CONSENSUS EVALUATION REPORT

GENERAL OVERVIEW

Open Call Collection	*OC-2019-1*
Proposal Reference	*OC-2019-1-23996*
Proposal Title	*Open Source Energy Models, Data and Evaluations*
Proposal Acronym	*OSEMoDE*
Review Panel	*RP 2 - Information and Communications Technologies related sciences and applications, targeting to advance and empower the society of tomorrow*
Evaluation Status	*Final*

EVALUATION

SUMMARY TABLE

S&T EXCELLENCE			NETWORKING EXCELLENCE			IMPACT			IMPLEMENTATION	Marks
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
4	4	3	4	4	4	3	4	4	4	38

COMMENTS

S&T EXCELLENCE

Soundness of the Challenge

Q1 - Does the proposal demonstrate a comprehensive command of the state of the art in the field and present a relevant and timely challenge?	Mark
The proposal addresses this question in a very good manner. Main strengths: The proposal presents a comprehensive review of the state of the art. It identifies major challenges for the reproducibility and explainability of energy systems modelling research outputs and results. They highlight the wasted effort in data gathering and set-up time for new researchers to understand existing models and data. They highlight that it takes time to understand the functionality, assumptions and algorithmic approaches of available models. The review identifies three areas of opportunity: namely data, models, and evaluation metrics. In relation to data, the proposal identifies the types, and some existing data sources, that are needed to support the assessment of energy systems transformation plans. They highlight the importance of uniform data formats to facilitate interoperability and exchange between coupled models. There are many classifications of "models". The proposal groups what they regard as the relevant energy systems models into clusters based on 1) geographic, sector, and time resolution; 2) methodology (optimisation, simulation focus etc). They note the growing complexity of such models, and that cross-sectorial model coupling can be facilitated through open source models. Finally, they note the issue of evaluation: how can research results be validated and compared across different sectors and modelling approaches. They highlight a number of quantitative model comparison initiatives.	4

The proposal would benefit from certain improvements: The proposal makes reference to energy models. In fact, energy models include wide areas of research. It would be better to focus on specific areas and try to solve the problem for one or a few research topics. The reason lies in the fact that to make available data and models is very difficult when companies are involved. Moreover, it is difficult to generalize for many research areas.	

Progress beyond the state-of-the-art

Q2 - Does the proposal describe an innovative approach to the challenge that advances the state of the art in the field?	**Mark**
The proposal addresses this question in a very good manner. Main strengths: Having highlighted the challenges and opportunities, the proposal describes their Action to fund networking and a knowledge curation initiative. This is an excellent idea. The proposal notes the many open energy data and modelling initiatives and describes how they plan to act as a central hub to act as both a repository, but also a living model/data/knowledge platform, with the consortium acting as moderator/regulators of their platform/wiki. They list four main objectives to address the challenges they have identified: i) Open energy data and models: they note the lack of sufficient model documentation. Where models and data are made available they do not necessarily follow best practice, such as standardised meta-data descriptors, common interface or user guides. This limits the opportunities for re-use, and means wasted effort to understand the data and/or model functionality, assumptions and methodology; ii) Increased complexity and interconnectivity requirements: the end-to-end energy transformation impacts require tractable high resolution (geographic and temporal) models; iii) Transparency: trust in the assessment of research outputs can only be achieved if they can be validated and reproduced and; iv) Fragmentation: linking the above concerns, the proposal justifies its aim to support the open energy systems modelling community. The proposal would benefit from certain improvements: Optimization tools are mentioned but the approach to solving the problem of open-access is not detailed. This is a crucial point because it is necessary to use programming languages that call open access libraries or to develop methods of solution. It is necessary to explain the process the proposers want to follow. The innovative approach is limited only to define model comparison metrics. No clear progress beyond the state of the art is explicitly claimed by the proposal.	4

Q3 - Are the objectives presented relevant to the challenge, clear and ambitious?	**Mark**
The proposal addresses this question in a good manner. Main strengths: The proposal aims to operate a crowdsourcing or community effort to achieve its stated aims. This has the advantage of being openly accessible to anyone and allows a broad range of interested parties to share their expertise. They document their approach by facilitating crowdsourcing/ a community approach; providing an IT platform to support the research and innovation community; providing "standardised" model comparison metrics; and supporting the FAIR philosophy. Three working groups are proposed to implement the project objectives. Each has clear objectives and time-stamped deliverables. Networking, schools and training are the actions described in the proposal to achieve the project aims. In respect of WG2 (Models), it is advisable enhancing the work by adopting practices in the computer science and operational research communities to define exactly what each "model" is and does, as well as facilitating the idea of model-coupling through standardised interfaces. This is a significant ambitious, but	3

worthwhile challenge.

The proposal has some weaknesses and the following improvements are necessary: The objectives presented are not sufficiently ambitious. The objectives are not described in a “SMART" way. The objectives are not measurable, and no information about the timely is presented. The objectives concerning the "Capacity-building" presented in Section 1.2.2.2. are not suitable for this criterion, while they speak about workshops, meetings, Training Schools. The area "energy models" is too wide. For example, only smart grids could be a very wide area and very complex task because it should be necessary to include actively distribution and transmission systems operators. Here the area seems really wider. It would be necessary to focus on a specific topic.	

NETWORKING EXCELLENCE

Added value of networking in S&T Excellence

Q4 - Does networking bring added value in tackling the challenge in relation to existing efforts at the European and/or international level?	**Mark**
The proposal addresses this question in a very good manner. Main strengths: The proposal addresses very well this criterion. The proposal considers the cooperation with some of the existing initiatives in the energy models domain at the European and international level, as well as with some scientific communities interested in this problem. It also shows how their platform will be used to disseminate data and models and make such work available to all interested parties beyond the consortium. Some EU countries are more advanced in their energy systems transformation. Harnessing the insights from that research and innovation will allow other countries to learn and adapt the open/shared data and models and results to their own geographic and demographic situations. The proposal would benefit from certain improvements: The added value brought by the proposal is not clearly highlighted in relation to the existing efforts.	4

Added value of networking in Impact

Q5 - Does the proposed network contain, or present a credible plan for securing, the critical mass and expertise for achieving the objectives and thus addressing the challenge?	**Mark**
The proposal addresses this question in a very good manner. Main strengths: The proposal addresses this question in a very good manner. The proposal names the type of participants already in the consortium. It contains a wide range of people across disciplines, genders and career stages. The proposal has clear ideas about how the expertise in the consortium can be both shared and enhanced within the consortium networking activities. The proposed network contains a credible structure for securing the critical mass and expertise for achieving the declared objectives. So, from the total of 52 proposers involved, the ratio between research-oriented and education-oriented proposers is 22/19, a very balanced one. The structure of the consortium is also very good, having 19.2% Electrical engineering, electronic engineering, Information engineering, 17.3% Mechanical engineering, 17.3% Other engineering and technologies, 15.4% Economics and business, 11.5% Environmental engineering, 15.2% Other, 3.8% Unspecified. The proposal lists a good spread already in its consortium and identifies the other major stakeholders who would have an interest in their work. It is worth noting that the international organisation listed (Eg ENTSOE, EDSO, ACER etc) already have significant calls for their time and expertise. It would be useful to think carefully about how the relationship is managed.	4

Likewise with the invitation to the general public, the bigger the network, the harder to ensure consensus and assure the quality of the outputs.

The proposal would benefit from certain improvements: There is a relative low percentage of companies. It is good to have the inclusion of a major industry application but it is not clear which are sectors involved. Even if the consortium itself has a good heterogeneous structure, including a lot of specialities, from a lot of countries, from different types of organisations, there is not presented something having the nature of a plan that would secure the critical mass of necessary experts with the necessary expertise. Moreover, the competences seem very general covering many fields of research. It would be better to focus on specific competences (interdisciplinary as well), focused on a specific area of energy.	

Q6 - Does the proposal identify the most relevant stakeholders and present a clear plan to involve them as Action's participants?	**Mark**
The proposal addresses this question in a very good manner. Main strengths: The number of stakeholders is adequate and the quality of stakeholders excellent. The proposal presents very well the main categories of relevant stakeholders that could be involved in the Action. For each type of stakeholder are also presented clear measures to involve them in the Action. The proposal would benefit from certain improvements: The involvement of the stakeholders is limited to participation at public events as meetings and workshops. One could think about including them in the proposal.	4

IMPACT

Impact to science, society and competitiveness, and potential for innovation/break-throughs

Q7 - Does the proposal clearly identify relevant and realistic impacts for science, society and/or competitiveness (including potential innovations and/or breakthroughs)?	**Mark**
The proposal addresses this question in a good manner. Main strengths: The proposal identifies a gap not currently addressed by COST Actions. If successful, this project will enhance participation in the energy system transformation. It will extract value from existing research works, and so speed up time to production for other researchers and their projects. The proposal has identified a very significant set of challenges and opportunities but will find the synthesis of data and models on its own platform a challenge to achieve. The FAIR philosophy/movement will support this project. The consortium has noted they plan to use a crowdsourcing/community approach over the time-span of the COST Action. If successful the outputs will facilitate further research and innovation. The openness of the proposed platform will facilitate innovation from outside academic and research institutions, and large industry. The proposal very well identifies relevant and realistic impacts on science and society. The proposal has some weaknesses and the following improvements are necessary: The application area is too wide in order to achieve credible results. More thought is needed to ensure the sustainability of the project deliverable after the project end. The strength and the weaknesses of existing models do not depend only by metrics but on specific assumptions on the physical behaviour and on the availability of data. The choice of a specific model in a specific domain is crucial. Moreover, it is not mentioned if attention will be focused on physically-based models or on black-box models or grey models. Moreover, depending on the techniques of solving optimization models, different tools, programming languages and algorithms should be used.	3

It is not clear how and with which tools the emission reduction will be reached. The proposal does not present any impact on competitiveness. There are no clear potential innovations mentioned.

Measures to maximise impact

Q8 - Does the proposed networking clearly contribute to knowledge creation, transfer of knowledge and career development?	Mark
The proposal addresses this question in a very good manner. Main strengths: The proposal addresses this criterion very well. There are presented measures to ensure the availability of knowledge (open access to models, tutorials, training and teaching material). There are also presented measures to ensure the transfer of knowledge to Early Career Investigators. The working groups of the proposal are clearly defined to support, create and disseminate knowledge about open energy data and energy models. They point out that curating these resources will reduce the duplication of time and effort to access appropriate high quality, high-resolution data sets for the analysis and evaluation of future energy systems models. The idea to curate such data and models should facilitate the growth in knowledge about what these models do, and how they work. This will then be useful, particularly to early-stage researchers, to generate an understanding of good practices in documentation and life cycle management. In turn, this will facilitate faster research and innovation which will support career development. The set of networking events, if successful, will work well to foster a sense of community within the Action. The proposal lists how additional stakeholders will be invited to participate in networking. This mechanism will, if successful, support the transfer of knowledge and expertise, and enhance career development opportunities both for the Action members and for the wider community through the availability of the resources on their platform. The proposal would benefit from certain improvements: There are no clear ideas for contributing to knowledge creation. Also, no measures are presented for career development, others than Training Schools.	4

Q9 - Is the plan for dissemination and/or exploitation of results clear and attainable and does it contribute to the dialogue between science and the general public or policy?	Mark
The proposal addresses this question in a very good manner. Main strengths: The proposal addresses very well many different communication channels. The proposal's idea to use a crowdsourcing/community approach will, if successful, make energy data and models accessible. If well-curated, members of the general public and policymakers will be able to assess the validity of scientific claims themselves. The FAIR philosophy noted in the proposal aligns very well with the objective of making the resources reusable. The proposal would benefit from certain improvements: The plan for dissemination and exploitation of results is not very ambitious. Dissemination targets are not properly assumed (for example, articles written in quality specialized journals). Neither the activity of exploiting the results is clearly detailed, with no specific objectives.	4

IMPLEMENTATION

Coherence and effectiveness of the work plan

Q10 - Is the work plan (WGs, tasks, activities, timeframe, deliverables and risk analysis) appropriate to ensure the achievement of the objectives?	Mark
The proposal addresses this question in a very good manner. Main strengths: The criterion is addressed very well. The WGs, tasks, activities, time-frame, and deliverables are appropriate and can ensure the achievement of the proposal's objectives. The activity within each workgroup is clearly presented, with the related deliverables. There is a high-level project plan, with objectives and deliverables for each work package. The proposal also notes the strategy of using short term scientific missions to address sub-projects and achieve the overall project objectives. It would be useful to ensure the same principles of inclusiveness previously mentioned are adopted in the formation of the STSMs and to ensure that roles and responsibilities are clearly defined to avoid duplication of work, or allowing gaps to arise. The proposal would benefit from certain improvements: The activities presented reflect the idea of the whole project, but there is a lack of details on energy models and use cases. The risk analysis is presented in a very general manner, without risk probability and impact. The risks of difficult collaboration between a high number of organizations from many countries with different specificity have not been sufficiently analysed and taken into account.More thought is required on how a large consortium can be managed (using a flat hierarchy) to ensure all participants/stakeholders have their voice heard and can contribute their expertise. It is worth spending time at the outset of the Action to specify roles and responsibilities for all participants. This is of critical importance as the network size will be large. Thought should be given to creating a "participant manual" as new participants joining the Action at later stages will have missed any kick-off/induction activities.	4