Grand Challenges i Wind Energy Science – Meeting the needs and services of the power system

General comment: the paper is well structured and a complete overview of the present status of wind plants services to the grid and their possible evolutions, challenges, and research needs. It is very useful not only to scientific community but to all wind energy stakeholders including policy makers.

Principal criteria	Excellent (1)	Good (2)	Fair (3)	Poor (4)
Scientific significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of of WES (substantial new concepts, ideas, methods, analyses, or data)?	X			
Scientific quality: Are the scientific approach and applied methods valid? Is sufficient information given so other researchers (in principle) can repeat the work? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?	X			
Presentation quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (abstract conveys efficiently the essence of the paper; number and quality of figures/tables; appropriate, fluent, and precise use of English language)?	X			

1. Does the paper address relevant scientific questions within the scope of WES? Yes, the paper presents an overview of the services that wind plants are or will be able to do to the grid and to the power system. This is a hot topic because wind energy is already well developed and a significant further growth is expected in the next decades with impacts on the power system.
2. Does the paper present novel concepts, ideas, tools, or data? Many concept are presented and broadly discussed, however the paper is not focused on one of them nor on presenting technical details.
3. Is the paper of broad international interest? Yes it is.
4. Are clear objectives and/or hypotheses put forward? Yes they are
5. Are the scientific methods valid and clear outlined to be reproduced? This is most an overview based on a high number of references
6. Are analyses and assumptions valid? Yes they are

7. Are the presented results sufficient to support the interpretations and associated discussion? Yes they are
8. Is the discussion relevant and backed up? Yes it is
9. Are accurate conclusions reached based on the presented results and discussion? Yes they are
10. Do the authors give proper credit to related and relevant work and clearly indicate their own original contribution? Yes they do
11. Does the title clearly reflect the contents of the paper and is it informative? Yes it does
12. Does the abstract provide a concise and complete summary, including quantitative results? Yes it does
13. Is the overall presentation well structured? Yes it is
14. Is the paper written concisely and to the point? It is not concisely because many concepts are presented, however there is the right space for each concept
15. Is the language fluent, precise, and grammatically correct? Yes it is
16. Are the figures and tables useful and all necessary? Yes they are
17. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used according to the author guidelines? Yes they are
18. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? NO
19. Are the number and quality of references appropriate? Yes they are
20. Is the amount and quality of supplementary material appropriate and of added value? na

Suggestions:

line75 to what the “realiability” is referred?

Page 5 Figure 1 is not clearly readible

Line 270 to which “their” is referred?

Page 305 I don’t seem to have found the definition of “capacity value”

Line 724 table 2 the second line of column “research and development needs” seems a rpetition of the first one