

Smart Energy Markets - *future electricity, gas and heating markets*

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This presentation introduces the concept of Smart energy markets. The implementation of future sustainable smart energy systems based on renewable energy cannot be implemented without addressing the issue of how to re-design existing electricity and gas markets. Moreover, markets for heating and transport fuels will also be challenged.

In recent years, the re-design of the electricity market has attracted a lot of attention and research. Current electricity markets face a fundamental challenge as the transformation of energy systems lead to large-scale increases in wind and solar and gradually approach a 100% renewable energy solution. Increasing amounts of renewable electricity productions lead to an increase in hours of zero or very low prices and consequently may not be able to sustain new investments in power capacities. Especially, for 100% renewable energy systems, such challenge is fundamental.

However, the re-design of electricity markets, should not be seen isolated from the re-design of the other energy markets. This presentation, illustrate and quantify how future renewable heating, green gas and liquid fuel markets will influence the electricity markets and vice versa. The concept of smart energy markets expresses the idea that the inclusion of such mutual influence becomes essential in the design of future energy markets designs, if one wants to facilitate the transformation into smart energy systems based on renewable energy.