

Key Issues Paper: Incentive Scheme for 100% Renewable Combined Power Solutions

Starting Position:

The integration of the fluctuating renewable energies solar and wind is one of the key tasks for the expansion of renewable energies worldwide.

Renewable energies are able to provide the needed capacity and flexibility to maintain assured capacity when wind and solar power are weak. Therefore, investments in renewable energy sources should be considered as investments in technologies, which can compensate for fluctuation, provide capacity and ensure grid stability.

Such technologies are available and applicable for real or virtual combined power solutions. Investments in an intelligent 100% renewable energy mix can provide the necessary requirements to ensure balance, full supply at any time and system services. Solar, wind, bioenergy and geothermal energy generation in combination with power transformers, power storages (batteries, pumped-storage, power to gas, biochar...) and heat storages (ice storage, geothermal heat storage, water storage, molten salt storage...), which are supplemented by new technologies for system stability (frequency and tension stability, reactive current generation, black start capacity...), can meet all requirements for network integrity and for the provision of capacity in a local context.

An issue of more recent concern are solutions combining power, heat and mobility. Small and large scale sector coupling power plants, which cover a wide range of all sectors (combined power solutions), are the basis for the extension of regional energy cells. Transforming to a 100% renewable energy transition in all energy sectors is much cheaper in energy cells than in a domestic context. There is a significant cost reduction on the distribution system level for regionally organized balanced energy systems. Thus, the extension of high voltage transmission lines can be reduced.

Solution:

- New creation of an incentive scheme for combined 100% renewable combined power solutions
- Power input according to standard load profile

A new tariff for combined 100% renewable combined power solutions, which balance out fluctuation and minimize the tasks of the network operators in their supply area, will be introduced.

Requirements:

1. Power is generated from 100% renewable energies. The investor can decide on the mix of technologies.
2. The power input has to be year-round on a quarter hourly basis according to the standard load profile or has to completely cover the electricity consumer's consumption.
3. Any income derived from heat sales is not taken into account.
4. The operator of a combined power solution has to arrange investments in storage technologies (heat, power) and other innovative developments on his own to improve market opportunities.

Marketing of Combined Power Solutions' Power

The power will be marketed through the following models. Power must not be fed into the public grid beyond these models.

- a) Combined power solution feed in tariff: The fed-in power is remunerated with the normal feed in tariff. The operator has to prove that the solution meets the requirements. Short-term technical malfunctions need not be counteracted by the operator.
- b) Self-consumption.
- c) Regional direct marketing: The operator of a combined power solution sells the power to local and regional customers. The requirement is the customer is supplied with renewable energy only based on load profile, year-round on quarter hourly basis except for technical malfunctions. The payment is negotiated between producer and customer. Combined power solutions can be linked virtually in a spatial context.
- d) Combination of a), b) and c) in accordance with the specific requirements.

Impacts and Benefits of an Incentive Scheme for 100% Renewable Combined Power Solutions

The dynamic extension of combined 100% renewable combined power solutions has many advantages:

- The grid extension at regional level, medium-voltage-level and 110kV-AC-voltage-level will be reduced significantly.
- Investments in grid system services will be minimized, which reduces overall costs as well.
- Public and private costs of provision for old power plants will be reduced step by step.
- Energy-sector companies can extend business activities, increase local value and create new jobs in the energy sector, especially in the renewable energy sector.
- The use of renewable heat will be supported because power to heat is indispensable for profitable combined power solutions. The same applies to electric mobility.
- Climate protection and CO₂-reduction in all sectors (heat, cooling, mobility) will be achieved through investments in the power sector.
- Security of electricity supply increases due to the decentralized capacities, storages and system services resulting from the investments in the combined power solution operators. Investments in renewable energy sources create grid stability and flexibility and do not affect other stakeholders.

September 2016

Hans-Josef Fell
Member of German Parliament (1998-2013)