Evaluation of the usability and usage of the integrated tool

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Document information

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Deliverable D5.13, Evaluation of the usability and usage of the integrated tool

1 TABLE OF CONTENTS

2 EXECUTIVE SUMMARY

This report describes the value of the integrated wind farm cluster design tool. Deliverable D5.12 shows the results of the scenarios. The present report contains the evaluation, implementations, and future perspectives. Thereto the evaluations as a result from user questionnaires as well as the evaluation reported in D5.12 based on test runs of various scenarios carried by WP5 participants are included.

The DTOC spin-off tool Wind & Economy is evaluated during the project by partners including industry participants. Additional user experiences are evaluated in D5.12 based on test runs of various scenarios made by EERA-DTOC participants.

Finally the future perspective beyond the project is integrated into the end-user questionnaire evaluation.

As main conclusions, the following points were highlighted as positive or as to-be-improved:

Main Positives

- Clearly arranged GUI, easy to use
- Excellent scenario management, good depth of information
- Integration of Google maps
- Fast and light user interface
- Video documentation as tutorials, steep learning curve
- Runs stable under Windows

Main drawbacks

- Problems using the tool under Linux/Mac platform
- VPN connection
    - Slow
    - Company restrictions
- QGIS
    - Learning QGIS is too complicated
    - Slow
    - Functionality for editing cable connections is not sufficient yet
- Reporting
    - Still limited
    - Scenario comparison missing
    - Many details missing in report

Future developments based on drawbacks

Commitment of software developers and design changes:

- Replace VPN connection by web services
- Faster connection to GIS via web/map service (instead of direct data base access)
- Tutorial for GIS usage and integration
- Extensive reporting of scenarios and scenario comparison

Wishes for future releases

- Extended reporting
- Calculate complete tree at once
- FAQ
- Better usability under Linux and Mac
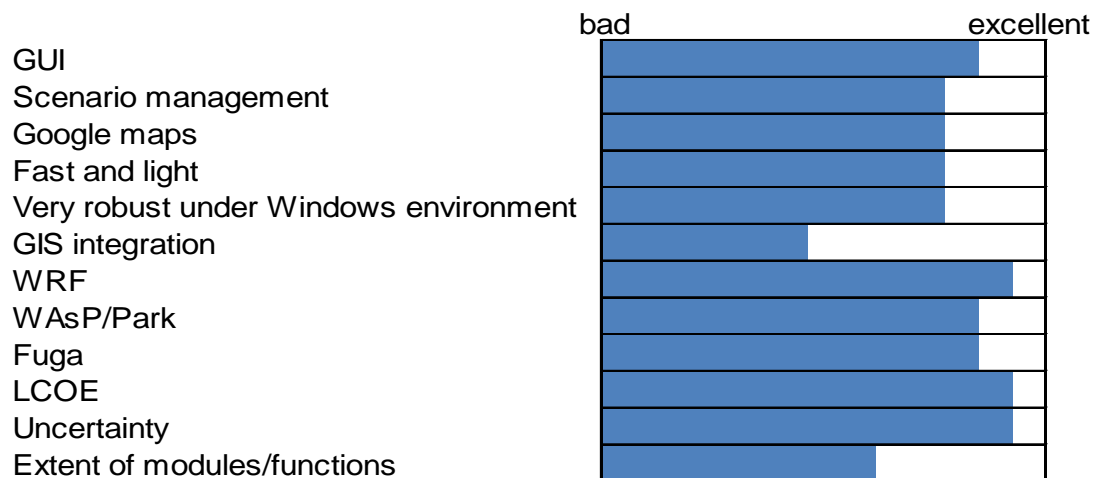- Future integration of electrical model

3 EERA-DTOC End User Questionnaire

In the following a summary of the end user questionnaire, which was handed out to all EERA-DTOC partners, is shown.
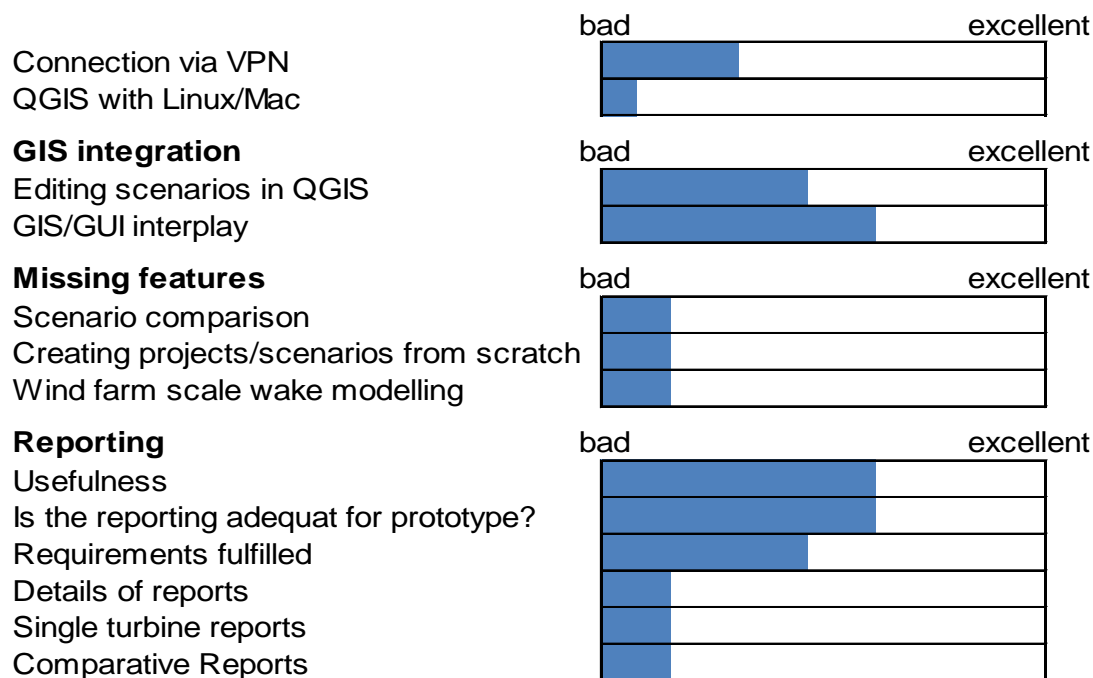
The detailed analysis of answers and the questionnaire template can be found in the Appendix document

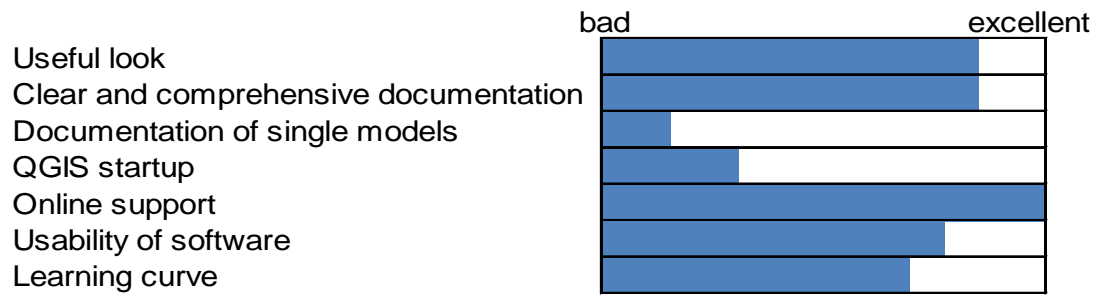Number of completed questionnaires: 7

What is implemented in a good way?

bad   excellent

GUI
Scenario management
Google maps
Fast and light
Very robust under Windows environment
GIS integration
WRF
WAsP/Park
Fuga
LCOE
Uncertainty
Extent of modules/functions

What should be improved?

bad   excellent

Connection via VPN
QGIS with Linux/Mac

GIS integration   bad   excellent
Editing scenarios in QGIS
GIS/GUI interplay

Missing features   bad   excellent
Scenario comparison
Creating projects/scenarios from scratch
Wind farm scale wake modelling

Reporting   bad   excellent
Usefulness
Is the reporting adequat for prototype?
Requirements fulfilled
Details of reports
Single turbine reports
Comparative Reports

System experience

	bad		excellent
Useful look			
Clear and comprehensive documentation			
Documentation of single models			
QGIS startup			
Online support			
Usability of software			
Learning curve			

4 RESULTS FROM EERA-DTOC TEST RUNS

Several parties carried out calculations with the software. These results are summarized in D5.12. Thereto a test matrix has been defined with which user stories and scenarios were divided over the partners. All parties were asked to report the results of their calculations in a prescribed format so that a consistent and comparable set of user reports has been obtained.

One of the main obstacles for a thorough testing was formed by remote access problems, since firewall problems prevented many users to run the tool from their offices. These problems could sometimes be solved through workarounds.

Generally speaking the users reported positive experiences, with easy installation (apart from the firewall problems) and a steep learning curve. The QGIS was sometimes mentioned to have long runtimes.

Most results which have been obtained were believed to be realistic. In many cases a comparison was made between Fuga and WAsP leading to a reasonable to good mutual agreement. Interfacing to other tools was however not possible yet from the EERA-DTOC tool by which the users who wanted to run other models than Fuga and WAsP had to run these cases off-line.

Very interesting was a study on the near future scenario in which the production was compared of a wind farm consisting of INNWIND.EU turbines and the production of the farm where the turbines were replaced by low induction (and higher diameter) AVATAR turbines. The farm with AVATAR turbines led to a higher gross energy production (as expected from the larger turbine) but also to lower wake losses which are attributed to the design concept (low induction) of the AVATAR turbine. The results of this study will be communicated to the AVATAR project.

Moreover a large number of observations were made which sometimes led to improvement of the tool, e.g.

- Too little detail in output results (largely solved)
- Expiry of licences without notice (solved)
- The use of an unconventional turbine type (i.e. the AVATAR turbine) led to unrealistic results (solved)
- The user story which investigates the effect of different turbine heights led to unrealistic cost variations, since the effect of tower height on turbine costs is not included yet.
- Some functionality didn't work on Unix, Mac (solved)
- Some puzzling results were found on the gross energy yield (still under investigation)
- It was found that the wind resource has to be changed at least once in the wind resource manager to get the correct wind resource even if other wind data are pre-selected in the GUI. This is an initialisation / misconfiguration problem. (Users have been informed on this).

5 CONCLUSIONS

The tool has been used extensively for testing by the user community. Usability and fitness for purpose was generally good, but a number of issues held up the progress. Most of these issues were resolved underway, and the remaining ones are being resolved for the commercial launch.