FIRECE CENTRAL EUROPE Project CE1131

WP T2: Implementation of the instruments, testing and transferability actions

Activity 2.5 PA 2: Improving energy efficiency in Industry Sector

D.T2.5.6
Evaluation of Pilot Action 2 addressed to Industry

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Introduction

The FIRECE project aims to contribute to the achievements of targeted results of Regional Energy Plans through an increased use of (innovative) financial instruments in the Central Europe area. The particular focus is on public support to industry to invest into energy efficiency and renewable energy sources.

The aim of this report is to evaluate the pilot actions addressed to Industry in order to ensure relevant transferring activities within the frame of FIRECE project.

The goal of the Pilot Action 2 was to assess the public investments to support Industry low carbon transition through analysis of projects/investment plans elaborated by SMEs on energy efficiency and renewable energy sources to verify their quality and quantity contribute to achieve the Energy Plans' targets, using the IT Tool developed in WP T1 (O.T1.4) and updated in WP T2 (O.T2.2).

Pilot Action was implemented in five regions: Italy, Austria, Germany, Poland, Czech Republic and consisted of assistance provided both to public authorities and entrepreneurs to optimize public resources addressed to industry and improve local/regional energy performance. The implementation of Pilot Action was based on the Methodology for the PA 2 addressed to industry (D.T2.3.2) and Methodology to test the tool to assess public investments for industry's low carbon transition (D.T2.2.3) developed in the project.

The partners which carried out pilot actions to assess Industrial sectors RE projects are:

- Chamber of Commerce of Venice Rovigo Delta-Lagunare, Italy
- Research Burgenland Ltd. Austria
- NEU e.V., Germany
- Regional Development Agency ARLEG, Poland
- ENVIROS, s.r.o., Czech Republic

The evaluation of Pilot Action 2 is based on the following reports:

- D.T2.5.1 Report of the pilot activities to assess Industrial sectors RE projects in the Veneto region and D.T2.5.7
- D.T2.5.2 Report of the pilot activities to assess Industrial sectors RE projects in Austria
- D.T2.5.3 Report of the pilot activities to assess Industrial sectors RE projects in Germany
- D.T2.5.4 Report of the pilot activities to assess Industrial sectors RE projects in Poland
- D.T2.5.5 Report of the pilot activities to assess Industrial sectors RE projects in the Czech Republic
- and D.T2.5.7 Summary reports on pilot actions in all involved countries

1. SUMMARY OF THE PILOT ACTIONS

For the purpose of this report, 32 energy efficiency projects were analysed in detail, based on data provided from four project partners carried out pilot actions in Italy, Austria, Czech Republic and Poland to assess SME's investment projects on EE/RES using the Project level tool. The German partner provided a set of data from a total of 176 projects, but due to the impossibility to analyse individual projects using the IT tool, it was not possible to evaluate their energy efficiency performance and fully include them in the report.

In this chapter the report provides an overview of the pilot activates carried out in five partner countries in relation to target groups of the Pilot Action 2, energy saving measures analysed and energy saving funds selected.

1.1 PA2 Implementation area

1. Italy, Veneto Region
2. Austria
3. Germany, Region of Leipzig
4. Poland / Lower Silesia Voivodeship
5. Czech Republic

1.2 Target group

SMEs are the main target group of the Pilot Action 2. Under Regulation (EU) No 651/2014 of the European Commission, micro, small and medium-sized enterprises (SMEs) are enterprises with fewer than 250 persons and whose annual turnover does not exceed EUR 50 million and / or \ t their annual balance sheet total does not exceed EUR 43 million.

Small and medium-sized enterprises (SMEs) are an important part of the overall energy consumption balance in Europe. Despite relatively low energy savings per company, the SME sector represents a significant cost-effective savings potential.

The individual scale of the single project, the ease and short time of its implementation, combined with the low financial risk of potentially unsuccessful investments, gives great potential to achieve the assumed effects in the short term. Although in SME sector, the earning capacity of investments is less predictable, lending risks are less on the project itself and much more on the overall earning ability of the business. Therefore, it is necessary to properly tailor financial instruments to the scale of the project, which will consist of a significant number of medium and small energy efficiency measures. In case of SME's, own resources are an important source of financing investment projects.

Investments in energy efficiency in SME's are not usually made on the basis of financial parameters alone. When projects are implemented, improvements usually meet other than energy efficiency objectives, such as technological needs (improvement of productivity or quality), reductions of maintenance costs, tightening of quality

expectations (requirements of larger manufacturers forcing their subcontractors to meet low-carbon economy targets as part of the marketing message to the SME's product recipients) etc.

SMEs from an energy efficiency point of view can be approached from the following elements forming the target site model:

1. Energy consumption.

   Energy consumption in SMEs comes down to energy consumption for the manufacturing process, processes accompanying the manufacturing process (internal transport, storage, administration) and the energy consumption of buildings and facilities.

2. Energy losses.

   Energy losses result from inefficient production and accompanying processes, energy dissipation through buildings and facilities and unreasonable human actions.

3. Energy sources.

   SMEs can be used as energy sources. The main sources are solar energy, process waste energy, chemical energy contained in production residues.

4. Energy storage facilities.

   SMEs generally do not have the potential to actually store energy. However, their technological installations in many cases have the characteristics of virtual energy storage. This is to take advantage of the potential to mitigate peaks in energy consumption and to reduce oversupply by using the inertia of energy consumption supported by the control of less important consumptions. The condition for their use is the introduction of active systems for controlling energy consumption and possibly energy production.

5. Comprehensive energy management

   Efficient energy management in SMEs can take place on two levels. The basic level is energy management within SMEs. The aim of this level of management is primarily to improve energy efficiency. The target level is energy management in relation to the local environment - the energy cluster. This means involving SMEs in mechanisms of energy system services or in structures of energy clusters or islands.

In each of the partner countries participating in Pilot Action, 8 projects implemented by micro, small and medium-sized enterprises (SMEs) were evaluated using the IT Tool (in total 32 investment projects), with the exception of the German partner who analysed set of data of in total 176 SME’s projects.

The following chart shows the share of analysed companies in terms of size of a company:

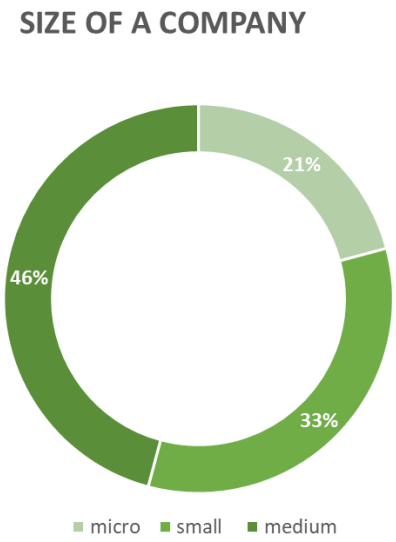


Chart 1: Share of SME's investment projects analysed in terms of company size

The Pilot Action 2 targeted small and medium enterprises who already have ongoing of finalised EE/RES projects, supported by public funding in a form of grants and/or loans under ERDF Operational Programmes 2007-2013 and 2014-2020, supplemented by own resources. Almost two thirds of the projects have been finalised, which means that they have been implemented and their energy efficiency has been verified, while the remaining projects (ongoing projects) will be verified in the next period.

The following charts show the share of analysed SME's in terms of type of projects and size of an investment

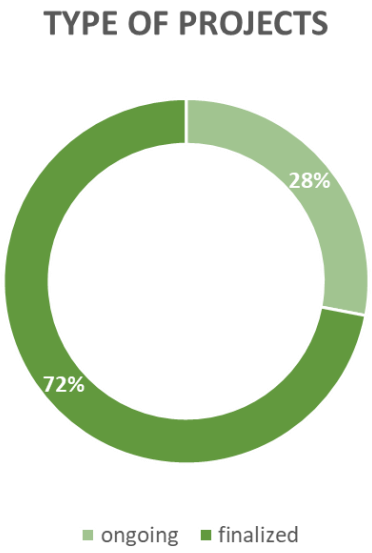


Chart 2: Share of SME's investment projects analysed in terms of type of projects

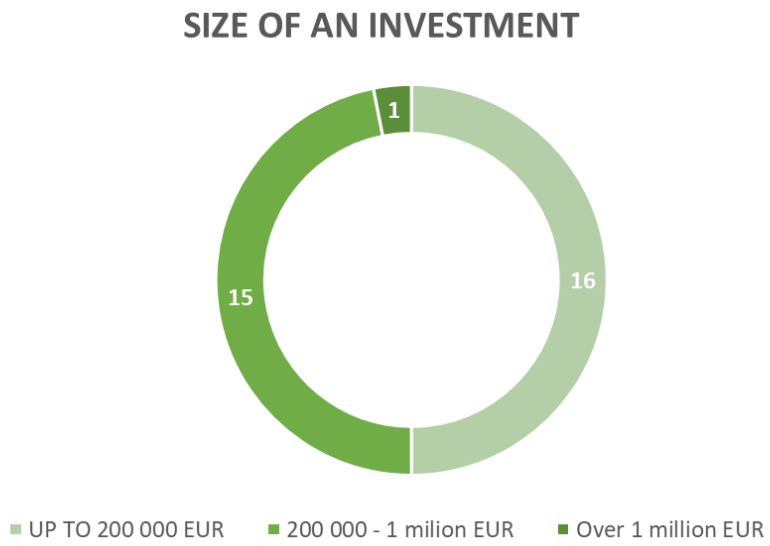


Chart 3: Number of SME's projects analysed in terms of size of investments

The implementation of the pilot activities also required the involvement of stakeholders and financial intermediaries who could share their experience on the EE/RES project assessment, provide necessary data and information to enhance the effectiveness of testing and transferability activities of the Pilot Action 2.

The stakeholders involved during the PA 2 included financial intermediaries (banks, financial advisors, intermediary institutions) and national and regional authorities managing Energy Plans and financial instruments. Representatives of regional stakeholders also attended FIRECE project workshops and meetings organized by each project partner in order to present and discuss the IT Tool to assess public investments developed in the project.

1.3 Energy saving measures / type of investments analysed

The energy saving measures considered and analysed in the pilot activities included the following:

1. Buildings insulation
2. Change of technological processes
3. Control of circulation pumps
4. Decrease of losses in heat distribution
5. Energy management
6. Installation of cogeneration units
7. Installation of flue gas pre-heaters to boilers
8. Installation of frequency inventors
9. Installation of heat pumps

10. Installation of photovoltaic systems (for electricity generation)
11. Installation of solar thermal systems (for heat generation)
12. Installation/replacement of compressors
13. Replacement of coal boiler with biomass boiler
14. Replacement of coal boiler with gas boiler
15. Replacement of coal boiler with new coal boiler
16. Replacement of existing lighting with LED80
17. Replacement of lighting LED80 with LED110
18. Thermal insulation of technologies
19. Transformers replacement
20. Waste heat utilisation

A wide range of energy saving measures were applied in the analysed projects in the partner countries, although different sets of measures were analysed in individual countries.

Country	Energy saving measures	No. of projects where measure was implemented
Italy	Installation of photovoltaic systems	8
Czech Republic	Installation of photovoltaic systems	4
	Buildings insulation	2
	Change of technological processes	2
	Replacement of coal boiler with biomass boiler	1
	Decrease of losses in heat distribution	1
	Replacement of existing lighting with LED80 or higher efficiency	1
	Other*)	1
Austria	Installation of photovoltaic systems	7
	Control of circulation pumps	3
	Replacement of existing lighting with LED80 or higher efficiency	3
	Installation of cogeneration units	2
	Decrease of losses in heat distribution	1
	Change of technological processes	1
	Installation/replacement of compressors	1
	Waste heat utilisation	1
	Installation of heat pumps	1
	Replacement of lighting LED80 with LED110 or higher efficiency	1
	Buildings insulation	1
	Installation of solar thermal systems (for heat generation)	1

Poland	Buildings insulation	7
	Energy management	6
	Installation of heat pumps	3
	Installation of photovoltaic systems	2
	Replacement of coal boiler with new coal boiler	1
	Other*)	1
Germany	Installation of LED lighting	93
	Decrease of losses in heat distribution	27
	Replacement of boiler / heater	25
	Thermal insulation of technologies / Cooling processes	11
	Installation of cogeneration units	10
	Installation/replacement of compressors	9
	Improvement of ventilation system	4
	Other*)	29

*) Measures that don't fit into any of the above twenty categories.

Table 1: Overview of energy saving measures implemented in partner countries

The Italian partner analysed only photovoltaic installations projects, while in other countries, projects consisting of combination of several measures were often analysed. In Poland, buildings insulation and energy management measures dominated among the projects; the partners from Austria and the Czech Republic analysed a wide range of energy saving measures with the predominance of projects focused on installation of photovoltaic systems. Most projects analysed in Germany invested in improving lightning with LED and decrease the losses in heat distribution/improve heat recovery and replace the boiler/heater system. In case of some projects more than one energy efficiency measure was implemented.

The table below shows the total number of projects for each type of energy saving measure implemented in the four partner countries: Italy, Austria, Czech Republic and Poland.

Energy saving measures	**Total number of projects where measure was implemented**
Installation of photovoltaic systems	21
Buildings insulation	10
Energy management	6
Installation of heat pumps	4

Replacement of existing lighting with LED80 or higher efficiency	4
Change of technological processes	3
Control of circulation pumps	3
Decrease of losses in heat distribution	2
Installation of cogeneration units	2
Other	2
Installation of solar thermal systems (for heat generation)	1
Installation/replacement of compressors	1
Replacement of coal boiler with biomass boiler	1
Replacement of coal boiler with new coal boiler	1
Replacement of lighting LED80 with LED110 or higher efficiency	1
Waste heat utilisation	1

Table 2: Overview of total energy saving measures implemented in Italy, Austria, Czech Republic and Poland

As we can see, half of the implemented projects represented installation of renewable energy sources - photovoltaic systems for self-consumption of power energy in SME's as well as building insulation. The interest in these type of measures may explain the fact that they are relatively easy to implement and evaluate. On the other hand, EE measures related to the replacement of existing lighting constituted a small percentage of the projects implemented by SMEs, and they are not so demanding to implement. This is particularly interesting if we compare the number of projects from four countries with set of data from Germany, where the number of projects related to the replacement of existing lighting with LED is dominant.

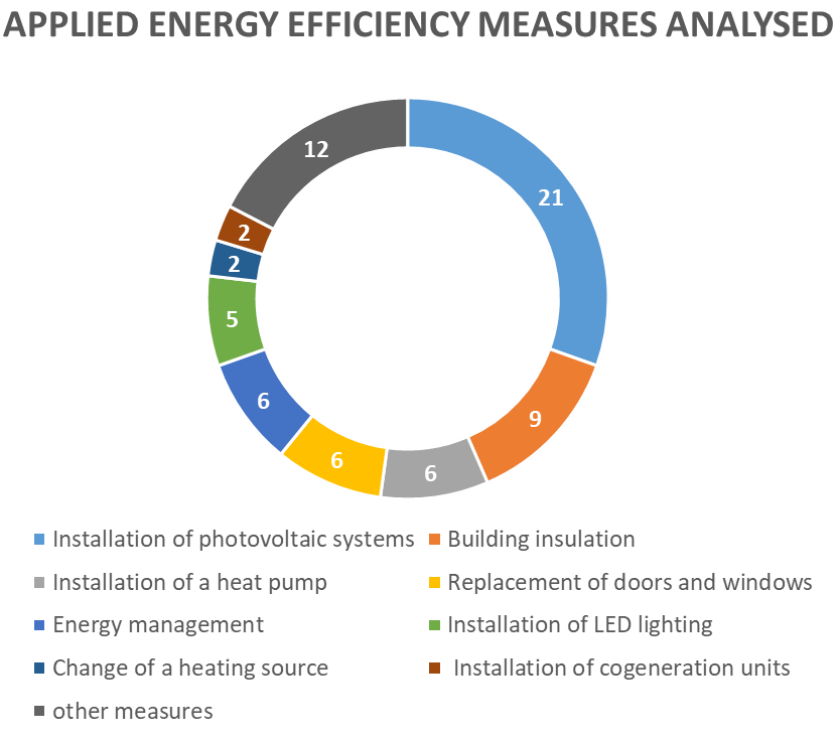


Chart 4: The share of applied EE measures in total number of projects in Italy, Austria, Czech Republic and Poland

1.4 Relevant energy saving funds

As the goal of the Pilot Action was to assess the public investments to support Industry low carbon transition through the analysis of investment projects elaborated by SMEs on energy efficiency and renewable energy sources, the relevant energy saving funds have been selected in each partner countries. SME's investments aimed at reducing energy consumption have been supported by public funding in a form of grants, loans under ERDF Operational Programmes 2007-2013 and 2014-2020, supplemented by own resources.

1. Energy saving fund in Italy

POR 2007-2013 (FESR), Axis 2, intervention line 2.1 "renewable energy production and energy efficiency", Action 2.1.3. - Rotation fund and capital contributions for investments made by SMEs aimed at reducing energy consumption.

The Axis 2 aims to contribute to the fight against climate change and reduce dependence on fossil fuels. In order to do that, the Line of action 2.1 is planned to promote the use of renewable sources of energy and to improve its efficiency.

In this sense, the Action 2.1.3 provides an incentive by granting of soft loans through a revolving fund and capital grants for improvement of production techniques in order to increase the energy efficiency of the plant, adopting measures that allow to exploit

the energy potential by using renewable sources and non-conventional power generation systems.

2. **Energy saving fund in Austria**

ERDF: The European Regional Development Fund in Austria 2014-2020

The Operational Programme contributes to the achievement of certain elements of the Europe 2020 strategy in Austria. In particular EU funds are used to increase innovation and research and development activities in small and medium-sized enterprises, including technology transfer and investment in certain R&D infrastructure. The programme also supports SMEs in promoting their competitiveness through investments in innovation, energy efficiency and the use of renewable energies. In certain urban areas the programme supports C02 reduction strategies and integrated sustainable development, and in certain other functional urban areas, cooperation and efficient use of resources, including Community Led Local Development in Tyrol as a pilot region. Overall, the programme is to a very high degree (more than 80%) focussed on 3 main areas:

- Research, development and innovation,
- Competitiveness of SME
- Transition towards a low carbon economy

3. **Energy saving fund in Germany**

Operational Programme Saxony 2014-2020 (ERDF) – Priority: Reduction of CO2 emissions

Under the programme, the Saxon Government established the Sustainable Energy Supply funding guideline. The regional government is granting up to 80% of eligible costs for each project meeting the requirements of the guideline. With these funds, SMEs have the possibility to develop and implement energy efficiency and renewable energy measures.

The specific objectives of the ERDF Operational Programme of Saxony directly address the Europe 2020 objectives, particularly emphasising the goals related to research, development & innovation and climate change & energy sustainability. 78,8% of Saxony's total ERDF allocation is foreseen for supporting research & innovation, for reducing CO2 emissions and for enhancing the competitiveness of SMEs.

4. **Energy saving fund in Poland**

Regional Operational Programme 2014-2020 of the Lower Silesian Voivodship 2014 – 2020 (ERDF)

At the regional level of Lower Silesia voivodeship the main source of financing energy efficiency and RES projects in industry is Regional Operational Programme of Lower Silesia 2014-2020, managed by the voivodeship government. The programme consists of 11 priority axes, out of which Priority Axis 3 - Low carbon economy- is aimed at

reducing the carbon emissions of the local economy and increasing the share of energy produced from renewable sources and increasing energy efficiency.

The Marshal's Office of the Lower Silesian Voivodship is responsible for managing ERDF funds under the ROP of the Lower Silesian Voivodship, while the Lower Silesian Intermediate Body (DIP), is responsible for the implementation of selected measures in the area of low-carbon economy, including Priority Axis 3 – Low carbon economy.

From the point of view of Pilot Action 2 and financial instruments addressed to energy savings for industry, the most relevant measure under PA3 is Measure 3.2. Energy efficiency in SMEs. It includes the 3.2. A, B, C sub-measures focused on energy efficiency and renewable energy sources. The funding of 3.2 A-C measures is provided in a form of grants with the allocation of 26 512 082 EUR (co-financed by ERDF).

5. **Energy saving fund in the Czech Republic**

The main source of financing of energy savings projects in the Czech Republic is represented by ERDF funding through the **Operational Programme Enterprise and Innovation for Competitiveness** (OPEIC).

OPEIC is intended mainly for the support of investment projects of Czech enterprises with emphasis on projects of small and medium-sized enterprises. It is managed by the Ministry of Industry and Trade, while the administration is performed by its subordinate Agency for Business and Innovation.

From the project FIRECE point of view, the Priority Axis 3 is the most relevant. It includes the sub-programmes focused on Energy savings, Renewable energy sources, Low-carbon technologies, and Smart grids.

While the overall budget of the programme is about 4,3 billion €, the allocation of PA 3 is about 1,2 billion € (28%).

The funding is provided in a form of **grants**; no financial instruments were applied in the programming period 2014-2020.

2. ANALYSIS OF PUBLIC INVESTMENTS ADDRESSED TO SUPPORT THE LOW CARBON ECONOMY - RESULTS OBTAINED FROM THE IT TOOL CALCULATION

As a preparatory activity for testing phase of SME's projects, a user-friendly IT instrument (O.T1.4) was developed by the project partner ENVIROS as the final result of an analysis of public investments addressed to Industry low-carbon transition projects and the identification of quality and quantity criteria to be applied for the assessment analysis.

2.1 IT Tool adaptation

The overall Tool is split into two separate tools: Programme level tool and Project level tool with the latter being used to evaluate SME projects under PA2.

The tool developed in the T1 work package was presented and discussed at local level and one transnational methodology was developed with local specification in agreement with local stakeholders considering targets to be achieved, existing local parallel actions and plans. The methodology served to support the testing phase of Pilot Action 2.

The Project level Tool used in the process of SME's projects assessment was prepared by the Czech partner ENVIROS and was based on Czech data, which included the national strategies and plans related to energy, as well as datasets available from energy audits carried out by ENVIROS experts. Therefore, it required the adaptation to local specification and energy plans of the remaining four partners from Italy, Austria, Germany and Poland. In the next phase, ENVIROS assisted the other FIRECE partners in development of their local specifications of the Tool. As a result, the Project level Tool completed with partners input data was adapted to local conditions with the help of ENVIROS and after some adjustments to the calculations, it was able to be used in the pilot activities to assess Industrial sectors RE projects in other countries participating in PA2. The full adaptation of the Tool has failed only in the case of Germany. Although the NEU e.V. worked on adapting the IT Tool, but finding suitable parameters (input emission factors) and adapting the requirements of the Tool showed to be too difficult. As a result, the assessment of financial instruments for energy efficiency projects with the IT Tool was in practice not feasible in Germany.

2.2 SME's project evaluation with the IT Tool

The Project level tool main focus is to evaluate economic parameters of a particular project (e.g. NPV – net present value, CF – cash flow, etc.) as well as its environmental benefits in terms of decreased carbon emissions.

The Project level tool requires to introduce two types of inputs (investment/funding related inputs, energy savings related inputs), and provide outputs in a form of energy and environmental benefits and economic indicators.

With reference to funding/financial support, the user is able to simulate how different types of instruments (subsidies, loans) and different shares of financial support affect economic parameters of the project and so its financial viability.

Investment/funding related inputs included: the Total investment, Type of financing (Loan, Subsidy, Own resources), the Interest rate, the Repay of the loan, the Discount rate, the Lifetime of the project/measure.

Energy saving related inputs included: Electricity, Natural Gas, Coal, Heat, Solid biofuels, Gaseous biofuels, Other fuels.

The following figure outputs are obtained from the evaluation of SME's investment project:

- The expected drop of CO2eq emissions
- The expected Cash Flow
- The NPV - Net Present Value
- The simple payback

In order to asses public investments addressed to support the low carbon economy, 32 energy efficiency projects funded from Operational Programmes in four countries were analysed using the Project level tool. In the basic scenario, two types of inputs data received from SME's projects (investment/funding related inputs and energy savings related inputs) were inserted to the Tool and outputs were obtained in a form of energy and environmental benefits and economic indicators.

The three groups of indicators were considered and calculated:

- Energy savings, including costs of energy savings
- GHG savings expressed in CO2eq savings, including costs of the savings
- Economic performance (cash flow, net present value, payback period).

2.2.1 Energy savings of analysed projects

Comparing the data obtained from the analysis of energy efficiency projects from four countries, it can be seen that from a global point of view, all projects generate similar effects in terms of energy savings costs.

The table below shows the results obtained from the IT Tool calculation of the assessment of EE/RES projects in Italy, Austria, Poland and Czech Republic.

Energy savings costs of EE/ RES projects in Italy, Austria, Poland and Czech Republic					
Country	**Total investment**	**(Total) Expected savings in MWh**	**(Total) Savings in kg of CO2eq**	**Cost of MWh**	**Cost of kg CO2eq*)**
Italy	1 205 217,25 €	1190,26	632 025,41	1 012,57 €	1,91 €
Austria	1 277 250,00 €	812,65	229 240,00	1 571,71 €	5,57 €
Poland	2 272 230,00 €	3004	1 014 893,55	756,40 €	2,24 €
Czech Republic	4 743 305,00 €	4758	2 061 260,73	996,91 €	2,30 €

Table 3: Overview of the results obtained from the assessment of EE/RES projects in Italy, Austria, Czech Republic and Poland

*) Cost of CO2eq was calculated based on the data from the from D.T2.5.1, D.T2.5.2, D.T2.5.4, D.T2.5.5 pilot activities reports.

At the same time, differences can be seen between partner countries:

1. The high cost of saving the CO2 equivalent in kilograms in Austria is twice as high as in other countries. This is due to the energy production structure in Austria, which is based on a 70% share of hydropower in electricity production.
2. Low cost of energy savings in Poland amounting to 70% of the average costs in the analysed countries. This is due to the structure of analysed projects in Poland, which are mainly based on building insulation.

2.2.2 GHG savings of analysed projects

The total amount of GHG (CO2eq) savings per analysed project varies in partner countries, but as it depends on the amount of investment, this absolute indicator does not have adequate information value as such.

Regarding the CO2eq savings per MWh saved, an analysis of the SME's investment projects implemented in the Czech Republic, shows that the best ratio is delivered by the projects on RES installation and the project on change of a heating source (new biomass boiler). The electricity and heat generation in the Czech Republic still involves a lot of coal, therefore savings of these energy carries result in the best CO2eq savings (the emission factors of these energy carriers are the highest) – about 900 kg/MWh. The worst performance was delivered by the project on modernization of a distribution system (16,23 kg/MWh).

In terms of costs of CO2eq savings achieved in the Czech Republic, very similar performance is demonstrated by RES projects (1,59 €/kg on average), and the projects on change of a heating source and combination of building insulation and change of a heating source (1,72 €/kg and 1,31 €/kg respectively), while the project on a mere building insulation has several times higher costs (9,86 €/kg). The project on modernization of a distribution system showed extreme costs of 177,53 €/kg.

In turn, the costs of CO2eq savings (expressed in €/kg) in Poland range from 1,62 €/kg to 34,87 €/kg. The lover costs are shown by the projects involving a set of measures incl. building insulation, replacement of doors/windows and installation of energy management system. The projects including a photovoltaic installation also demonstrate good performance (2,60 €/kg and 4,99 €/kg), while the highest costs is shown by the project (34,87 €/kg) on modernization of the technological heat and cooling system, installation of energy management system and change from electricity to gas, which demonstrates poor performance in other areas (energy, GHG emissions, economy).

In Austria the CO2eq savings per MWh saved range from 254 to 310 kg/MWh and the costs of CO2eq savings (expressed in €/MWh) range from 1.417 €/MWh to 1.730 €/MWh.

2.2.3 Economic performance of analysed projects

If we take into account the economic parameters of the projects implemented in the partner countries, we can observe big differences in relation to the NPV, "cash flow breakpoint" - i.e. a year when cumulative savings exceed cumulative expenses (cumulative CF = 0) and simple payback of individual projects.

Out of 32 analysed projects, 23 projects deliver positive net present value, while NPV of remaining 9 projects is negative. When it comes to "cash flow breakpoint", 6 projects can never reach CF = 0. In case of the other projects, the repayment can be achieved from several years up to several dozen.

In the Czech Republic the fastest repayment was achieved in the project combining a building insulation and a change of a heating source (8 years) followed by RES projects (10-11 years for most of the projects, one project – 21 years). In case of the other projects, the repayment can be achieved only several years after the lifetime of the measure, while the project on modernization of a distribution system can never reach CF = 0 when taking into account time value of money (discount rate).

In turn in Poland, the fastest repayment (5 years) was achieved in the project implemented by the company running the Eldercare Home, which carried out an investment involving a set of measures to modernise the building in which it operates (incl. building insulation, modernization of heating source). In case of the other projects, the repayment can be achieved after 9 to 11 years, which is also a very good economic performance.

One of the simple parameters for assessing the economic efficiency of implemented projects is the simple payback period, calculated by the Tool.

When assessing investment projects in partner countries on the basis of a simple payback period in years, we can see that they show similar effects.

The following table and the chart show the number of SME's investment projects (32 projects in four countries) analysed in terms of simple payback period.

Simple payback period (max value in years)	Number of projects
10	10
15	8
20	4
25	2
30	2
more than 30	6

Table 4: The number of SME's projects analysed in terms of simple payback period

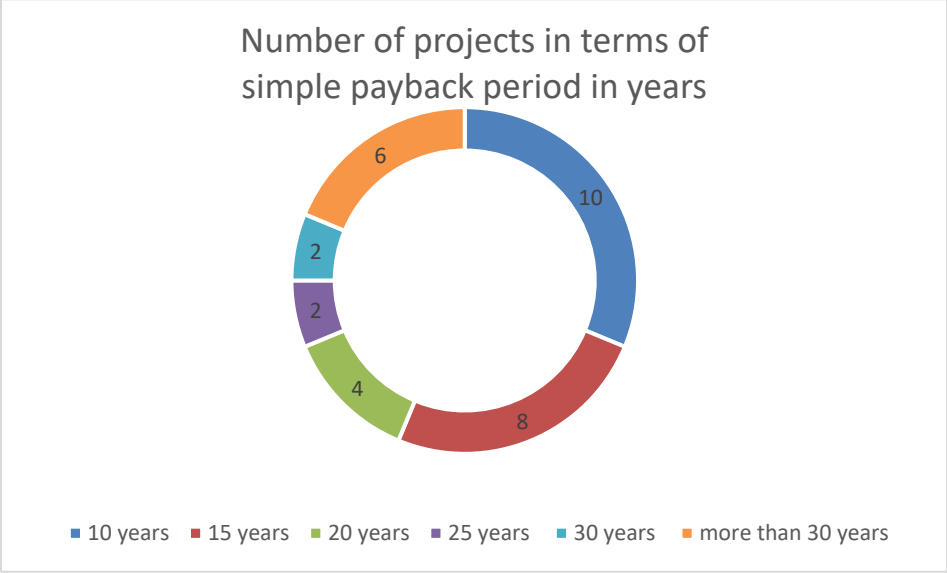


Chart 5: The number of SME's projects in terms of simple payback period analysed in Italy, Austria, Czech Republic and Poland

More than half of the 32 analysed projects demonstrated a simple payback time to 15 years, which is acceptable for most of the energy efficiency measures. These projects usually concern installations of photovoltaic systems and buildings insulation.

Projects with a payback time of more than 15 years up to 30 years on improving energy efficiency in SME's require in-depth analysis. Such a long pay-back period for modernisation and energy efficiency improvement projects, implemented on a small scale without an additional system of financial support based on the implementation of regional energy plans, indicates that the measures implemented are not economically viable. However the evaluation of such projects based on financial indicators, without taking a broader perspective, does not provide a full response to the effectiveness of the financial instruments used to support SME's investments in renewable energy and energy efficiency. The IT tool has precisely identified these projects. An additional evaluation of these projects in terms of their quality and quantity contribute to achieve the Energy Plan's target would be required.

Out of 32 analysed projects, 6 provided a simple payback period that exceeds 30 years. One of the project consisted of replacing of old central heating pipework with new pipes and shown very poor performance in all areas (energy and economy). Although it didn't deliver high energy savings and was investment-intensive at the same time, the modernization was necessary to be carried out due to the age of the old pipework. The implementation of the measure was not motivated primarily by energy and financial savings, but by technological needs. As we can see, the analysis of an exploited heating network only from the point of view of the energy balance with the omission of heat carrier losses, supply interruptions and the possibility of changing the heating technology for customers is too simplified.

The remaining projects with a very long simple payback period were related to the production of heat or cold, modernization of circulation in the heating network, installation of heat pumps. There was also a project related to production technology, i.e. replacement of a resistance furnace for the production of ceramics.

The implementation of project with simple payback period higher than the lifetime of the measure, leads to the conclusion that without the support of grants, these projects would not have been implemented or would have been implemented on a much smaller scale.

2.2.4 Calculation of alternative scenarios

In order to assess an impact of the different types of instruments and different shares of financial support on the economic and environmental parameters of the analysed projects, two alternative scenarios were developed and analysed in three partner countries: Austria, Poland and the Czech Republic.

To do so, the IT tool was used to simulate how each project performance would change if financial instruments (in particular soft loans) were used instead of own resources

(Scenario 2 subsidy + loan) or if the subsidy was completely excluded and the support would cover only the soft loan (Scenario 3 loan + own resources).

The relevant simulations were analysed and described by the partners in their summary reports D.T2.5.7.

In terms of results, energy and GHG emissions savings – both absolute and relative indicators – remained the same in the above described scenarios as in the basic scenario in all analysed projects. Concerning economic indicators, the cash flow and the simple payback period also didn't change, while the cash flow breakpoint and the net present value differ significantly.

The summary results of the relevant simulations are provided in the table below

Indicator	Basic scenario **Subsidy + own resources (+loan in Austria)**	Scenario 2 **Subsidy + soft loan**	Scenario 3 **Soft loan + own resources**
Net present value (NPV)			
Number of projects with NPV >0	16	**17**	10
Number of projects with NPV < 0	8	**7**	14
Cash flow (CF) breakpoint			
Number of projects with CF breakpoint "never"	6	**5**	9
Number of projects with CF breakpoint = 1 year	0	**10**	0

Table 5: Economic performance of the projects analysed in Austria, Poland and the Czech Republic

As we can observe, the use of financial instrument (soft loan) instead of own resources for co-funding of the project has the ability to increase its NPV and decrease the CF breakpoint.

The most favourable economic indicators were achieved in the scenario 2 including subsidy and soft loans substituting own resources. When combining a subsidy with a soft loan (scenario 2), 10 projects significantly improved their CF breakpoint and generate positive cash flow since the beginning. Their annual financial savings are higher than the annual loan instalment and at the same time, the company does not need to provide its own initial investment. Only five failed to achieve positive NPV.

Whereas the substitution of subsidy with a soft loan (scenario 3) delivers decrease of NPV and increase of CF breakpoint in comparison to basic scenario. In this scenario

14 projects demonstrated negative NPV in comparison to 8 projects with NPV < 0 in basic scenario.

Calculation of alternative scenarios performed with the use of the Tool in partner countries has shown that **the best results have been achieved with the certain level of a subsidy component with soft loans.**

3. CONCLUSION OF THE INDUSTRIAL SECTOR ENERGY EFFCIENCY PROJECTS ASSESSMENT ANALYSIS

The goal of the Pilot Action 2 was to assess the public investments to support Industry low carbon transition through analysis of projects/investment plans elaborated by SMEs on energy efficiency and renewable energy sources to verify their quality and quantity contribute to achieve the Energy Plans' targets, using the IT Tool.

According to the D.T2.3.2 Methodology for the PA2 addressed to industry, each project partner should involve 8 SME's who have plans to develop a new energy efficiency or renewable efficiency projects or SME's who have ongoing projects. So in the frame of the FIRECE project we should receive data form 40 SME's in total.

Finally, in order to meet the objectives of PA2 and to verify quality and quantity contribute of SME's projects to achieve the Energy Plans' targets, 32 ongoing and finalized projects were analysed using the IT Tool. Although 32 involved SME's from four countries are not a a big pattern, but they can serve as a sample to observe similarities or differences.

In order to assess and then monitor the performance of the investment projects using the IT Tool, the list of key performance indicators was defined with the proposed monitoring indicators.

3.1 Key performance indicators to monitor the PA2

Name of the indicator	Unit of measure
Additional capacity for renewable energy production	kW
Estimated annual reduction in greenhouse gases	tons of CO2 equivalents
Decrease in annual primary energy consumption of business buildings	kWh/year
Decrease in primary energy consumption by energy efficiency improvements	GJ/year
The amount of energy produced from renewable energy sources	GJ/year
Primary energy use	PJ
The amount of energy produced from renewable energy sources in total gross energy consumption	PJ/year

Number of enterprises receiving support	Number of enterprises
Total investment costs	EUR
Amount of non-refundable grants spent by enterprises from public grants	EUR
Amount of refundable grants spent by enterprises from public grants	EUR
Electricity savings	MWh/year
Heat savings	GJ/year
Savings at current prices	Eg. EUR/year
Total savings	%
Renewable capacity	MW
CO_2 emission reduction	Tones of CO_2/year

Table 6: KPI's to monitor PA2

Based on the Methodology to test the tool to assess public investments for industry's low carbon transition (D.T2.2.3), the following parameters in particular were taken into account when assessing the achievement of the Energy Plans objectives.

- *Number of enterprises receiving support*
- *Total investment costs*
- *Estimated annual reduction in greenhouse gases*
- *Effective ratio of investment to reduction of CO2 emissions in kg per year or Mtoe per year.*
- *Absolute amount of energy savings (heat or electricity) compared to the original state (values).*
- *(Total) Expected savings in MWh*
- *(Total) Savings in kg of CO2eq*
- *Cost of MWh*
- *Cost of kg CO2eq*

3.2 SME's contribution to EU/national level targets

FIERCE project aims to contribute to the implementation of the Regional Energy Plans and to contribute to achieve the targets planned at EU and national level.

The European Union puts significant effort in deep emission reduction to maintain the leadership position in the fight against global warming and has set itself targets for reducing its greenhouse gas emissions progressively up to 2050. Key climate and energy targets are set in the '2020 Climate and Energy Package' and consequent '2030 Climate and Energy Framework'. These targets are defined to put the EU on the way to achieve the transformation towards a low-carbon economy as detailed in the '2050 Long-term Strategy'.[1]

The targets are set in three areas, which include:

- Improvement in energy efficiency,
- Generation of energy from renewable energy sources,
- Reduction of greenhouse gas emissions

with the year 1990 being used as a reference. (see Table 7 for specific targets).

Year	Energy efficiency target	RES target	GHG emissions reduction target
2020	20 %	20 %	20 %
2030	32.5 %	32 %	40 %
2050	significant future investments		80 %

Table 7: Targets of the EU energy and climate policy

The individual targets for each Member State were also set. Some of the partner countries, e.g. Germany, Italy or Poland are not reaching the targets planned, while others (Austria, Czech Republic) fulfil them.

The share of renewable energies in Austria is currently around 33.5 %. Electricity is already generated at around 72 % from renewable sources. Austria is therefore already a pioneer in the electricity sector in terms of Europe.

Although the Czech Republic seems to be fulfilling the actual targets, its energy performance is still much below the EU average. Therefore, improvement in energy efficiency is still very important and remains a high priority.

Poland conducts an active climate and energy policy and undertakes measures across all the dimensions of the Energy Union. With respect to the structure of energy carriers,

[1] https://ec.europa.eu/clima/policies/strategies_en

the leading role in electricity production in Poland still plays coal (77%), however its percentage share in the electricity generation structure will decrease gradually, down to ca. 60 % in 2030. At the same time, Poland will place emphasis on diversifying energy carriers by successively increasing the share of RES and by including nuclear power in the energy balance starting from 2033.

In Saxony (Germany) until the late 1990s the primary energy consumption was dropping almost every year. Since the beginning of the 21st century, however, the values stayed constant, especially within the period of the Energy and Climate Programme 2012-2020.

Comparing the data obtained from the analysis of energy efficiency projects in partner countries, it can be seen that all the projects have the ability to generate energy and GHG savings, and so to contribute to the goals of national/region energy plans.

Country	Number of projects analysed	Total investment	(Total) Expected savings in MWh	(Total) Savings in kg of CO2eq
Italy	8	1 205 217,25 €	1190,26	632 025,41
Austria	8	1 277 250,00 €	812,65	229 240,00
Poland	8	2 272 230,00 €	3004	1 014 893,55
Czech Republic	8	4 743 305,00 €	4758	2 061 260,73

Table 8: Energy savings obtained from the implementation of EE/RES projects

In Germany the project partner NEU e.V. reached out to the regional energy agency SAENA in order to obtain the data on energy efficiency projects and it was able to receive data of 176 projects implemented and accompanied by SAENA between the years 2014 and 2018. The projects that have been provided by the regional energy agency of SAENA are partially showing results of the impact public funding programmes can generate. The data is not delivering detailed information about the individual SME's projcts, but it indicates the broad variety of energy efficiency measures that have been implemented. Therefore, it can be assumed, that - from small, medium to big enterprises – all kinds of companies are taking advantage from public funding programmes and are therewith actively contributing to the regional energy targets. All analysed projects are contributing to an energy saving of around 26,100 GWh per year, which is in average 148 GWh per year per project. The total accumulated amount of saved CO2 is around 11,700 t CO2 per year and per project around 66.6 t CO2.

When defining the guidelines, it should be taken into account that implementation of EE/RES projects are not only motivated by achieving energy savings, but also by technological need, reduction of maintenance costs or decreasing dependence on external energy sources. The energy saving per company may be low, therefore it is necessary to have an effect of scale, which requires the proper use of the financial instruments.

The Project level tool allows for a detailed evaluation of both economic parameters and environmental benefits in terms of decreased carbon emissions of a single project. This, in turn, can serve as a basis for a broader benchmarking of how funds are spent in different countries / regions in comparable areas.

As installation of photovoltaic system in SME's was one of the most frequently chosen energy efficiency measure in the partner countries, outputs obtained from evaluation of photovoltaic projects using IT Tool were summarized in the below table.

Economic and environmental parameters of photovoltaic projects analysed in Italy, Czech Republic and Austria

Country	Type of Economy activity	Investment	Expected savings in MWh	Savings in kg of CO2eq	Cost of MWh	Cost of kg CO2eq	Simple payback period
Italy	N. d.	83 100,00 €	79,13	42 131,22	1 050,17 €	0,51 €	5
	N. d.	196 250,00 €	348,23	185 408,23	563,56 €	0,94 €	3
	N. d.	40 100,00 €	39,13	20 834,00	1 024,79 €	0,52 €	5
	N. d.	84 275,10 €	118,05	62 853,41	713,89 €	0,75 €	4
	N. d.	290 138,00 €	104,88	55 838,64	2 766,38 €	0,19 €	14
	N. d.	202 750,00 €	152,77	81 339,39	1 327,16 €	0,40 €	7
	N. d.	152 750,00 €	203,56	108 381,53	750,39 €	0,71 €	4
	N. d.	155 844,15 €	144,51	76 941,52	1 078,43 €	0,49 €	5
Czech Republic	Manufacturing of machinery for quarrying	89 451,00 €	55	48 388,64	1 626,38 €	0,54 €	17
	Processing of plastics (injection moulding)	442 882,00 €	323,4	284 525,26	1 369,46 €	0,64 €	20
	Construction and buildings	225 700,00 €	143	125 810,49	1 578,32 €	0,56 €	26
	Logistics and storage of frozen and chilled foodstuffs	85 463,00 €	85	74 782,46	1 005,45 €	0,88 €	16

Austria	Technical engineering	295 450,00 €	173,25	44 070,00	1 705,34 €	0,15 €	22
	Food-processing	85 000,00 €	95	26 600,00	894,74 €	0,31 €	8
Average		175 510,00 €	158	84 516,00	1 110,82 €	0,48 €	11

Table 9: Overview of the results obtained from the assessment of photovoltaic projects in Italy, Austria and the Czech Republic

Cost of CO2eq was calculated based on the data from the from D.T2.5.1, D.T2.5.2, D.T2.5.5 pilot activities reports

Analysing the above data, we can see significant differences between countries where photovoltaic installation projects have been implemented. If we take into account the simple payback time, projects in Italy have a simple payback time close to 5 years, only one project deviates significantly from the average. It can be assessed that projects of this type in Italy do not require additional support from the point of view of their economic viability.

In Austria, two projects show that with well-used photovoltaic capabilities integrated into the technological process, an 8-year return on investment is possible. At the other extreme are projects in the Czech Republic with a very long payback period of 20 years on average. This means that without additional support, investment in a photovoltaic installation in the Czech Republic is not economically reasonable.

The costs of obtaining MWh and kg CO2eq savings do not differ as drastically from the average as payback time and are not a key factor influencing the difference in results.

The IT tool can also be used to simulate how the project performance would change if financial instruments (in particular soft loans) were used. The relevant simulations of two alternative scenarios were described earlier in the chapter 2.

Comparison of the three different financing models in Austria, Poland and the Czech Republic, included:

- Basic scenario: subsidy + own resources (+loan in Austria)
- Scenario 2: subsidy + soft loan;
- Scenario 3: soft loan + own resources.

The most favourable economic indicators were achieved in the scenario 2 including subsidy and soft loans substituting own resources, which leads to significantly increased NPV and decreased the CF breakpoint. Whereas the substitution of subsidy with a soft loan delivers decrease of NPV and increase of CF breakpoint in comparison to basic scenario.

Taking into account the environmental savings achieved by the analysed projects, the implementation of investments in all projects has contributed to the achievement of the objectives of national/regional energy plans. However, while analysing selected

projects at the same time in terms of economic feasibility, which is equally important, the best results have been achieved with a certain level of a subsidy component combined with soft loans. Nevertheless, to make the projects also economically viable, a certain level of a subsidy component seems to be necessary to be involved into the financing schemes.

4. CONCLUSION OF THE PERFORMANCE OF THE PROJECT LEVEL TOOL (O.T1.4) AND THE METHODOLOGY (T2.2.3) TO ASSESS PUBLIC INVESTMENTS FOR INDUSTRY'S LOW CARBON TRANSITION

The Project level Tool developed in the T1 work package was presented and discussed at local level and one transnational methodology was developed with local specification in agreement with local stakeholders considering local targets to be achieved, existing local parallel actions and plans. The methodology served to support the testing phase of Pilot Action 2.

The Tool was developed with the aim to provide a calculation of energy, environmental and economic performance of the energy-related projects, and to allow the user to simulate and compare different possibilities of financing.

In this chapter the report provides comparison of the performance of the Tool used by project partners in the pilot activities to assess industrial sector projects on energy efficiency and renewable energy sources.

4.1 Technical aspects

As the IT Tool was prepared by the Czech partner ENVIROS and was based on Czech data, it required the adaptation to local condition of each participating region from Italy, Austria, Germany and Poland. In the next phase, ENVIROS assisted the other FIRECE partners in development of their local specifications of the Tool.

The Tool is developed in MS Excel and includes macros. In the process of local specifications elaboration, some partners faced a problem that the Tool (macros) did not work properly in their MS Excel version; however, these issues were flexibly solved by ENVIROS.

Based on basic input data of a single projects (investment / funding and energy savings related inputs), the Tool provides outputs in a form of energy and environmental benefits and economic indicators.

Besides the inputs inserted by the user in the main screen, the additional data on emission factors had to be incorporated into the Tool in advance. These data vary among countries and regions as they are dependent on particular economic and market conditions and energy mix. As a preparatory activity for testing phase of SME's projects, the emission factors had to be identified for each country/region and provided to the Czech partner ENVIROS. For some partners, it was a little bit difficult to identify the national/regional factors relevant for the Tool, and so the development of local specifications took more time than envisaged.

In Germany the adaption of the IT tool was mostly hindered by the data collection. German emission data was very detailed for many industrial branches and industrial

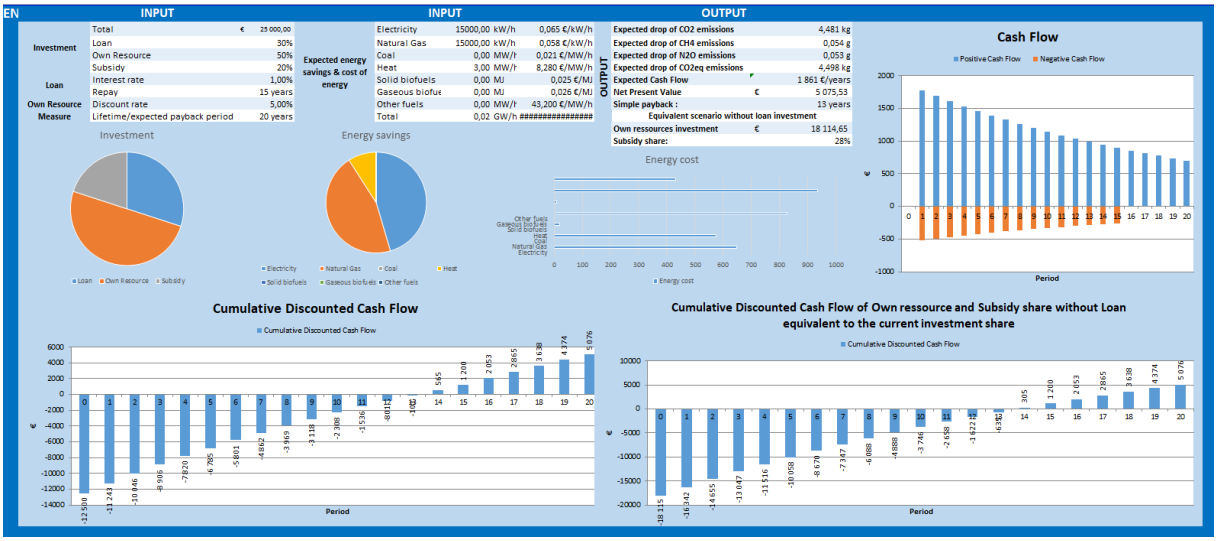
processes, but was not available in the format the tool is using. Trying to adapt the values or the tool itself took a long time without satisfying results and setbacks and therefore, approaching SMEs for piloting was not feasible.

In Austria the additional input data for the expected energy savings was also difficult to provide, as the data on emission factors for the Tool were not available in Austria first. To run the Tool in Austria, ENVIROS had to help with the conversion of the input data.

At the end the Project level Tool completed with partners additional input data was adapted to local conditions of partners regions and was able to be used in the pilot activities to assess Industrial sectors RE projects in partner countries participating in PA2.

4.2 User friendliness of the IT Tool (O.T1.4) and its local adaptation (O.T2.2)

The dashboard represents the general overview of the input and output data calculated for single investment project analysed.



Inserting of the input data is easy; the input tables are highlighted in lighter colour and the specific fields are described. The Tool includes internal control mechanisms that prevent data to be inserted in a wrong format (e.g. text instead of numbers, share of financial resources higher than 100%, etc.).

For data on energy savings and energy prices, several units can be used (kWh, MWh, GWh, MJ, GJ, TJ), and they are automatically recalculated to the common unit selected by the user.

The table with outputs is also highlighted in lighter colour, and the outputs are displayed in charts, too. When the user changes some of the inputs, the results are immediately visible in the charts.

The interface of the tool is simple; it does not require an advanced level of IT skills. The results are presented in a clear and easy to interpret manner.

However, some issues regarding the inputs and the charts were identified by the partners using the Tool during the testing phase of PA2:

- table Input: The field 'Lifetime/expected payback period' relates to the lifetime of the measure. The text 'expected payback period' can be misleading for users.
- chart Energy cost: The bars of specific energy carries does not match the items in the legend.
- chart Cash Flow: The negative cash flow in the year '0' (initial own investment) is not displayed.
- table Input: Which expected values are meant: those that are produced or consumed? Maybe additional explanation would be required.
- table Input: the units of expected energy savings are wrong- it should be MWh or kWh (not MW/h or kW/h)
- chart "cumulative discounted cash flow of own resource and subsidy share without loan equivalent to the current investment share" is not clearly understandable for users (what is meant).

4.3 Recommendations and suggestions

The use of the IT tool to assess public investments for industry's low carbon transition proved to be very useful in the evaluation of SME's projects clearly linking investments done to energy saving effects. The wider use of the tool provides an opportunity to make targeted decisions on key areas of support for SMEs related to energy efficiency improvements.

The tool showed that when assessing more complex projects, the quantity and quality of data collected during project implementation is insufficient. Further work is required in this direction. The following scenarios are possible:

- improving the quality of required data provided by SMEs and using the IT tool as it is now
- recognition that the tool is unable to properly evaluate more complex projects and using the IT tool as a filter to find such projects; in such a situation, complex projects required different procedures

- recognition that extending the IT tool with the next parameters is necessary and performing the required work.

The Tool and the presented outputs are built on basic calculations that definitely could be extended to make the Tool more robust and the results more precise – which, however, would require more data to be inserted as inputs and would pose more requirements on the users.

The more sophisticated version of the Tool could include for instance the following aspects:

- Consider different lifetimes of measures in case of projects that consist of several measures;
- Consider additional annual savings not relevant to energy savings (e.g. lower maintenance costs);
- Consider different subsidy rates for different measures
- Consider depreciation (amortization) of new equipment;
- Calculate with expected inflation;
- Consider the time delay between the beginning of the project (i.e. year ‘0’) and the time when the company receives a subsidy;
- Besides the simple payback period, calculate also discounted payback period;

5. RECCOMENDATIONS IN VIEW OF THE TRANSFERABILITY AND DISSEMINATION ACTIONS

The main focus of FIRECE project is on public support to industry to invest into energy efficiency and renewable energy sources.

The goal of the implementation of pilot actions in five partner countries to assess investment plans implemented by SMEs, was to see how industrial sector can contribute to the achievements of targeted results of Regional Energy Plans. In order to evaluate EE/ RES investment plans, a user-friendly IT tool was developed in the project, which performance was checked by the partners involved in PA2. The IT Tool (O.T1.4) together with the methodology for PA2 addressed to industry (D.T2.3.2) was used to measure the effectiveness of the financial instruments and test the quality and quantity contribute of SME's projects.

The results of pilot actions carried out in five partner countries were collected and summarized in order to evaluate the possibilities of further use of IT Tool and the assessment procedure and to ensure their transferring and dissemination. Although the total number of 32 SME's tested is not a big pattern, but we were able to observe the similarities and differences among partner countries and thus to see strengths and weaknesses of the Tool used and the methodology applied.

As the FIRECE focus is on the regional energy plans, it is essential to support companies only if they contribute to the regional targets in terms of energy savings. Measures for this energy saving are an important part of the criterion for expected results. To complete the pilot methodology, a KPIs list was elaborated to support the evaluation and the impact SME's investments plans on the Regional Energy Plans indicators and others targets (financial targets, ROI, etc). The list is not exhaustive and may serve as an sample together with the assessment procedure for further use by interested stakeholders.

The FIRECE project was implemented to achieve a specific objectives and to ensure the transferability and dissemination of the projects outputs.

In case of pilot Action 2, the transferable outputs include the IT Tool (O.T1.4) and the methodology for PA2 addressed to industry (D.T2.3.2), which may be also the subject to further analysis and adaptation to local conditions. As demonstrated by the pilot actions carried out in the selected countries, adaptation to local conditions is crucial to the successful implementation of the assessment procedure at regional level. It also requires the involvement of regional stakeholders and sectoral agencies which have an overview of the regional energy market.

Target groups - actors addressed by transferring action of PA2 output, interested in using the Tool include:

- Local authorities
- Regional authorities
- National authorities
- Financial and business intermediaries
- SME
- Sectoral agencies

The IT Tool and the assessment procedure is addressed and available for public authorities, financial agencies, intermediates, professionals, SMEs in each partner country. Potential users and interested actors should be engaged at any stage of its adaptation by defining the objectives, regional targets, selecting the measures in order to obtain the Tool tailored to specific local conditions.

Well-used Project level Tool gives a lot of support in the decision-making process by managing authorities, both at the regional and national level.

The analysis of energy efficiency projects is a complex task that requires the consideration of many factors. The tool offers a great opportunity to locate the strengths and weaknesses of the implemented activities. By making full-scale use of the Tool, it is possible to easily and quickly assess the project submitted for assessment and place it in the broader context of similar projects on a larger scale. This gives clear warning signs that a more detailed project analysis is necessary to make a successful decision.

Using the tool, it is possible to define areas of energy efficiency activities which, at the current stage of development, require support, as they bring measurable and expected environmental effects, and at the same time have not been implemented on an appropriate scale, because their costs are unacceptable to market participants without appropriate support instruments.

The use of the Project level tool to compare the way how public resources are used in different countries to improve local/regional energy performance, offers great analytical opportunities. On its basis, it is possible to assess the impact of the local pricing policy - energy sales costs, equipment purchase costs - on the environmental effects obtained. It also provides an opportunity to undertake more detailed analyses and exchange experiences between countries. They give decision makers the chance to ask interesting questions: What objective factors can be taken into account when comparing the effectiveness of disbursement of support funds? How different factors influence the obtained results? The example of each country shows EE/RES projects that differ significantly from the average. Detailed analysis of these projects gives the opportunity to improve the process of supporting the low-carbon transition in industry sector in Central Europe in the future.

The daily use of the IT tool has a positive impact on the understanding of the IT tool users of the basic aspects related to energy consumption and the impact of energy consumption on environmental parameters. In this case the dissemination is combined with the awareness -raising activities on energy efficiency topics. A clear and user-friendly interface also has also a training value. Most of the staff of the project evaluation units are not always specialists in energy efficiency issues. Using the Tool, they are able to locate areas where they need to improve their competences and determine to what extent this improvement is necessary in order to work effectively.

A very big advantage of the Tool is the identification of projects that are so complex or unique that they require individual consideration. Thanks to the Tool, it is possible to build effective procedures for the assessment of both regular and unique investment projects submitted by SMEs. Such projects were easily localized by the Tool during the testing phase in parent countries. The Tool gives also the possibility to compare a funding mix of loan, subsidy, and own to an equivalent mix of own resource/subsidy funding with the precise share of subsidy needed to find the same conditions as the loan with preferential interest. It offers the SME's the opportunity to simulate various financing options and to evaluate the long-term nature of their investment by issuing cumulative cash flows. This enables SME's to choose financing options that are better aligned with the general development of the company.

The tool can certainly be used at national level, but whether it is of interest to individual stakeholders would have to be investigated further. 8 pilot projects assessed by each partner participating in PA2, are not sufficient for this, as each project is individual, with very different parameters. To analyse the detailed information (behind the tool) relevant to local specification of each of the partner countries is the challenge to ensure a meaningful performance of the Tool. It development and adaptation to local conditions is possible at national level under the guidance and support of the regional stakeholders. The wider use of the IT Tool and the assessment procedure developed in the project, gives a very good opportunity to increase the effectiveness of the financial instruments aimed at improving the energy efficiency of SMEs and so to assure the sustainability of the project outputs.

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