D.T2.5.5

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

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

Prepared by	ENVIROS, s.r.o.
Project number and acronym	CE 1131 FIRECE
Lead partner	Chamber of Commerce of Venice Rovigo Delta-Lagunare
Address	Dykova 53/10, 101 00 Prague 10, Czech Republic
Email	pavel.ruzicka@enviros.cz
Date, venue	31/07/2020, Prague

INDEX

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 the Czech Republic.

EXECUTIVE SUMMARY

Country / region / PA2 Implementation area

Czech Republic

Relevant energy saving funds:

Operational Programme Enterprise and Innovation for Competitiveness 2014 – 2020 (ERDF)

Target group – SMEs[1]

Number of SME's involved:

8 companies:

- micro: 2
- small: 2
- medium: 4

Type of projects:

Finalized and ongoing projects

- implemented: 6
- implemented and verified: 2

Energy saving measures / type of investments analysed

Energy savings projects: 4

Measures involved:

- Change of a heating source: 2
- Modernization of a heating system (distribution): 1
- Building envelop insulation: 2

[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.

- Replacement of doors and windows: 2
- Installation of LED lighting: 1
- Modernization of a technology: 2

Renewable energy sources projects: 4

Measures involved:

- Roof photovoltaic power plant: 4
- Battery system: 2
- Charging station for electro vehicles: 1

Involved stakeholders

Czech-Moravian Guarantee and Development Bank

Ministry of Industry and Trade

SMEs

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

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). Therefore, the projects funded from this source were included into the Pilot Action 2.

OPPIK 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.

The most preferred are the areas of research and development, energy saving and ICT, which are distributed into four priority axes:

- PA 1: Advancement of research and development for innovation;
- PA 2: Development of entrepreneurship and competitiveness of small and medium-sized enterprises;
- PA 3: Efficient energy management, development of energy infrastructure and renewable energy sources, support for the introduction of new technologies in the management of energy and secondary raw materials;
- PA 4: Development of high-speed Internet access networks and information and communications technologies.

From the project FIRECE point of view, the PA 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. The level of support respects the EU State Aid rules.

The results of the OPEIC are monitored by a set of indicators. For FIRECE, the following can be considered the most important:

- Installed capacity of renewable energy sources;
- Decrease of GHG emissions;
- Final energy consumption in the industry sector;

- Final energy consumption in the service sector.

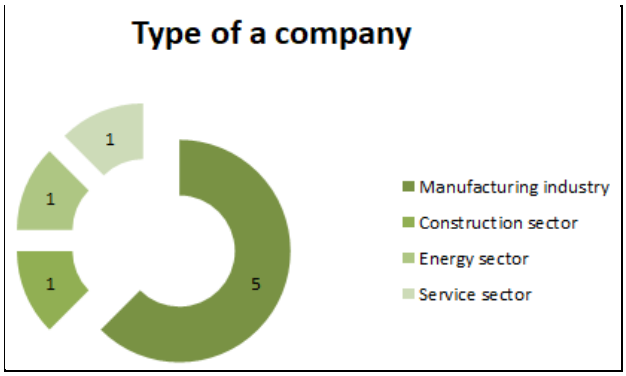
2. SELECTION OF SME's INVESTMENT PROJECTS FOR THE ASSESSMENT

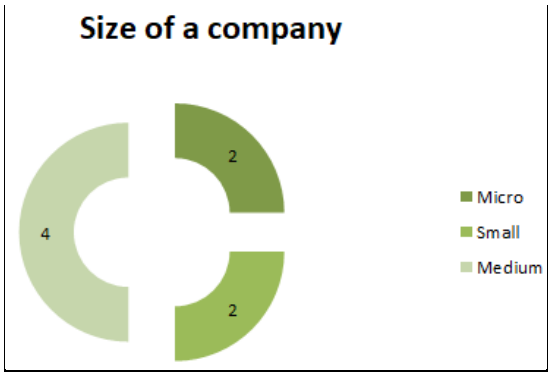
2.1 Criteria followed to identify projects

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

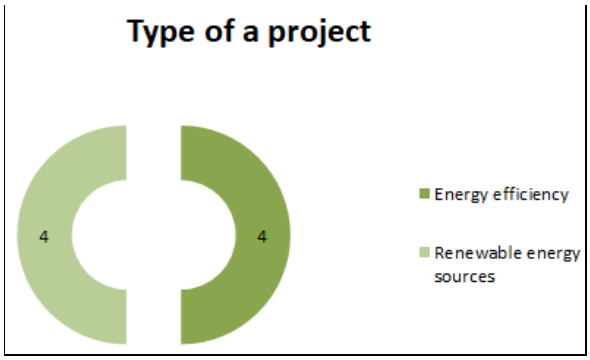
1. **Type of a company:** The goal was to involve in particular industrial companies, which are the main focus group of the FIRECE project. Mostly manufacturing companies were selected; however, we wanted to include also a few other industrial or service sectors.
2. **Size of a company:** Within SMEs group, the intention was to cover micro, small and medium-sized enterprises.
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;[2]
    ii. between 200 000 EUR and 1 million EUR;
    iii. over 1 million EUR.

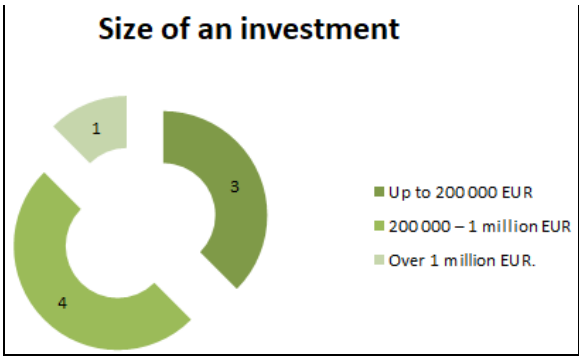
The following charts show the share of individual types of projects within the individual criteria:



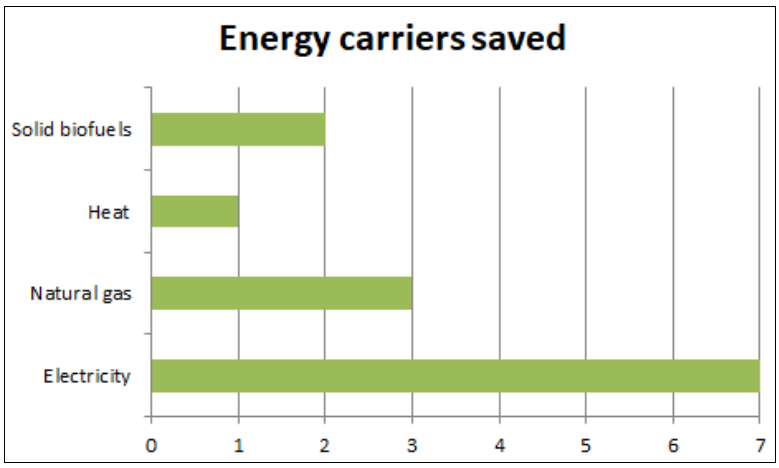


[2] This amount is considered as a level up to which projects will be financed only through financial instruments in the next programming period.





Moreover, the projects were selected so that the realized measures included savings of various energy carriers as shown in the following chart:



2.2 Description of SME's investment projects analysed

The analysed projects were implemented mostly by manufacturing enterprises, which are typical organizations applying for funding from OPEIC. They included both companies manufacturing products for other industrial enterprises (e.g. machinery) and companies producing final products for consumers (e.g. furniture). The non-manufacturing sector was represented by a construction company, a heating plant, and a logistics park.

The analysis included only the projects that had already been implemented. While the verification of energy performance of two projects is available, the remaining projects will be verified in the next period.

Half of the projects represent installation of renewable energy sources in particular roof photovoltaic power plants, in two cases combined with a storage battery system and a charging station for electric vehicles. Two projects focus on increasing the energy efficiency of a heating system (biomass boiler, modernization of a distribution system for heat and hot water), while the remaining two consist of a wider set of

energy saving measures, such as building envelop insulation, roof insulation, replacement of doors and windows, installation of LED lighting, and modernization of technology.

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

Implementation of the projects was motivated by reaching energy savings and/or decreasing dependency on external energy sources. However at the same time, they represent projects with higher investment costs and/or less attractive economic performance (i.e. high payback period). It is very probable that without funding they would not have been implemented or would have been implemented on a much smaller scale.

Table 1 - Main characteristics of analysed projects

Company	Sector	Size	Project	Investment	Status
1.	Manufacturing of machinery for quarrying	Medium (73 employees)	Roof photovoltaic power plant and battery system	89 451 EUR	implemented
2.	Processing of plastics (injection moulding)	Small 45 (employees)	Roof photovoltaic power plant, battery system and charging station for electro vehicle	442 882 EUR	implemented
3.	Manufacturing of housing and office furniture	Medium 58 (employees)	Change of heating source – installation of a new biomass boiler	244 198 EUR	implemented
4.	Heating plant	Micro 5 (employees)	Modernization of a distribution system for heat and hot water	870 099 EUR	implemented and verified
5.	Construction and buildings	Medium 233 (employees)	Roof photovoltaic power plant	225 700 EUR	implemented
6.	Logistics and storage of frozen and chilled foodstuffs	Small 14 (employees)	Roof photovoltaic power plant	85 463 EUR	implemented
7.	Manufacturing of ceramic products	Micro 5 (employees)	Set of measures: - building envelop insulation - replacement of doors/windows	71 743 EUR	implemented

			- modernization of technology (electric resistance furnace)		
8.	Manufacturing of machinery for rubber and plastics industry	Medium 198 (employees)	Set of measures - building envelop insulation - change of heating source (gas heaters) - installation of LED lighting - modernization of technology (furnace, welding aggregates)	2 713 769 EUR	implemented and verified

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

The European Union 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'.[3]

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 %

Following the targets set at the EU level, individual targets for each Member State were also set. The table 3 shows the targets relevant for the Czech Republic as well as the country's 2016 performance.

Table 3 - The Czech Republic - targets and performance

Year	EE target		RES target	GHG target
2020 target	20 %	25.30 Mtoe	13 %	9 %
2030 target	32.5 %	-	20.9 %	14 %
2016 performance		24.88 Mtoe	14.9 %	10.9 %

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

Although the Czech Republic seems to be fulfilling the actual targets, its energy performance is still much below the EU average.[4] Therefore, improvement in energy efficiency is still very important and remains a high priority.

Financial mechanisms, in particular the Operational Programme Enterprise and Innovation for Competitiveness (OPEIC), are considered one of the main instruments how to promote and support implementation of energy savings projects as well as installation of new renewable energy capacities.

As provided in the chapter 1, the results of the OPEIC are monitored by a set of indicators. In relation to the energy and climate targets, the following are the most relevant:

- Installed capacity of renewable energy sources;
- Decrease of GHG emissions;
- Final energy consumption in the industry sector;
- Final energy consumption in the service sector.

By implementation of specific projects on energy savings, RES installation and own energy production, SMEs and other businesses directly contribute to the objectives of the OPEIC as well as to the national (and so European) energy and climate targets.

[4] According to Eurostat statistics (https://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=t2020_rd310), the energy productivity is only slightly above 50 % of the EU average.

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

4.1 Stakeholders' involvement

ENVIROS is a consultancy company, which core business is to provide assistance to companies, including **industrial enterprises**, in the area of energy and environment. This assistance includes also projects on identification of energy savings and RES installation measures, elaboration of energy audits, identification of suitable financing sources and management of subsidy projects.

Therefore, ENVIROS is in regular contact with SMEs and co-operates with them on energy-related projects. Obtaining information and data about specific projects, which were analysed in the pilot action 2, thus did not pose any problem.

Besides SMEs, the **Ministry of Industry and Trade** (MIT) and the **Czech-Moravian Guarantee and Development Bank** (CMZRB) were involved. While MIT is a managing authority of the OPEIC financial mechanism, CMZRB is responsible for operation of supplementary financing programmes that provide soft loans for energy projects. Both institutions are involved in the process of preparation of financial mechanisms for the upcoming programming period.

Several personal meeting were held with their representatives as well as they participated in the FIRECE project workshops.

4.2 IT tool adaptation

As ENVIROS was a responsible partner for development of the Tool including local specifications, the first version of the Tool was developed based on Czech data – and so no further adaptation was necessary. The data sources included national strategies and plans related to energy, and datasets available to ENVIROS from elaborated energy audits.

In the next phase, ENVIROS assisted the other FIRECE partners in development of their local specifications of the Tool.

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
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Manufacturing of machinery for quarrying		
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			
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)	including battery system		
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	89 451 EUR	
	Loan	-	-
	Own resource	39 290 EUR	45,92 %
	Subsidy	50 161 EUR	56,08 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	55	MW/h	95,80 €/MW/h
Natural gas			
Coal			
Heat			
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	48 174,46 kg
Expected drop of CH4 emissions	514,69 g
Expected drop of N2O emissions	675,58 g
Expected drop of CO2eq emissions	48 388,64 kg
Expected Cash Flow	5 269 €/year
Net Present Value	43 025,86 €
Simple payback *(in years)*	17 years
Equivalent scenario without loan investment	
Own resources investment in Euro	39 286,88 €
Subsidy share (in %):	56%

Project #2

Project No. / Name	2		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		■	
Type of business activity (*Please tick*)	Production	Services	
	■		
Type of economic activity to which the investment relates	Processing of plastics (injection moulding)		
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	
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)	including battery system and charging station for electro vehicle
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	442 882 EUR	
	Loan	-	-
	Own resource	171 664 EUR	38,76 %
	Subsidy	271 218 EUR	61,24 %

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

Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	323,4	MW/h	68,10 €/MW/h
Natural gas			
Coal			
Heat			
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	283 265,83 kg
Expected drop of CH4 emissions	3 026,35 g
Expected drop of N2O emissions	3 972,38 g
Expected drop of CO2eq emissions	284 525,26 kg
Expected Cash Flow	22 024 €/year
Net Present Value	172 392,44 €
Simple payback *(in years)*	20 years
Equivalent scenario without loan investment	
Own resources investment in Euro	171 661,06 €
Subsidy share (in %):	61%

Project #3

Project No. / Name	3		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Manufacturing of housing and office furniture		
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			
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 old biomass boiler with modern 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	244 198 EUR	
	Loan	-	-
	Own resource	146 862 EUR	60,14 %
	Subsidy	97 336 EUR	39,86 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	15

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	161	MW/h	60,04 €/MW/h
Natural gas			
Coal			
Heat			
Solid biofuels	-14,00	MW/h	0,00 €/MW/h (own source)
Gaseous biofuels			

Other (indicate type)			
Output data			
Expected drop of CO2 emissions	141 019,79 kg		
Expected drop of CH4 emissions	587,66 g		
Expected drop of N2O emissions	1 855,75 g		
Expected drop of CO2eq emissions	141 587,49 kg		
Expected Cash Flow	9 666 €/year		
Net Present Value	- 39 385,45 €		
Simple payback *(in years)*	25 years		
Equivalent scenario without loan investment			
Own resources investment in Euro	146 860,68 €		
Subsidy share (in %):	40%		

Project #4

Project No. / Name	**4**		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Heating plant		
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	
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

		In Euro	As % of Total
Investment	Total	870 099 EUR	
	Loan	-	-
	Own resource	435 050 EUR	50 %
	Subsidy	435 049 EUR	50 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
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	18,53	MW/h	363,40 €/MW/h
Coal			
Heat			
Solid biofuels	283,47	MW/h	5,84 €/MW/h
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	3 696,97 kg
Expected drop of CH4 emissions	18 673,69 g
Expected drop of N2O emissions	2 473,80 g
Expected drop of CO2eq emissions	4 901,01 kg
Expected Cash Flow	8 389 €/year
Net Present Value	- 321 036,63 €
Simple payback *(in years)*	104 years
Equivalent scenario without loan investment	
Own resources investment in Euro	435 049,50 €
Subsidy share (in %):	50%

Project #5

Project No. / Name	5		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Construction and buildings		
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			
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	225 700 EUR	
	Loan	-	-
	Own resource	120 902 EUR	53,57 %
	Subsidy	104 798 EUR	46,43 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	143	MW/h	61,66 €/MW/h
Natural gas			
Coal			
Heat			
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data	
Expected drop of CO2 emissions	125 253,60 kg
Expected drop of CH4 emissions	1 338,18 g
Expected drop of N2O emissions	1 756,50 g
Expected drop of CO2eq emissions	125 810,49 kg
Expected Cash Flow	8 817 €/year
Net Present Value	16 838,33 €
Simple payback *(in years)*	26 years
Equivalent scenario without loan investment	
Own resources investment in Euro	120 907,49 €
Subsidy share (in %):	46%

Project #6

Project No. / Name	6		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
		■	
Type of business activity (*Please tick*)	Production	Services	
		■	
Type of economic activity to which the investment relates	Logistics and storage of frozen and chilled foodstuffs		
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	
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	85 463 EUR	
	Loan	-	-
	Own resource	44 748 EUR	52,36 %
	Subsidy	40 715 EUR	47,64 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	85	MW/h	62,95 €/MW/h
Natural gas			
Coal			
Heat			
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	74 451,44 kg
Expected drop of CH4 emissions	795,42 g
Expected drop of N2O emissions	1 044,07 g
Expected drop of CO2eq emissions	74 782,46 kg
Expected Cash Flow	5 351 €/year
Net Present Value	38 841,42 €
Simple payback *(in years)*	16 years
Equivalent scenario without loan investment	
Own resources investment in Euro	44 748,43 €
Subsidy share (in %):	48%

Project #7

Project No. / Name	7		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
Type of business activity (*Please tick*)	Production	Services	
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	modernization of electric resistance furnace		
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	71 743 EUR	
	Loan	-	-
	Own resource	34 559 EUR	48,17 %
	Subsidy	37 184 EUR	51,83 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25 – building 15 - technology

Energy saving related input			
Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	2,8	MW/h	166,27 €/MW/h
Natural gas	24,09	MW/h	45,10 €/MW/h
Coal			
Heat			
Solid biofuels			
Gaseous biofuels			

Other (indicate type)			
Output data			
Expected drop of CO2 emissions	7 258,78 kg		
Expected drop of CH4 emissions	112,93 g		
Expected drop of N2O emissions	43,07 g		
Expected drop of CO2eq emissions	7 274,44 kg		
Expected Cash Flow	1 552 €/year		
Net Present Value	- 10 312,90 €		
Simple payback *(in years)*	46 years		
Equivalent scenario without loan investment			
Own resources investment in Euro	34 558,60 €		
Subsidy share (in %):	52%		

Project #8

Project No. / Name	**8**		
General investment data			
Enterprise Size (*Please tick*)	Micro	Small	Medium
Type of business activity (*Please tick*)	Production	Services	
Type of economic activity to which the investment relates	Manufacturing of machinery for rubber and plastics industry		
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	modernization of furnace, welding aggregates
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	installation of gas heaters (replacing central heat supply)

Investment / funding related inputs			
Investment		In Euro	As % of Total
	Total	2 713 769 EUR	
	Loan	-	-

	Own resource	1 628 261 EUR	60 %
	Subsidy	1 085 508 EUR	40 %

Loan	Interest rate (in %)	n/a
	Repay (in years)	n/a
Own resource	Discount rate (in %) (if no data use typical country value)	4 %
Measure	Lifetime of the measure	25 – building 15 - technology

Energy saving related input

Energy type	The value of energy saved	Energy unit	Average cost of the unit of energy in Euro
Electricity	575	MW/h	90,47 €/MW/h
Natural gas	-901	MW/h	30,86 €/MW/h
Coal			
Heat	5084	MW/h	48,04 €/MW/h
Solid biofuels			
Gaseous biofuels			
Other (indicate type)			

Output data

Expected drop of CO2 emissions	2 061 260,73 kg
Expected drop of CH4 emissions	23 153,37 g
Expected drop of N2O emissions	27 240,58 g
Expected drop of CO2eq emissions	2 069 957,26 kg
Expected Cash Flow	268 451 €/year
Net Present Value	2 565 497,68 €
Simple payback *(in years)*	10 years
Equivalent scenario without loan investment	
Own resources investment in Euro	1 628 261,40 €

Subsidy share (in %):	40%

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.