

Trading Fundamentals – The Importance of Forward Curves

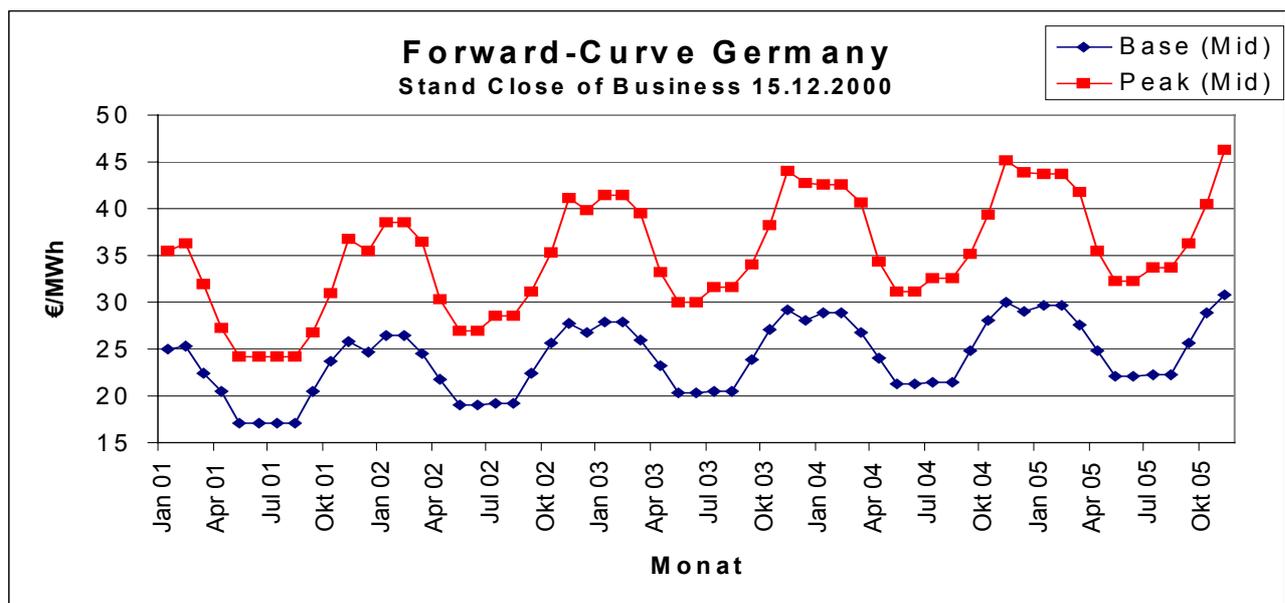
Not long ago, forward curves were unheard of in the European gas and power markets. Today, however, they are one of the key decision factors in buying and selling energy (be this power, gas, oil or coal), and even in investment decisions. The following paper discusses where they come from and what they really mean. The paper focuses on power markets in Europe.

Spot Markets and Forward Markets

Prices at the European spot markets for power have always been extremely volatile. Companies that want to protect themselves against this volatility can, in today's markets, buy or sell power forward, i.e. for future months or years rather than for the next day. Doing this can reduce their risks, and steady their cash flows and/or their margins. Such forward power is traded via the telephone in bilateral transactions (so-called „Over The Counter“ or OTC, usually through the intermediation of a broker), or it is traded through futures markets such as Nordpool or the EEX.

Deriving the Forward Curve

Traders active in the OTC or futures markets will have a good understanding of the price for forward power – for example, at any given point in time in January they will be able to say how much baseload or peakload costs for February, for March, for the next quarters, for the rest of the year and for the next years. Based upon statistical analysis of historical data and their experience traders can then, once they know the price for say 2004, extrapolate prices for individual months, weeks, days, and even hours, inside of 2004. The graphical representation of these current forward prices is called the forward curve. A typical example for the Close of Business on December 15, 2000 is shown below.



Since prices change all the time, so does the current forward curve – „the“ forward curve does not exist, one can only say „the forward curve at such and such point in time“. Forward curves are quoted in industry journals on a daily basis (e.g. Platt's European Power Daily) or in newspapers to the extent the forward trade takes place on exchanges, and with news providers like Bloomberg or Reuters they can even be observed real time.

Forward Curves are influenced by a multitude of factors, which are mainly a function of regulation, technical factors, or stochastic. Forward curves change constantly because some of these underlying factors are highly unpredictable and change frequently:

- Regulation has a fundamental impact, as can be seen in Spain or the Netherlands, where market structure elements such as the stranded cost recovery mechanism (Spain) or so-called Protocol (NL) significantly influence price levels. Trading almost came to a halt in the UK when discussions regarding the New Energy Trading Agreement introduced significant uncertainty, and in Germany

power was traded in Großkrotzenburg under Verbände vereinbarung I and is now traded in „Germany, RWE Grid“ under Verbändevereinbarung II. Mis-regulation is also one of the root causes of the price levels and the price volatility in California.

- Technical factors include seasonalities (see example forward curve in the chart above), the structure of the power plants (thermal or hydro) and fuel costs, plant closures and construction, bottlenecks on the grid (e.g. to Italy) and the way these are being treated by the network operator, etc.
- Stochastic factors include weather, water levels, plant failures etc.

Driving the Forward Curve – Demand and Supply, and Price and Value

Forward Curves are fundamentally driven by demand and supply – producers offer certain volumes at certain prices, consumers buy certain volumes at certain prices. When the positions of producers and of consumers don't match traders step in by assuming risks that at a given point in time no one else wants to take. (This incidentally is a crucial macro-economic role that traders fulfil.)

In so doing traders frequently distinguish between „price“ and „value“ – if a trader thinks, based upon his analysis and experience, the value of, say, June Baseload is €20/MWh, but it trades at €18/MWh, then the trader should purchase June Baseload until the price goes up to €20/MWh as well. Doing so is, of course, speculative, because the market assesses the current worth of June Baseload to be €18/MWh. However, if many market participants (i.e. producers and consumers, too) are of the same opinion they will move the price up to the „correct“ level, and then naturally those that saw the initial „under-evaluation“ first made money in the process.

Relevance of Forward Curves

Forward Curves are extremely important, because they reflect the current price of a good. If a sales person sells below the current price, his firm loses money – with June Baseload traded at €18/MWh, selling below €18/MWh will result in lost opportunities even if generation costs were even less. Hence, the forward curve, or the current forward price, are not only a benchmark in the traded wholesale-markets, but have to be the benchmark in the retail-markets as well. Even for assets, whose value changes with the forward curve (power plants, refineries, oil or gas fields etc.), the current forward curve is one of the key input factors for evaluating such assets.

Also, forward curves are used for marking to market. Marking to market is a process that traders go through at the end of every day, whereby they have to prove to their managers that they have made money. Basically, the open positions of each trader are valued at current market prices. Revaluing the portfolio tomorrow will show whether the trader made or lost money. If one had 100 MW baseload for June (i.e. the trader is long 100 MW) which are worth €18/MWh today and €16.5/MWh tomorrow, the trader has lost more than 100.000€ in one day (720hours x 100 x €1,5/ MWh). This daily process imposes a high degree of rigour upon both the trader and his manager.

However, forward curves are frequently taken as a forecast of future prices – and that they are definitely not. No trader can with any degree of certainty predict the price of the dollar in three years, nor the price of power or oil next month. Forward prices are simply the current evaluation of all market intelligence of future prices – given current information the current forward price is currently the „best guess“ in the market. Since many people have invested large amounts of money in this market, it can be assumed to be a relatively informed best guess. Nonetheless, ex post this may not turn out to be the „correct“ guess, as any piece of new information will change that best guess. Still, at any point in time the forward curve is the best predictor, the „best guess“ that there is – however false it may turn out in retrospect.