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Considering flexibility in network expansion planning: present practices and regulatory conditions

Andrei Morch, SINTEF Energi AS, Norway

Nuno Amaro, R&D Nester, Portugal

Gianluigi Migliavacca, RSE S.p.A, Italy

FlexPlan in a nutshell

- The main objective of the project is development of a new planning methodology - Creation of a new tool for optimizing T&D grid planning, considering the placement of flexibility elements located both in transmission and distribution networks as an alternative to traditional grid planning: in particular, storage, demand response)
- H2020 project (2019-2022)
- Coordinated by RSE SpA (Italy)
- Participants:
 - Nine Research partners
 - Three TSOs
 - One DSO
 - Seven countries

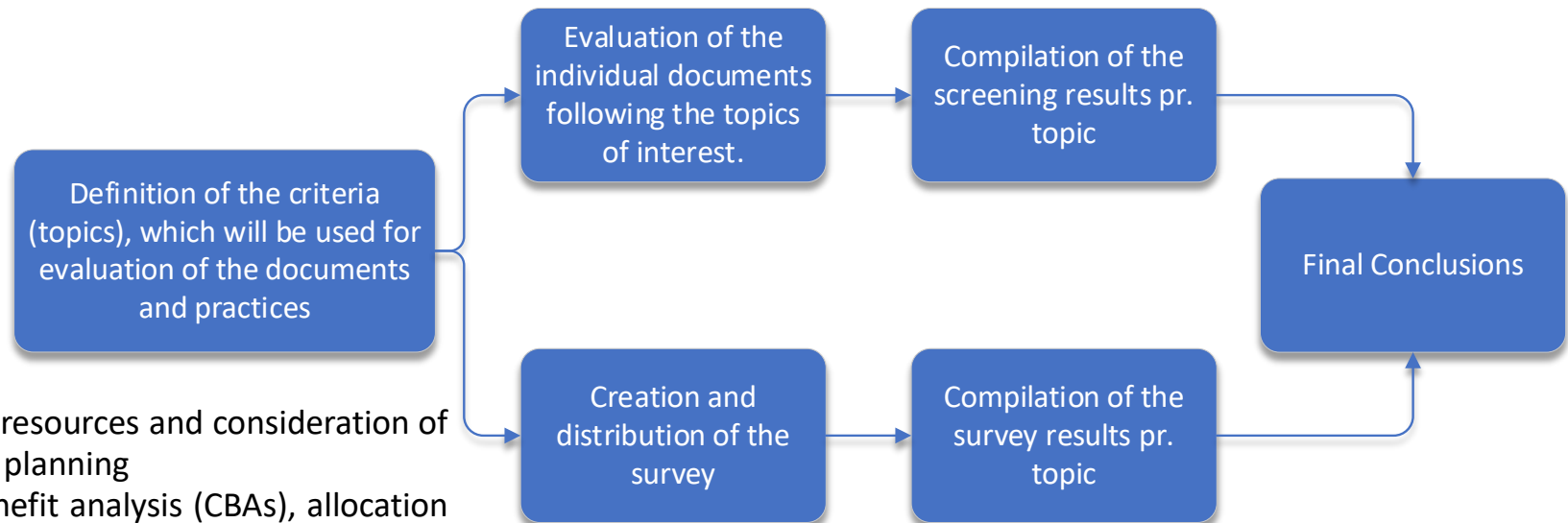


Objectives of the study

- Aim of this screening is to get a picture of the present overall pan-European regulation and political targets to ensure that the subsequent project activities are correctly oriented
- Additional objective is to analyse the existing regulation, identify possible regulatory gaps and raise the need for the consideration of additional topics in future regulation (by the end of the project)

The screening methodology

- The European Commission (EC): Directives and Regulations, including Network Codes (NCs)/Guidelines
- ENTSO-E: NCs/Guidelines, including standard methods for cost-benefit analysis
- Interest organisations and associations as Eurelectric, E.DSO, GEODE and CEDEC



- Flexible resources and consideration of these in planning
- Cost-benefit analysis (CBAs), allocation of costs, criteria for evaluation of new projects
- Interaction between TSOs and DSOs, including planning, sharing of resources, roles and responsibilities
- Other subjects, including incentive mechanisms, criteria for development of scenarios, reliability criteria, etc.

- Three TSOs
- Four DSOs

Requirements related to consideration of flexible resources in planning

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- Internal Electricity Market (IEM) Directive (2019/944):
 - Requires that distribution network development plan shall also **consider demand response, energy efficiency, energy storage facilities or other resources** that the DSO has to use as an alternative to system expansion
 - TSOs shall fully take into account the potential for the use of demand response, energy storage facilities or other resources as alternatives to system expansion when elaborating Ten-Year Network Development Plan (TYNDP)
- The IEM Regulation (2019/943) requires that for integration of the growing share of renewable energy, the future electricity system should make use of **all available sources of flexibility**, particularly demand side solutions and energy storage
- The ENTSO-E's 3rd Guideline for Cost Benefit Analysis (CBA) of Grid Development Projects: **flexibility of demand** is considered as a consistent part of the estimation of the socio-economic welfare
- None of the survey responding System Operators (SOs) consider flexible resources in their current planning practices.



Ownership and operation of energy storage*

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- The most recent recast of the IEM Directive reaffirms the position stated before, which (as a general rule) does not allow SOs to own, develop, manage or operate energy storage facilities
- However, SOs are allowed to own, operate or manage such devices, among other conditions, if these devices are *“are fully integrated network components and the regulatory authority has granted its approval”*, which can pave the way for many exceptions
- The most recent version of the recasts has been partially modified, in order to take into account input coming from some stakeholders, among others Eurelectric, expending the possible terms of derogation for SOs for operational purposes
- It seems it could be possible to own and operate batteries for some new actors formalised in the IEM Directive, as active customers and possibly Citizens Energy Communities (CECs)



* the project does not aim at taking any specific position on this subject

Rules for TSO/DSO allocation of costs and incomes in new common investment projects

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- There is a clear message from the EC that socio-economic welfare should be taken as the main indicator for the prioritization of investments in new grid projects
- ENTSO-E has developed a CBA of Grid Development Projects, ensuring a common framework for multi-criteria CBA for TYNDP projects (ref. EU Regulation 347/2013)
- There are no commonly agreed rules for allocation of costs between TSOs and DSOs in common investment projects. Two different views presented in common "Data Management Report" (Use Case "Balancing")

DSO view: Balancing services based on assets connected on the DSO level should, for economic reasons, not lead to any additional constraints in DSO networks. If this is the case, TSO and the market actor interested in using this asset connected to the DSO network on the balancing market **should cover the full costs of any grid enforcement** according to the national regulations on the allocation of network expansion costs.)

TSO view: In case of additional constraints in DSO's networks, a regulatory framework should be established in which the **compromise** between the additional value of the flexibility not available to the balancing markets due to these constraints and the network expansion that resolves those congestions is evaluated and, in any case, ensures a proper allocation of the corresponding additional costs.

Sharing of resources between TSO and DSO: what are the priorities?

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- The IEM Directive defines that **DSOs shall cooperate with TSOs** for the effective involvement of market participants connected to their grid in retail, wholesale and balancing markets. Delivery of balancing services stemming from resources located in the distribution system shall be agreed with the relevant TSO.
- Further screening and survey of the present practice indicated that at present **there is no common regulatory or practice** background allowing to draw clear conclusions on this topic. The necessity of defining this is clearly highlighted both at the institutional level and by the stakeholders.

Conclusions

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- The EC proposes to consider the existing flexibility resources as a consistent part of network expansion planning and considering demand response and storage with the same priority as generation in dispatching and re-dispatching procedures
- Difficult to see any common well-established practice in Europe, meaning that the process is still under development
- Use of market-based mechanisms whenever possible is underlined in several regulatory documents with reference to many network operative aspects, e.g. for the procurement of resources for ancillary services
- EC shows a very pragmatic approach on several critical issues, as for example ownership and operation of energy storage
- There are several unresolved issues related to interaction between TSOs and DSOs, which have to be addressed. Otherwise these disagreements may potentially become show-stoppers in the future common projects
- The introduction of new actors e.g. CECs could change the landscape and roles/procedures applied both in the planning and in the operation phases

Thank you...

Andrei Z. Morch



Contact Information

Affiliation:	SINTEF Energy Research
Phone:	+47 93071718
Email:	andrei.morch@sintef.no

The FlexPlan web



- The official web site of the FlexPlan project is: <https://flexplan-project.eu/> All project news and other information are posted there
- Project brochure can be downloaded from: https://flexplan-project.eu/wp-content/uploads/2020/02/FlexPlan_brochure.pdf
- All project publications (deliverables, papers, important presentations) are publicly downloadable from: <https://flexplan-project.eu/publications/>

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