The growing European weather derivatives market,
a European energy trader’s perspective

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PCE Investors Limited
To ensure you know about the weather hedging and trading opportunities available across Europe (and beyond)

To prevent problems like this:

Dong Rating Suffers as Wind Riskier Than Nuclear: Nordic Credit

May 1 (Bloomberg) -- Dong Energy A/S, the world’s biggest builder of offshore wind farms, is a riskier investment than Nordic peers more reliant on nuclear energy as its wind business threatens to hurt cash flow, Moody’s Investors Service said.

Dong, which aims to increase its wind-turbine capacity threefold by 2020, is rated Baa1 at Moody’s, three steps above junk and two levels below the A2 grade that Vattenfall AB of Sweden and Fortum Oyj of Finland enjoy. Fortum and Vattenfall are both betting on nuclear energy and hydro power.

“The main risk to Dong is the wind factor as it could be unpredictable and make cash flow more volatile,” Paul Lund, an analyst at Moody’s in London, said in an interview. “Dong may have an expectation of how much the wind will blow, but if it doesn’t in a particular year, they will make less money on them than they anticipate.”

Source: Bloomberg, Peter Levring, 1 May 2012
Cumulus is a weather and energy trading group, based in London but active globally

It expresses its award-winning expertise in two strategies - weather derivatives in the *Cumulus Fahrenheit Fund* and energy futures in the *Cumulus Energy Fund*

The nine-strong team has a combined 120 years of experience - 40 of it in weather derivatives

We are the market-maker for European weather derivatives on the CME and are an active member of the Weather Risk Management Association

The Cumulus funds are managed on the PCE Investors platform
I’m here to share experiences from very different perspectives:

PCE Investors (2005 onwards)
CIO, Cumulus Funds

Director of Environmental Financial Products

Credit Lyonnais (2002-2003)
Head of Weather Derivatives

Aquila Energy (2001-2002)
Weather Origination Manager

Founder and CEO

Weather Risk Management Association (2009 onwards, part-time)
Director
A Wide Variety of the Most Relevant Locations is Available on the CME

**European Cities**


- 24 US cities
- 6 Canadian cities
- 11 European cities
- 3 Japanese cities
- 3 Australian cities
WEATHER DERIVATIVES BACKGROUND AND HISTORY

Temperature Futures on the CME - 2010 & 2011 data

CME weather derivative volumes in 2010 & 2011, sources: CME and PCE / Cumulus
WEATHER DERIVATIVES BACKGROUND AND HISTORY

Temperature Futures on the CME - 2010 & 2011 data

77,814 European contracts traded on the CME in 2010 and 2011 (despite the absence of a market-maker at the time)

• Again, most related to energy (5,750 in summer, 24,599 in winter)

• This equals ~1,500 standard clips (50 lots, as that makes £1k /€1k per degree Celsius per day, given the ‘tick sizes’ of £20 or €20)
Temperature Futures on the CME - 2010 & 2011 data

CME weather derivative volumes in 2010 & 2011, sources: CME and PCE / Cumulus
Many European Energy Companies Now Manage their Weather Risk

In the year-ending March 2011, there were at least 634 OTC weather trades in Europe.

Energy companies represent a good portion of these trades (consistent with the seasonal breakdown: 123 summer and 511 winter).

The total risk transferred through these contracts was ~$1.5bn.

Sources: PwC (on behalf of the Weather Risk Management Association) and PCE / Cumulus
Many European Energy Companies Now Manage their Weather Risk (2)

Europe is a solid 64% of the global OTC weather market

However, it’s currently only 10% (up from 7%) of the global weather futures market, so only 21% (up from 18%) of the overall global weather market, leaving plenty of room for growth

It’s particularly important to note that the market depth is far larger – if the parties like the price and face a large risk then hundreds of millions of euros of capacity is available for single OTC trades

Data from year ending March 2011
Sources: PwC (on behalf of the Weather Risk Management Association) and PCE / Cumulus
## Market Conventions

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Europe</th>
</tr>
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<tbody>
<tr>
<td>Active since</td>
<td>1996</td>
<td>1998</td>
</tr>
<tr>
<td>CME-listed since</td>
<td>1999</td>
<td>2003</td>
</tr>
<tr>
<td>Execution</td>
<td>Brokers and CME screen</td>
<td>Brokers, Auctions and CME screen*</td>
</tr>
<tr>
<td>Main Winter index</td>
<td>Heating Degree Days</td>
<td>Heating Degree Days</td>
</tr>
<tr>
<td>Main Summer index</td>
<td>Cooling Degree Days</td>
<td>Cumulative Average Temperature</td>
</tr>
<tr>
<td>Temperature measure</td>
<td>Fahrenheit</td>
<td>Celsius</td>
</tr>
<tr>
<td>Threshold</td>
<td>65F</td>
<td>18C</td>
</tr>
<tr>
<td>Tick size</td>
<td>USD 20</td>
<td>GBP 20 / EUR 20</td>
</tr>
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</table>

* since Cumulus became the market-maker in 2011
## Auctions are a Major and Expanding Part of the European Weather Market

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>2008</td>
<td>Feb</td>
<td>Barcelona &amp; Madrid</td>
</tr>
<tr>
<td></td>
<td>Apr</td>
<td>Rome</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>Rome, Barcelona &amp; Madrid</td>
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<td></td>
<td>Oct</td>
<td>Paris</td>
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<tr>
<td></td>
<td>Oct</td>
<td>London &amp; Amsterdam</td>
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<tr>
<td>2009</td>
<td>Oct</td>
<td>London</td>
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<tr>
<td></td>
<td>Nov</td>
<td>London</td>
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<tr>
<td>2010</td>
<td>Mar</td>
<td>London</td>
</tr>
<tr>
<td></td>
<td>Apr</td>
<td>London, Paris, Essen &amp; Amsterdam</td>
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<tr>
<td></td>
<td>Nov</td>
<td>Paris</td>
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<tr>
<td></td>
<td>Nov</td>
<td>Oslo</td>
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<td></td>
<td>Dec</td>
<td>Oslo</td>
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<tr>
<td>2011</td>
<td>Jan</td>
<td>Amsterdam</td>
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<td></td>
<td>Feb</td>
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<td>Jun</td>
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<td>Essen</td>
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<tr>
<td>2012</td>
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<td>Essen &amp; London</td>
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<tr>
<td></td>
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<td>London</td>
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<tr>
<td></td>
<td>Mar</td>
<td>Amsterdam &amp; Essen</td>
</tr>
</tbody>
</table>

This list excludes a number of other auctions, often in even larger size, conducted privately in the OTC market.
Why is the US Weather Market 4 Times Larger?

- Energy consumption (population and intensity)
- US natural gas trading (speculators are active risk managers)
- More weather volatility (really?)
- Liquidity breeds liquidity
- Cultural differences (sources of finance drive hedging behaviour)
- Less credit risk (preference for futures over OTC)
- Maybe it isn’t? (different views on comparing OTC and CME trade sizes)
- Who cares anyway? (cf equity market volumes)
UK Natural Gas Hedge

UK Gas Suppliers offer a fixed-price tariff to domestic customers.

Winter gas consumption depends on temperature so the Supplier has to buy extra gas on cold days and sell surplus gas on warm days.

Prices are generally correlated with demand which increases the risk.

Some Suppliers hedge via a combined weather and gas product.
These structures have been very effective hedges this winter, with gas prices jumping through the threshold during the only seriously cold period.

Source: UK Met Office and Bloomberg
Get Involved

The weather market is large, growing and can accommodate any client need

For further information:
• Attend WRMA events (Barcelona, September 17-19)
• Refer to wrma.org, including the recent webinar at wrma.org/weather-markets-webinar.html
• Visit cmegroup.com/trading/weather
• Interact with market participants
• Get advice from independent experts

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