

# INSTRUCTIONS FOR USE OF ASSESSMENT TOOL FOR COMMUNITY ENERGY PROJECTS

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D.T2.2.2 - Tool 2

Version 2  
Q3 2020

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## A. Introduction

Assessment Tool for Community Energy Projects is a Microsoft Excel based spreadsheet, developed as a part of ENES-CE Interreg Central Europe project aimed to development of local and regional energy strategies and action plans, together with the required set of tools needed to support local communities in development of community-based energy projects.

Version 1 was finalised 6 2020. Further voluntary improve has been made in Q3 and documented in Version 2.

## B. What this tool should be used for?

This tool is designed to be as generic as possible in order to be able to provide quantitative financial and qualitative impact-oriented assessment of the community projects of any kind. It can provide indication about potential profitability, size of the investment and financial return of the project as well as visual positioning of the project in regard with multiple qualitative social aspects. The tool should be used as a support to lead informed discussion about the energy projects, both within community and project developers as well as with representatives of (local) public authorities. The tool should be used in project inception and planning phase.

## C. What this tool should not be used for?

Since the tool has been designed in a very generic way, it may miss some important details for certain (if not all!) types of energy projects. Therefore, this tool IS NOT a replacement for an industry/technology specific dedicated tool for project financials calculation. This does not mean that calculations within this tool are incorrect, they are just not detailed enough to support all the elements of a particular real-world project. However, the tool could be a good verification mechanism to verify outputs of other tools and ensure that their calculations are in the same value range as outputs of this tool or to instigate additional verification of the outputs of the specific tool. In case that the outputs do not match, it is likely that the specific tool provides more accurate results than this generic tool.

## D. What are the limitations of the tool?

However generic it is, the tool is focused on the energy projects that are generating their revenues by the production of the electricity. The tool in its current version does not have support for projects that are generating revenues from the generated heat (e.g. cogeneration projects).

## E. Features

The tool features could be divided in two different segments: financial features and non-financial features as follows:

- Financial
  - Calculation of
    - Internal rate of return (IRR)
    - Nett present value (NPV)
    - Lowest acceptable Debt Service Capital Ratio (DSCR)
    - Capital Cost per kW built
    - Cashflow over the years of operation
    - Capital expenses (CAPEX)
    - Annual revenues
    - Annual expenses (OPEX)
    - EBITDA
    - Tax Liabilities
    - Depreciation
    - Debt Service Repayment Plan
  - Charts
    - Annual revenues
    - Electricity sales revenues
    - Loan Payments
    - Annual Expenses
    - Total Annual Tax Liability
    - Returns to Investors
    - Net after tax cash flow
    - Running IRR
  - Ownership structure
    - Multiple equity partners
    - Flip in ownership structure
  - Other
    - Annual indexation (due to inflation)
    - Switch in tariff scheme (feed-in to market tariff)
    - Public grants
- Non-financial
  - Electricity generation
  - Loss of the efficiency of installed equipment
  - Social impact assessment
    - 6-dimensional scoring
      - Financial participation
      - Community ownership
      - Climate impact
      - Added value to local economy
      - Perception of impact on environment
      - Legal complexity
    - Spider-chart for visualisation
    - General impact assessment score
    - Project comparison



## F. Tool usage

The tool is designed to be easy for use also for non-experts. Therefore, the first general principle was that the tool should prevent possible corruption of calculations due to unintentional modification of calculation cells. Therefore, all data that needs to be provided as an input is gathered within one sheet called “Assumptions”. Based on the data entered into assumptions, all other sheets are filled-in and automatically calculated.

In the sheet “Assumptions” there are also 3 types of fields – fields that could be edited (painted yellow), fields that are automatically calculated (painted green) and fields that are not used (painted grey).

<b>Legend</b>
Green cells indicate information and are updated automatically based on user input into yellow cells.
Input information about the project into yellow cells.
Gray cells are not used.

The second general principle of the tool design was that each input parameter should have its period of applicability (in terms of years), which means that some costs or expenses can run for only first 5 years of operations or they can run only the last 5 years of operations or anything in between. Also, in the period in which the cost/expense applies, it is possible to define depreciation/appreciation of the cost.

Type of the expense/revenue

Annual change  
(e.g. inflation)

Valid from  
year #

Valid until  
year #

Expenses	€	Annual Escalation	Year Start	Year End	Notes
Operations & Maintenance	-	1.5%	1	25	
Operations & Maintenance Contingency Fund	-	1.5%	1	25	
Project Management Fee	-	1.5%	1	5	
Insurance	-	2.0%	1	25	
Property Tax	-	-1.0%	1	25	
Lease Payments to Landowners	-	2.0%	1	25	
Admin/Financial/Legal Management	-	2.0%	1	25	
Production Tax Expense (€/kWh)	-	2.0%	1	25	
Warranty Expense	-	2.0%	4	25	
Decomm. Fund Pre-Warranty Expiration	-	2.0%	1	25	
Decomm. Fund Post-Warranty Expiration	-	2.0%	1	20	
Other Expense	-	1.0%	1	20	

## G. Description of Assumption inputs

Here is the description of individual fields in different sections of the Assumptions sheet.



## A.1. Project Generation section

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 electricity	40%				

**Project Name** – name of the project. Used in order to identify project and distinguish it from others

**Project Owner** – project developer or originator

**Manufacturer** – manufacturer of the electricity producing equipment on the project

**Number of production units** – if the project is consisted of several production units (e.g. several PV installations and similar) then please input the number of units. If this is only one generation unit or the number of units has not been specified yet, please use number 1.

**Unit size (W)** – a nominal power production of individual power generation unit. If you used “1” for number of production units, then please use total project power for Unit Size

**Project Size (kW)** – calculates the total size of the project by multiplying nominal unit size with number of production units

**Generated Energy per kWp** – easy to use ratio to calculate the annual generated electricity in connection to the installed kWp. An annual escalation has to be used in most projects as the efficiency drops over the years. Years to be used for duration in which power is generated.

**Rate of self-consumed electricity** – Ratio for the quantity of self-consumed electricity in %. E.g. an rate of 40% of the generated electricity is used by the project owner itself. This use of energy is granted specific funds in some states. Additionally the savings in comparison to the standard price €/kWh is calculated and used to assess the benefit of the project.

## A.2. Project cost

Project Cost					Notes
Total Cost					
Years to Depreciate					

**Total Cost** – Indicates the total cost of the project. It depends on the technology used and stage to which the project has been developed. Development Cost is usually significantly lower than TakeOver Cost of already built projects.

**Years to Depreciate** – number of years of expected project “financial” lifetime. Usually there are accounting standards for the maximum number of years of depreciation, but accountants might in certain circumstances advise “accelerated depreciation” in order to improve the project’s profitability if the cashflow allows it. If not certain, please use the number of years that you expect to operate the plant as a number of years to depreciate.

## A.3. Revenue

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



**Power Purchase Agreement Rate / Market RES Rate (€/kWh)** – indicates the agreed price with the buyer of the electricity or the market price over the certain time-period. It is common practice to use Power Purchase Agreement (PPA) instruments to make projects bankable and interested to investors. Some countries offer incentivized feed-in tariffs (above-market PPAs) for investors in renewable energy projects and some are feeding into the grid and sell it to an exchange market. Then you have to use your market price and insert it in this cell. If not sure, you can leave this price at 0. Please fill in also Year Start and Year End columns from which year the rate applies and till which year it should be valid.

### A.4. Equity & Flip Structure

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

This chapter defines the ownership and financial debt/equity/grant structure of the project.

**Flip Year** – defines the year in which the ownership structure changes. It is common in cases in which investors do not want to take on themselves risks of the project development. In this model, developer develops the project and takes the risk of this phase, and at certain moment upon project completion it sells the project (or part of it) to the (community) investor. Changes in ownership percentage do not always occur at a predetermined point in time. Some projects are structured to not flip or change ownership percentage between local and equity investors until the Equity Investor meets his Required Rate of Return. In this field, please enter the number of the year in which this flip takes place. If there is no flip, please enter 0.

**Flip Buy-Out Payment Fee** – indicates the amount of the fee that the equity investor will get at the moment of the transfer of the ownership.

**Local Owner Percentage Pre-Flip** – indicates the local/community percentage of ownership of the project before Flip Year

**Local Owner Percentage Post-Flip** – indicates the local/community percentage of ownership of the project after Flip Year

**Equity Owner Percentage Pre-Flip** – indicates the Equity Investor’s percentage of ownership of the project before Flip Year

**Equity Owner Percentage Post-Flip** – indicates the Equity Investor’s percentage of ownership of the project after Flip Year.

**Other Public or State Provided Funding** – the value of investment/funding that was received as a grant incentive for project development by Public entities. Does not influence neither equity neither debt part of the financial structure.

**EU Grant** – the value of the investment/funding that was received as an EU grant. Does not influence neither equity neither debt part of the financial structure.

**Local Owner Contribution** – the amount of money invested by Local Owner

**Equity Investor Contribution** – the amount of money invested by Equity Investor



**Total Debt** – the amount that needs to be taken as debt in order to close the financial structure of the project. It is **automatically calculated** as a difference between sum of total project cost and sum of all equity contributions together with grants.

## A.5. Project Debt

			Year Start	Year End	Notes
<b>Project Debt</b>					
Total Debt	€ -				
Debt Term in Years	5				
Interest Rate (%)	0%				
Annual Debt Payment	€ -		1	5	
Minimum Allowed Debt Service Coverage Ratio	0.00				

**Total Debt** – it is automatically calculated based on the input from [Equity & Flip Structure](#) section.

**Debt Term in Years** – Duration of the repayment of the debt loan

**Interest Rate (%)** – defines the interest rate that is charged by debt provider to the project owners

**Annual Debt Payment** – it is automatically calculated out of the project's debt repayment plan. It shows the amount that needs to be paid annually in order to repay the loan. It is possible to indicate a loan grace period by changing the Year Start number to the number of the year in which the repayment of the loan starts.

**Minimum Allowed Debt Service Coverage Ratio** – many financial institutions require that debt conditions and size of the equity contribution are set in a way which ensures that there is enough liquidity from the project revenues generated to ensure continuous and stable repayment of the loan. It depends on the type of the project, experience and references of the developer and project owner as well as on the geographic region of the project. It is usual around 1,20 – 1,30. If not sure, please leave at 0.

## A.6. Local owner financing

					Notes
<b>Local Owner Financing</b>					
Local Owner Equity	€ -				
Local Owner Discount Rate	0%				
Local Owner Tax Rate	0%				
Is the Local Owner also the Land Owner?	no		1	25	
Is the Local Owner also the Project Manager?	yes		1	25	

**Local Owner Equity** – it is automatically calculated based on the inputs in [Equity & Flip structure](#) section.

**Local Owner Discount Rate** – the cost of capital, expected financial return of the project for Local Owner.

**Local Owner Tax Rate** – indicates the tax rate that the owner needs to pay for profits generated by the plant

**Is the Local Owner also the Land Owner** - If yes, then the Lease Payments, after taxes, will be included in the 'Local Owner Return' on the Pro Forma sheet.

**Is the Local Owner also the Project Manager** - If yes, then the Project Management Fee, after taxes, will be included in the 'Local Owner Return' on the Pro Forma sheet.

## A.7. Equity Investor Financing

					Notes
<b>Equity Investor Financing</b>					
Equity Investor Equity	€ -				
Equity Investor Discount Rate (%)	0%				
Equity Investor Tax Rate (%)	0%				
Equity Investor Required Rate of Return (%)	0%				

**Equity Investor Equity** - it is automatically calculated based on the inputs in [Equity & Flip structure](#) section.

**Equity Investor Discount Rate (%)** - the cost of capital, expected financial return of the project for Equity Investor.

**Equity Investor Tax Rate (%)** - indicates the tax rate that the owner needs to pay for profits generated by the plant. It is usually the same as for Local Owner if Local Owners do not enjoy some particular taxation benefits or incentives due to their contribution to local community.

**Equity Investor Required Rate of Return (%)** – It is used for comparison on the ProForma sheet to indicate if required IRR has been met or not. If not, than project is not fulfilling investors expectations and is not financially feasible.

## A.8. Incentives

Incentives		Annual Escalation	Year Start	Year End	Notes
Production Incentive Payment (€/kWh)	€	-	1%	1	25

**Production Incentive Payment (€/kWh)** – indicates some other revenues that could be generated by the project, but are not directly related to the selling of the electricity. E.g. it could be carbon capture incentive that brings additional revenues to the plant by selling carbon offset records to the companies that have higher then allowed emissions. It can also be used for specific funding per kWh, which is not define as selling.

## A.9. Expenses

Expenses		Annual Escalation	Year Start	Year End	Notes
Operations & Maintenance	€	-	1.5%	1	25
Operations & Maintenance Contingency Fund	€	-	1.5%	1	25
Project Management Fee	€	-	1.5%	1	5
Insurance	€	-	2.0%	1	25
Property Tax	€	-	-1.0%	1	25
Lease Payments to Landowners	€	-	2.0%	1	25
Admin/Financial/Legal Management	€	-	2.0%	1	25
Production Tax Expense (€/kWh)	€	-	2.0%	1	25
Warranty Expense	€	-	2.0%	4	25
Decomm. Fund Pre-Warranty Expiration	€	-	2.0%	1	25
Decomm. Fund Post-Warranty Expiration	€	-	2.0%	1	20
Other Expense	€	-	1.0%	1	20

**Operations & Maintenance** – indicates the operational costs for the support of the normal operations of the plant as well as regular maintenance cost in the accordance with the manufacturer’s specifications

**Operations & Maintenance Contingency Fund** - This fund can be established as a reserve for any unexpected O&M expenses. This could be useful in case that the plant is planned to be operated longer then coverage of usual maintenance service agreement or if there is some special reason to expect possible extraordinary events that could impact the operation of the plant. If not sure, please use 0 for this value.

**Project Management Fee** – Fees paid out to the operator of the plant for coverage of commercial management costs.

**Insurance** – cost of insurance against force majeure events. Insurance against technical malfunction is usually included in the cost of generation equipment or Operations

**Property Tax** – in some countries, there is a property tax that needs to be paid for real estate in the possession of the owner.

**Lease Payments to Landowners** – cost of lease of the land or roofs if not owned by the project owners

**Admin/Financial/Legal Management** – cost of fulfilment of all regulatory and administration costs needed for successful project operations.

**Production Tax Expense (€/kWh)** – in some countries there is a special tax for revenues generated for electricity production. Usually VAT or reduced VAT rate applies.



**Warranty Expense** – cost of warranty is usually included in the price of the power generation equipment. This expense usually refers to the additional expense for warranty requirements out of the standard warranty period offered by the equipment manufacturer.

**Decommissioning Fund Pre-Warranty Expiration** – amount of funds that needs to be taken aside to cover for decommissioning costs of the plant at the end of the plant’s lifetime. Usually the amount paid for decommissioning is lower during the warranty coverage period and then increased in years after the warranty expiration.

**Decommissioning Fund Post-Warranty Expiration** - amount of funds that needs to be taken aside to cover for decommissioning costs of the plant at the end of the plant’s lifetime. Usually the amount paid for decommissioning is lower during the warranty coverage period and then increased in years after the warranty expiration.

**Other Expenses** – accounts for all other, not-mentioned expenses.

*Note: This section is intentionally made comprehensive in order to serve as a checklist when accounting for all needed project expenses. It is expected that not all of the costs could be known in early stages of the project, so in this case all unknown fields should be left with 0 as input and only “Operations & Maintenance” field should be used as a mandatory.*

## A.10. Depreciation

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

**What kind of Depreciation can the project utilize?** - Non-taxable entities, such as schools, generally cannot utilize an accelerated depreciation tax schedule. In most cases, straight-line depreciation is generally used. You can either use “Straight-Line” or “None”, whichever is applicable.

## A.11. Cost Tools

Cost Tool	Notes
Project Cost per kW	This is a tool to help the user determine the total installed cost of the project. Once the installed cost is determined the user should manually enter the results from cell J33 or J43 into cell C20.
Project Power, kW	
Total Cost	
-OR-	
<b>Break-out Cost Tool</b>	
Feasibility study	€ -
Project Design & Development	€ -
Production equipment	€ -
Interconnection	€ -
Commissioning	€ -
Installation/Construction	€ -
Other	€ -
<b>TOTAL</b>	€ -

This is a set of 2 tools to help the user determine the total installed cost of the project.

Cost Tool just uses standard values for the cost of the plant per power installed for a certain type of the technology.

**Project Cost per kW** – standard, market-based price of cost of the project per kW of the power installed. It is an industry standard and could be found out easily on the internet or from energy experts.

**Project Power, kW** – planned size of the project. It is automatically taken over from [Project generation section](#).

**Total Cost** – indicative total cost of the project. Is calculated as a result of Project cost per kW and Project Power.



More advanced Break-out Cost Tool takes into account all different aspects of the project costs during the construction phase and usually leads to a more accurate results about the Project Cost.

**Feasibility study** – Cost of initial study that shows the feasibility of the project implementation and investment. If the study shows that a project is not feasible, no other expenses should be invested into a project.

**Project Design & Development** – Cost of all required technical and administrative studies, plans and designs needed to acquire the permits that are required for the construction of the project.

**Production equipment** – Cost of energy generation equipment

**Interconnection** – Cost of acquiring a suitable connection with the electricity grid

**Commissioning** – the cost of assuring that all systems and components of plant are designed, installed, tested, operated, and maintained according to the operational requirements of the owner or final client.

**Installation/Construction** – the cost of construction and installation works on the plant

**Other** – all other costs needed that the plant becomes fully operational

## A.12. Community Value Assessment Tool

Community Value Assessment Tool	
Financial participation	4
Community Ownership	5
Climate Impact	3
Added Value to Local Economy	2
Visual Impact On Environment	4
Legal Complexity	1
<b>FINAL SCORE</b>	<b>3.167</b>

Community Value Assessment Tool is a quantitative tool that can measure value and contribution of the project to the community. 6 different aspects of the community value are rated with the grades between 1-5 and the FINAL SCORE is the average of all the grades.

The description of the meanings of all grades is described in the sheet “Criteria description”

The visual output of the Community Value Assessment tool is displayed on a spider chart in the sheet “Ratings overview”.

## H. Comparison of different projects

Since the calculations of the financial outputs of the energy projects is a complex task, it was difficult to develop a tool that would be able to compare several projects within one Excel sheet. That’s why the comparison of the project is intended to be done in two steps.

Step 1 – each project should fill in data in its own Excel document. The documents should be named with the name of the project in it in order to be easily found.

Step 2 – the user should select one of the filled-in Excel documents and should use sheet named “Project ratings” in order to fill-in manually the required summary data from other Excel documents to this spreadsheet in order to enable comparison of the projects.

The data that needs to be filled in is:



- All 6 grades/elements from the [Community Value Assessment](#) section
- Project cost from the [Project generation section](#).
- IRR from the “Project Summary” sheet
- NPV from the “Project Summary” sheet

Project name	Financial participation	Community ownership	Climate impact	Added value to local economy	Visual impact on environment	Legal complexity	Project cost	IRR	NPV
PV SWP	5	5	5	3	4	3	€ 78.000,00	0,04	€ 32.761,30
Peer project 2	3	5	4	3	4	2	€ 950.000,00	0,08	€ 87.145,00
Peer project 3	3	3	4	2	5	1	€ 441.000,00	0,13	€ 45.621,00

If this procedure is followed, the user will have comparison of the projects on one sheet with all the most important parameters.

Also, in “Ratings overview” sheet, a spider chart comparing all entered projects will be displayed.

## I. Technical notes

The tool has been developed as a Microsoft Excel Workbook compatible with Microsoft Excel 2005 and later format.

In order to minimize the risk of the data corruption in the tool, all cells that do not require any user input are made protected and cannot be edited in normal mode.

In case that the user has sufficient knowledge to expand and improve the tool, the following password should be used for unlocking the locked cells: “vatrogasacmirko”.