Output factsheet: Tools

Version 1

Project index number and acronym	CE 1449 ENES-CE
Lead partner	Municipality of Forlì
Output number and title	OT2.1 Tools for the citizens involvement – Tool nr. 2
Responsible partner (PP name and number)	PP08 Municipal Utilities Pfaffenhofen (SWP)
Project website	https://www.interreg-central.eu/Content.Node/ENES-CE.html
Delivery date	30.11.2020

Summary description of the key features of the tool (developed and/or implemented)

When starting a new energy cooperative for renewable energy projects, the problem is often how to judge different projects and investment possibilities. This tool gives a strong indication on how high the quality of the specific project is.

The delivered Tool 2 (D.T2.2.2) was created in an EU-wide cooperation and therefore is now a very good tool to get a first feeling for PV-projects worldwide. Input was given from every project partner on different levels and intensities.

The key features are:

- Overview of Key Performance Indicators (KPI) of a PV project
- Full integration of citizen involvement parameters
- Easy to fill out for people with basic experience
- Consideration of soft success factors, especially regarding citizen involvement
- Different revenue models for EU-wide usage
- Different financing models for EU-wide usage
- Implementation of possible Flip Years
- Guidance for calculating rough costs without deeper project knowledge
- Excel-based and possibility of further development or individualization
- Different graphs to visualize the KPIs, e.g.:
    - Annual kWh Generation
    - Annual Revenues
    - Sales Revenues
    - Loan Payments

- Annual Expenses
- Returns
- Cash-Flow
- IRR

In addition to the Excel-based calculation file a text-file was created as a manual for the usage of the tool. With this help everybody should be able to use the tool. In this text is also password to be able to edit all of the cells.

It will be tested in the future and in WPT3 of ENES-CE. Also, it was checked with already existing projects on credibility.

To sum it up, the tool is a comprehensive, versatile tool for the initial analysis of potential photovoltaic projects. This can now be used in the pilot actions and if applicable improved furthermore. It would be welcome if it is continuously developed and used in different countries. For this Excel was a good choice.

NUTS region(s) where the tool has been developed and/or implemented (relevant NUTS level)

The tool was developed in cooperation of the following NUTS regions:

- DE21J
- ITH58
- HR046
- HU101
- PL314
- SI012

It has been checked especially with already existing projects in DE21J.

Expected impact and benefits of the tool for the concerned territories and target groups

The tool will be spread through online media. Used will be the project website as well as the national project partners. The goal is to distribute the tool as widely as possible and make it accessible to as many people as possible. In addition, it will be spread through the projects newsletter to get further attention.

Furthermore, it will help the users to assess projects faster and in a more efficient way. So, in the end it will help European partners to increase the usage of renewables overall because they are getting more accessible to everyone. One of the most important aspects along that project development is the citizen involvement. Therefore, the focus on the “soft factors” will help any project developer this will help every project developer to keep the citizens in mind from the beginning. And this will lead to easier and faster project implementation.

At the moment this tool has not led to any additional uptake at policy or institutional level. Mainly, because this tool has to be used in the future and its impact will then really reveal itself.

Sustainability of the tool and its transferability to other territories and stakeholders

The tool was designed to be as transferable as possible. This is quite a hard task to fulfill because there are loads of different revenues streams, costs and legal aspects throughout the European Union.

Hence, to make the tool applicable for as many countries as possible and under as many circumstances (financing scheme, revenue streams, cost structure, experience, usage of electricity) as possible, it had to be specified to one energy source. This also makes it easier to maintain. If one would include all renewable energy sources, you would need a lot of manpower to keep it up to date.

A lot of flexibility is included in the filling in of the equity structure. This will help to use the tool also when regional circumstances change.

In addition, the tool is very sustainable because it is made in Excel. Therefore, it has a very good longevity as many people around the European Union have the possibility to design this individually and adapt it to their specific application.

Lessons learned from the development/implementation process of the tool and added value of transnational cooperation

One of the most important lessons was the difference between the result in a perfect world and a realistic approach. In a perfect world you would be able to use the tool for every single renewable energy and country. But when we had a closer look on the creation process it showed up quite clearly and quickly, that it is not possible to include all of these features. It would even be hard to create one tool for all renewable energies within one country.

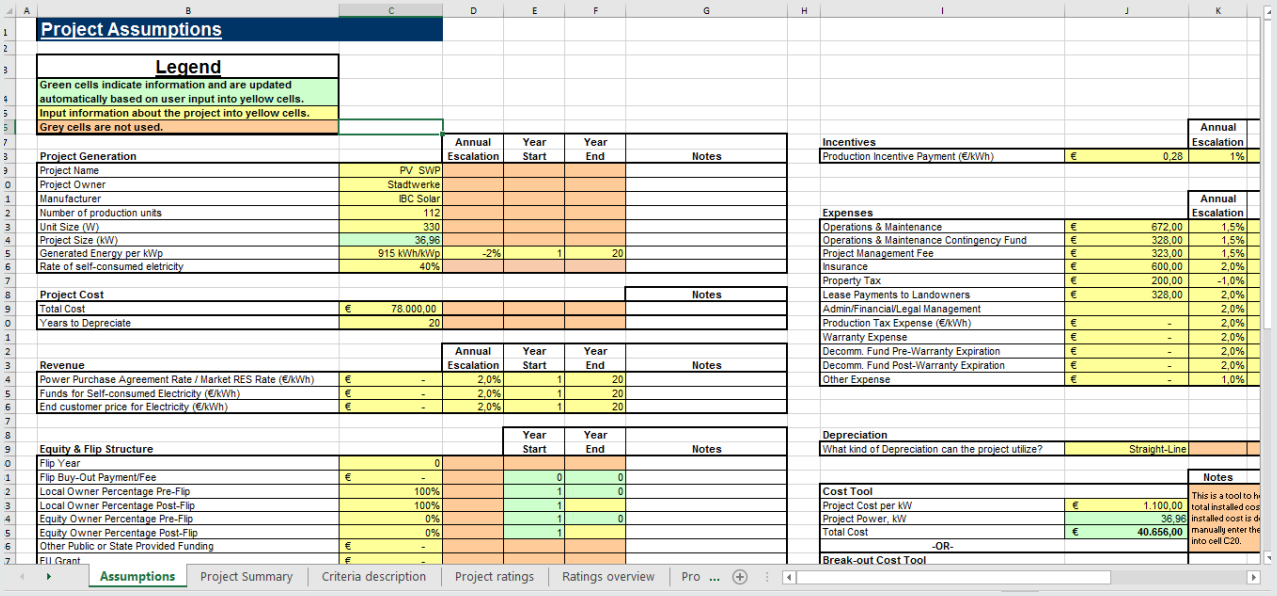
Value through transnational cooperation was definitely added throughout the process, because you are able to consider different perspectives and views on the topics. For example for some project partners the self-consumption was an important topic and for others not really.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

D.T2.1.1 Analysis of existing support tools for energy planning and previous projects results

D.T2.1.2 Methodology for a support toolbox to citizens integrated energy planning and financing
D.T2.2.2 Tool 2: Community energy investment guidelines – technical, business and legal aspects
https://www.interreg-central.eu/Content.Node/ENES-CE.html

First spreadsheet, where all of the assumptions have to be put in:



Project Assumptions

Legend

Green cells indicate information and are updated automatically based on user input into yellow cells.
Input information about the project into yellow cells.
Grey cells are not used.

Project Generation		Annual Escalation	Year Start	Year End	Notes
Project Name	PV SWP				
Project Owner	Stadtwerke				
Manufacturer	IBC Solar				
Number of production units	112				
Unit Size (W)	330				
Project Size (kW)	36,96				
Generated Energy per kWp	915 kWh/kWp	-2%	1	20	
Rate of self-consumed eletricity	40%				

Project Cost		Notes
Total Cost	€ 78.000,00	
Years to Depreciate	20	

Revenue		Annual Escalation	Year Start	Year End	Notes
Power Purchase Agreement Rate / Market RES Rate (€/kWh)	€ -	2,0%	1	20	
Funds for Self-consumed Electricity (€/kWh)	€ -	2,0%	1	20	
End customer price for Electricity (€/kWh)	€ -	2,0%	1	20	

Equity & Flip Structure		Year Start	Year End	Notes
Flip Year	0			
Flip Buy-Out Payment/Fee	€ -	0	0	
Local Owner Percentage Pre-Flip	100%	1	0	
Local Owner Percentage Post-Flip	100%	1		
Equity Owner Percentage Pre-Flip	0%	1	0	
Equity Owner Percentage Post-Flip	0%	1		
Other Public or State Provided Funding	€ -			
EU Grant	€ -			

Incentives		Annual Escalation
Production Incentive Payment (€/kWh)	€ 0,28	1%

Expenses		Annual Escalation
Operations & Maintenance	€ 672,00	1,5%
Operations & Maintenance Contingency Fund	€ 328,00	1,5%
Project Management Fee	€ 323,00	1,5%
Insurance	€ 600,00	2,0%
Property Tax	€ 200,00	-1,0%
Lease Payments to Landowners	€ 328,00	2,0%
Admin/Financial/Legal Management		2,0%
Production Tax Expense (€/kWh)	€ -	2,0%
Warranty Expense	€ -	2,0%
Decomm. Fund Pre-Warranty Expiration	€ -	2,0%
Decomm. Fund Post-Warranty Expiration	€ -	2,0%
Other Expense	€ -	1,0%

Depreciation	
What kind of Depreciation can the project utilize?	Straight-Line

Cost Tool		Notes
Project Cost per kW	€ 1.100,00	This is a tool to h total installed cos installed cost is d manually enter the into cell C20.
Project Power, kW	36,96	
Total Cost	€ 40.656,00	
-OR-		
Break-out Cost Tool		

Assumptions | Project Summary | Criteria description | Project ratings | Ratings overview | Pro ...

Second spreadsheet with the KPIs for a first project assessment:

	Project Summary	
Project Name		PV SWP
Project Size (MW)		0,03696
Equipment type		IBC Solar
Net Capacity Factor (Years 1-25)		8%
Total kWh Produced (Years 1-25)		547.858
PPA	€	-
Market rate	€	-
Ownership Structure		All Local
Total Installed Cost	€	78.000,00
Local Investor Contribution	€	78.000,00
Local Investor IRR		6%
Local Investor Return (NPV)	€	48.199,78
Equity Investor Required Rate of Return		0%
Equity Investor Contribution	€	-
Equity Investor IRR		#ZAHL!
Equity Investor Return (NPV)	€	-
Lowest DSCR		0,00
O & M Rate (% of revenues)		9,3%
Capital Cost per kW	€	2.110,39
IRR (Years 1-25)		4%
Net Present Value (Years 1-25)	€	32.761,30
Local acceptance index		4,17

Assumptions | Project Summary | Criteria description | Project ratings | Ratings overvi

Fifth spreadsheet which shows the performance in the “soft factors”:

Sixth spreadsheet which calculates the KPIs:

	A	B	C	D	E	F	G	H	I
1			0,300	0,306	0,312	0,318	0,325	0,331	
2									
3	**PV SWP Pro Forma**								
5									
6	**Year**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7									
8	**CAPITAL EXPENDITURES**								
9	**Equity Investment (Project Cost Less Debt & Grants)**	-78.000							
10									
11	**REVENUES**								
12	**Amount of Generated Electricity (kWh/yr)**		33.818	33.142	32.466	31.789	31.113	30.437	29.7
13	**Amount of Self-Consumed Electricity (kWh/yr)**		13.527	13.527	13.527	13.527	13.527	13.527	13.5
14	**Power Purchase Agreement Rate / Market RES Rate (€/kWh)**		0,000	0,000	0,000	0,000	0,000	0,000	0,0
15	**Electricity Sales Revenue per PPA/Market RES (€)**		0	0	0	0	0	0	0
16	**Funds for Self-Consumed Electricity (€/kWh)**		0,000	0,000	0,000	0,000	0,000	0,000	0,0
17	**Total Funds for Self-Consumed Electricity (€)**		0	0	0	0	0	0	0
18	**End customer price for Electricity (€/kWh)**		0,000	0,000	0,000	0,000	0,000	0,000	0,0
19	**Savings from Avoided Electricity Consumption (€)**		0	0	0	0	0	0	0
20	**Production Incentive Payments (€)**		9.469	9.373	9.273	9.171	9.065	8.957	8.8
21	**Total Annual Revenues (€)**		**9.469**	**9.373**	**9.273**	**9.171**	**9.065**	**8.957**	**8.8**
22									
23	**EXPENSES**								
24	**Operations & Maintenance**		672	682	692	703	713	724	73
25	**Operations & Maintenance Contingency Fund**		328	333	338	343	348	353	35
26	**Project Management Fee**		323	328	333	338	343	348	35
27	**Insurance**		600	612	624	637	649	662	67
28	**Property Tax**		198	196	194	192	190	188	18
29	**Leaseholder Payments**		328	335	341	348	355	362	36
30	**Admin/Financial/Legal Management**		0	0	0	0	0	0	0

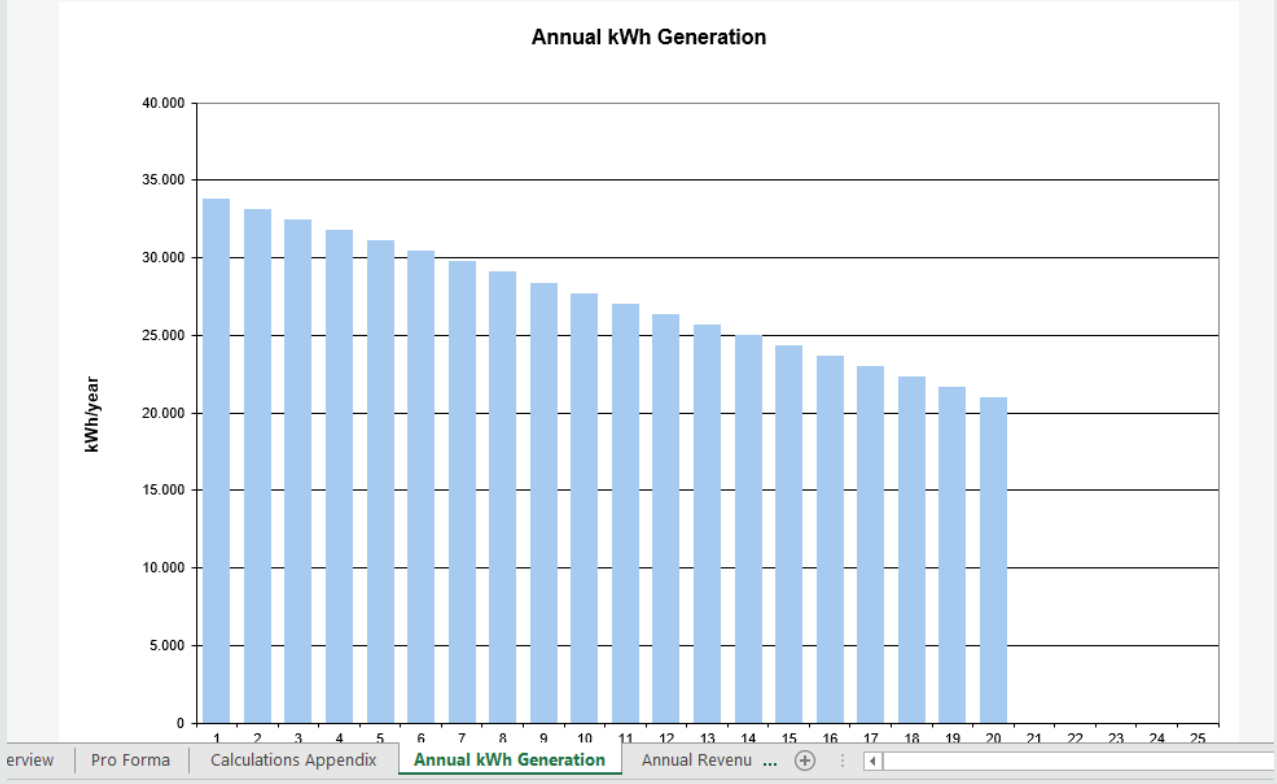
Project Summary | Criteria description | Project ratings | Ratings overview | **Pro Forma** | Calcul ...

Seventh spreadsheet which calculates the depreciation:

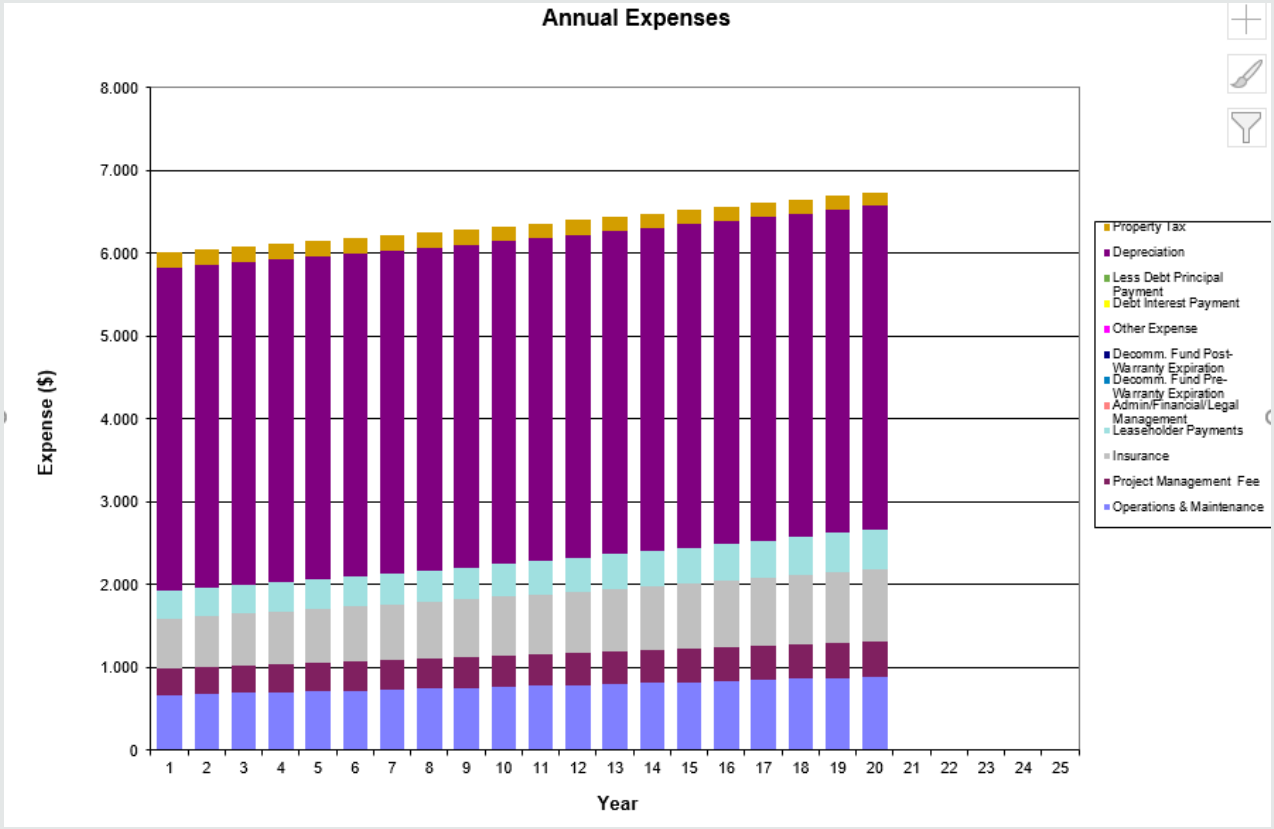
	A	B	C	D	E	F	G	H	I	J	K	L	M
5	**Depreciation - Straight Line**												
7	**Net Book Value**	78.000											
8	**Years to Depreciate**	20											
9	**Year**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
10	**Beginning Value**	78.000	74.100	70.200	66.300	62.400	58.500	54.600	50.700	46.800	42.900	39.000	35.100
11	**Annual Depreciation**	3.900	3.900	3.900	3.900	3.900	3.900	3.900	3.900	3.900	3.900	3.900	3.900
12	**Ending Value**	74.100	70.200	66.300	62.400	58.500	54.600	50.700	46.800	42.900	39.000	35.100	31.200
18	**Debt Service Schedule**												
19	**Year**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
20	**Beginning Balance**	0	0	0	0	0	0	0	0	0	0	0	0
21	**Interest Payment**	0	0	0	0	0	0	0	0	0	0	0	0
22	**Principal Payment**	0	0	0	0	0	0	0	0	0	0	0	0
23	**Ending Balance**	0	0	0	0	0	0	0	0	0	0	0	0

Criteria description | Project ratings | Ratings overview | Pro Forma | **Calculations Appendix** | ...

Visualization example 1:



Visualization example 2:



Visualization example 1: