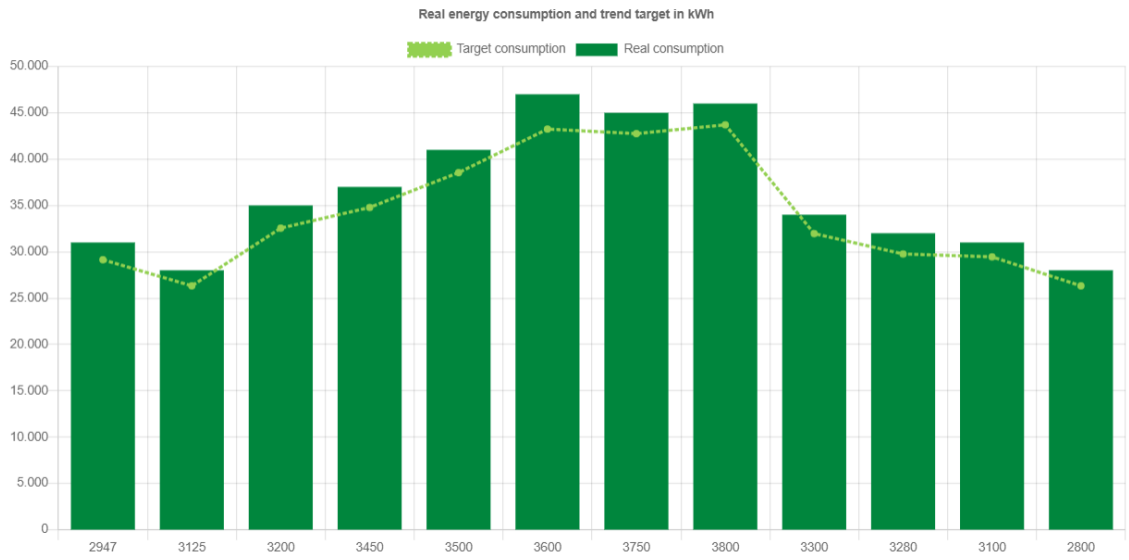
SME mPower Efficiency

A holistic framework for Empowering SME's capacity to increase their energy efficiency

SMEmPower Online Tool Guide

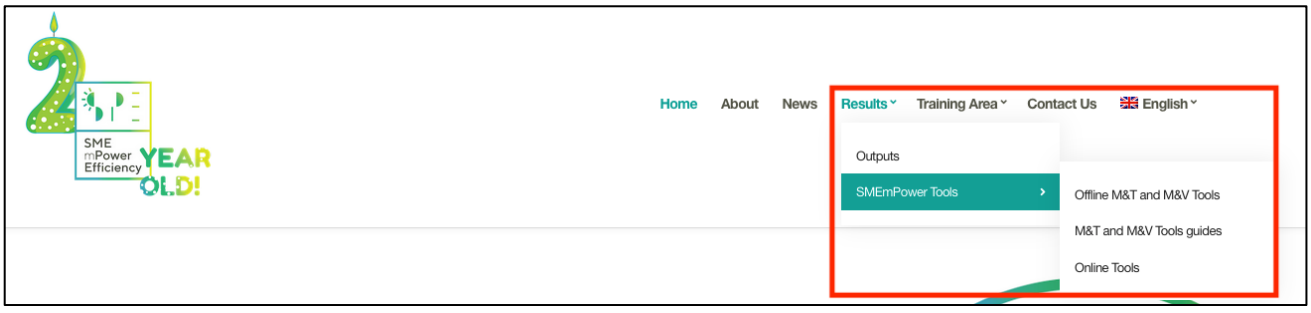


Introduction

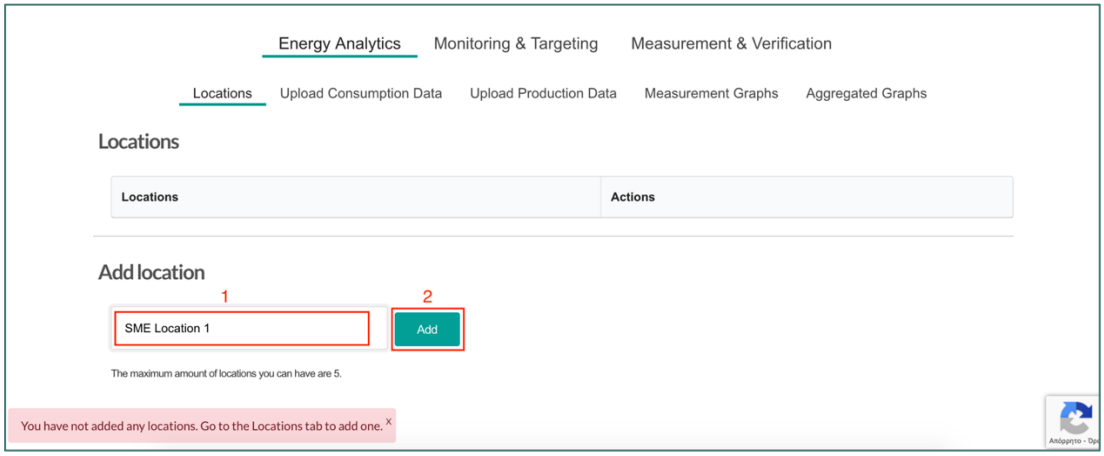
This document is a guide on how to use the online version of the Energy analytics, Monitoring and Targeting (M&T) and Monitoring and Verification (M&V) tools that were developed in the context of SMEmPower Efficiency Project. In order to access the tools, a member account is required. Registration is free.The scope of the online tool is to allow energy managers and engineers to visualize energy consumption measurements, identify and explain increased energy readings, create scenarios of reduced energy consumption (i.e., monitor and target), and finally verify the results by uploading measurements after the energy saving measures that have been employed.
The above procedure is done in three steps: 1) Upload data manually or using the automatic template uploader, inspect and verify the data, 2) Use the M&T tool to create an energy saving scenario that can be employed in an SME, 3) Upload the measurements after the energy saving scenario has been implemented and verify the results.

1. Energy analytics tool

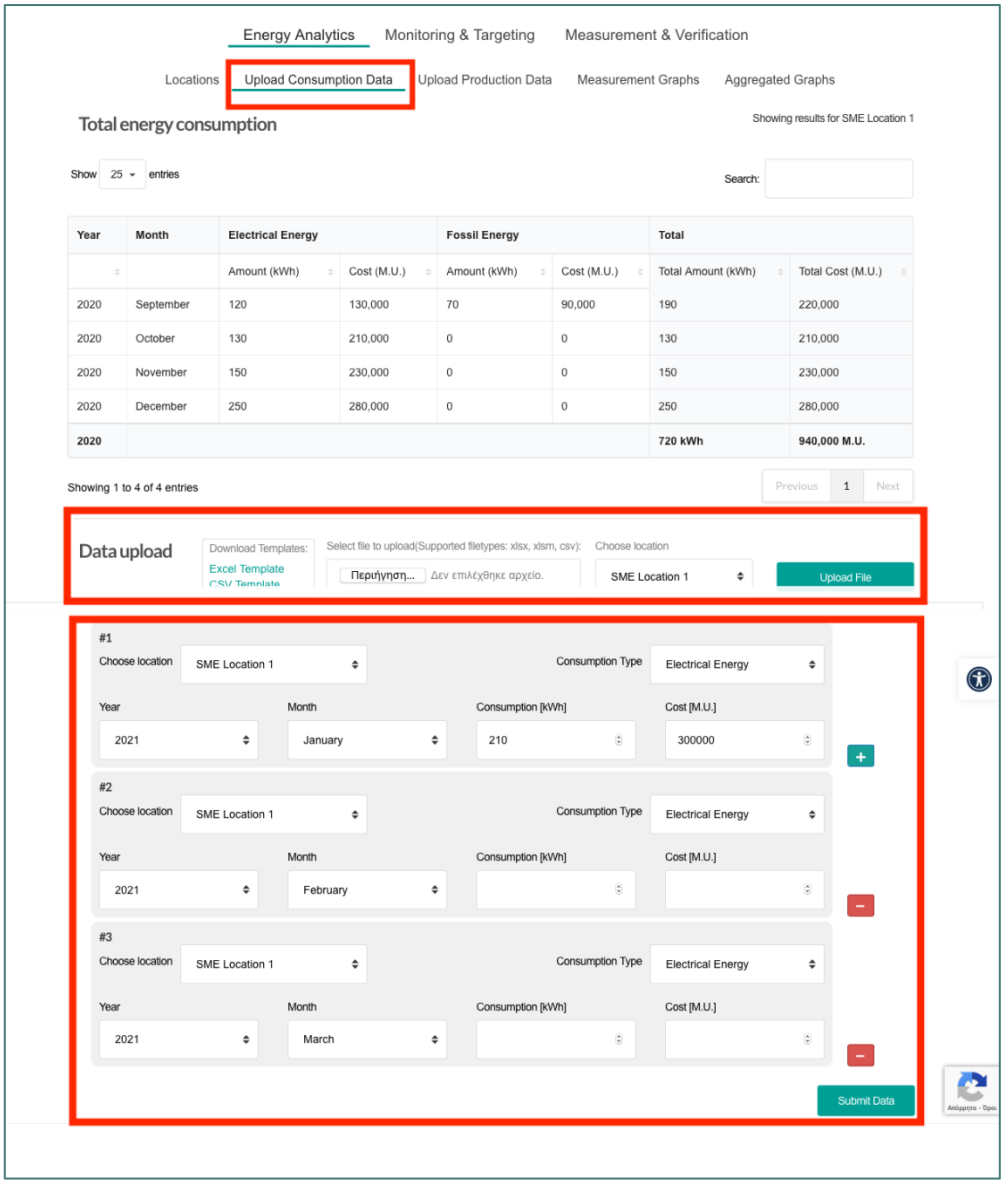
- After logging in, navigate to the "**Results**" menu and select "**SMEmPower Tools**" and then "**Online Tools**":



- By default, you will be redirected to the **locations** subtab of the **energy analytics** tool. Uploaded measurements are stored in **locations**. Users may have up to **5 locations** per account. **Locations** can be renamed but cannot be deleted. The content of each Location could be overwritten with new data, e.g. an existent loacation is desired to be erased by the database and be substituted by a new one.
- Type a **location name** and click "**add**"



- The **location** is now stored and should be visible.
- Select the second sub-tab "**Upload consumption Data**". Either using the data uploader or the manual logger add the available electrical and/or fossil energy consumption data.



- In order to upload data using the **excel** or **csv templates**, the data must follow the following format:

Year	Month	Electrical Energy Consumption	Electrical Energy Cost	Fossil Energy Consumption	Fossil Energy Cost
2020	1	800	1510	.	.
2020	2	150	1416	.	.
2020	3	130	1315	.	.
2020	4	604	2343	.	.
2020	5	130	.	.	.
2020	6	97	.	.	.
2020	7	8,4	.	.	.
2020	8	515	.	.	.
2020	9	164	.	.	.
2020	10	3563	.	.	.
2020	11	7345	.	.	.
2020	12	3453	.	.	.
2021	1	.	.	.	.
2021	2	.	.	.	.
2021	3	.	.	.	.
2021	4	.	.	.	.
2021	5	.	.	.	.
2021	6	.	.	.	.
2021	7	.	.	.	.
2021	8	.	.	.	.
2021	9	.	.	.	.
2021	10	.	.	.	.
2021	11	.	.	.	.
2021	12	.	.	.	.

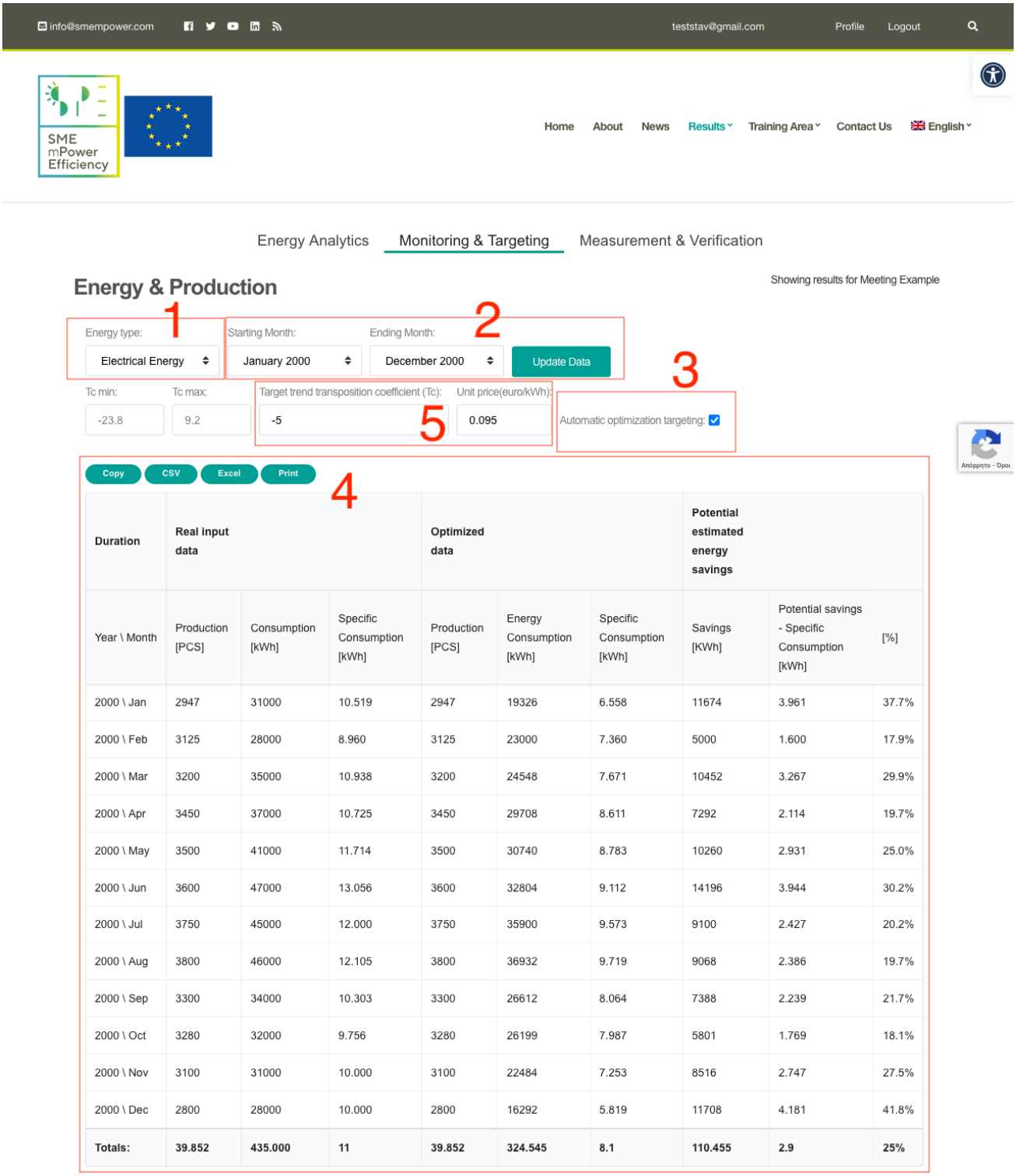
- Select the third sub-tab "**Upload production data**". Either using the data uploader or the manual logger, add the available aggregated production data.
- To visualize and inspect the data, navigate to the "**Measurement graphs**" and "**Aggregated graphs**" sub-tabs.

2. M&T Tool

Select the second tab "**Monitoring & Targeting**". Take the following steps:

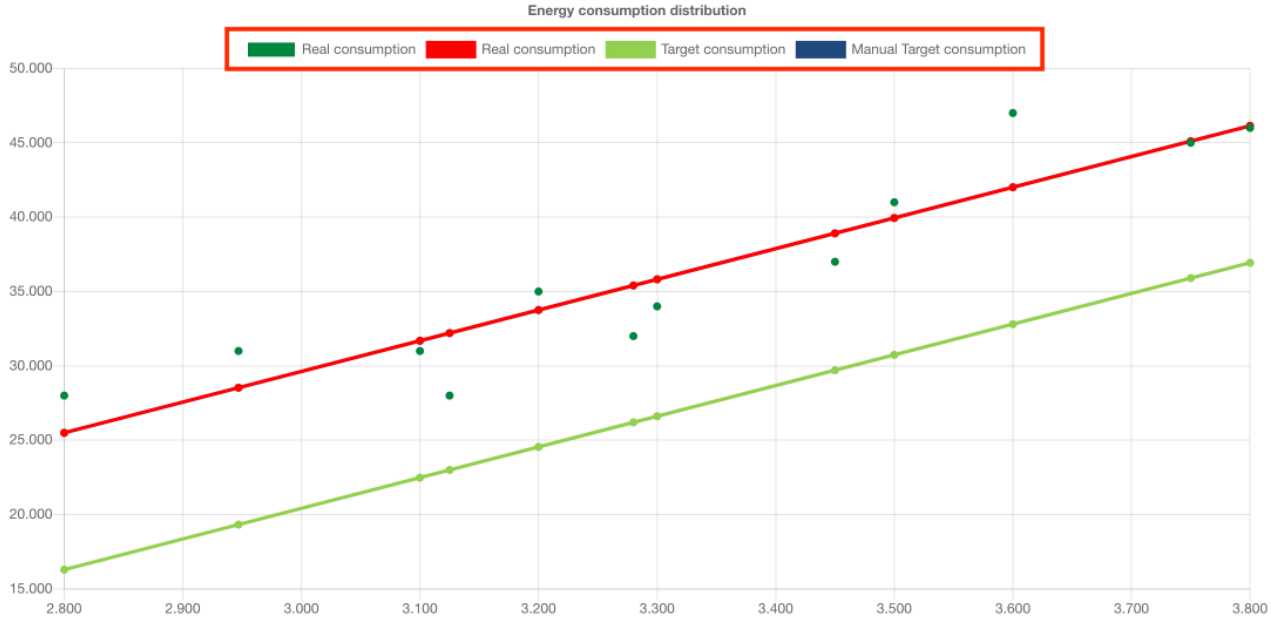
1. Select the Energy type that the tool will target.
2. Select the time period of the data that will be used by the M&T tool and click "**Update Data**". These data are considered as the base case period in your analysis.
3. Select "**automatic optimization targeting**".
4. Inspect the table that is automatically generated. The "**Real input data**" column is divided into three columns (i.e., 1,2 and 3). The first and second one contain data that were directly taken from the data previously uploaded in the "**energy analytics**" tab. The third one contains the ratio of the power that was consumed to produce one piece in any unit. The "**Optimized data**" column is divided into three columns (i.e., 4,5 and 6). The fourth column contains similar data to the first one. The fifth column is the core of the tool, it contains a reduced energy scenario, which depends on the value of the cell "**Target trend transposition coefficient (Tc)**". The sixth column corresponds to the third one. Finally, in the "**Potential estimated energy savings**" the savings of the generated scenario based on the value of the coefficient are generated.

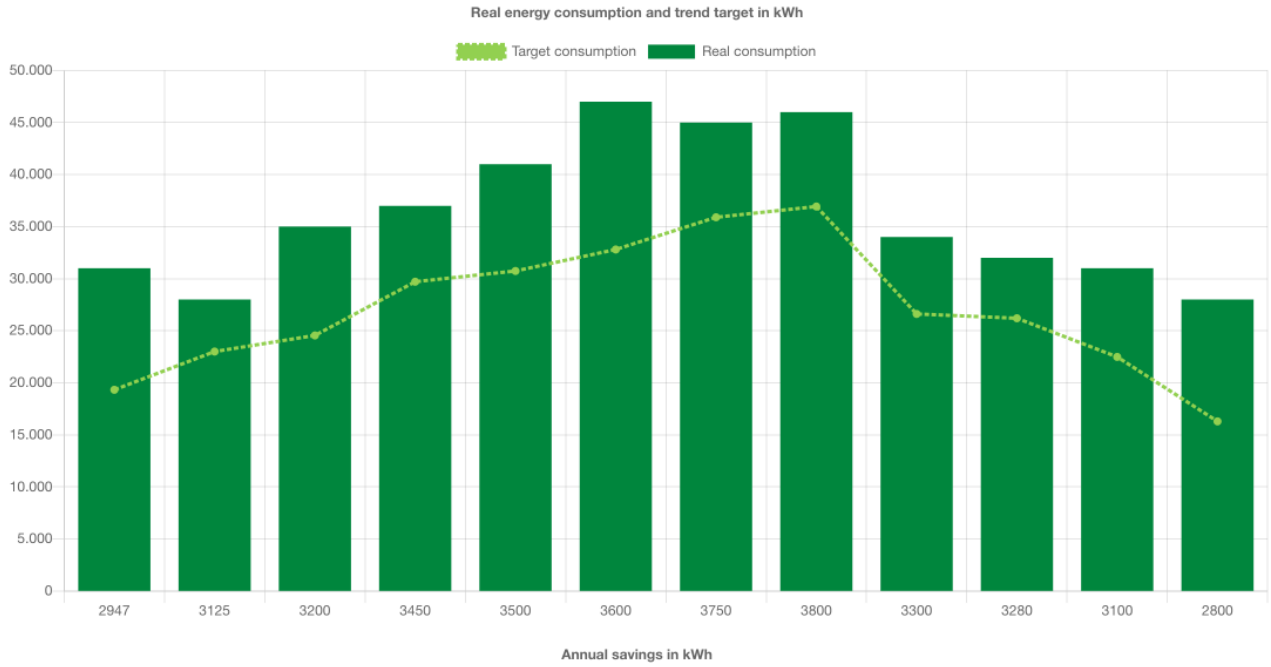
5. Change the value of the cell "**Target trend transposition coefficient (Tc)**" while keeping the value between the limits generated to the left. Inspect the newly generated scenario. Change the value of the coefficient until a realistic scenario has been achieved.
6. Manual energy targeting is available. Deselect "**automatic optimization targeting**" and in the newly generated column add the "**%**" that the energy is targeted to be reduced by.



Duration	Real input data			Optimized data			Potential estimated energy savings		
Year \ Month	Production [PCS]	Consumption [kWh]	Specific Consumption [kWh]	Production [PCS]	Energy Consumption [kWh]	Specific Consumption [kWh]	Savings [KWh]	Potential savings - Specific Consumption [kWh]	[%]
2000 \ Jan	2947	31000	10.519	2947	19326	6.558	11674	3.961	37.7%
2000 \ Feb	3125	28000	8.960	3125	23000	7.360	5000	1.600	17.9%
2000 \ Mar	3200	35000	10.938	3200	24548	7.671	10452	3.267	29.9%
2000 \ Apr	3450	37000	10.725	3450	29708	8.611	7292	2.114	19.7%
2000 \ May	3500	41000	11.714	3500	30740	8.783	10260	2.931	25.0%
2000 \ Jun	3600	47000	13.056	3600	32804	9.112	14196	3.944	30.2%
2000 \ Jul	3750	45000	12.000	3750	35900	9.573	9100	2.427	20.2%
2000 \ Aug	3800	46000	12.105	3800	36932	9.719	9068	2.386	19.7%
2000 \ Sep	3300	34000	10.303	3300	26612	8.064	7388	2.239	21.7%
2000 \ Oct	3280	32000	9.756	3280	26199	7.987	5801	1.769	18.1%
2000 \ Nov	3100	31000	10.000	3100	22484	7.253	8516	2.747	27.5%
2000 \ Dec	2800	28000	10.000	2800	16292	5.819	11708	4.181	41.8%
Totals:	**39.852**	**435.000**	**11**	**39.852**	**324.545**	**8.1**	**110.455**	**2.9**	**25%**

7. For all the different energy saving scenarios that are tested, observe the graphs that are generated below the table of the monitoring and targeting tool. When the tool is in ""automatic optimization targeting"" mode, the "**Manual target consumption**" line can be hidden as it is not used. When "automatic optimization targeting" is disabled, i.e., the tool is in manual mode, the "**Target consumption line**" must be hidden and the "**Manual Target consumption line**" must be enabled.



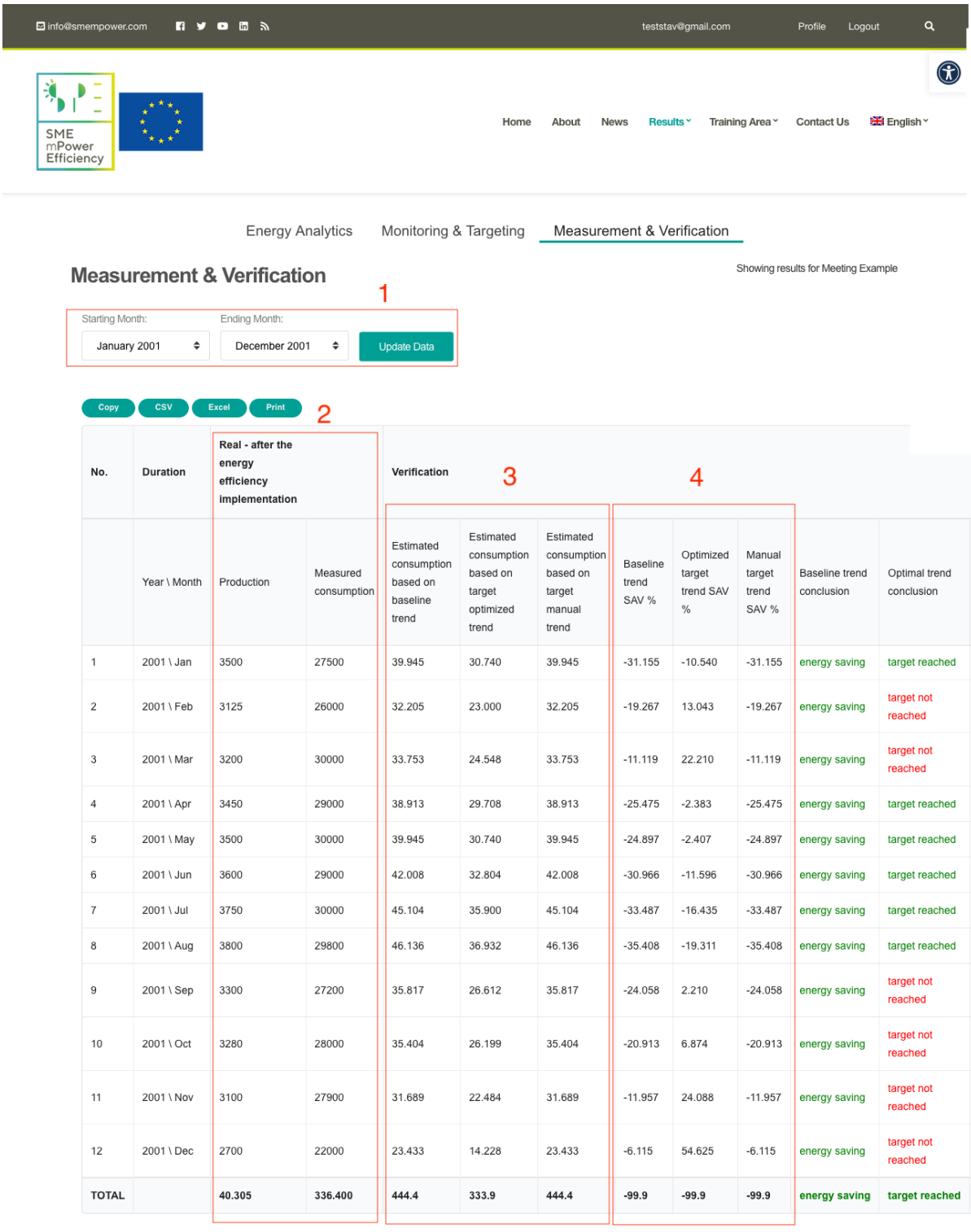


3. M&V Tool

Select the third tab "Measurement & Verification". Take the following steps:

1. Select the time period of the data that will be used by the M&V tool and click "Update Data". The selected time period must be **after the energy saving measurements have been**

implemented. These data must be already present in your database. You are expected to have uploaded them in the **energy analytics** tool.



No.	Duration	Real - after the energy efficiency implementation		Verification								
	Year \ Month	Production	Measured consumption	Estimated consumption based on baseline trend	Estimated consumption based on target optimized trend	Estimated consumption based on target manual trend	Baseline trend SAV %	Optimized target trend SAV %	Manual target trend SAV %	Baseline trend conclusion	Optimal trend conclusion	Manual trend conclusion
1	2001 \ Jan	3500	27500	39.945	30.740	39.945	-31.155	-10.540	-31.155	energy saving	target reached	target reached
2	2001 \ Feb	3125	26000	32.205	23.000	32.205	-19.267	13.043	-19.267	energy saving	target not reached	target reached
3	2001 \ Mar	3200	30000	33.753	24.548	33.753	-11.119	22.210	-11.119	energy saving	target not reached	target reached
4	2001 \ Apr	3450	29000	38.913	29.708	38.913	-25.475	-2.383	-25.475	energy saving	target reached	target reached
5	2001 \ May	3500	30000	39.945	30.740	39.945	-24.897	-2.407	-24.897	energy saving	target reached	target reached
6	2001 \ Jun	3600	29000	42.008	32.804	42.008	-30.966	-11.596	-30.966	energy saving	target reached	target reached
7	2001 \ Jul	3750	30000	45.104	35.900	45.104	-33.487	-16.435	-33.487	energy saving	target reached	target reached
8	2001 \ Aug	3800	29800	46.136	36.932	46.136	-35.408	-19.311	-35.408	energy saving	target reached	target reached
9	2001 \ Sep	3300	27200	35.817	26.612	35.817	-24.058	2.210	-24.058	energy saving	target not reached	target reached
10	2001 \ Oct	3280	28000	35.404	26.199	35.404	-20.913	6.874	-20.913	energy saving	target not reached	target reached
11	2001 \ Nov	3100	27900	31.689	22.484	31.689	-11.957	24.088	-11.957	energy saving	target not reached	target reached
12	2001 \ Dec	2700	22000	23.433	14.228	23.433	-6.115	54.625	-6.115	energy saving	target not reached	target reached
TOTAL		**40.305**	**336.400**	**444.4**	**333.9**	**444.4**	**-99.9**	**-99.9**	**-99.9**	**energy saving**	**target reached**	**target reached**

2. Inspect the table that is automatically generated. The "**Real – after the energy implementation**" column is divided into two columns that present the production and consumption after the energy saving measures have been implemented. The data are directly taken from the data previously uploaded in the "**energy analytics**" tab. The third one contains

the ratio of the power that was consumed to produce one piece in any unit. The "**Verification**" column is divided into three sets of three columns. The first set of three contains the consumption calculations that are calculated based on the two M&T scenarios that are created by the tool for the measurements of the two years respectively. The concept here is to have an estimation about the energy consumption based on three (3) different consumption trends: (a) the one before the application of the energy efficiency measures, i.e., the base case time period, (b) the consumption trend as resulted by the Automatic optimization targeting, and (c) the consumption trend as resulted by the manual targeting. The second set of columns contains the consumption calculations of the second set of columns expressed in percentage. The last set of columns is a simple conclusion of the difference of saved consumption energy.