Data collected of planned energy saving measures

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1. Introduction

The below targets were defined in the SET Project description of action as project performance indicators:

Overall objective	Target within the action duration :	Target by 2020:
To contribute to the EU 2020 targets on energy efficiency and renewable energy sources	▪ 260.610 (Euro)Cumulative investment made by European stakeholders in sustainable energy ▪ Only indirect targeted by measures: Renewable Energy production triggered ▪ **Year 2015: 173,91 (toe) Year 2016: 748,48 (toe)** Primary energy savings compared to projections	▪ 14.058.597 (Euro) Cumulative investment made by European stakeholders in sustainable energy ▪ Only indirect targeted by measures: Cumulative Renewable Energy production triggered ▪ 49.665,16 (toe) Cumulative Primary energy savings compared to projections
	▪ **Year 2015: 441,38 (t CO2e/year) Year 2016: 1.901,61 (t CO2e/year)** Reduction of greenhouse gas emissions	▪ 126.462,75 (t CO2e) Cumulative Reduction of greenhouse gas emissions

Figure 1.1 – IEE Common performance indicators (source: SET Annex I)

As it can be seen, the overall expected investment from stakeholders during the project duration is around 260000 € resulting in savings of about 920 toe/year.

Task 4.2 of the project consisted in implementation of training and informative sessions about the SET Scheme functionalities for a minimum of 100 companies and its application on companies' premises.

The main goal of Task4.3 was collecting data of companies assisted during Task 4.2 about the energy saving measures they are planning to install or have already installed since the participation in the project begun and which resulted from the application of SET Scheme. to understand the real project added value in terms of energy efficiency investments and planned savings.

This report describes how the activities of these tasks, which are interconnected, were organized between project partners and with companies and the main obtained results.

2. About SET

SET, Save Energy in Textile SMEs, is a collaborative project launched to enable the European textile SMEs to improve their energy efficiency and achieve tangible and countable economic and resource-efficiency benefits.

More information on SET can be found in the official website www.euratex.eu/set.

The SET project is a part of Energy Made-to-Measure information campaign running until 2016 to empower over 300 textile & clothing companies, notably SMEs, to become more energy efficient.

Quick updates can be also found in the Energy Made-to-Measure group on

3. SET Scheme application at companies

SET Scheme application in companies in the scope of Task4.2 were performed in accordance with a model of at least two different sessions, as in the represented in the following figure:

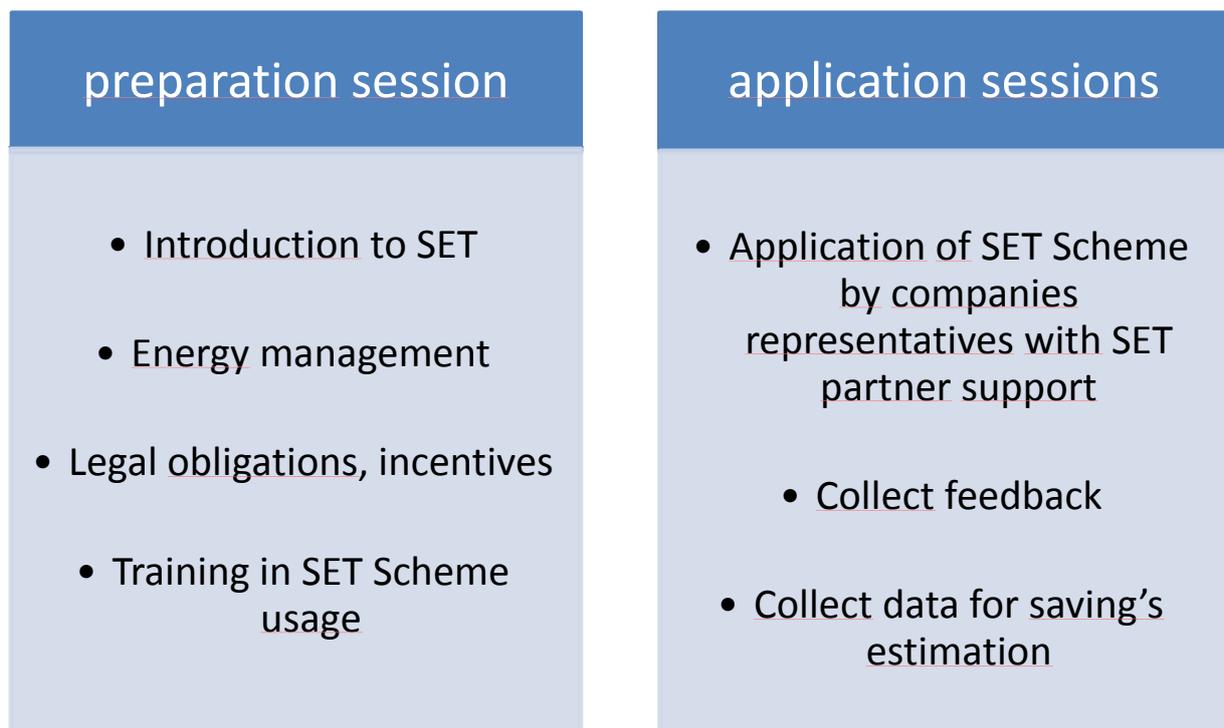| preparation session	application sessions
• Introduction to SET • Energy management • Legal obligations, incentives • Training in SET Scheme usage	• Application of SET Scheme by companies representatives with SET partner support • Collect feedback • Collect data for saving's estimation

Figure 3.1 – Model for SET Scheme training and application sessions

The preparation sessions were sessions the group of companies participating in the project in each country with the purpose of being training and demonstration events.

The application sessions focused on application of SET Scheme in the companies with support from SET local partners and were performed both bilateraly with only one company or with small groups of companies.

In the following figures (figures 3 and 4) can be seen examples of preparation and application sessions.

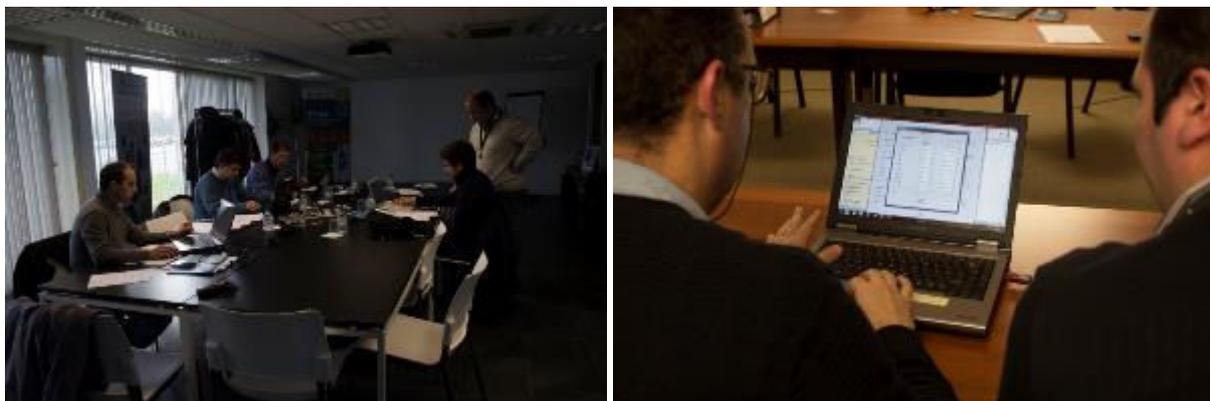Figure 3.2 – Preparation session (SET Event) in Romania

Figure 3.3 – Application sessions in Portugal: left – with a group of companies, and right - individually

This approach had some variations in different countries considering the reality of the country's textile industry structure or geographic distribution, and their own policy.

Deliverable 4.1 presents the description of each individual session that occurred in the nine different countries.

4. Data collection

The collection of planned energy savings was performed through one single page form (figure 2), developed by the Task leader (CITEVE) and delivered to the other partners to be used one for each participating company.

Figure 4.1 – Form for planned energy savings data collection

This form is made of 5 points, each of them is described below:

1) **Company:** due to confidentiality issues, companies are only identified by the UID and country. Turnover value is also requested in this field in order to calculate the indices after measures implementation;

2) **Initial energy indices:** this field presents the energy indices of the company before install energy efficiency measures (these values are found in the SET Tool *Step1_OutputA*);

3) **Selected best practices and savings in energy consumption:** here, the energy efficiency measures which resulted from the application of SET Scheme and the companies found suitable to be implemented according their reality, are inserted, as well as the estimated savings in electrical and thermal energy, potential investment and payback period;

4) **Energy indices after best practices implementation:** this is an automatic field that shows the new energy indices of the company after the implementation of the measures presented in point 3).

5) **Remarks:** any important information not suitable to be inserted in the other fields.

After filling one form per each participating company, local partners have sent the information to the task leader in order to be aggregated the data and analyzed.

5. Results

In this chapter are presented the main results of tasks 4.2 and 4.3, which means the number of participating companies and planned energy savings resulting from SET Scheme application in companies.

The results here presented are based in aggregated data. No individual data from a single company are delivered in this report.

5.1.   Number of companies in Task 4.2

100 Textile SMEs were aimed to be selected for Task 4.2 along the three value creation steps in SET project: Yarn Production (YP), fabric production (FP) and finishing (F).

Task 4.1 have presented the selection in each of the targeted countries: Germany (DE), Czech Republic (CZ), Hungary (HU), Belgium (BE), Romania (RO), Italy (IT) and Portugal (PT). This selection has been done according to the national peculiarities, i.e. interest in Energy Efficiency, frequency and importance of value creation step on each country.

Country	Objective	Selected companies	SET Scheme applied in	Valid datasets in SET Web
Germany	26	27	14	18
Czech Republic	13	17	11	15
Hungary	12	13	13	20
Belgium	12	23	3	3
Romania	13	13	13	12
Italy	12	12	20	21
Portugal	12	15	12	8
Bulgaria	3	3	3	3
Croatia	3	6	5	5
Lithuania	3	3	3	3
France	0	1	1	1
TOTAL	**100**	**133**	**98**	**109**

Figure 5.1.1 – Number of selected companies per country for Task 4.2

Finally, 133 companies have been selected to participate in Task 4.2, which is more than the target of 103 (the original objective was 100 but since in task 3.2, only 47 out of the 50 have participated, the project consortium decided to compensate that deviation in task 4.2).

In order to analyze the number of companies which have participated in the overall project, the number of Task 3.2 and 4.2 shall be added.

Country	Objective	Selected companies	SET Scheme applied in	Valid datasets in SET Web
Germany	38	58	20	18
Czech Republic	20	24	18	19
Hungary	19	21	20	31
Belgium	19	30	6	8
Romania	20	21	22	21
Italy	19	17	27	28
Portugal	19	23	20	16
Bulgaria	3	3	3	3
Croatia	3	6	5	5
Lithuania	3	3	3	3
France	0	1	1	1
TOTAL	150	207	145	153

Table 5.1.2 – Total number of companies per country

It is possible to conclude that the number of companies selected to participate in the project, in both tasks 3.2 and 4.2 were enough to fulfill the target of 150 companies. This means that around 200 companies were put in direct contact with the project assisting to the SET events (or preparation sessions) and had training on the usage of SET Scheme. However, from those selected companies, not all of them have completed the SET Scheme application in their companies by different reasons. Anyway the total number of companies applying SET Scheme within the project duration is very close to the targeted 100 (97%).

The number of datasets in SET Web resulting from the application of SET Scheme on companies during both application phases (Tasks 3.2 and 4.2) is 153.

5.2. Planned energy savings

After receiving data of planned energy savings from local partners, the task leader have aggregated and analyzed it in order to answer the objectives of task 4.3.

From the total number of companies which have participated in the project, around half of them are planning to implement energy efficiency measures resulted or supported by the application of SET Scheme.

The results here presented are based in aggregated data. No individual data from a single company are delivered in this report.

The planned or already implemented efficiency measures are expected to total a primary energy saving 6011,1toe (divided in similar parts by electrical energy and thermal energy).

Table 5.2.1 – Total planned energy measures, savings and investments

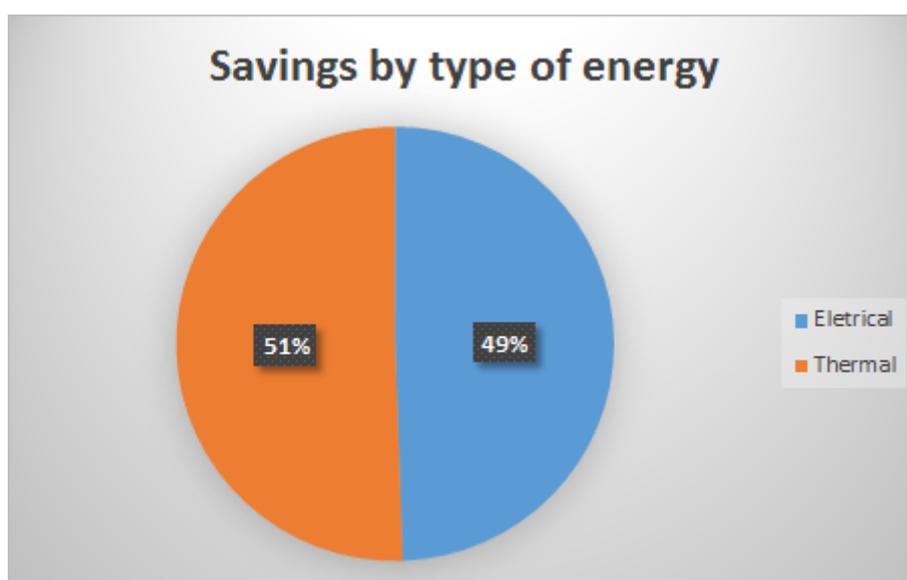|	Estimated savings (toe/year)	Estimated savings (€/year)	Planned investments [€]
Implemented	1284,6	700360	2708498
Planned	4726,6	2488127	5082537

Figure 5.2.1 – Distribution of primary energy saving by type of energy

The already implemented energy efficiency measures results in total savings of around 1280 toe/year. This values is higher than the targeted for 2015 and 2016.

It shall be remarked not all the planned efficiency measures have data for savings and/or investments. Sometimes it was not possible for partners and companies to estimates the savings for a specific measure and for other there wasn't and estimate for the needed investment.

5.2.1. By country

In this subchapter, it is presented the analysis of energy efficiency measures by each of the participating countries.
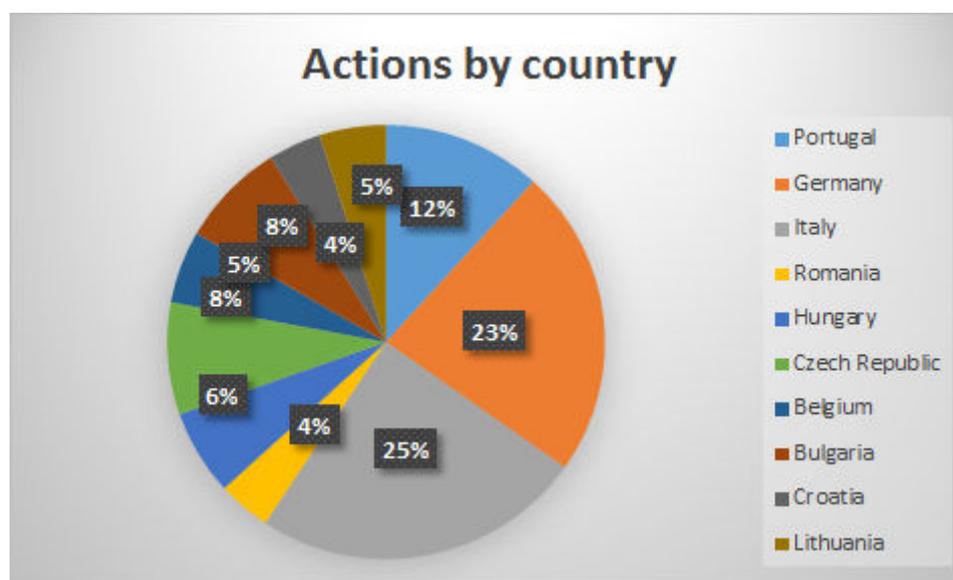

Figure 5.2.1.1 – Distribution of planned energy efficiency actions by country

The number of energy efficiency actions launched or supported by the use of SET Scheme in companies is distributed by all participating countries, with exception of Croatia, where it was not possible to get this information together with companies. There isn't a direct relation between the number of participating companies per country and the number of energy efficiency actions planned or launched.
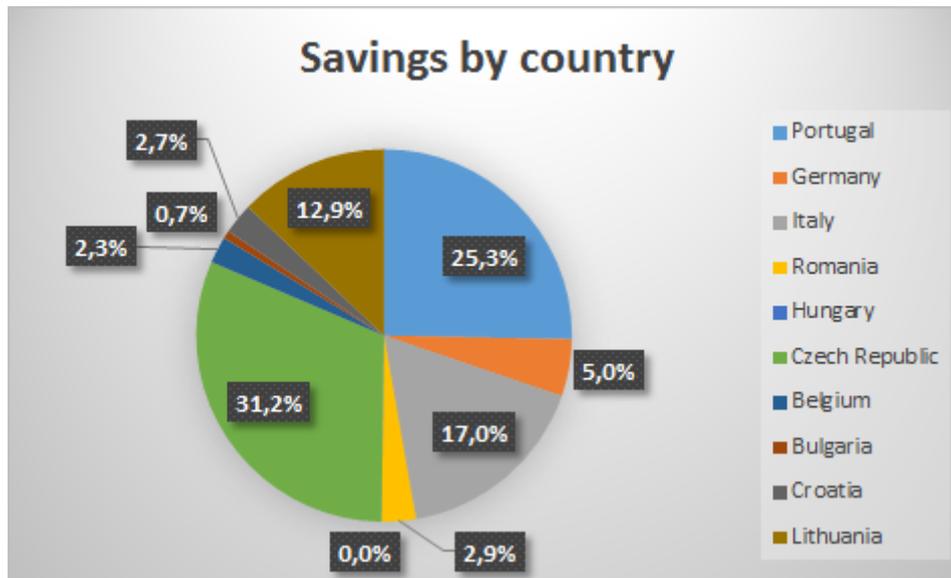
Figure 5.2.1.2 – Distribution of planned energy savings by country

Regarding the planned savings, it can be seen that the majority of them are concentrated in three countries: Portugal, Czech Republic and Italy. This is not directly related with the number of participating company neither with the number of planned actions. However, this distribution is easily explained by the type of planned action: in these two countries most of the planned actions are measures related heat recovery, which are more energy saving than measures to save only electricity.

In Hungary, companies have provided the measures they were planning to implement or have already implementing but haven't provided data about savings and investments, thus, the value for this country do not appear in the graph.
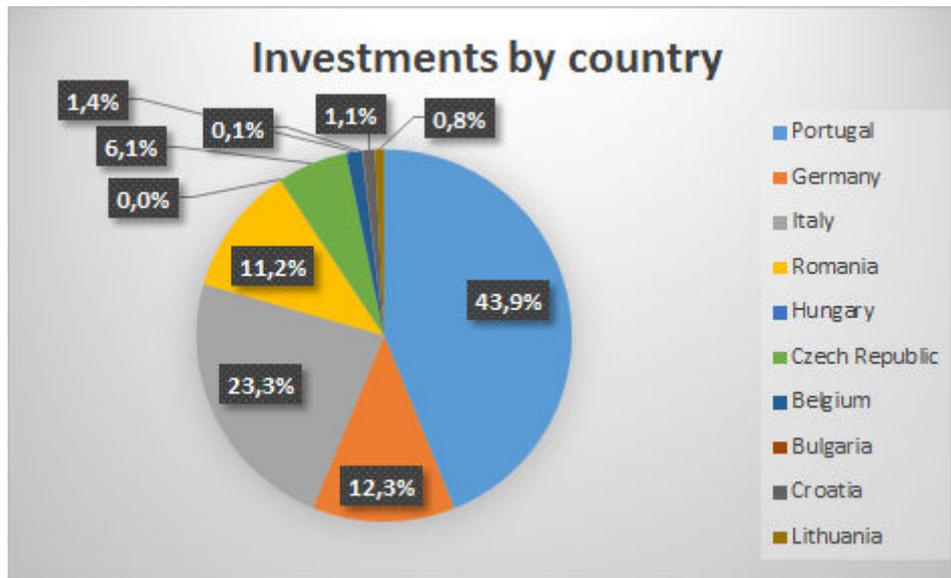
Figure 5.2.1.3 – Distribution of planned investments by country

The higher amount of investments in Portugal is explained by the nature of considered energy efficiency measures, which are mostly related with heat recovery and installation of photovoltaic panels to produce electricity. As well, one of the participating companies have installed a photovoltaic central to produce electricity with 1MW of installed power and two other are also planning to implement these kind of actions.

In Hungary, companies have provided their what measures they were planning to implement or have already implementing but haven't provided data about savings and investments, thus, the value for this country do not appear in the graph.

5.2.2. By type of measure

In this section is presented the distribution of energy efficiency measures, its savings and investments by type of measure. The following types of measures were considered:

- **Specific measure - Yarn Production**: all measures related with process equipment used processes defined for yarn production;
- **Specific measure - Fabric Production**: all measures related with process equipment used processes defined for fabric production;
- **Specific measure – Finishing**: all measures related with process equipment used processes defined for finishing (example: heat recovery from dying machines waste water or heat recovery from stenter exhaust);
- **Cross-cutting - Power factor correction:** this measure don't provide energy savings but it is important for companies due to the huge economic savings;
- **Cross-cutting - Heating/Air conditioning;**
- **Cross-cutting - Electric motor;**
- **Cross-cutting - Compressed air**: all measures related with compressed air systems (example: reduction and control of compressed air leaks or heat recovery from compressor cooling air);
- **Cross-cutting - Pumping systems;**
- **Cross-cutting - Fan systems;**
- **Cross-cutting – Lighting;**
- **Cross-cutting - Steam systems**: all measures related with steam or hot water systems from the boiler house until the delivery (examples: installation of economizer in steam generator or insulation of steam/condensate pipes);
- **Cross-cutting - Vacuum systems;**
- **Cross-cutting - Photovoltaic panels;**
- **Cross-cutting - Energy management systems;**
- **Cross-cutting – Cogeneration;**
- **Other cross-cutting.**

The following figures present the distribution of energy efficiency measures by type of measure.
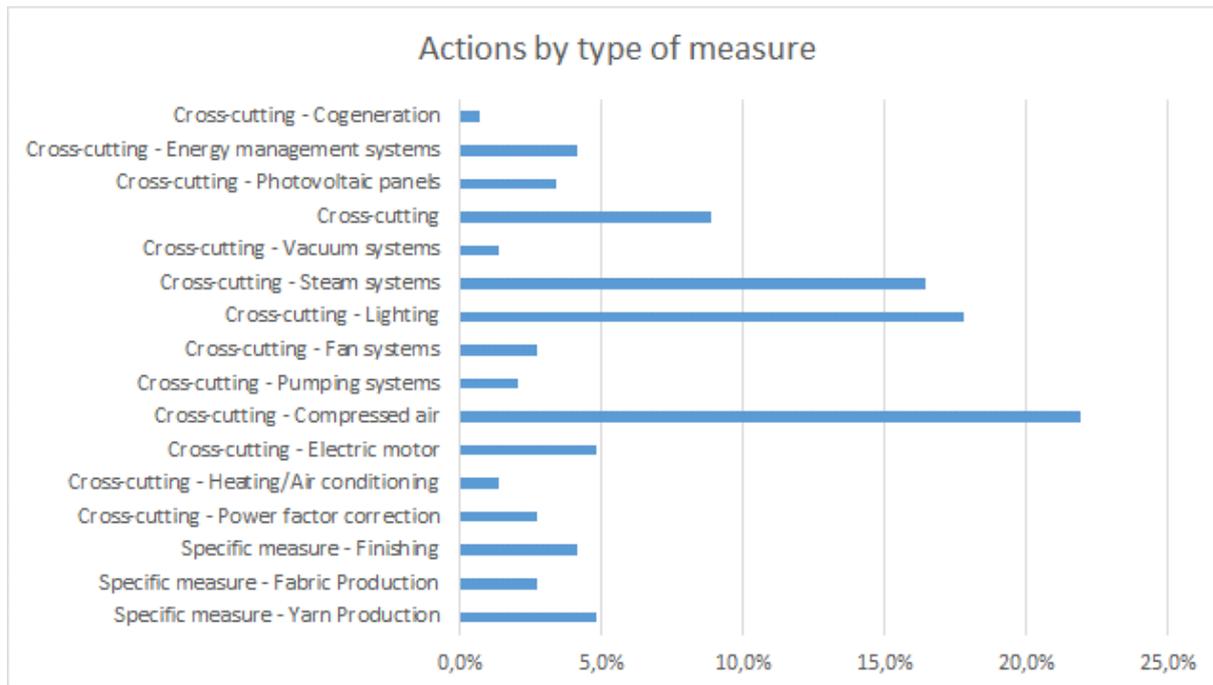
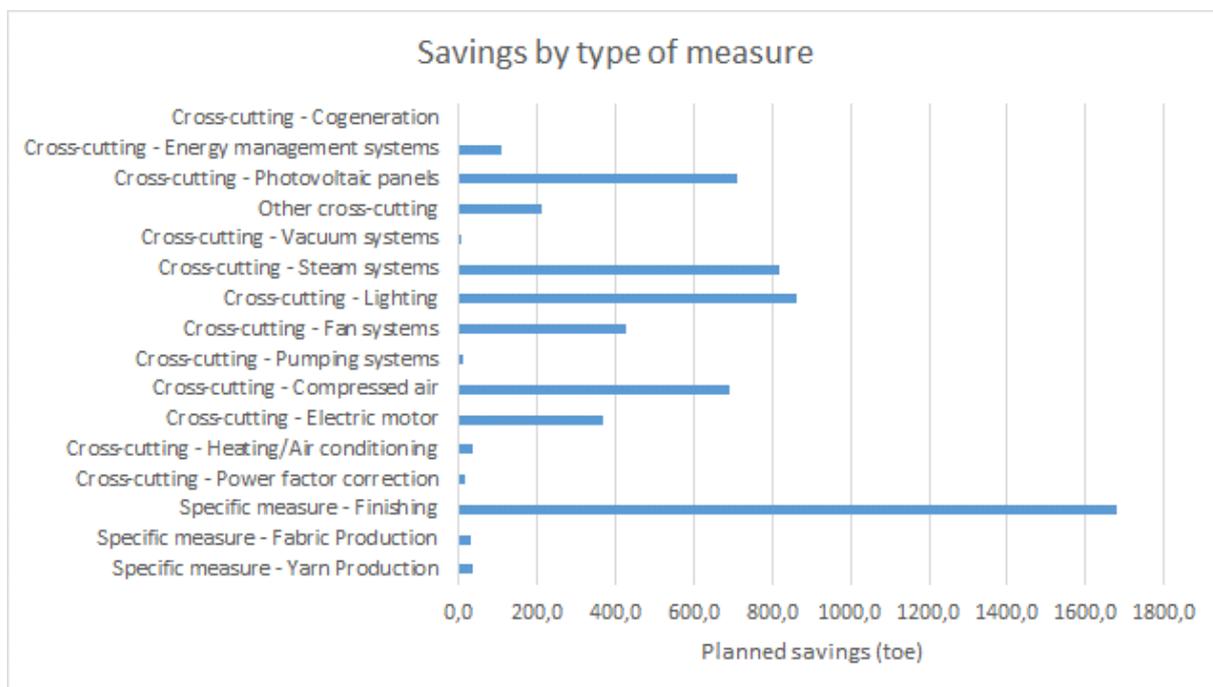Figure 5.2.2.1 – Percentage of planned actions by type of measures

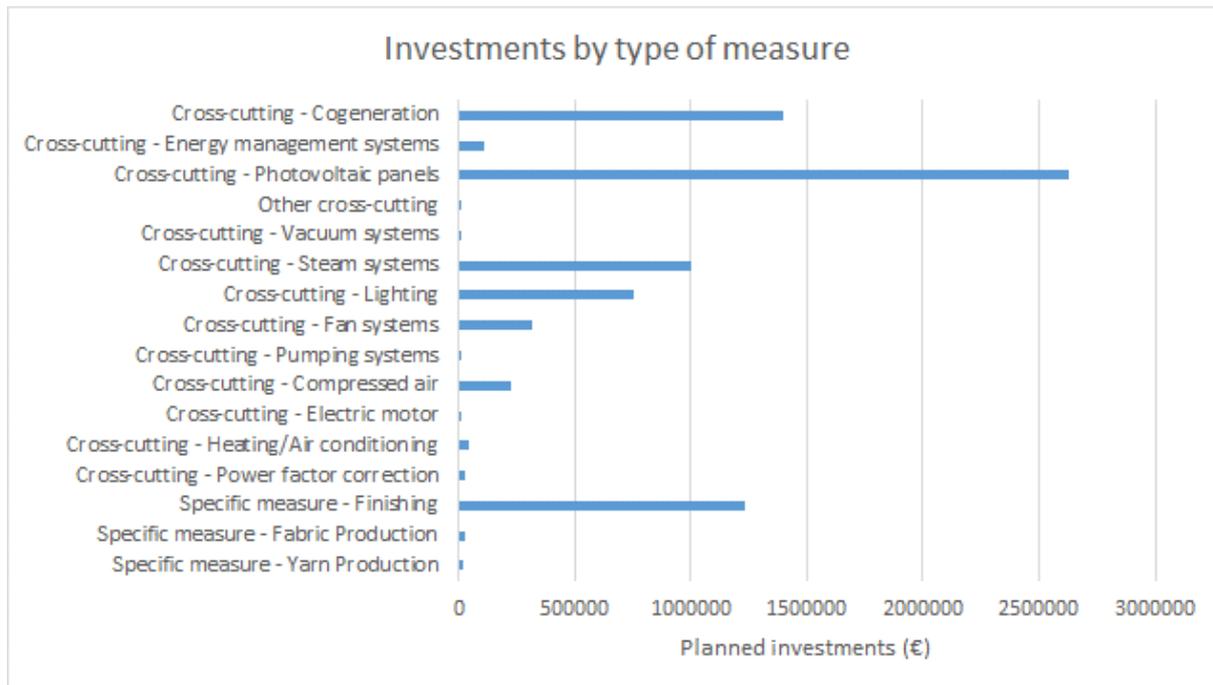Figure 5.2.2.2 – Expected savings by type of measure

Figure 5.2.2.3 – Investments by type of measure

With the analysis of the presented graphs is possible to verify the majority of planned actions is related with compressed air, lighting and steam systems.

Cross cutting measures are usually preferred because textile companies are in some way reluctant to implement changes in their production processes fearing to decrease product quality. Only finishing companies usually apply specific measures resulting from the high thermal demand of their processes.

The thermal demand of finishing processes results in significant energy savings any time an efficiency measure is implemented, thus this kind of measures present the higher amount of planned energy savings, followed by measures related with compressed air, lighting and steam systems and installation of photovoltaic panels.

In what concerns to investments, the installation of photovoltaic panels to produce electricity is the type of measure with higher values, since this measure represents an initial significant investment.

5.2.3. Comparison with IEE Performance indicators

The following table presents the comparison between the IEE Common Performance Indicators planned and achieved for the SET project. These values are based on the results presented above.

Table5.2.3.1 – IEE Performance indicators within the project by 2016

Common Performance indicator	Planned target	Actual achievement
Cumulative investment (Euro)	260.610	2.708.498
Renewable Energy (toe/year)		169,57
Primary energy savings (toe/year)	922,39	1.115,02
Reduction GHG emissions (t CO2e/year)	2.342,99	3.026,74

As it can be seen all planned targets were achieved within the project duration. This reflects the work performed by all partners together with the participating companies in each of the countries.

In order to compare actual achievements with planned targets on SET Annex I, the assumptions made for the number of companies using SET Scheme until 2020 were kept unchanged.

Considering the planned and already implemented efficiency measures in all the 145 companies, it was calculated the average values for each company. These average values were then multiplied for the 1150 companies and for an average period of effective implementation in all the 1150 companies of 1,5 years. The resulting IEE performance indicator are presented in the table below

Table5.2.3.1 – IEE Performance indicators within the project by 2020

Common Performance indicator	Planned target	Actual achievement
Cumulative investment (Euro)	14.058.597	124.908.237
Renewable Energy (toe/year)		10.489,82
Primary energy savings (toe/year)	49.665,16	76.303,85
Reduction GHG emissions (t CO2e/year)	122.462,75	210.326,9

Performance indicators for 2020 are expected to be achieved and also surpassed. Investment values are much higher than the expected due to the type of some efficiency

measures considered: installation of photovoltaic panels, installation of cogeneration plants or productive equipment replacement. For this kind of measures the investment needed for saving 1 toe of energy is much higher than the considered in SET Annex I.

6. Conclusion

This document compiles the most important results from *Task 4.2 – Application of SET Scheme at 100 companies* and *Tas4.3 – Data collection of planned energy saving & project added value.*

During the timeframe of Task 4.2, SET Scheme was applied in a total of 98 companies, spread by all targeted countries. This number falls only very short of the original target of 100 companies and is considering very satisfactory paying attention to the modified circumstances (updated regulation and overlapping impact in companies).

Nonetheless the number of valid datasets in SET Web database is already very significate (around 150) but is still expected to be increased after project ending at the end of September, as a result of the project communication in several events across the targeted countries.

Data collected from companies show the expected energy savings resulting from already implemented or planned energy efficiency measures is higher than the targeted IEE Common Performance Indicator. The same is valid for the other IEE performance indicators: reduction of greenhouse gas emissions and investments.

With all the dissemination activities performed in the last months is expected the fulfillment of 2020 targets for IEE performance indicators.

Disclaimer

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- The contents hereafter are provided free of charge and are designed to support European companies of the textile / clothing industry, notably the SMEs, to improve their awareness on energy consumption and potential energy savings.
- The tool and its contents are believed to be accurate yet they neither guarantee absence of errors nor they claim to replace energy audits.
- The sole responsibility for the use of this tool and of the information it provides lies with the users.

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