



R-ACES
Energy Cooperation Platform

User Guide Self-Assessment Tool

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Introduction

The first public release of the R-ACES Self-Assessment Tool is built in Microsoft Excel and is available for download on the R-ACES website: <https://r-aces.eu/tools/>. With the Self-Assessment Tool, users make an inventory of data in four categories that are important when exploring opportunities for energy exchange: energy supply (heating, cooling, electricity), energy demand (heating, cooling, electricity), stakeholders and existing infrastructure. By answering several questions, users can then self-assess the information completeness and quality of the inventory and identify the next steps for the region.

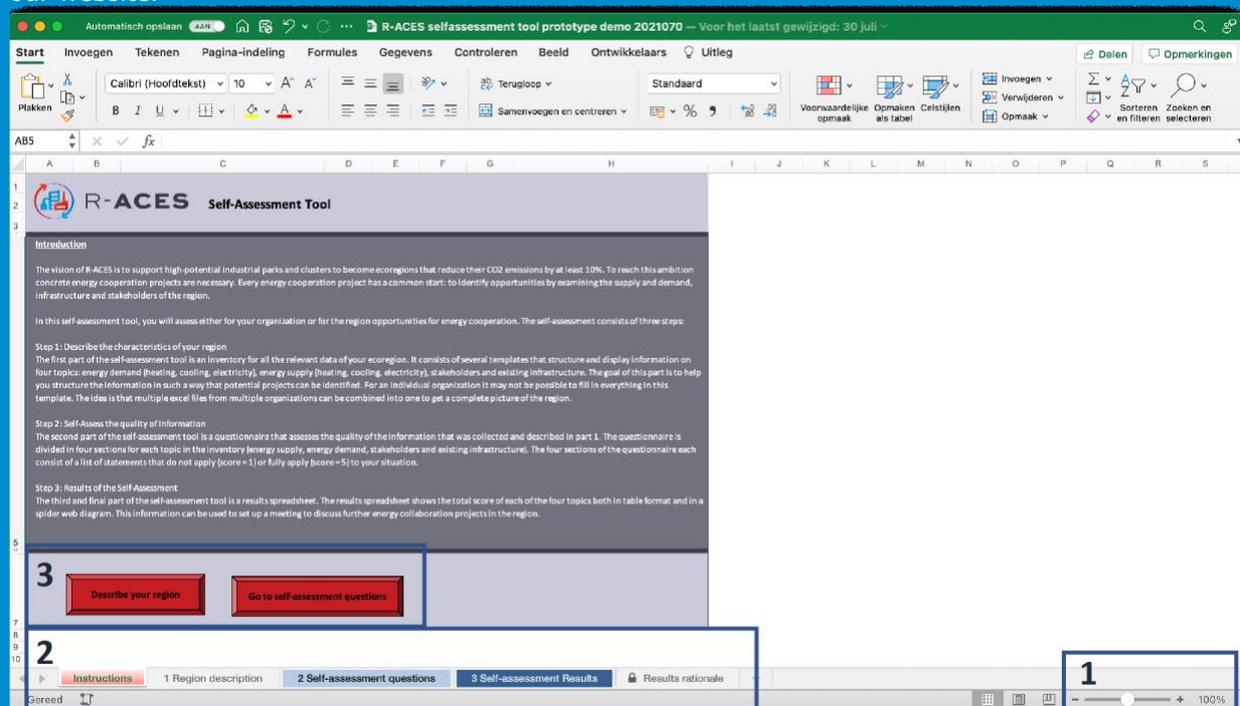
The Self-Assessment Tool consists of three parts: a region description, a self-assessment questionnaire and a results sheet. This user guide describes all the steps in using the Self-Assessment Tool:

- 0. Getting started: how to download and open the Self-Assessment Tool and how to navigate between tabs**
 - 1. Region Description**
 - 2. Self-Assessment questions**
 - 3. Self-Assessment results**
 - 4. Next steps**

Use Excel

Before getting started, make sure you have Microsoft Excel installed. The tool was built in Microsoft Excel and is not guaranteed to work in another spreadsheet editor. It has been tested on both MacOS and Windows.

We advise to make a copy of the self-assessment tool so that you always have an empty version of the self-assessment tool. In case you forget to do this, you can always download a new version from our website.



There are a few elements on the screen that we will explain here and that help to navigate in the Self-Assessment Tool. The numbers correspond to the numbered elements in the picture.

- 1. Zoom scroll bar.** Use the scroll bar to zoom in or out by clicking and dragging the bar left or right. Alternatively the scroll function of your mouse or mousepad can be used.
- 2. Tabs.** The Self-Assessment Tool is split into five separate tabs. You can access different parts of the self-assessment tool by clicking here. The normal order to complete the self-assessment tool is from left (instructions) to right (3. Self-assessment results). The lock on tabs is used to prevent a user from accidentally editing them. The final tab (Results rationale) is an appendix that is used for the Self-assessment results.
- 3. Buttons.** An alternative way to navigate between the different tabs in the Self-Assessment Tool is by clicking on the red buttons. Describe your region brings the user to 1 Region description and Go to Self-Assessment questions brings the user to 2 Self-assessment questions.

0. Getting started

To download the R-ACES Self-Assessment Tool, visit <https://r-aces.eu/tools/>, navigate to the Self-Assessment Tool and click on "Download the tool". The file will then usually be available from your downloads folder.

To open the tool, double click on the .xlsx file and Microsoft Excel is started up. The first screen you see is an introduction screen. You can click on "1 Region description" to start the self-assessment.

1. Region description

The first part of the self-assessment tool is the region description. Here, you will describe available energy sources, energy demand, stakeholders and existing energy infrastructure for the region. It is expected that a single organization is only able to fill in their own information and not that of other stakeholders in the region. The idea is that multiple 'partial' region descriptions add up to a fully detailed and complete region description. Alternatively, in the case stakeholders already work together, filling in the region description can be a collaborative effort. The end goal of this part of the self-assessment tool is that by describing the region fully, opportunities for energy cooperation are discovered and users learn what type of information is important to collect.

The starting screen looks like this. We will now explain some important elements.

The screenshot shows the R-ACES self-assessment tool in Microsoft Excel. The spreadsheet is titled "2. Description of your region" and contains the following sections:

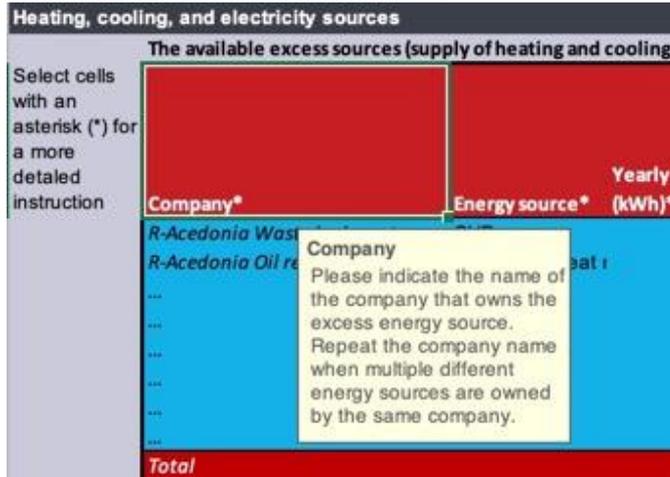
- Instructions:** A text box explaining the tool's purpose and goal.
- Color legend:** A legend indicating that dark red columns indicate important information and light red columns indicate helpful but non-essential information.
- Columns:** A list of columns for the data tables, including Company, Energy source, Yearly production, Hours per year available for exchange, Yearly production in excess, Supply temperature, Desired return temperature, Day pattern, Week pattern, Seasonality effect, Please describe notifiable major interruptions planned, Can information be shared, and How long will the source continue to exist.
- Columns with an asterisk:** Columns that have an asterisk in the header, indicating they have an additional explanatory text that pops up when the cell is selected.

Company*	Energy source*	Yearly production (MWh)*	Power (MW)	Hours per year available for exchange (h)	Yearly production in excess (MWh)*	Supply temperature (°C)*	Desired return temperature (°C)*	Day pattern*	Week pattern*	Seasonality effect*	Please describe notifiable major interruptions planned*	Can information be shared?*	How long will the source continue to exist?*	Notes*
R-Acedonia Waste incinerator	CHP	103417000	10000	8000	103417000	150	Unknown	24 hours operation	n/a	n/a	5-10% closed for maintenance	Yes	2050 and further	
R-Acedonia Oil refinery	Oil refinery heat	672000000	230000	8765	672000000	500	Unknown	24 hours operation	n/a	n/a	n/a	Yes	2050 and further	
Total		775417000	240000	16765	775417000									

Company*	Electricity source*	Yearly production (MWh)*	Operating hours (h)	Power (MW)	Yearly production in excess (MWh)*	Day pattern*	Week pattern*	Seasonality effect*	Please describe notifiable major interruptions planned*	Voltage (V)	Can information be shared?*	How long will the source continue to exist?*	Notes*
R-Acedonia Waste incinerator	CHP	74448000	8000	10000	74448000	24 hours operation	n/a	n/a	5-10% closed for maintenance	13.8 kV	Yes	2050 and further	

- 1. Instruction.** A short instruction for region description.
- 2. Color legend.** The columns (see number 3) can have a dark red or light red color. A dark red color indicates that information in the corresponding field (see number 4) is important. A light red color indicates that information in the corresponding field is helpful but not essential in early stages of energy cooperation.
- 3. Columns.** Columns provide the title for the content in the corresponding fields (see number 4).
- 4. Columns with an asterisk** have an additional explanatory text that pops up when the

column is selected. See for an example:

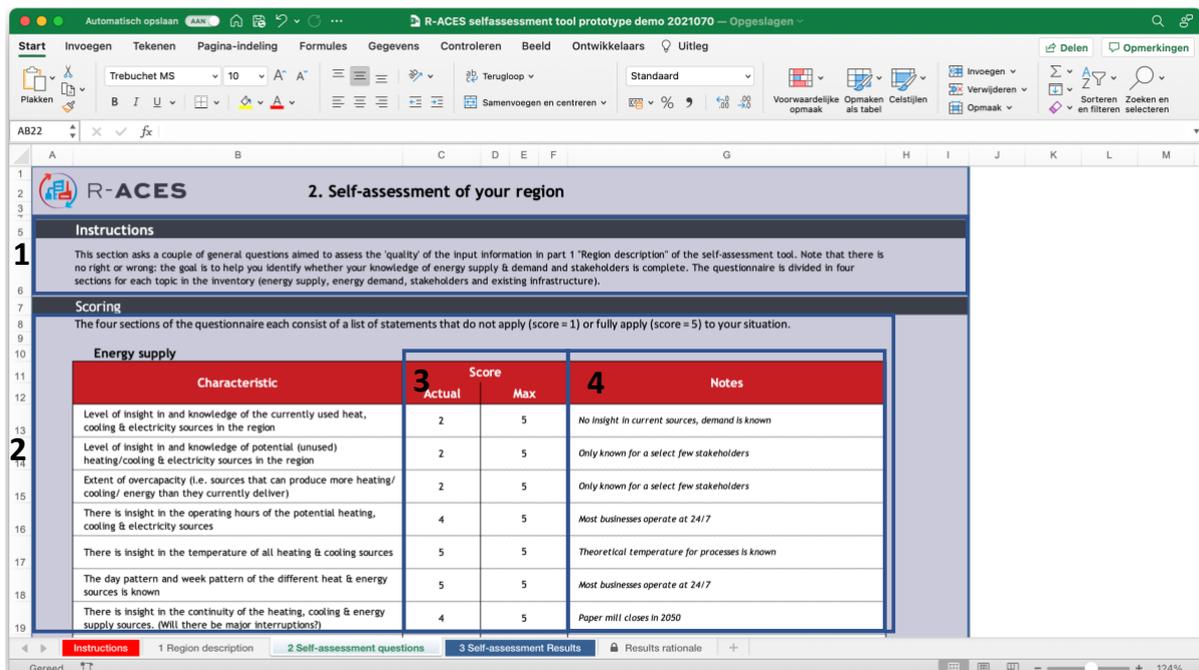


4. **Input field.** Users can fill in their input here by selecting the specific cells. The column titles and descriptions (for columns with an asterisk) describe the type of content for the input field. In some cases a unit (e.g. kWh) is provided.
5. **Total.** For some input fields, there is a cell in this row that totals a number. For example the total yearly energy production in kWh. Some of these cells are used in the Results section of the tool.

2. Self-Assessment questions

The second part of the tool consists of self-assessment questions. These questions measure the information quality and completeness for the region. The idea is that a user scores these questions on their own or together with the other stakeholders from the perspective of the region. E.g. the questionnaires can be filled in individually and then using the group average. Another possibility is to discuss the questions together with the stakeholders and agree on a value.

The starting screen looks like this. We will now explain some important elements.



1. **Instructions.** A short instruction for the Self-assessment questions.

- Self-assessment questions.** For Energy supply, demand, existing infrastructure and stakeholders there is a box with self-assessment questions, a field to score (3) and a field for notes (4).
- Score field.** In this column, for each statement, a score between 1 and 5 can be selected. A score of 1 means that the statement does not apply to your situation. A score of 5 means that the statement fully applies to your situation. The maximum score for each statement is set to 5 in the current version.
- Notes field.** In this column, for each statement, notes can be added. The field is formatted as an open text field with no limits.

3. Self-Assessment Results

In the third part of the tool, the results of the self-assessment are summarized and presented in a spider web diagram. The spider web diagram includes the total score of the four self-assessment question categories – energy supply, energy demand, existing infrastructure and stakeholders – as well as an indication of the electricity potential and the heating or cooling potential. The potentials are based on a simple analysis of the match between energy demand and energy supply, where a maximum score is given when the demand and supply are perfectly balanced. Finally, the tool also provides the user with suggestions based on whether the user has received a low score or a high score. A full overview of suggestions for either score is included in the tab 'Results rationale'.

The screen looks like this. We will now explain some important elements.

The screenshot shows the R-ACES self-assessment tool interface. The main content area is divided into several sections:

- Energy Management Self-Assessment Summary:** This section contains two tables. The first table, labeled 'Characteristic', shows scores for Energy supply (45), Energy demand (35), Stakeholders (35), and Existing infrastructure (25), with a total score of 45. The second table, labeled 'Region statistics', shows Total demand (7794700 kWh), Total supply (7941700 kWh), Gap/Potential (147000 kWh), and a score of 19 out of 30.
- Self-Assessment Score:** A spider web diagram showing the relative scores for each category.
- Results of the Self-Assessment:** A table with columns for Type, Score, and Max. It lists Energy supply (29/45), Energy demand (22/35), Stakeholders (8/35), and Existing infrastructure (5/25). Each row includes a 'Results rationale' text box.
- Instructions:** A bottom navigation bar with tabs for 'Instructions', '1 Region description', '2 Self-assessment questions', '3 Self-assessment Results', and 'Results rationale'.

- Self-assessment information.** In this field, a name for the ecoregion, date of completion and name of the user can be provided.
- Ecoregion statistics.** Here, the total demand and total supply in kWh is calculated using the Region description from the first part of the Self-Assessment Tool. The Gap / Potential is the difference between total demand and total supply. When the value is 0, there is a perfect balance between demand and supply, which will yield the maximum score of 30. If there is a gap between supply and demand, the score is reduced using two simple formulas:

- a. **When supply > demand:** $\text{Score} = \text{Max Score} * \text{Total demand} / \text{Total supply}$
- b. **When demand > supply:** $\text{Score} = \text{Max Score} * \text{Total demand} / \text{Total supply} * 0.75$

As you can see, an additional penalty (factor 0.75) is used when the demand > supply, since in this case there is a scarcity in energy supply.

3. **Spider web diagram.** The total scores of the self-assessment questions (part 2), the electricity potential and heating or cooling potential are visualized in a spider web diagram. The red diagram is the maximum possible diagram, the blue diagram displays the actual scores from the self-assessment.
4. **Self-assessment results.** Here, suggestions are automatically generated on how to further improve the data quality and completeness. For each category, there are two possible 'result rationales', one for a low score (< 33%) and one for a high score (> 33%).
5. **Read the full results rationale.** This button brings the user to the results rationale tab. Here all the possible outcomes of the self-assessment are listed.

4. Next steps

After having completed the R-ACES Self-Assessment, you will have an inventory of data in four categories that are important when exploring opportunities for energy exchange. Ideally, the process of collecting data (part 1), answering the self-assessment questions (part 2) and interpreting the results (part 3) is done together with the stakeholders in the region. In that case, the data is validated and useful for taking the next steps in designing new energy systems.

If this was not done, a (partially) completed self-assessment can also be discussed and validated afterwards.

The results page provides some suggestions on how data of the inventory can be improved based on answers in the self-assessment questionnaire. The suggestions are automatically generated and are by design generic. We hope that by answering the questions together with stakeholders and discussing the suggestions, more concrete next steps are determined.

Exporting your results

Microsoft Excel has a built-in print functionality. Where you can find this function depends on the version of Excel you are using, your operating system and language. Please consult the official Microsoft Excel documentation for further help.

We suggest to print in landscape format.

Alternatively, you can also save your progress on your hard disk.

Disclaimer

This is a user guide to the first public release of the R-ACES Self-Assessment Tool, published in May 2021 and available for download on the R-ACES website. The content of this user guide has been selected by the R-ACES consortium with the utmost care. In case of errors or when instructions are not clear, please contact christa.deruyter@ispt.eu.