D.T2.5.4

Report of the pilot activities to assess Industrial sectors RE projects in the Poland

WP T2: Activity 2.5 – PA 2: Improving energy efficiency in Industry Sector

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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 activity *2.5 Improving energy efficiency in Industry Sector* includes Pilot Actions carried out in five partner countries to assess Industrial sector RE projects using the Project level tool developed in WP T1 (O.T1.4) and updated in WP T2 (O.T2.2). The goal is to assess the public investments to support Industry low carbon transition: analysis of projects/investment plans elaborated by SMEs on EE/RES to verify their quality and quantity contribute to achieve the Energy Plans' targets.

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

This report summarizes the activities that were carried out in Poland.

EXECUTIVE SUMMARY

Country / region / PA2 Implementation area

Poland / Lower Silesia Voivodeship

Relevant energy saving funds:

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

Target group – SMEs[1]

Number of SME's involved:

8 companies:

- micro: 3
- small: 4
- medium: 1

Type of projects:

Finalized projects: 8

Energy saving measures / type of investments analysed

Energy savings projects:

Measures involved:

- Energy management: 6
- Building insulation: 6
- Replacement of doors and windows: 4
- Installation of heat pumps: 3
- Coal boiler replacement: 1

[1] 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 \ their annual balance sheet total does not exceed EUR 43 million.

Renewable energy sources projects: 2

Measures involved:

- Installation of photovoltaic systems (for electricity generation):2

Involved stakeholders

Lower Silesia Intermediary Institution

SMEs

1. SELECTION OF THE FINANCIAL INSTRUMENT ADDRESSED TO ENERGY SAVINGS FOR INDUSTRY

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 following sub-measures focused on energy efficiency and renewable energy sources:

Measure: 3.2.A. Deep energy modernisation of facilities , including replacement or modernization of the energy source, aimed at increasing energy efficiency by reducing heat losses and reducing electricity consumption with possible consideration of RES (excluding sources in the system of high-efficiency cogeneration and trigeneration).

Measure: 3.2.B. Support for installations recovering waste heat as defined in Directive 2012/27/EU.

Measure: 3.2.C. Application of energy efficient technologies in the company (including modernisation and extension of production lines to more energy efficient ones).

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).

Type of beneficiary of the Measure 3.2 includes:

- micro, small and medium-sized enterprises (SMEs).
- agricultural producer groups;
- enterprises whose majority of shares belong to territorial self-government units.

Minimum and maximum project value and co-financing:

Minimum project value: 12.000,00 EUR of total expenditure

Maximum project value: 2,4 million EUR of total expenditure

Maximum % level of co-financing of total eligible expenditure at project level: 85% (EU funds + any co-financing from the national budget)

The results of measures implemented under PA3 are monitored by set of indicators, out of which the following ca be considered the most important for the pilot action:

- the amount of electricity saved [MWh/year] / the amount of energy saved Heat [GJ/year]
- Reduction of final energy consumption as a result of project implementation [GJ/year]
- production of electricity from newly built installations using RES/ new capacity of RES installations [MWh/year]
- Production of heat energy from newly built RES installations/ new capacity of RES installations [MWh/year].
- Reduction of final energy consumption due to project implementation [GJ/year]
- Estimated annual decrease in greenhouse gas emissions [tonnes of CO2eq/year]

2. SELECTION OF SME's INVESTMENT PROJECTS FOR THE ASSESSMENT

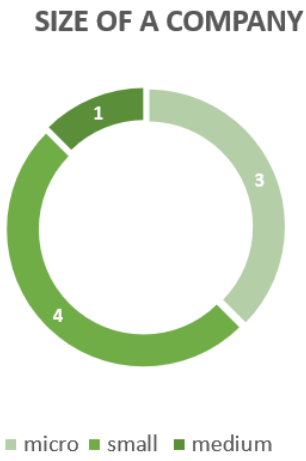
2.1 Criteria followed to identify projects

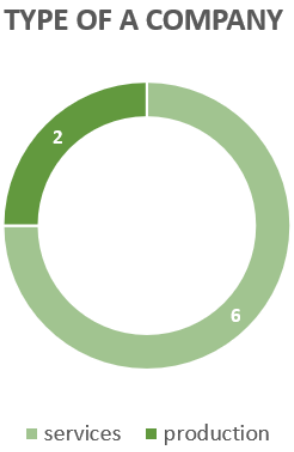
When selecting the companies and investment projects carried out, it was assumed that they represent a variety of different types of companies in terms of a company size, investment size or types of applied energy efficiency measures.

In the process of projects selection, the following criteria were applied:

1. **Type of a company:** The majority of companies selected were services companies (6); however, we wanted to include also a few other production companies (2)
2. **Size of a company:** Within SMEs group, the intention was to cover micro, small and medium-sized enterprises.

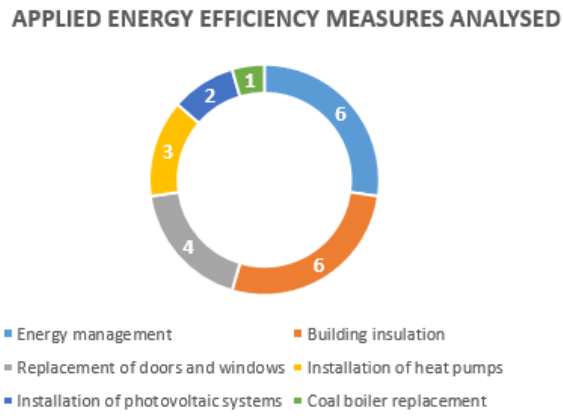
   The following charts show the share of selected companies in terms of type and size of a company:

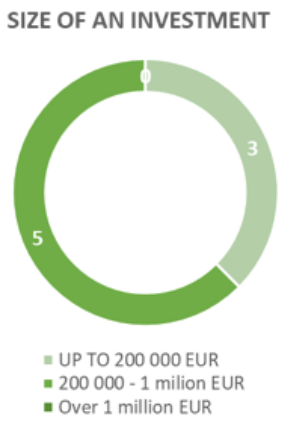




3. **Type of a project:** Both energy efficiency projects and projects on installation of renewable energy sources were included.
4. **Size of an investment:** Three levels (ranges) of investment were intended to be covered:
   i. up to 200 000 EUR;
   ii. between 200 000 EUR and 1 million EUR;
   iii. over 1 milion EUR

The following charts show the share of selected companies in terms of type of a project and size of an investment:





2.2 Description of SME's investment projects analysed

The majority of investment projects analysed were implemented by services companies (6), which dominated among the companies applying for co-financing from the ROP Measure 3.2. Energy efficiency in SMEs. They included hotel and guesthouse, health center, eldercare home, rental and property management, as well as installation of air conditioning, while two manufacturing companies included printing house and beer production.

All investment projects carried out by the selected companies consisted of several measures aimed at improving energy efficiency and installation of renewable energy sources.

Implementation of the projects was motivated by reaching energy savings and reduction of operating costs, mainly through building insulation and application of energy management system. Thermomodernisation of buildings and replacement of windows and doors, which constituted the majority of the analysed investments, was to lead to improvement of wall insulation and stopping heat loss.

Two of analysed projects were focused on the increased share of renewable energy sources in total energy consumption through installation of photovoltaic systems. In case of three projects there were also installation of heat pumps included.

The main characteristics of the projects are summarized in table 1.

Table 1 - Main characteristics of analysed projects

Company	Sector	Size	Project	Investment	Status
1.	Services (Eldercare & Care Home)	Micro	Set of measures: - building insulation: insulation of walls, floor, roof - replacement of external doors/windows - modernization of heating system	429 385 EUR	implemented and verified
2.	Servicing and installation of air conditioning	Small	Set of measures: - installation of heat pumps - replacement of external doors/windows - building insulation	162 993 EUR	implemented and verified
3.	Rental and property management	Medium	Building insulation Energy management	560 145 EUR	implemented and verified
4.	Health center	Small	Set of measures: - building insulation: insulation of walls, floor, roof - replacement of external doors/windows - replacement of heating system - energy management system - Installation of photovoltaic systems - installation of heat pumps	75 990 EUR	implemented and verified

5.	Printing house	Small	Building insulation: insulation of walls, floor, roof Replacement of coal boiler	304 707 EUR	implemented and verified
6.	Hotel and spa	Small	Set of measures: - building insulation: insulation of walls, floor, roof - replacement of external doors/windows - energy management system - Installation of photovoltaic systems - installation of heat pumps	371 038 EUR	implemented and verified
7.	Guesthouse and restaurant	Micro	Set of measures: - building insulation - replacement of doors/windows - energy management	268 401 EUR	implemented and verified
8.	Beer production	Micro	Set of measures - modernization of the technological heat and cooling system, - installation of energy management system - change from electricity to gas	48 531 EUR	implemented and verified

3. CONTRIBUTION OF SME's PROJECTS TO ACHIEVE REGIONAL ENERGY TARGETS

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'.[2]

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 2 for specific targets).

Table 2 - Targets of the EU energy and climate policy

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

The individual targets for each Member State were also set. The table 3 shows the targets relevant for Poland.

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

Table 3 - Poland - targets and performance

Year	Energy efficiency target	RES target	Target for reducing greenhouse gas emissions (non-ETS sectors)
2020	12%	15 %	14%
2030	23 %	21%-23%	30 %

Poland conducts an active climate and energy policy and undertakes measures across all the dimensions of the Energy Union.

At present, there are two strategic framework documents determining the state energy policy. They are: The Energy Policy for Poland, which is currently being updated (the draft Energy Policy for Poland 2040, hereinafter: EPP2040 is under public consultations now)[3] and the Strategy for Responsible Development 2020 – with an outlook to 2030 (adopted in 2017).

The main objective of the energy policy is energy security while ensuring the competitiveness of the economy and energy efficiency, reducing the impact of the energy sector on the environment and making the optimum use of own energy resources. The electricity production in Poland is based on coal, which ensures the country an appropriate level of energy security and production stability. The coal mining sector in Poland (lignite and coal) also plays a very important social role.

The EPP2040 envisages eight strategic directions, namely:
(1) making the optimum use of own energy resources,
(2) expanding electricity-production and network infrastructure,
(3) diversifying natural gas and oil supplies and expanding network infrastructure,
(4) developing energy markets,
(5) implementing nuclear power projects,
(6) developing renewable energy resources,
(7) developing the heating and cogeneration sector,
(8) improving energy efficiency.

[3] https://www.gov.pl/web/aktywa-panstwowe/zaktualizowany-projekt-polityki-energetycznej-polski-do-2040-r

The following indicators are to be used as the overall measure of the achievement of the EPP2040:

- 56-60% share of coal in the generation of electricity in 2030
- 21-23% RES in gross final energy consumption in 2030.
- Introduction of nuclear energy in 2033.
- Reducing of CO_2 emissions by 30% by 2030 (in relation to 1990)
- Improvement in energy efficiency by 23% by 2030. (in relation to the 2007 forecasts).

According to the forecast analyses carried out, as a result of the EPP 2040 implementation by the 2040, the annual greenhouse gas emission will be reduced by 50% (in relation to the 1990) and the emission of air pollutants will be also reduced (e.g. with respect to different pollutants by 10 to 20%), which will have an impact on the improvement of the environmental quality, including air quality.

With respect to the structure of energy carriers, the leading role of coal is planned to be maintained, but the percentage share of this fuel in the electricity generation structure will decrease gradually, down to ca. 60 % in 2030 (at present, the share of coal and lignite in electricity generation is ca. 77 %), due to the forecast growth in energy demand. The above-described trend will maintain in the following decade, i.e. until 2040.

At the same time, Poland will place emphasis on diversifying energy carriers by successively increasing the share of RES (the role of which in electricity generation will grow mainly due to two technologies, namely wind power technology and photovoltaics) and by including nuclear power in the energy balance starting from 2033.

In view of the ongoing work on the final national documents in the field of energy, in 2019 the Lower Silesian Voivodship started working on the new Lower Silesian Energy Strategy. One of the objectives of the document is to achieve the climate neutrality of Lower Silesia region by 2050 through the reduction of CO2 emissions and high energy efficiency in the industry sector. Through the preparation of new Strategy, the development priorities of the region will be diagnosed and set up. In the new operational programme for 2021-2027, 30% of the total funds will be allocated to support low-carbon economy of the region. By implementation of specific projects on energy savings, RES installation and own energy production, SMEs and other businesses could directly contribute to the objectives of the national (and so European) and regional energy and climate targets.

4. ACTIVITIES CARRIED OUT TO ASSESS INDUSTRIAL SECTORS RENEWABLE ENERGY PROJECTS

4.1 Stakeholders' involvement

Prior to industrial sector assessment activities, RDA ARLEG organized on December 17th 2019 a local workshop to present and discuss the IT Tools to assess public investments developed in the project with local stakeholders. The workshop was attended by representatives of regional authorities responsible for development of energy plans and financial instruments, including the Marshall Office of the Lower Silesia Voivodeship (Department of European Funds RPO Management), National Economy Bank and The Lower Silesia Intermediate Body responsible for the implementation of ROP selected measures in the area of low-carbon economy, including Priority Axis 3 – Low carbon economy Activity 3.2. Energy efficiency in SME's).

In order to select the SME's investment projects and obtain relevant data needed for assessment activities, regular contact has been maintained with The Lower Silesia Intermediate Body as an institution which implements and finance the ROP selected energy efficiency measures for SME's, provided the necessary information for the evaluation process.

4.2 IT tool adaptation

The IT Tool used in the process of RES/EE projects assessment was prepared by the Czech partner ENVIROS and 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 for Poland / Lower Silesia region. It was especially difficult to obtain the data on emission factors for the individual energy sources, as not all required data were available or consistent with the project area for Poland.

In the end, the tool completed with Polish input data was adapted to local conditions with the help of Enviros, and after some adjustments to the calculations, it worked properly and was able to be used in the pilot activities to assess Industrial sectors RE projects in the Poland.

5. ASSESSMENT PROCEDURE OF SME's PROJECTS

5.1 Input and output data of the investment assessment

As a preparatory activity, a user-friendly IT instrument was developed 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. The tool focuses on the evaluation of the project's economic parameters and environmental benefits.

Investment/funding related inputs:

- 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:

- Electricity
- Natural Gas
- Coal
- Heat
- Solid biofuels
- Gaseous biofuels
- Other fuels

Figure outputs

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

The equivalent scenario is also calculated that relates to the situation when the project does not use any financial instrument (loan) and the co-financing is secured only by own resources. The NPV of both scenarios is the same, while the

cash flow becomes positive sooner in case of the equivalent scenario – as shown in the figures. The investment with this direct investment is completed by the missing subsidy share.

The input and output data of the 8 SME's investment assessment are presented in the attached tables:

5.2 Tables - IT tool calculation results

Project #1

Project No. / Name	1		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
	X		
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Services (Eldercare & Care Home for the disabled)		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	- insulation of walls, floor, roof		
Change of technological processes			
Control of circulation pumps			
Decrease of losses in heat distribution			
Energy management			
Installation of cogeneration units			
Installation of flue gas pre-heaters to boilers			
Installation of frequency inventors			
Installation of heat pumps			
Installation of photovoltaic systems (for electricity generation)			
Installation of solar thermal systems (for heat generation)			
Installation/replacement of compressors			
Replacement of coal boiler with biomass boiler			
Replacement of coal boiler with gas boiler			
Replacement of coal boiler with new coal boiler			

Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	429 385 EUR	
	Loan	-	-
	Own resource	201 271 EUR	46,87 %
	Subsidy	228 113 EUR	53,13 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	2825,35	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	263 953,78 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	4 009,84 g
Expected drop of CO2eq emissions	265 148,71 kg
Expected Cash Flow	46 194 €/year
Net Present Value	485 961,32 €
Simple payback *(in years)*	9 years
Equivalent scenario without loan investment	
Own resources investment in Euro	201 295,78 €
Subsidy share (in %):	53%

Project #2

Project No. / Name	2		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		X	
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Servicing and installation of air conditioning		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	Roof, walls and ground floor insulation, replacement of windows and doors		
Change of technological processes			
Control of circulation pumps			

Decrease of losses in heat distribution	
Energy management	installation of automatic energy management systems
Installation of cogeneration units	
Installation of flue gas pre-heaters to boilers	
Installation of frequency inventors	
Installation of heat pumps	X
Installation of photovoltaic systems (for electricity generation)	
Installation of solar thermal systems (for heat generation)	
Installation/replacement of compressors	
Replacement of coal boiler with biomass boiler	
Replacement of coal boiler with gas boiler	
Replacement of coal boiler with new coal boiler	
Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs

		In Euro	As % of Total
Investment	Total	162 993 EUR	
	Loan	-	-
	Own resource	105 532 EUR	64,75 %
	Subsidy	57 460 EUR	35,25 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	277,81	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	25 953,93 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	394,27 g
Expected drop of CO2eq emissions	26 071,45 kg
Expected Cash Flow	4 542 €/year
Net Present Value	- 50 431,33 €
Simple payback *(in years)*	36 years
Equivalent scenario without loan investment	
Own resources investment in Euro	105 538,11 €
Subsidy share (in %):	35%

Project #3

Project No. / Name	3		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
			X
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Rental and property management		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	X		
Change of technological processes			
Control of circulation pumps			
Decrease of losses in heat distribution			
Energy management	X		
Installation of cogeneration units			
Installation of flue gas pre-heaters to boilers			
Installation of frequency inventors			
Installation of heat pumps			
Installation of photovoltaic systems (for electricity generation)			
Installation of solar thermal systems (for heat generation)			
Installation/replacement of compressors			
Replacement of coal boiler with biomass boiler			
Replacement of coal boiler with gas boiler			
Replacement of coal boiler with new coal boiler			
Replacement of existing lighting with LED80 or higher efficiency			

Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	560 145 EUR	
	Loan	-	-
	Own resource	309 435 EUR	55,24 %
	Subsidy	250 709 EUR	44,76 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	3197,72	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	298 741,85 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	4 538,32 g
Expected drop of CO2eq emissions	300 094,27 kg
Expected Cash Flow	52 283 €/year
Net Present Value	324 879,88 €
Simple payback *(in years)*	11 years
Equivalent scenario without loan investment	
Own resources investment in Euro	309 424,95 €
Subsidy share (in %):	45%

Project #4

Project No. / Name	4		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		X	
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Health center		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	Roof, walls and ground floor insulation, replacement of windows and doors		
Change of technological processes			
Control of circulation pumps			

Decrease of losses in heat distribution	
Energy management	X
Installation of cogeneration units	
Installation of flue gas pre-heaters to boilers	
Installation of frequency inventors	
Installation of heat pumps	X
Installation of photovoltaic systems (for electricity generation)	X
Installation of solar thermal systems (for heat generation)	
Installation/replacement of compressors	
Replacement of coal boiler with biomass boiler	
Replacement of coal boiler with gas boiler	
Replacement of coal boiler with new coal boiler	
Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs

		In Euro	As % of Total
Investment	Total	75 990 EUR	
	Loan	-	-
	Own resource	35 392 EUR	46,58 %
	Subsidy	40 597 EUR	53,42 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	162,38	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	15 170,09 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	230,45 g
Expected drop of CO2eq emissions	15 238,76 kg
Expected Cash Flow	2 655 €/year
Net Present Value	- 3 186,23 €
Simple payback *(in years)*	29 years
Equivalent scenario without loan investment	
Own resources investment in Euro	35 396,15 €
Subsidy share (in %):	53%

Project #5

Project No. / Name	5		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		X	
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Printing house		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	Roof, walls and ground floor insulation, replacement of windows and doors		
Change of technological processes			
Control of circulation pumps			
Decrease of losses in heat distribution			
Energy management			
Installation of cogeneration units			
Installation of flue gas pre-heaters to boilers			
Installation of frequency inventors			
Installation of heat pumps			
Installation of photovoltaic systems (for electricity generation)			
Installation of solar thermal systems (for heat generation)			
Installation/replacement of compressors			
Replacement of coal boiler with biomass boiler			
Replacement of coal boiler with gas boiler			
Replacement of coal boiler with new coal boiler	X		

Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	304 707 EUR	
	Loan	-	-
	Own resource	143 251 EUR	47,01 %
	Subsidy	161 456 EUR	52,99 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	1460,13	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	136 410,29 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	2 072,27 g
Expected drop of CO2eq emissions	137 027,83 kg
Expected Cash Flow	19 468 €/year
Net Present Value	146 397,51 €
Simple payback *(in years)*	16 years
Equivalent scenario without loan investment	
Own resources investment in Euro	134 243,12 €
Subsidy share (in %):	53%

Project #6

Project No. / Name	**6**		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		X	
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Hotel and spa		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	Roof, walls and ground floor insulation, replacement of windows and doors		
Change of technological processes			
Control of circulation pumps			

Decrease of losses in heat distribution	
Energy management	X
Installation of cogeneration units	
Installation of flue gas pre-heaters to boilers	
Installation of frequency inventors	
Installation of heat pumps	X
Installation of photovoltaic systems (for electricity generation)	X
Installation of solar thermal systems (for heat generation)	
Installation/replacement of compressors	
Replacement of coal boiler with biomass boiler	
Replacement of coal boiler with gas boiler	
Replacement of coal boiler with new coal boiler	
Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs

		In Euro	As % of Total
Investment	Total	371 038 EUR	
	Loan	-	-
	Own resource	176 414 EUR	47,55 %
	Subsidy	194 623 EUR	52,45 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	1 519,73	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	141 978,33 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	2 156,85 g
Expected drop of CO2eq emissions	142 621,07 kg
Expected Cash Flow	20 263 €/year
Net Present Value	127 037,98 €
Simple payback *(in years)*	18 years
Equivalent scenario without loan investment	
Own resources investment in Euro	174 425,29 €
Subsidy share (in %):	53%

Project #7

Project No. / Name	7		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
	X		
Type of business activity (*Please tick*)	Production	Services	
		X	
Type of economic activity to which the investment relates	Manufacturing of ceramic products		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation	including roof insulation and replacement of doors and windows		
Change of technological processes			
Control of circulation pumps			
Decrease of losses in heat distribution			
Energy management	X		
Installation of cogeneration units			
Installation of flue gas pre-heaters to boilers			
Installation of frequency inventors			
Installation of heat pumps			
Installation of photovoltaic systems (for electricity generation)			
Installation of solar thermal systems (for heat generation)			
Installation/replacement of compressors			
Replacement of coal boiler with biomass boiler			
Replacement of coal boiler with gas boiler			
Replacement of coal boiler with new coal boiler			

Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	268 401 EUR	
	Loan	-	-
	Own resource	126 225 EUR	47,03 %
	Subsidy	142 176 EUR	52,97 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	1 340,87	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	125 268,62 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	1 903,01 g
Expected drop of CO2eq emissions	125 835,72 kg
Expected Cash Flow	21 923 €/year
Net Present Value	139 754 €
Simple payback *(in years)*	12 years
Equivalent scenario without loan investment	
Own resources investment in Euro	126 229,24 €
Subsidy share (in %):	53 %

Project #8

Project No. / Name	**8**		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
	X		
Type of business activity *(Please tick)*	Production	Services	
	X		
Type of economic activity to which the investment relates	Beer production		
Type / subject of investment	*Please tick or indicate % share of energy savings*		
Buildings insulation			
Change of technological processes			
Control of circulation pumps			
Decrease of losses in heat distribution			

Energy management	X
Installation of cogeneration units	
Installation of flue gas pre-heaters to boilers	
Installation of frequency inventors	
Installation of heat pumps	
Installation of photovoltaic systems (for electricity generation)	
Installation of solar thermal systems (for heat generation)	
Installation/replacement of compressors	
Replacement of coal boiler with biomass boiler	
Replacement of coal boiler with gas boiler	
Replacement of coal boiler with new coal boiler	
Replacement of existing lighting with LED80 or higher efficiency	
Replacement of lighting LED80 with LED110 or higher efficiency	
Thermal insulation of technologies	
Transformers replacement	
Waste heat utilisation	
Other – please indicate type	Modernization of the technological heat and cooling system, + change of electricity to gas

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	99 571 EUR	
	Loan	-	-
	Own resource	48 535 EUR	48,74 %
	Subsidy	51 035 EUR	51,26 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a

Own resource	Discount rate (in %) (if no data use typical country value)	3 %
Measure	Lifetime of the measure	20

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity			
Natural gas			
Coal			
Heat	30,43	GJ	16,35 €/GJ
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	2 842,87 kg
Expected drop of CH4 emissions	0,00 g
Expected drop of N2O emissions	43,18 g
Expected drop of CO2eq emissions	2 855,74 kg
Expected Cash Flow	406 €/year
Net Present Value	- 42 494,83 €
Simple payback *(in years)*	200 years[4]
Equivalent scenario without loan investment	
Own resources investment in Euro	48 531,11 €
Subsidy share (in %):	51 %

[4] Note: in case of project No 8 the output data (simple payback in years) obtained from the IT tool's calculation showed that the input data were incomplete/inaccurate from an energy efficiency point of view or the goal of the project was other than energy savings.

Annex: Tool – Description of inputs and outputs

Investment/funding related inputs:

- The Total refers to the total investment in the project, including each funding share (Loan, Subsidy, Own resources).
- The Loan is the share of the loan funding on the total investment
- The Subsidy is the share of the subsidy funding on the total investment
- The Own resources is the share of own funding by the project beneficiary on the total investment
- The Interest rate is the rate linked to the loan share
- The Repay is the period length to repay the loan
- The Discount rate refers to the rate used for the discount factor on cash flow, in order to estimate the NPV
- The Lifetime is the expected lifetime of the project

Energy saving related inputs:

- Electricity
- Natural Gas
- Coal
- Heat
- Solid biofuels
- Gaseous biofuels
- Other fuels

Figure outputs

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

- The expected drop of CO2eq emissions is the sum of CO2, CH4 and N2O emissions
- The expected Cash Flow is calculated based on the energy savings and the energy cost inputs

- The NPV is the Net Present Value calculated for the project funding mechanism
- The simple payback is the total investment divided by the Cash Flow
- The equivalent scenario: Subsidy share is a theoretical share of subsidy that would be needed in case of implementation of the equivalent scenario (without loan) to keep the same NPV of the project.
- The equivalent scenario: Own resources is the share of own funding by the project beneficiary in case of the equivalent scenario.