Web Consultation – Desired characteristics for open-source FlexPlan.jl library release

Feedback was received from the following experts:

- Emil Hillberg (RISE)
- Paul Hines (Packetized Energy)
- Jan Segerstam (ENERIM)
- Tim Schittekatte (FSR)
- Stamatios Chondrogiannis (JRC)
- Hendrik Natemeyer (Amprion)
- Sven Flake (OPTANO GmbH)
- Evangelos Vrettos (SwissGrid)
- Michel Noussans (FEEM)
- Qian Dai (China Electric Power Research Institute)

Question 1: How is the willingness in your organization w.r.t. usage of open-source models?

Summary of received feedback:

Four out of the ten respondents indicated that open-source software is effectively used in their organisations, two respondents have indicated that there is strong support and limited internal use, and four respondents have stated that they are not using open-source software at the moment.

Critical analysis:

We observe that the use of open-source models depends strongly on the type of business of the respondents. Research institutes and small and medium sized enterprises are more in favour of using open-source software more than utilities and commercial software providers (as their business is to sell their own software). The main barriers are of using open-source models / software is given below.

Question 2: If they are not used at the moment, what are the main reasons / barriers for that?

Summary of received feedback:

The main barriers have been identified as, concerns about security, lack of customer support and trainings, concerns about methodological, mathematical and computational robustness of the open-source models, lock-in effects within the respective organisations (e.g., with specific software tools and languages). One respondent has also indicated that no software development is performed within his organisation.

Critical analysis:

The most frequent concerns have been identified as security concerns and support. For research grade open-source software, one solution could be to provide tools which do not have to rely on the transfer of sensitive data, or to use trusted security protocols to do so. A second take-away is that for robust open-source models, continued maintenance after the finish of the research projects is required to provide the necessary support. This way the community can be enlarged, and usage of open-source models facilitated.

Question 3: Are you developing / contributing to open-source software?

Summary of received feedback:

Most of the respondents using open-source software have stated that they are also contributing to open-source software development.

Critical analysis:

This is a very encouraging result, as it proves that useful open-source models can be picked up and further improved by the industry for future applications.

Question 4: What are the most important selection criteria for you / your organization to use open-source models? – Please rank following options

- Quality of documentation
- Availability of tutorials
- Frequency of model updates / releases
- Number / variety of data interfacing options
- Customizability of the model
- Computational performance

Summary of received feedback:

The most important selection criteria for the usage of open-source software have been ranked as follows based on the different responses received:

1. Quality of documentation
2. Customizability of the models
3. Computational performance
4. Number / variety of interfacing options
5. Frequency of model updates and releases
6. Availability of tutorial

In addition, following other rankings criteria have been proposed:

- Fitness for the solution of the problem at hand
- Terms of licensing
- Maintenance of the open-source models
- Quality of the results

Critical analysis:

Based on the results received, focus will be given on providing high quality documentation of the FlexPlan.jl package before release. With respect to customizability, FlexPlan.jl follows the same design guidelines of the PowerModels.jl environment, and as such provides and easily customizable solution. The FlexPlan model also makes use of a number of decomposition techniques and interfaces to a number of different optimisation solvers to achieve computational performance. The quality of the results should be ensured on a number of test cases solved, and maintenance should be continued after the end of the project.

Additional feedback recieved:

It has been suggested by one respondent to consider Julia based tools from LANL, e.g., PowerModels.jl and PowerModelsDistribution.jl. We are happy to announce that FlexPlan.jl is using PowerModels.jl and PowerModelsACDC.jl as the underlying libraries and the same design guidelines.