



LEHRSTUHL FÜR ENERGIEHANDEL UND FINANZDIENSTLEISTUNGEN LEHRSTUHL FÜRENERGIEWIRTSCHAFT Energy Finance / INREC 2010

Interaction of Spot and Future Prices of Electricity

Tobias Federico

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The most common expression regarding power price forecast in the market is "the best forecast of future electricity prices is the today's future derivative price".

This sentence is referring to the potential development of the yearly average spot price in the future in comparison to the today's traded derivative prices of a yearly delivery of electricity for the same period.

But how good has the forecast been and what type of models can be used in the electricity market to describe these interactions?



Forward Prices: What do they mean?

- The market price for Cal 09 Base on the 11.02.2008, is the average spot price (Phelix Base) on this day on the market for the year 2009.
- The same applies for Cal 09 Peak...





What is HPFC?



The Hourly Price Forward Curve is the present expectation for how the electricity prices will develop over a period of time in the future.

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Future Prices as Forecast





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hPFC Procedure Summary







Combination of demand curve and current future prices.

Usually used for Back-to-Back procurement, deviations still possible.

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Modelling power plant dispatch

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Merit Order

- availability renewables
- power plant DB
- efficiencies according to year of construction
- STMGC according to commodity prices

Power Demand

- regression analysis of daily average demand
- parameters: calendar and temperature data
- hourly load profile according to monthly day type

Power Plant Dispatch

hourly power plant dispatch with according market clearing price





Expected Spot Market Prices as Evaluation for Power Plants

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Source: Energy Brainpool



F1BY 2009 in 2008 Trading



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Interaction spot and future prices Page 10

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Hourly power price vs. wind power forecast

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Three legislative steps to bring power from renewables into the commercial market

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Allocation of EEG electricity	Allocation of EEG electricity physically to	Trading residuals	Refinancing the EEG feed-in-tariff
1 until July 31 st , 2009	municipalities as monthly constant base load EEG-band	OTC/EPEX (not regulated, approx. 1/3 of residuals on EEX spot auction)	Ø EEG tariff and power grid charge per kWh of consumption
2 since August 1 st , 2009	municipalities as monthly constant base load EEG-band	EPEX spot market only (price independent offers based on forecast of EEG power generation ±3,000.00 EUR/MWh Spot Auction ±9,999.99 EUR/MWh Intraday)	Ø EEG tariff and power grid charge per kWh of consumption
3 from January 1 st , 2010	EPEX spot market only (price independent offers based on forecast of EEG power generation -3,000.00 EUR/MWh Spot Auction down to -9,999.99 EUR/MWh Intraday) total EEG generation	EEG residuals none	EEG share 2.047 ctEUR/kWh of consumption (2010) and power grid charge (for EEG-balancing energy only)

Bringing EEG-electricity into the market offers economical stimuli to prepare the market for competitive electricity from renewables.

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October 4th, 2009: Extreme negative spot market prices

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Unlimited Bid of Renewable Energy on the EPEX Spot

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Interaction spot and future prices Page 16

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Forecasting Quality of F1BM two Month Ahead

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Is Everything Fundamental?

F1BY Jan 11 Price Development in 2010 60,00 55,00 [EUR/MWh] 45,00 40,00 23.02.2010 14.04.2010 23.01.2010 04.01.2010 03.06.2010 ×1,09,2010 Date **Tobias Federico** Interaction spot and future prices Energy Brainpool Page 18

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- Future price do show a strongly deviation from the spot prices
- Future prices are the expectation value of spot prices in the delivery period
- Beside of risk premium of weather risks, supply risks, convenience yield or security yields (for hedging purposes) legal changes in the spot market regime do affect the "forecasting" potential of future prices
- The market needs a much better understanding in the interaction of future and spot prices
- Scientific models should be applied soon in the standard procedure in evaluating supply contracts and power plant dispatching







www.energybrainpool.com