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EDITORIAL

A new era of renewable power plants?

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During 2016, the costs of electricity from renewable sources have fallen fast. Procurement of electricity from off-shore wind power in Europe resulted in successful bids dropping from 70€/MWh in July, to 60\$/MWh in September and then to a winning bid of only 50\$/MWh at Kriegers Flak in November.

Similar auctions in Latin America and the Middle East have resulted in solar-PV prices falling from around 50\$/MWh in the early part of the year, to bids around 30/MWh at the end of the year or even report of a bid at 25\$/MWh for Abu Dhabi in September.

To see how rapid this price development is: Extrapolate over the coming year and both wind and solar electricity would come out at a price of 0 before the end of 2017. Though that will, of course, not happen.

However, an oil price at 50\$/barrel corresponds to an energy price of 30\$/MWh. With low thermal efficiency, oil has long been unable to compete for grid supply of electricity. But now, we have reached the moment when solar power plants may be built producing electricity at lower cost per unit energy than the energy content of crude oil.

Ideas about producing fuels using electricity to make energy-rich molecules able to substitute oil products in the transport sector have often been dismissed. The number of hours per year where the value of electricity has been low enough has been too small. As long as the average cost of renewable electricity was higher than the oil price, no-one could build the power plants if the number of hours grew.

However we may soon enter a period where renewable power plants may be built to produce fuels most of the time. Only when the value of electricity is particularly high, electricity will be fed into the grid instead of producing fuels.

These opportunities will open a new class of technologies for industrial scale engineering and learning that will bring costs down.

Research and engineering efforts were carried out in anticipation of this coming situation are now valuable. This is kind of research, carried out with foresight, we would like to disseminate.

Planning research with foresight and thinking in scenario terms is important: What research and engineering efforts are relevant if you pay only 50\$ for a battery than can store 1 kWh 25,000 times? What is relevant knowledge if solar PV panels cost as little as any facade material? And what if fusion will provide electricity at less than a cent per kWh?

This way of planning research is obvious to some. When the future role of wind generators and electric vehicles on a large scale in China was considered in a planning context the relevant elements and minerals were identified. Without rare earth metals the scenario could not be efficiently realised.

To Energy Science and Engineering this is relevant as it can speed up desirable development and avoid global development mistakes. High-quality research with such perspectives, we can make available with open access.