 actions support the numerical indicators mentioned in the previous chapter. Although there are other actions that have benefits for the MA and policy Instrument, they are not part of the LOCARBO project indicators (defined at project proposal C 6.2), thus they are not included here.

On the other hand, actions defined for specific objective “A1 and A3” have multiple results which come from the operation methodology of the Virtual Power Plant Programme. We are planning to use these links and assets to the full extent to reach the goals and indicators planned in this document.

The external conditions required for reaching the assorted result are defined below the table.

Program structure and activated	Action	Assorted result	External conditions / assumptions
A.1 Improving stakeholder engagement with SMEs using the Virtual Power Plant Programme (Demand side intervention)	A 1.1	A 1.1.1	EE2, EE3
	A 1.1	A 1.1.2	EE2, EE3
	A 1.1	A 1.1.3	EE1
	A 1.1	A 1.1.4	EE2, EE3
	A 1.3	A 1.3.1	EE1
	A 1.3	A 1.3.2	EE4
	A 1.3	A 1.3.3	EE4
	A 1.3	A 1.3.4	EE4
A.3 Monitoring the performance of the policy instrument (match-making intervention)	A 3.1 -3.3	A 3.1.1	EE2, EE3
		A 3.1.2	EE2, EE3

Table of external conditions

EE1:

The level of involvement of local stakeholder groups (i.e. the community of users benefitting of Virtual Power Plant Programme), or the capacity to communicate and disseminate achieved results is satisfying. This means SMEs keep applying for the programme and the status quo remains.

EE2:

EDIOP-4 policy instrument remains open and is developed for the needs of SMEs with the assorted funds available for call applicants. There are no major negative changes in the instrument, or its budget.

EE3:

The managing authority remains receptive and supportive for MI6 monitoring and early warning actions. The local climate policy remains stable with improvements introduced.

EE4:

Climate and SECAP platform members and local municipalities will be active in the field of renewable energy and energy efficiency. Regular platform meetings will be held and participants will be eager to join new endeavors.

Annex 1 - Regional Analysis

Territorial scale identification

In order to provide an overall context for the regional analysis, the next section covers an overview on the three main consumers of energy, i.e. households, business sector and the public sector (central administration, institutions, municipalities).

The short analysis will show the three main sectors and their overall final energy consumption, establishing a baseline. Out of these we concentrate on the territorial aspect and the business sector, as the EDIOP-4 policy instrument (selected for further improvement in the frameworks of the LOCARBO project) aims at SME business sector players.

In terms of territorial distribution, Hungary has 19 counties plus the Capital. In 2016 there are 346 cities and 2809 municipalities registered as shown below.

Counties	County seat	Area (km ²)	Population	Population density (capita/km ²)	No. of municipalities
Budapest	-	525	1,740,041	3,314	23
Bács-Kiskun	Kecskemét	8,445	522,312	62	119
Baranya	Pécs	4,430	388,907	88	301
Békés	Békéscsaba	5,630	357,740	64	75
Borsod-Abaúj-Zemplén	Miskolc	7,247	678,261	94	358
Csongrád	Szeged	4,263	419,366	98	60
Fejér	Székesfehérvár	4,358	425,581	98	108
Győr-Moson-Sopron	Győr	4,208	451,827	107	183
Hajdú-Bihar	Debrecen	6,211	538,037	87	82
Heves	Eger	3,637	305,336	84	121
Jász-Nagykun-Szolnok	Szolnok	5,582	383,128	69	78
Komárom-Esztergom	Tatabánya	2,264	310,200	137	76
Nógrád	Salgótarján	2,545	198,933	78	131
Pest	Budapest	6,391	1,245,048	195	187
Somogy	Kaposvár	6,036	315,850	52	245
Szabolcs-Szatmár-Bereg	Nyíregyháza	5,936	551,871	93	229
Tolna	Szekszárd	3,703	229,116	62	109
Vas	Szombathely	3,336	256,458	77	216
Veszprém	Veszprém	4,493	354,565	79	217
Zala	Zalaegerszeg	3,784	285,154	75	258
Hungary	-	93,030	9,957,731	107	3176

Source: National Statistics Office

Energy consumption

In terms of primer energy consumption, Hungary has rather small and declining figures.

Dimension	2010	2011	2012	2013	2014
Total primer energy consumption, TJ	1 085 351	1 053 851	989 699	956 652	963 384
<i>Of which by origin:</i>					
Local	462 467	451 303	443 085	427 457	424 266
Import	789 176	732 463	721 562	719 345	804 159
<i>Of which by type:</i>					
Coal and its products	113 811	113 079	112 245	94 212	92 176
Oil and its products	283 978	270 474	249 929	242 809	273 008
Natural Gas	410 838	391 519	347 654	326 791	292 223
Renewables	85 547	83 212	78 339	81 868	86 562
Nuclear	172 471	171 648	172 846	168 208	171 203
Net electricity import	18 705	23 919	28 686	42 765	48 213
Final consumption, thousand toe	16 370	15 855	14 332	15 045	15 096
<i>By sector:</i>					
Industry	2 858	2 665	2 283	3 727	3 903
Transport	4 172	4 034	3 752	3 496	3 910
Households	5 714	5 517	5 136	4 852	4 431
Services	3 134	3 148	2 763	2 444	2 242
Agriculture, fisheries	492	491	398	526	610
Produced electric power, million kWh	37 371	35 983	34 588	30 290	29 371
<i>By energy resources:</i>					
Fossil sources, %	49,3	48,5	46,3	39,6	35,5
Nuclear sources %	42,2	43,6	45,7	50,7	53,3
Renewable sources, %f	8,1	7,5	7,7	9,2	10,7
Other, %g	0,4	0,4	0,3	0,4	0,6
Produced primer energy from renewable and waste sources, division by sources ktoe					
Water	16,7	19,1	18,3	18,3	26,0
Wind	45,4	53,8	66,2	61,7	56,5
Geothermal	97,9	104,4	107,2	112,7	128,9
Solar	4,8	6,0	6,6	8,1	11,0
Biogas	35,8	60,7	44,5	76,8	76,0
Biofuels	140,9	142,4	281,0	305,2	302,9
Biomass	1576,4	1 470,7	1 492,6	1 465,9	1 446,1

Source: National Statistics Office

The main Hungarian production sources are oil, gas and nuclear, while renewables have a growing trend but still lagging the main sources. The Hungarian energy strategy states, that the more extensive usage of renewables in production and the reduction of our energy import dependence are the main goals for 2030. As Hungarian energy import is determinant (compared to own production), it has a relevant price effect (EUR/HUF rate exposure, global energy prices, etc.) on all consumers, affecting the energy efficiency scene as well.

Renewables have grown considerably in the last 6 years, however they are still far behind the fossil and nuclear sources (50+%) in terms of production. The most used sources are biomass and biofuels, while emerging energy sources, such as solar production is still low. Hungary has significant geothermal potential to be exploited better, moving on from the current district heat production to agriculture and electricity production (co- and trigeneration).

The following table summarises total energy data in Hungary.

	Capita	Primer energy	Production	Import	Electricity	CO ₂ emission
	Million	TWh	TWh	TWh	TWh	Mt
2012	9.97	290	125	153	38.8	47.4
2013	9.89	262	119	140	38.5	39.5

Source: National Statistics Office

System of values – SMEs in energy efficiency

On a global scale, there is no trusted source for calculating the total share in energy consumption by micro- small and medium enterprises (hereinafter: SMEs), however the IEA estimates that SMEs account for at least 13% of global final energy consumption annually (74 EJ)¹. This means that they are a valid target for rationalizing energy consumption and accelerating the uptake of energy efficiency.

In terms of the business sector (focusing on the PI target group, i.e. SMEs), the number of SMEs in Hungary is around 500,000 constituting the vast majority (99.8%) of the business sector in numbers. However, their share in employment barely reaches 67%. In terms of added value, they provide less than 58%.

¹ Source IEA https://www.iea.org/publications/freepublications/publication/SME_2015.pdf

	Number of enterprises			Number of persons employed			Value added		
	Hungary		EU-28	Hungary		EU-28	Hungary		EU-28
	Number	Share	Share	Number	Share	Share	Billion €	Share	Share
Micro	478021	94.2%	92.7%	847980	34.6%	29.2%	9	18.7%	21.1%
Small	24617	4.9%	6.1%	461790	18.8%	20.4%	8	16.1%	18.2%
Medium-sized	4039	0.8%	1.0%	400148	16.3%	17.3%	9	18.8%	18.5%
SMEs	506677	99.8%	99.8%	1709918	69.8%	66.9%	26	53.6%	57.8%
Large	867	0.2%	0.2%	741405	30.2%	33.1%	23	46.4%	42.2%
Total	507544	100.0%	100.0%	2451323	100.0%	100.0%	49	100.0%	100.0%

Source: Small Business Act factsheet, 2015

Consumption

The primary energy consumption in Hungary accounts for 262 TWh, out of which 34 TWh is consumed by SMEs (13%). Gas consumption is more than triple of electricity consumption in natural.

Prices

Based on our latest Hungarian research, two key energy elements can be identified as a baseline in all investments and cost calculations. These are natural gas and industrial electricity prices in the region.

Natural gas, industrial net prices (Eurostat, 2014)

Yearly consumption	Price (EUR/kWh)
I1 : consumption < 277 778 kWh	0,0405
I2 : 277 778 kWh < consumption < 2 777 778 kWh	0,0429
I3 : 2 777 778 kWh < consumption < 27 777 778 kWh	0,0392
I4 : 27 777 778 kWh < consumption < 277 777 778 kWh	0,0287
I5 : 277 777 778 kWh < consumption < 1 111 111 111 kWh	0,0320
I6 : consumption > 1 111 111 111 kWh	0,0337

Source: EUROSTAT: Gas prices for industrial consumers - bi-annual data (from 2007 onwards) (nrg_pc_203)

Industrial electricity prices (Eurostat, 2014S2)

Yearly consumption	Price (EUR/kWh)
IA : consumption < 20 000 kWh	0,1047
IB : 20 000 kWh < consumption < 500 000 kWh	0,0999
IC : 500 000 kWh < consumption < 2 000 000 kWh	0,0900
ID : 2 000 000 kWh < consumption < 20 000 000 kWh	0,0876
IE : 20 000 000 kWh < consumption < 70 000 000 kWh	0,0880
IF : 70 000 000 kWh < consumption < 150 000 000 kWh	0,0869
consumption > 150 000 000 kWh	0,0835

Source: EUROSTAT: Electricity prices for industrial consumers - bi-annual data (from 2007 onwards)

Potentials

There are three levels of potential energy savings in the local context:

- Theoretical potential
- Economic potential
- Real potential

Theoretical potential is the value calculated from the ideal situation if each and every energy efficiency investment was implemented, regardless of its economic feasibility, with the sole focus of saving as much energy as possible at every SME consumption point). The theoretic savings potential in the Hungarian SME sector (according to the latest study) is 3,672 GWh. It's investment requirements are estimated to EUR 2 billion.

Economic potential is the value, where economic return is taken into consideration, meaning, that at a time scale economically feasible for SMEs (5-10 years based on a 2015 survey with the involvement of 117,000 SMEs in Hungary) an energy efficiency investment has a zero to positive NPV. The potentially gained energy savings value from these investments would be 1,750 GWh requiring a total investment of EUR 400 million.

Real potential value means the share of the economic potential, which complements the economic potential with the motivation factor, ensuring the SMEs go for these investments instead of capacity building, or other investments. This considerably smaller value is the most important, as economic players are most likely to aim for these kinds of investments. The real potential value is 1,349 GWh, with an investment requirement of EUR 375 million.

Please note that the real potential will be further described in the ambition setting section of this paper. This potential can be divided further as:

- A. Probable potential: SMEs and industrial companies fully open to energy efficiency investments as savings. They are highly involved and interested in saving energy within an economically reasonable boundaries. They had positive attitude and answers during our survey.
- B. Unsure potential: As the name suggests, during our research and questionnaire these participants have given unclear answer with a slight probability of postponing their energy efficiency investments until the economic climate develops further.
- C. Uninterested potential: Those companies that clearly stated, that no matter how fast their energy efficiency investments return, they are uninterested and not willing to even consider the possibility of investing in the energy efficiency. They can also be identified as "lost potential". The education of these players will be key in planning future interventions.

Regional support context: Policy Instrument – EDIOP Priority 4

The Hungarian policy instrument selected in the LOCARBO project for further enhancement is the Economic Development and Innovation Operational Program 2014-20 (EDIOP) Priority 4.

The priority has a threefold objective structure based on and tied to thematic (energy efficiency), financial and regional categories. The national energy strategy aims to reduce the heating energy needs of Hungarian buildings by 30%. This goal is to be achieved by 2030 with the help of energy programs complying with EU targets. The priority, matching the EDIOP main goal structure aims to help the competitiveness of the business sector by supporting its energy efficiency and renewable energy production investments.

Considering the other goal structure (transforming a low-carbon economy) the main focus is the development and innovation in harmony with environmental goals. According to our previous research, energy efficiency is only a tertiary goal in at least one third of Hungarian companies, while they use 40% more energy during their operation than their western counterparts.

As a result of our previous research, an EDIOP 4 draft call for proposals was formulated in late 2015. With a total support of EUR 193,548,387, the call aims for SME energy efficiency investment support. The call uses a combined financing methodology with refundable (loan) and non-refundable parts for building energy efficiency and renewable investments. The program focuses on co-funding investments with an underpinned ROI only with the restriction that applicants are obliged to incorporate renewable energy sources in their project plans (with the exception of wind energy as it is not supported in the current state of the call).

Other energy efficiency interventions in the Hungarian context

In Hungary, there is a quantifiable demand for second and third party financial support for energy efficiency investments. These are served mainly by government OP based actions, which focus on dimensions of the energy efficiency context, and not market based solutions. Government intentions aim at, for instance interventions supporting the

- Built environment
- Corporate energy efficiency
- Awareness raising in energy efficiency to households
- Energy efficiency in agriculture
- Regional and local energy efficiency investments
- Public sector and public goods related energy efficiency investments

Apart from EDIOP 4, there are multiple energy efficiency support opportunities for public sector players in the Regional OPs and the Environment and Energy Efficiency OP, e.g.:

- EEOP-1.2.0 Capacity development for climate strategies, awareness raising
- EEOP-2.2.1 Wastewater treatment for municipalities
- EEOP-5.2.2 Government buildings' energy efficiency program
- EEOP-5.2.5 Zero, or close to zero energy consumption demo buildings- passive houses
- EEOP-5.2.9 Building energy efficiency program for municipalities
- EEOP-5.4.1 Awareness raising programs for energy efficiency
- EEOP-5.4.2 Greenolympics complex awareness raising program.

The municipalities are the main targets of the currently running energy efficiency programs in Hungary. To offset this, the Hungarian project partner – using its own application system operated since 2011 – focuses also on reaching SME and business players within the scope of its research program to foster energy efficiency and renewables related investments in the business (SME) sector.

Reasons behind obstacles in SME uptake of Energy Efficiency

International research shows that the first step in improving energy efficiency is creating awareness, mainly at the decision makers of the company who are usually “far” from the monthly energy bill. Attention, rationalization, metering and checking energy consumption is capable of producing a 10% saving. Conscious energy consumption is cheap and hardly requires investment, only a change in attitude and corporate practices. Those who can make it with our help, become “Energy Conscious Company”. It is an award and a sticker similar to a Michelin guide sticker, companies are proud to put on their web site, show in their hallways.

The next step comes when a company has already made an energy efficiency investment and proves us its result. General practice shows that a further 10% savings is attainable through fast returns on non-subsidized investments. Investments resulting in extensive energy savings usually show a slower return but they are still more advantageous in the current economic climate than the volatile energy sector. Therefore, the Virtual Power Plant Program – inventor and operator of the Award of Excellence in Energy Efficiency – is about to urge the government to help the return of such investments by a motivating regulatory environment and by grants from European Structural Funds.

The lack of interest of SMEs in energy efficiency derives from two main issues:

- Firstly: SME CEOs, SME owners do not handle energy efficiency as a priority, while other issues require their attention on a daily basis.
- Secondly: Complex energy investment has a slow return rate. If it is financed only by the company itself, energy efficiency investments can take up 6-10 years to pay for themselves. To negate this effect other parties, partnership based solutions must arise to negate the effect. The equation is simple if a core business process has a return time of 2-3 years and an energy efficiency has 6, the faster return core investment will be favored.

Stakeholders in facilitating energy efficiency actions

Government organizations and their decision making bodies, as they have the means to implement policy instruments which will be created in the project. As government supports are a key in realizing energy efficiency investments, the following players are key in their roles:

Institutional level/regulatory partners

- Ministry for National Economy (NGM)
- Ministry of National Development (NFM)
- In the regional context the HUNGARIAN ENERGY AND PUBLIC UTILITY REGULATORY AUTHORITY (MEKH) is the key and responsible partner for PI creation in the energy sector,

Public sector partners can be of help in the local implementation, communicating the regional attributes as they have a deeper insight to local matters, and they can help identifying key points of interests, where Policy instruments should take actions for maximum effect on energy efficiency. These partners are

- local municipalities,
- city councils,
- government agencies relevant to energy efficiency,

NGOs and Non-Profit organizations provide also good options for establishing a deep spread stakeholder network, and communicating project goals and action items towards the target segments, who will be affected by the project results. Main stakeholders selected in previous programs, now formulating a Local Living Lab for LOCARBO are:

29. Ministry of National Economy	30. National Sustainable Development Council
31. Ministry of National Development	32. Association of Climate Friendly Municipalities
33. Budapest Zoo	34. Association of environmental services and production companies
35. American Chamber of Commerce	36. Hungarian Electrotechnical Association
37. Audi Hungária Motor Ltd.	38. Hungarian Energy engineers' group
39. Bay Zoltán Applied Sciences Research Institute, Nonprofit- Ltd.	40. Hungarian Chamber of Engineers
41. Budapest University of Technology Building energy and building machinery Faculty	42. MAPASZ Innovativ Buildings' Association
43. Budapest University of Technology Faculty of mechanical Engineering	44. MATÁSZSZ
45. Corvinus University Budapest, Institute of environmental studies	46. University of Miskolc
47. Cothec Energetics Ltd. A partner company of COFELY- GDF SUEZ	48. Hungarian Trade Agency
49. Lorand Eotvos University, Economy and environmental psychology faculty	50. High School of Nyíregyháza
51. Energy management journal	52. University of Obuda
53. Energy management science association	54. Seed SME Development Fund
55. Metropolitan district heating company	56. Employee Association

As most large stakeholders can be involved in PI formulation and further improvement, it is vital to know that all city councils and all SMEs/business partners cannot and should not be involved in the core project tasks. They are considered out of scope in the context of rational project reach. However, their role is important. As they are the local end users/facilitators of a PI, ICM/ SSPA their awareness must be kept up by classic methods such as:

- Newsletters/ Email/ Posters – This follows a one-way communication and utilizes emailed updates, hard copy brochures, posters, newsletters mailed or emailed. This way only a basic knowledge can be shared.
- Contacting through organizations for these out of scope stakeholders, such as councils of mayors, association of climate friendly municipalities, etc. These associations have a benefit of direct contact with a great number of stakeholders who later would be end users of energy efficiency PIs and technologies produced by LOCARBO project. A few examples of these kind of stakeholder associations are:
 - Hungarian Association of Mayors
 - Association of Climate Friendly Municipalities
 - Green Technology Cluster
 - Air Workgroup

- Solar Energy Cluster

By contacting these stakeholder collector organizations, we can promote that out of the scope stakeholders are informed of the project results.

A. Supply-Demand relations among local stakeholders in “supplementary services and products offered by authorities”

Virtual Power Plant program in Hungary can be considered as an SSPA (Supplementary Services and Products Offered by Authorities) and Innovative communication model too, run by the project partner (PP6 – Hungarian Innovation and Efficiency Nonprofit Ltd – Virtual Power Plant Program). This way Project Partner is directly involved as a producer of consumer (or prosumer) services for energy efficiency and low carbon policies/practices. The following section will provide information about the SSPA role.

In Hungary, the most widely recognised and supported supplementary service is the Virtual Power Plant Program™'s which sets out to negate the production of a 200 MW capacity fossil power plant.

Program description

The general aim of the program is to

- collect experience and best energy efficiency practices of successful companies,
- transform them into transferable knowledge and forward them to Hungarian companies especially SMEs, who lack of the expertise and workforce of energy managers internally,
- motivate the management of the SMEs to invest time and energy in energy efficiency,
- award the best companies showing results and use them as a role model for the others
- cooperate with the relevant authorities in order to create a legislation framework supporting energy efficiency.

The Virtual Power Plan Program is the largest energy efficiency movement targeting mainly the business sector in the region. In 2015 the project contacted 117.000 SMEs over the phone, and 20,000 via an online questionnaire, interviewed 1500 of them, and visited and conducted energy efficiency audit at 300 companies. There are over 2000 additional companies who filled out a proprietary, energy efficiency focused self-survey. There are hundreds of companies who received the program's prestigious award on the annual gala ceremony in the Parliament. The project's accumulated knowledge about technologies, investment rationalities, motivation factors are unparalleled in the region.

A few notable partners and honorary award recipients in the program are:

- Audi Motor Hungary Ltd.,
- Deutsche Telekom Hungarian subsidies
- Budapest Transport Privately Held Corporation (BKV)
- Opel Hungary
- Bay Zoltán Applied Sciences research Institute, Nonprofit- Ltd.
- National Sustainable Development Council
- Association of Climate Friendly Municipalities
- Association of environmental services and production companies
- Hungarian Electrotechnical Association
- Hungarian Energy engineers' group
- Hungarian Chamber of Engineers

Program mechanics

International research shows that the first step in improving energy efficiency is creating awareness, mainly at the decision makers of the company who are usually “far” from the monthly energy bill. Attention, rationalization, metering and checking energy consumption is capable of producing the first 10%-25% in energy savings. Conscious energy consumption is cheap and hardly requires investment, only a change in attitude and corporate practices. Those who can make it with the project’s help, become “Energy Conscious Companies”. It is an award and a sticker similar to a Michelin guide sticker, companies are proud to put on their web site, show in their hallways.

The next step comes when a company has already made an energy efficiency investment and proves us its result. General practice shows that a further 10% savings are attainable fast returns on non-subsidized investments. Investments resulting in extensive energy savings usually show a slower return but they are still more advantageous in the current economic climate than the volatile energy sector. Therefore, the Virtual Power Plant Program – inventor of the Award of Excellence in Energy Efficiency – has urged the government to help the return of such investments by a motivating regulatory environment and by grants from European Structural and Investment Funds. The success story behind the actions are the new EDIOP 4 funds for accelerating Energy Efficiency investments in the business sector.

The Award of Excellence in Energy Efficiency was launched in 2011. The program aims to foster companies’ energy awareness and energy efficiency investments.

Benefits of the program

The following benefits have been reached by the program in the local context:

- More than 8,500 partners have joined the program. By participating in the self-assessment survey methodology, they provided a vast database to contemplate to, and assess the current state of energy efficiency considerations in the business sector.
- From energy efficiency investments, the program has realized large scale energy savings, namely around 5% of the entire Hungarian energy output (equivalent to the output of a large or two smaller, typical fossil power plants) has been saved by new energy efficiency investments in the business sector.
- The program adopted best practices from “role model” companies with leading market shares in their respective sectors, such as Audi Hungary, E.On Hungary, MAVIR Hungarian Independent Trans-mission Operator Company Ltd. and Telekom Hungary.

Areas to develop and improvement opportunities

The program aims at tackling all significant energy consumers and participants in the energy industry to facilitate a more rationalized energy consumption pattern, and also the use of energy efficiency technologies/investments.

Some key stakeholders are incorporated, however other large energy consumers must be sought out to take part in the program. These players shall come from large industrial sectors, such as automotive, building and construction, pharmaceuticals, and green industry. To further bolster the energy efficiency savings reached, a great number of service sector partners must be incorporated too. Players with high energy savings potential are Microsoft Hungary, SAP Hungary, etc.

B. Community awareness vs. Individual driven actions: the demand for “Innovative cooperation models” looking at Local Energy Communities (LEC) perspective

As stated in the previous sections, the Virtual power Plant Program™ is both an SSPA and ICM asset capable of promoting LOCARBO actions.

The Virtual Power Plant™ Program is operating a company energy efficiency motivational pipeline and award program. Participating, companies (with a strong focus on SMEs) make energy saving commitments that the program collects with the aim to achieve justified savings equivalent to the production of a 200MW fossil power station by 2020.

We believe that the implementation of the program does require a strong mind set of sustainability. The program leader is devoted to energy efficiency and open to offer energy efficiency related mentoring, motivational and award services to SMEs.

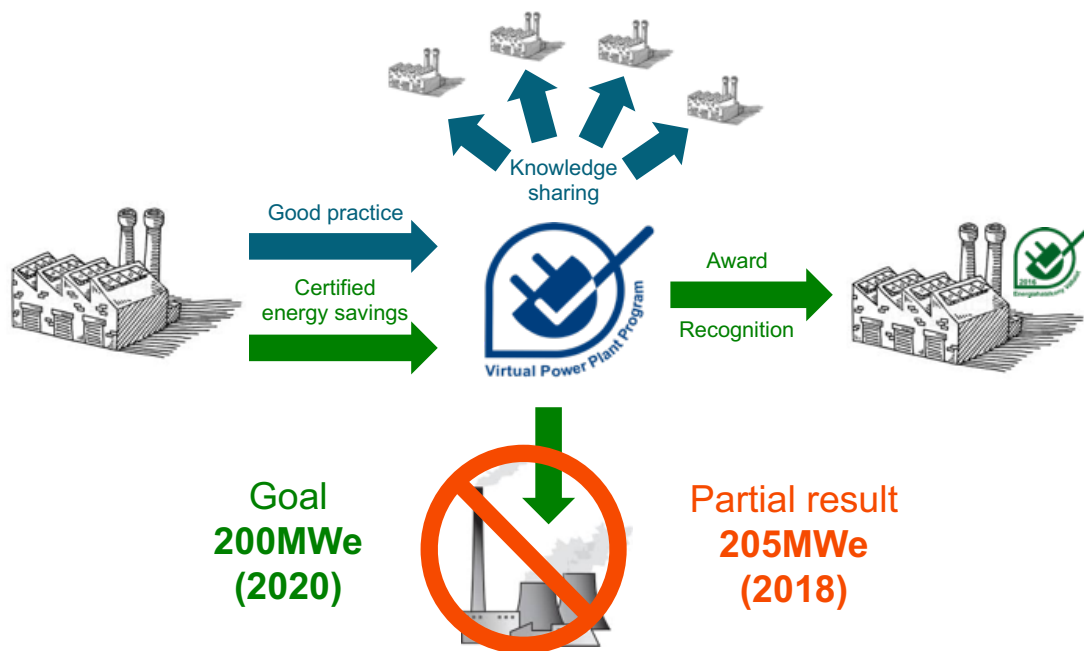
Cooperation Model

As it is seen on the following picture the cooperation program works on a knowledge sharing basis. New award nominees present their energy efficiency projects. These projects are audited by professional energy engineers. All projects undergoing the audit procedure receive a feedback on real energy savings, which is calculated by an established and validated methodology to show how much of a power plant’s capacity is saved by realizing the given project.

After this process, award nominees share their project results and experience (technologies used, risks arising during projects, etc.) via a professional (highly technical) and an easy-to-understand article for the broad public. These articles and audit results are stored in a common knowledge database accessible by project partners.

Those nominees, who have shared their results and experiences are later awarded and recognised among the energy efficiency conscious stakeholders in the economy. This kind of recognition gives them market based advantages, such as:

- A well known brand supports them
- CSR opportunities with lots of PR actions to build upon
- A differentiating factor among same products/services with other market players
- Shared knowledge of other energy efficiency projects and considerations of what to do next



Source: Virtual Power Plant Programme™

Main results

In 2015 through the program 160,000 SMEs were contacted by phone, and an additional 20,000 via an online survey, 1,500 companies were interviewed, and complete energy audit was conducted at 500 companies.

The program has been selected from about 500 contestants to the TOP3 energy efficiency programs in Europe by the European Commission and EASME at the EU Sustainable Energy Award 2015.

Local Energy communities in the context

Local energy communities come into play at two points of the context. First, they can participate in the contest as an award nominee sharing their energy efficiency best practices. For instance, in 2013 and 2014 Rackeve municipality contested with local energy efficiency solutions, such as district heating solutions, and local energy efficiency action programs.

The other “entry point” is participating in the knowledge sharing community and receiving all energy efficiency project data relevant to the given energy community. This way for example other municipalities can join, and learn of Rackeve’s best practices in the system. **This way knowledge sharing is promoted, in an innovative context, as players “deposit” their best practice in Virtual Power Plant Program™, while others take out knowledge and preferably come back to share their own results**, adding to the already growing knowledge base and the leverage effect of the Virtual Power Plant Program™.

C. Smart people for effective technologies: does the ICT sprawl in everyday life encourage energy efficiency practices.

Smart technologies enable the promotion of energy efficiency through disclosing potentials yet untapped. Smart metering, for instance, provides an opportunity to learn what the main consumers of energy are in a company or a building, which then may lead to actions.

In Hungary, there has been many corporate, and also a few government pilots to use smart metering. Our policy instrument, the EDIOP-4 was also planned first to be a two stage intervention, with SMEs applying for the procurement and use of smart metering in the first stage and then planning and implementing their energy efficiency investments (using smart metering results) in the second stage.

The main reason for not using the approach was the small and fragmented and cost-inefficient use of funds (a few thousand euros worth smart meters for SMEs) where transaction costs of funds delivery and management could be higher than the investment itself.

On the other hand, corporate programs (such as E.ON Hungary's program) reached 10,000s of households with smart meters with questionable results so far. However, it is foreseen with consent that smart metering is inevitably penetrating market and providing more data not only for end-users (potential investors of energy efficiency) but for utility companies as well, who can then (using big data analysis) may predict and plan the demand better for users. With the cost of energy peak shaving being high, it is an area, where large-scale energy efficiency investments emerge. This area gains more and more focus with the increase of small renewable energy producers (e.g. household solar panels and windmills) on the electricity grid.

Smart metering is also a tool for coping with electricity bill payment issues as pre-paid systems offer the potential of reducing liabilities towards the utilities.

With the emerging of industry 4.0 approach, methods and tools in the economy and corporate players, it is foreseen that energy efficiency investments will more and more rely on sensor data gained through smart machines, smart production and smart metering, also enabling the internal optimisation of energy usage through autonomous machines and machine to machine (M2M) communication and local decision making.

D. Local numbers in energy efficiency policies and programs

Based on the contents and data sets of the previous sections, the section on local numbers build on three pillars:

1. Energy consumption and energy efficiency potential in target group:

As stated earlier the Hungarian primary energy consumption is around 290-260 TWh, showing a steady decline in recent years.

	Capita	Prim. energy	Production	Import	Electricity	CO ₂ -emission
	Million	TWh	TWh	TWh	TWh	Mtons
2012	9.97	290	125	153	38.8	47.4
2012R	9.92	273	123	145	38.9	43.6
2013	9.89	262	119	140	38.5	39.5

Source: National Statistics Office

The SME target group – based on IEA data – contributes cca. 13% to primary energy consumption.

The SME building sector has a surveyed theoretic energy efficiency potential of 3672 GWh.

2. Demand for energy efficiency solutions, real potential

As stated in previous research and described earlier, there is a difference in energy efficiency potentials based on their economic feasibility and the willingness of the target segment to incorporate them.

This can be built up from two factors: their initial energy consumption based on their sector characteristics, a good example is the following table:

	2010	2011	2012	2013	2014
Final consumption, thousand toe	16 370	15 855	14 332	15 045	15 096
<i>By sector:</i>					
Industry	2 858	2 665	2 283	3 727	3 903
Transport	4 172	4 034	3 752	3 496	3 910
Households	5 714	5 517	5 136	4 852	4 431
Services	3 134	3 148	2 763	2 444	2 242
Agriculture, fisheries	492	491	398	526	610

Source: National Statistics Office

The other factor is the willingness of the intervention subject (in this case, SME building owner / renter) to implement energy efficiency improvements.

Out of the many potential figures surveyed, it is the **real potential** value that means the part of the economic potential, which complements the economic potential with the motivation factor, ensuring the SMEs go for these investments instead of capacity building, or other investments. This considerably smaller value is the most important, as

economic players are most likely to aim for these kinds of investments. The real potential value of the Hungarian SME buildings is 1349 GWh, with an investment requirement of 374 MEUR.

3. Aligning demand with support

The third factor is making sure the “other side” balances out the demands. This is done by the energy efficiency accelerator programs EDIOP 4.1.1 direct support and other governmental actions on building up an energy efficiency aware society:

- EEOP-1.2.0 Capacity development for climate strategies, awareness raising
- EEOP-2.2.1 Wastewater treatment for municipalities
- EEOP-5.2.2 Government buildings’ energy efficiency program
- EEOP-5.2.5 Zero, or close to zero energy consumption demo buildings- passive houses
- EEOP-5.2.9 Building energy efficiency program for municipalities
- EEOP-5.4.1 Awareness raising programs for energy efficiency
- EEOP-5.4.2 Greenolympics complex awareness raising program.

E. Ambitions Analysis

Based on our earlier research there is 1349 GWh real energy efficiency potential in the Hungarian SME sector that the survey disclosed.

This means, that with a close to 50% government support on energy efficiency investments, the Hungarian SME sector can save a summarized (electricity and natural gas) energy efficiency consumption of 1,4 TWh/year, which is more than third of the identified theoretical potential.

However, to achieve this goal, a sum of EUR 375 million investment is required. (50% of which should come from EU and government support).

Our research came to the conclusion that following the changes of the government support parameters, the real energy efficiency saving potential and GHG emission rates are changing at a different rate. The latter is clearly based on which part of the energy efficiency savings come from electricity based or natural gas based investments (because of their different GHG effects).

As we have identified during our research, the close to 50% government support level is the key, as it makes possible the most effective use of invested equity by meeting SME financial expectations. Below this level, support intensity is not attractive enough. Above these investment levels the effectiveness degrades (to well known reasons of negative externalities, e.g. free-riding behaviour on government funds). At the 50% level however a **11,6 GWh/ bn HUF** invested effectiveness KPI can be achieved.

This rate also promotes an estimated 520 Mtons of GHG emission saving. Our research came to the conclusion that the GHG saving potential's dynamics are growing the most intensive between the 30-50% government support levels.

At the level of 50% support intensity (per unit efficiency is the greatest here, source: Mi6)

- Theoretical energy efficiency potential: 3672 GWh/year
- Real potential: 1349 GWh/year
- Theoretical GHG savings: 1217 MT/year
- Real GHG savings: 520 MT/year

At the level of 70% support intensity:

- Theoretical energy efficiency potential: 3672 GWh/y
- Real potential: 1780 GWh/y
- Theoretical GHG savings: 1217 MT/y
- Real GHG savings: 653 MT/y

At the level of 30% support intensity:

- Theoretical energy efficiency potential: 3672 GWh/y
- Real potential: 750 GWh/y
- Theoretical GHG savings: 1217 MT/y
- Real GHG savings: 348 MT/y

As Mi6 set out to steer investors and SMEs from the theoretical side of investments to a more real and achievable strategy, new motivations arise in the solely quantitative model. Qualitative factors must be assessed as well. These factors must be further researched in the future, and must be addressed to increase the per investment and per GHG unit effectiveness of all government support intensity segments.

Our research has already proven that the energy efficiency potential and investment costs don't correspond proportionally along the line. The function is rather steep at the first intensity ranges and then slows its intensity like any parabolic function. This shows lost efficiency along the line, where economic players are encouraged by the sole magnitude of government support, to find other means of using the excess money given.

This way our second main ambition is to assist in further improving a reasonable Policy Instrument which helps developing energy efficiency investment rates, promotes cost-efficiency (energy and GHG saved per investment related support unit) and at the same time does not alter or distort the market. Supporting goals of the ambition are:

1. Accelerate and facilitate investments, which later can become best practices (in terms of project management-, technology used-, energy efficiency)
2. Start the leveraging effect of the government funds on energy efficiency investments and facilitate the start and uptake of market based financing models
3. Help accelerate the construction market
4. Sustainably save energy and GHG emissions in the coming years

The main goal is to increase energy savings and use of renewables, with the help of the following actions:

- Further stimulate energy efficiency investments with policy and business driven instruments
- Help realizing the 1349 GWh energy efficiency saving potential along with 520 Mt/y GHG potential
- Facilitate communication between stakeholders to ensure the success of the EDIOP priority 4, SME energy efficiency program
- Give advice on regional players how to ensure that feasible energy efficiency projects are born
- Socialize the knowledge to a wide basis through the Virtual Power Plant Program, also extending the program to a wider basis
- Help creating governmental and local PIs that support energy efficiency investments, but also offsets the free-riding effects in governmental funds

F. SWOT Analysis

Policy Instrument: EDIOP 4 (SME energy efficiency combined with renewable energy)

Strengths

- Established energy policies, legal framework and policy instruments at the EU and Hungarian level
- Understanding of the Consumer Behaviour, through a research of 117,000 SMEs and continuous active engagement with 8500+ companies
- Strong, statistically and empirically based concept of the ideal composition of an energy efficiency and renewable energy PI (including as-is and to-be status)
- Well-established financial and project management and monitoring procedures
- Experienced institutional system and human capacity to manage projects.

Weaknesses

- Heterogeneity of SME sector
- SMEs of smaller sizes are exponentially more costly (relatively high transaction cost) and therefore less effective to access and engage (fragmentation)
- Information asymmetries in the energy efficiency market – requiring government and EU intervention
- No previous SME-targeted energy efficiency EU co-funded intervention
- Pioneer function in launching combined schemes (grant+loan obligatory)
- Low budget compared to needs

Opportunities

- EDIOP priority 4 call ready to open
- Government open for cooperation with market players
- High willingness of municipalities to join energy efficiency and climate programs because of other opportunities funded by Operative Programs (e.g.: Environmental Program and later H2020)
- Very high positive social, environmental and economical effects to unlock to unlock by SMEs
- Future OP revisions may allocate more funds to this purpose

Threats

- Slow policy making and changing mechanisms at a governmental level
- Operational program funding limited and subject to potential future revision
- Current EDIOP 4 energy efficiency program has a different than ideal support structure

PP6 Strengths-Opportunities strategy based SWOT analysis:

The Hungarian project partner has already reached a key stakeholder group. As PIs are going to be made on local and regional level, the project can take a faster start with involving all key stakeholders. Also, the key players of local energy efficiency regulations, municipalities are highly aware of the energy efficiency needs and opportunities of their region, thus they'll be more cooperative in adapting the selected PIs. The project partner also has a high understanding of already existing PIs, and also helps maintaining an SSPA action Virtual Power Plant program, thus it can further help the acceleration of regional take up of ICMs.

The equation stands here as:

SSPA+ICT-»ICM in energy efficiency

SSPA- the Virtual Power Plant Program is the cornerstone of giving ICTs (best practices localized for SMEs - described in section B, community awareness) to everyone reached in the knowledge sharing network. This results in an innovative, gamification like ICM model, where players “deposit” their energy efficiency results, quantify them and show other players how it is done. This is then extended to a large scale (8500+) user reach and facilitated by other governmental programs, like EDIOP priority 4- this way energy efficiency investments can be realized at lower costs with better ROI.

Weaknesses and Threats strategy:

1. As it is stated in the analysis large groups of local SMEs cannot be reached in a centralized fashion as VPP works.

To counter this ICM model must be reformed and municipalities must be entrusted with communicating energy efficiency solutions (e.g. in the form of PIs) to reach a wider scale of local energy efficiency end users.

2. However, energy efficiency usage must be facilitated on a monetary level (as we suggested earlier 50% support/project). While the current EDIOP 4 structure differs from our solution and all Operative Programs receive a strict review by EU bodies, restructuring current funding solutions becomes an increasingly harder problem.

To counter this new partnership based financial models, and other (PI based) roles must be defined for Institutional level/regulatory partners- project sponsors as well.

G. PP Statement

The Hungarian Innovation and Efficiency Nonprofit Ltd. aims at collecting and sharing knowledge at a European level, in order to foster SME related energy efficiency investments.

We are positive that the collective knowledge of the Project Partners (even if they relate to target groups other than SMEs in energy efficiency) has the potential to improve the Hungarian policy instrument. Also, we are set out to share our knowledge on SME energy efficiency development to enhance policy instruments of our Project Partners in other fields.

Annex 2 – Action Plan Guide: Reference framework and general purposes

An operative framework to support Implementation plan development

What we expect from an Action Plan: a preliminary analysis

In this section we describe the general schema for the Action Plan, each elements represent a synthesis of the complex work of operative design and should be considered strongly integrated with all the other sections.

This schema could be improved according with specific needs or thematic requirements. The objective of this proposal is to share at project level a common and effective grid in order to compare different elaborations delivered by each Project Partner.

Please consider also the opportunity to follow the proposed schema and to attach any additional material in order to produce a comprehensive picture of the AP

The structure of the AP:

- i. Strategic approach
- ii. Vision, goals and results
- iii. Implementation procedure
- iv. INPUTS analysis
- v. Indicators and sources of verification
- vi. External conditions assessment

Strategic approach

Starting from the “ambitions” to be addressed in the AP, a clear identification of strategic framework for the operation should be defined through the statement of “overall objectives” and main achievement strategies to be implemented. A strategy should identify an homogeneous field of application (i.e. training people; CO2 reduction investments; etc.) aggregating specific objectives, outcomes and effects to which we look at in order to face main troubles.

Vision, goals and results

For each strategy, the expected intervention scenario (in other words the vision) has to include a set of operative objectives (selected according with the strategic priorities), activities and related outcomes which has to be defined according to general selection criteria. We consider ‘selection criteria’ those horizontal principles of “Feasibility” and “Effectiveness” to be demonstrated through adequate clarification of:

- role and responsibilities of the AP promoters
- role and function of involved Stakeholders
- clear identification of (financial, human, natural etc.) resources necessary to carry on the operations
- comparison of alternatives compared in a quantitative grid of indicators
- explicitation of external conditions influencing the process (positively or negatively)

The goals refer to the specific objective included in a strategy (i.e. Strengthen training activities and programmes ...; Strengthen the capacity of policy makers in; Integrate innovations and technologies for; Contribute to environmental actions through; Monitor and evaluate). Results should be clearly identified and measurable according to a specific set of indicators.

Implementation procedure

The implementation procedure will be based on the series of activities to be realized in order to produce expected results.

The AP has to be design considering an effective time frame according with “feasibility” and “effectiveness” principles. In the LOCARBO case the timeframe of the operations is defined by the project itself. The two implementation phases identify the preparation period in about 30 months and the implementation phase which cannot exceed two years (24 months).

This second temporal constraint represents the maximum time each Project Partner has to implement the AP.

It will be important to schedule the operative steps and activities necessary to realize results included in the AP over 24 months.

INPUTS analysis

The AP has to include a detailed analysis of resources to be provided for the realization of the implementation procedure.

INPUTS could be described in categories:

- a) financial resources,
- b) human resources,
- c) environmental resources

Other categories will be included according to the specific fields of action.

Indicators and sources of verification

According with LOCARBO project we have to consider two indicators matrix: Project Indicators and AP indicators.

In fact, in order to be compliant with Project requirement each Partner has to measure the level of “influencing Policy Instrument” through specific indicators declared in the LOCARBO Application Form.

The table is included in the section “Self-defined performance indicators” (ref. section C.6.2 of the approved Application Form)

Policies	Self-defined performance indicators	Target
Policy 1	% of Stakeholders directly involved in LOCARBO benefitting form SF financing for realizing implementation projects under Province of Potenza Action Plan	70
Policy 2	GWh- Electricity consumption of private enterprises in the tertiary sector (excluding public administration)	7
Policy 3	Annual reduction of energy consumption in public buildings - kWh/year	7000000
Policy 4	Number of SME's that have introduced methods of measuring energy efficiency through the instrument.	80
Policy 5	Number of households with improved energy consumption classification	20000
Policy 6	Reduction of primary energy consumption in SMEs (GJ)	100000
Policy 7	Number of public buildings refurbished in an energy efficient way	8

The column Policies refers to the single Policy Instrument identified by each partner. The following table regards the correspondence between Project targets and

	Organization	Country	Selfdefined performance indicators	Target
1	Province of Potenza	IT	GWhElectricity consumption of private enterprises in the tertiary sector (excluding public administration)	70
2	Basilicata Region	IT	Annual reduction of energy consumption in public buildings kWh/ year	7
3	Municipality of Vila Nova de Gaia	PT	Annual reduction of energy consumption in public buildings kWh/ year	7000000
4	Durham County Council	UK	Number of SME's that have introduced methods of measuring energy efficiency through the instrument.	80
5	Kaunas University of Technology	LT	Number of households with improved energy consumption classification	20000
6	Hungarian Innovation and Efficiency Nonprofit Ltd	HU	Reduction of primary energy consumption in SMEs	100000
7	Alba Iulia Municipality	RO	Number of public buildings refurbished in an energy efficient way	8

Considering AP indicators, as a general rule, each results should be measured by at least one indicator and each objectives should be accompanied by a set of indicators allowing to report the impacts generated by each objectives.

Each indicator will be accompanied by the definition of the Source of Verification: it means the source providing data for measurements.

As a general example please consider the condition in which the strategy is “to improve energy performance of residential buildings”. In this strategy we have different specific objectives with their indicators and source of verification i.e.:

Objectives	Indicator	Sources of verification
To improve heating systems	reduction of energy bill for eating (€)	Regular Survey to Households
	m3 of natural gas saved	Data from Regular Survey to Households compared with pre-investments statistics
To promote responsible use of heating systems in households	Effective hours of use per day	Regular Survey to Households
	N° of households respecting the technical level of Comfort temperature / Total N° of households	Regular Survey to Households

Concerning results

Results	Indicator	Sources of verification
New Eating plants in each residential apartment	N° of eating system installed € invested m2 of residential surface equipped with new eating systems	Project implementation data

Renovation of buildings insulation	m2 of vertical external surfaces renewed with high performance insulation materials N° of apartments insulated	Project implementation data
“Improving users’ behavior” campaign	N° of training events realized N° of participants N° of households participating	Attendance sheet Project data
.....

External conditions assessment

According to time frame for the implementation, the identification of responsibilities and INPUTs an effective design of the AP should include the assessment of internal and external constraints/conditions.

It means that each actor involved in the process has to clearly identify the external factors influencing the implementation process. We can define “external factors” the whole of actions, tools, decisions, approvals etc. depending on the responsibility of actors not directly included in the implementation process, by whom depends the possibility to implement an activity or the success to achieve an objective through a set of results.

Among such external conditions the normative and regulatory authorization process represents a relevant potential constraint for infrastructural activities; ROPs financing procedures could be external conditions for financing operations and activities; national and European rules for tenders could influence the process of purchasing equipment or technologies necessary for specific activities included in the AP.

Another examples of external conditions affecting the goal achievement could be the level of involvement of local groups (i.e. the community of users benefitting of a specific services), or the capacity to communicate and disseminate achieved results letting people aware of a new territorial conditions or services etc.; or the confidence of local entrepreneurship in investing on targeted sectors delivering clusters or PPP agreements.

The AP, after declaring such external condition, should be sensitive in monitoring such components during implementation phase in order to adjust on-going the provisions ensuring the global achievement of desired objectives stated in the AP’s strategy.

A toolkit of techniques and approaches from previous experiences

In order to stimulate a positive integration between standardized approach and case studies in developing Action Plan we present a short analysis of a set of former Cooperation Projects selected because oriented to deliver an Action Plan among the main project outputs.

Such small list of experienced allowed to investigates the frequency of standardized approach in concrete applications. We refer to well-known methodologies and approaches such as SWOT, Risk Assessment, Policy recommendation etc. widely used in transnational cooperation experiences.

According with LOCARBO approach several of those analytical stages were already experienced in the previous project stages (GPs selection and assessment, RAIS methodology and application) but it is useful to point out such list considering those approaches as a wider toolkit we can refer to.

In fact, the considered approaches are not only finalized to deliver an output (like SWO analysis) but are mainly oriented to design an operative procedure especially if we combine several approaches.

Some relevant cases from transnational cooperation practices.

In this chapter, we analyze a set of Projects developed under the framework of EU Cooperation programs (in particular INTERRG IVC) oriented to deliver an Action Plan considered as the operative dimension through which the project results will be applied at territorial level.

These reference projects come from the Good Practices Database of INTERREG IVC program and other relevant databases:

SUSTAIN: Working across land and sea boundaries | Environmental and risk protection - Water management (http://www.sustain-eu.net/what_are_we_doing/index.htm). The topic of the project is the use of a wood shredder to convert organic, agricultural waste into material suitable for surfacing local footpaths. Key success factors were discussions with the agriculturalists as to the (financial) benefits accruing, specific trainings and on-the-job experience of working with the machinery.

MiSRaR: A study on the environmental, economic and social impacts of climate change in Greece | Environmental and risk protection - Natural and Technological risk (http://www.misrar.nl/publications/brochure_1_on_risk_assessment). The MiSRaR project is about protecting people, environment and property against the destructive impact of natural and technological hazards. MiSRaR lays down the principles of risk mitigation, discusses how mitigation processes should be launched, how risk and capability assessment should be undertaken, and provides ideas for drafting mitigation plans, for financing of and lobbying for implementation actions, and for monitoring, enforcement and evaluation.

PRESERVE: Peer Reviews for green and sustainable regions through EUROPE | Environment and risk prevention - Cultural heritage and landscape (<http://preserve.aer.eu/it.html>). The PRESERVE project aims to make their tourism strategies more sustainable and to set new standards for regional actors. The partners intends to increase the effectiveness of the regional development policies starting with cultural heritage and the countryside as central factors of the development. This project is into the best practice because, after the project, the local economy has been revived and previously deserted areas have seen an uplift.

PERIURBANparks: Improving Environmental Conditions in Suburban Areas | Environment and risk prevention - Biodiversity and preservation of natural heritage (including air quality) (<http://www.periurbanparks.eu/live/index.php?a=open&id=4c99fc98837e2&ids=4c8ff07964a15&l=en>). PERIURBANparks is a regional initiative project, which uses interregional exchange of experiences to improve policies on management of natural suburban areas. PERIURBAN focuses specifically on policy and management solutions to mitigate pressures on biodiversity. Focus on the creation and management of parks in natural suburban areas, in line with European environment policy and redevelopment in suburban areas, can impact positively on the environment and on halting biodiversity loss.

ENERCITEE European networks, experience and recommendations helping cities and citizens to become Energy Efficient | Environment and risk prevention - Energy and sustainable transport. EnercitEE contributed to the improvement of local and regional policies and provided assistance in the transfer of knowledge on energy efficiency and sustainable transport.

TOURage (no in best practice) Developing Senior Tourism in Remote Regions | Innovation and the knowledge economy - Entrepreneurship and SMEs. TOURAGE project has the overall

purpose to improve sustainable regional economy by developing senior tourism. In 2014 the PESTO project which is coordinated by the E.N.T.E.R. network selected TOURAGE as one of the 20 best European tourism projects enhancing sustainable tourism development. The selection was made from a project pool containing around 200 projects.

BOO-Games: Boosting European Games Industry | Innovation and the knowledge economy - Entrepreneurship and SMEs (<http://www.boogames.eu/>). Games could represent a new source of growth for Europ.economy but many regions are still missing adequate policies + funding schemes which could sustain this market. Further, funding + support mechanisms often do not meet the special needs of the small + innovative game developers. Aim of the BOO-Games project is to support the pub.reg.development authorities in understanding the importance of the games industry for the Europ.economy.

Applied techniques and approaches:

The following list represents the operative steps identified through the analysis of the selected transnational cooperation project experiences in the process of AP development. Those activities refer to the general framework of “project design” methodologies such as PCM, LFA, SODA.

Mental mapping (brainstorming)

A good way to identify ideas and also relevant risks can be an open brainstorming session at one of the partner meetings. All partners should be involved in this process to raise their awareness about possible risks, and to identify as many relevant risks as possible, the impact in order to identify possible solution or understand if is the case to change activities, roles, times or budget into the action plan.

SWOT

Risk Matrix

There are many kind of risk to consider in the project: once potential risks must be identified and qualified according to their impact on the project and their probability of occurring.

Workshop and Seminars

A workshop session is important in the EU project to link the “expert vision” for each tematics to every participant region. Furthermore, a workshop is a way to engage and networking with stakeholders.

networking and stakeholders engagement.

There are different action to involve the stakeholder in the project and there are also different levels of stakeholders engagement that can be resumed in a matrix where can catalog every stakeholder in a category, such as Unaware: Unaware of project and potential impacts, Resistant: Aware of project and potential impacts and resistant to change, Neutral: Aware of project yet neither supportive nor resistant, Supportive: Aware of project and potential impacts and supportive to change, Leading: Aware of project and potential impacts and actively engaged in ensuring the project is a success; and define the current level of engagement and the desired one.

Interview and focus group

In order to receive more in-depth information concerning the current state of the art of the regions, semistructured interviews are hold with stakeholders in each region. The target of the people interviewed are representatives of the various stakeholder groups and come from all sectors of society. From the results of the interviews it is possible to identify the main trends.

Transferring good practices and instrument

Transferring good practices and instrument from one region to another it means contribute to enrich and renew the way they implement their policy.

Peer review

A Peer Review method helps regional authorities to understand how well their policies are working and support them in making improvements. During the project, the review team holds meetings with key stakeholders in order to ascertain the strength, weaknesses and potential of the policies. After the visit the review team prepares a report with a series of recommendations and set of benchmarks on how to improve the policies.

Exchanges experiences or stages

The transfer of practice and simple instrument is generally not sufficient to ensure a policy effect so it will be crucial exchange also experience (or staff for a period) on the different policy framework of their region. it is through this strategic approach that the cooperation can achieve more structural changes in each participant region.

Setting out a toolkits

The project action will develop a methodology or produce toolkits applicable in other framework.

Sub project call for proposal

Sometimes the project structure include call for proposal in order to involve sub-themes that explore different sides of the same coin.

Policy recommendation (transferable approach)

One of the main outputs/actions of the EU projects is declaring to address (influence) local policy as a real step for the challenge.

The following matrix represents the frequency of methodological steps in the sample set of projects:

	Mental Mapping	SWOT	Risk Matrix	Workshop and seminars	interview and focus group	Networking and stakeholders engagement	transferring good practices and instrument	peer-review	exchanges experiences or stages	setting out a toolkits	sub project call for proposal	Policy recommendation
SUSTAIN				x			x		x	x		x
MiSRaR			x	x			x					
PRESERVE		x		x		x	x	x	x	x		x
PERIURBAN parks				x		x	x			x		x
EnercitEE				x			x		x		x	x
TOURage	x	x				x	x		x			x
BOO-Games		x			x	x						x

Some comprehensive consideration concerning the set of reference projects:

All kind of project aim to address local policy;

Peer Review and Risk Matrix are not so much used as a methodology. It is possible to affirm the same about the sub-project call for proposal.

The networking, the involvement and the engagement of stakeholders, the identification of good practices and instruments to exchange and the willingness to exchange experience are the recurrent and relevant methodological steps in every project.

Annex 3: Letter of acknowledgement signed by the MA

Letter of Acknowledgement from the relevant organisation responsible for policy

For Structural Funds programmes (i.e. Investment for Growth and Jobs and European Territorial Cooperation programmes), the list of policy responsible organisations is available on the 'In my country' pages on the programme website www.interregeurope.eu

Project acronym	LOCARBO
Project title	Novel roles of regional and LOcal authorities in supporting energy consumers' behavior change toward a low CARBOn economy
Name of the signing organisation (original) including department if relevant)	Gazdaságfejlesztési Programok Irányító Hatósága, Gazdaságfejlesztési Programok Végrehajtásáért Felelős Helyettes Államtitkárság, Nemzetgazdasági Minisztérium
Name of the signing organisation (English) including department if relevant)	Managing Authority for Economic Development Programmes, Deputy State Secretariat of Economic Development Programmes, Ministry for National Economy
Name of the policy instrument addressed (original)	Gazdaságfejlesztési és Innovációs Operatív Program (4. Prioritás)
Name of the policy instrument addressed (English)	Economic Development and Innovation Operational Programme (Priority 4)
Name of partner(s) concerned in the application form (English)	Hungarian Innovation and Efficiency Nonprofit Ltd.



We hereby acknowledge in line with the Letter of Support issued by us on 23.07.2015

- that we have engaged with the stakeholder group with the assistance of the project partner in order to further improve the Policy Instrument,
- that we have considered, discussed and taken on board insights, expert information and transferred market knowledge provided by the project partner in improving and changing the management and the strategic focus of the Policy Instrument and its corresponding scheme conditions,
- we count on the further professional assistance of the partner in the LOCARBO project to follow up the performance of the Policy Instrument via an Action Plan.

Name of Signatory Tamás Karsai

Position of Signatory Deputy State Secretary,
Head of Managing Authority

Date 18 December 2017

Signature and instution stamp (if exists)



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