
Basis Risk

in the Weather Market

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Basis Risk

- What is basis risk in weather market?
- Why is it important not to neglect basis risk?
- What is the problem about basis risk?
- How can we evaluate basis risk?
- How can we avoid to underestimate basis risk?
- What can we learn from key examples of basis risk?

Basis Risk

What is 'Basis Risk' in weather market?

Location basis risk

Hedge for Paris, your exposition is Nice

Product basis risk

Hedge for HDD, but rather air temperature

Time basis risk

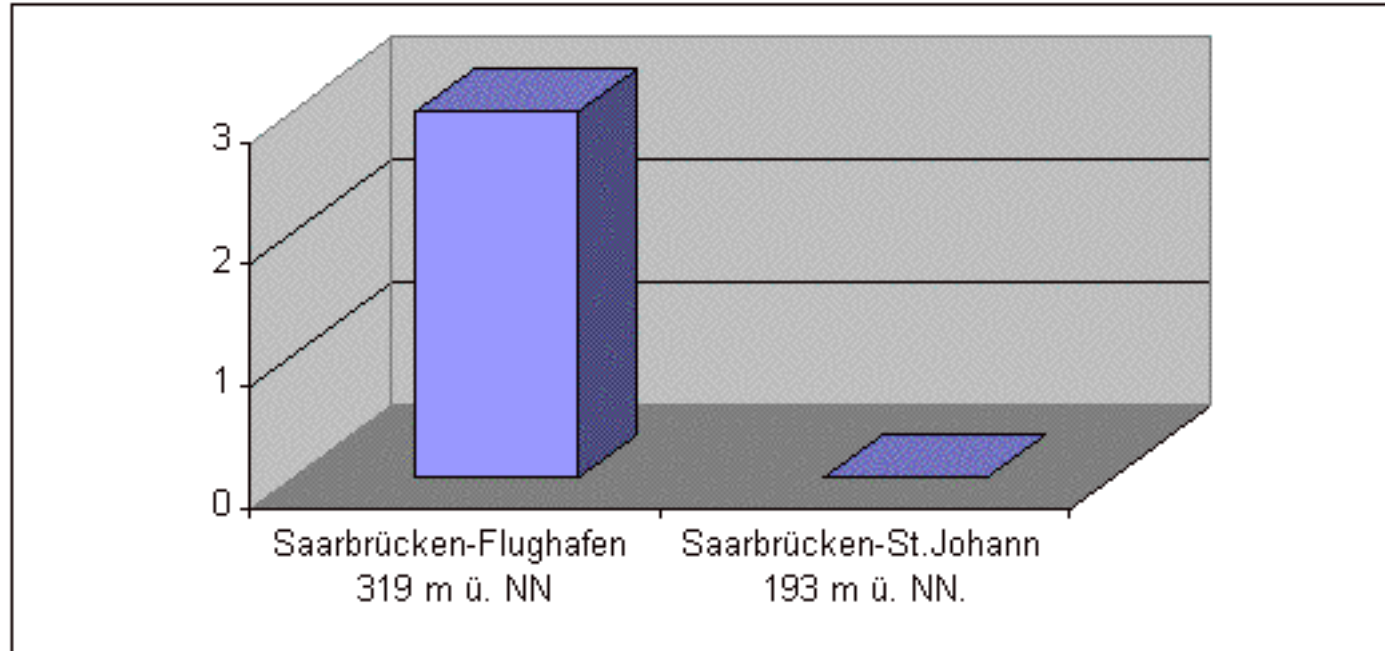
Liabilities due in March, payout of derivative in April

Basis Risk

Location Basis Risk

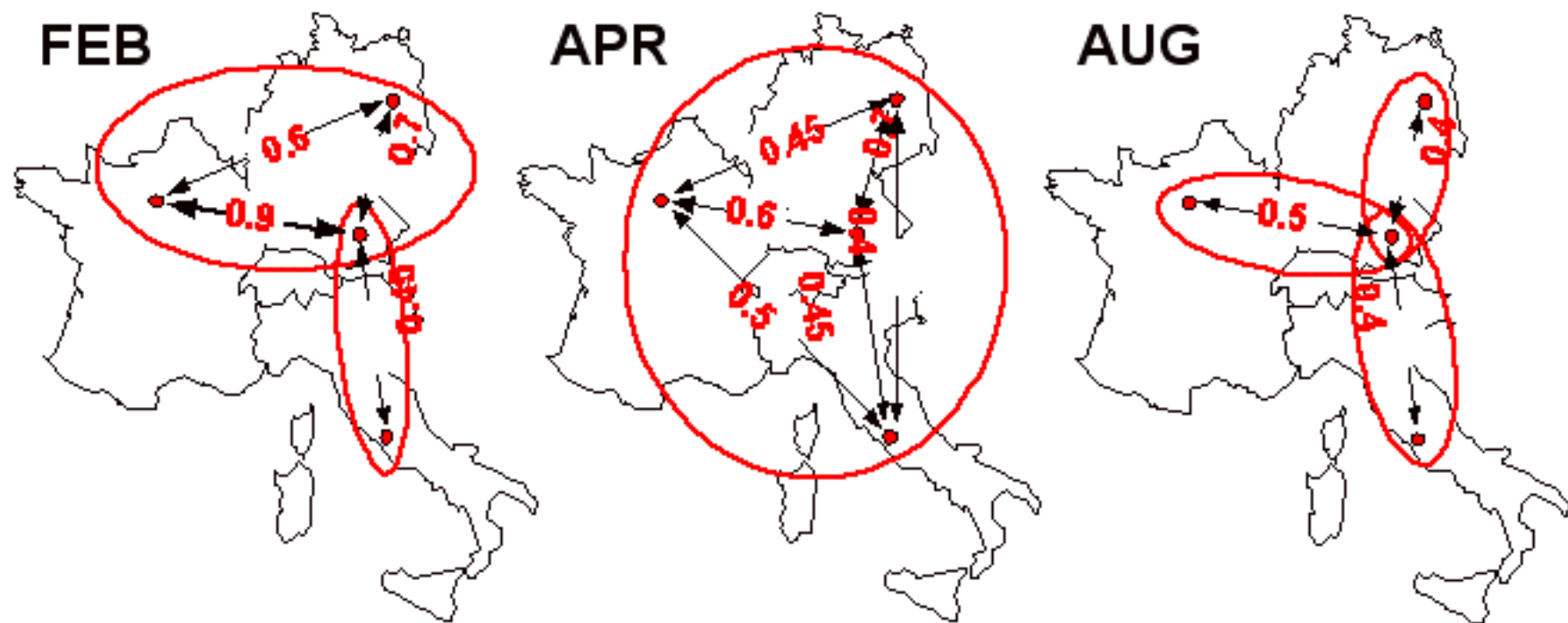
Dont forget third dimension!


example: Frostdays for Saarbrücken in April 1999



Basis Risk

r^2 of monthly mean air temperature



 $r^2 \geq 0.4$

Basis Risk

What do this strong correlations imply?

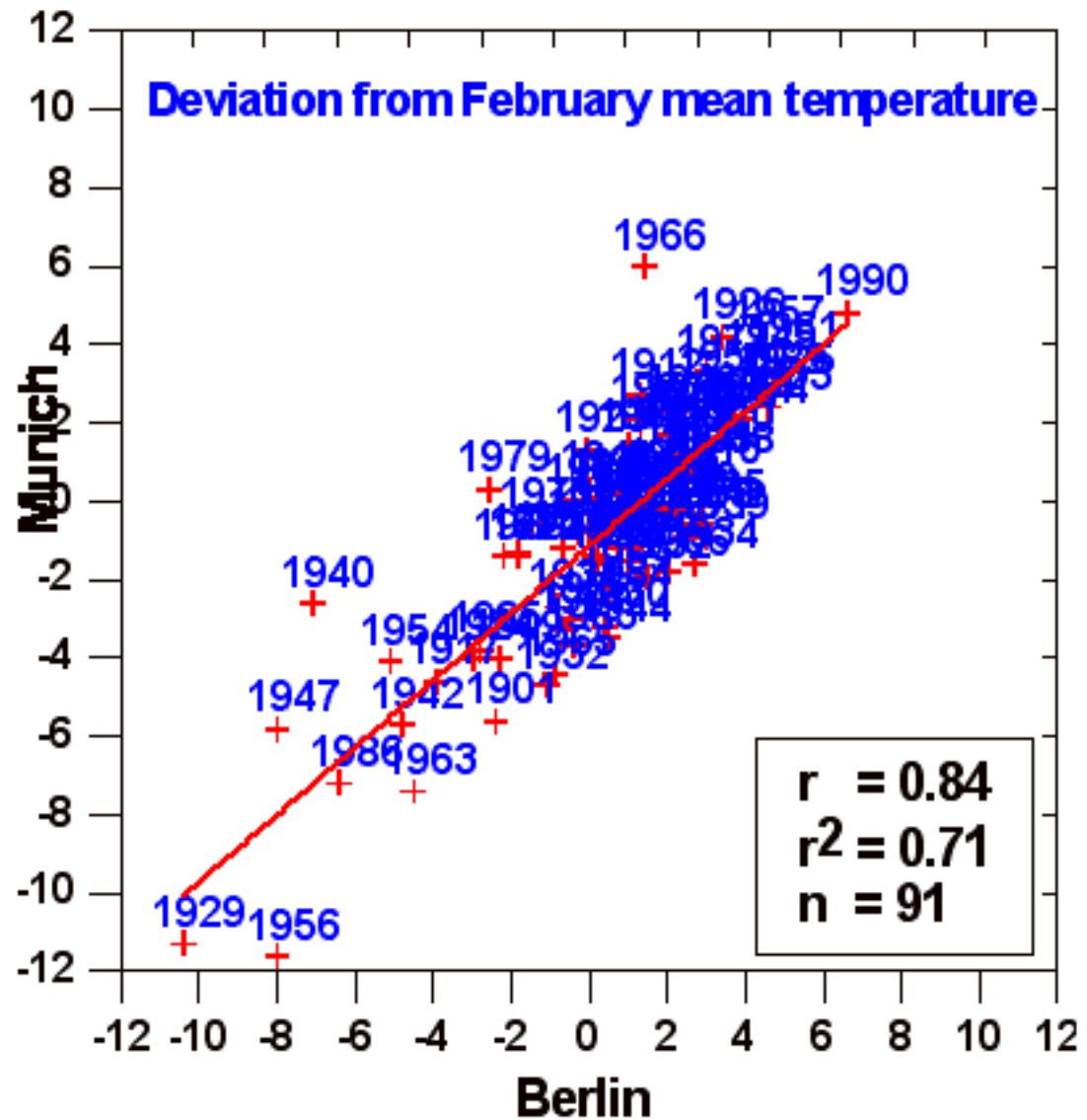
- Even in a large geo-space there is no 'natural' hedge
- Geographical diversification only useful in global scale

What do this strong correlations **not imply?**

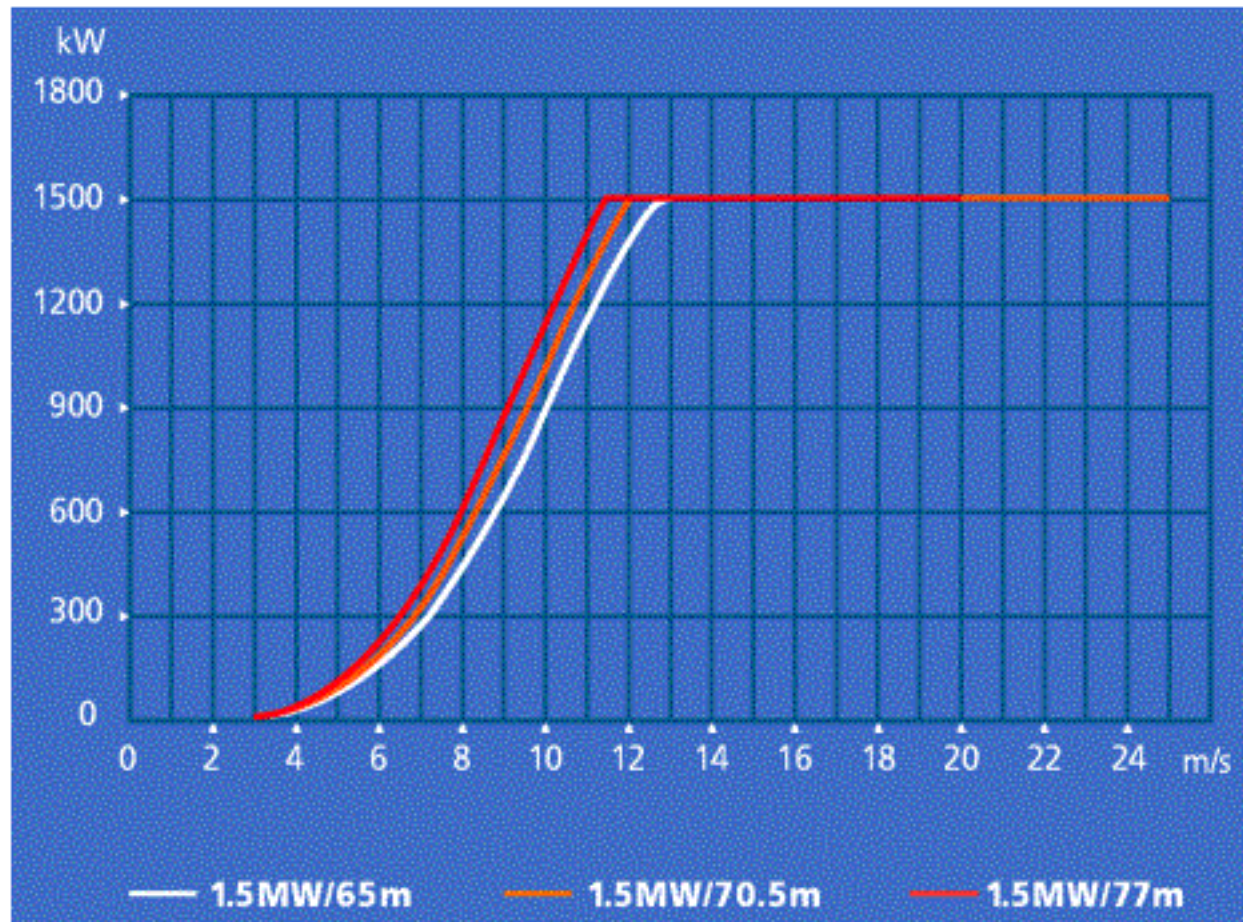
- That there is no basis risk for the hedger

Basis Risk

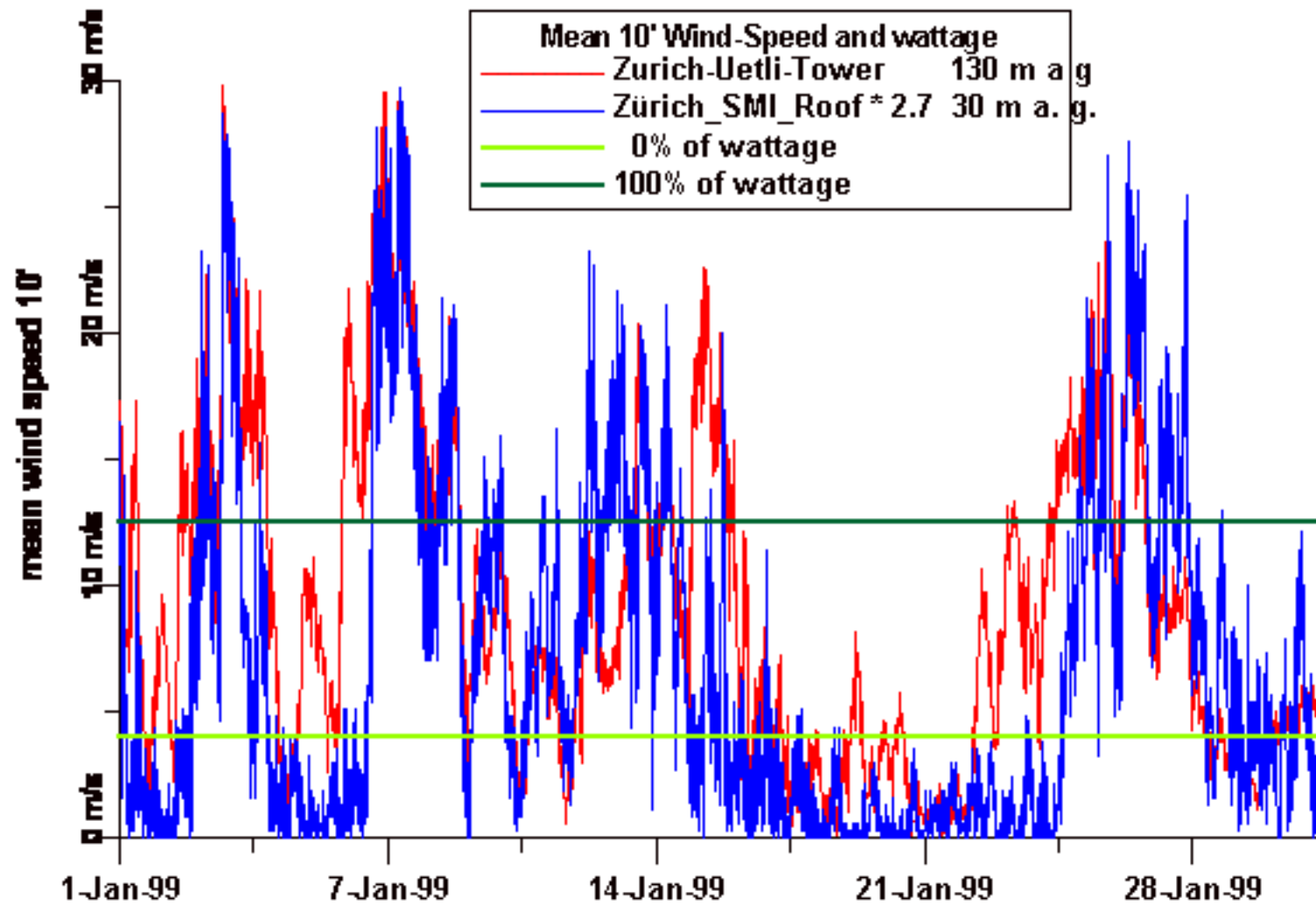
outliers can be fatal!



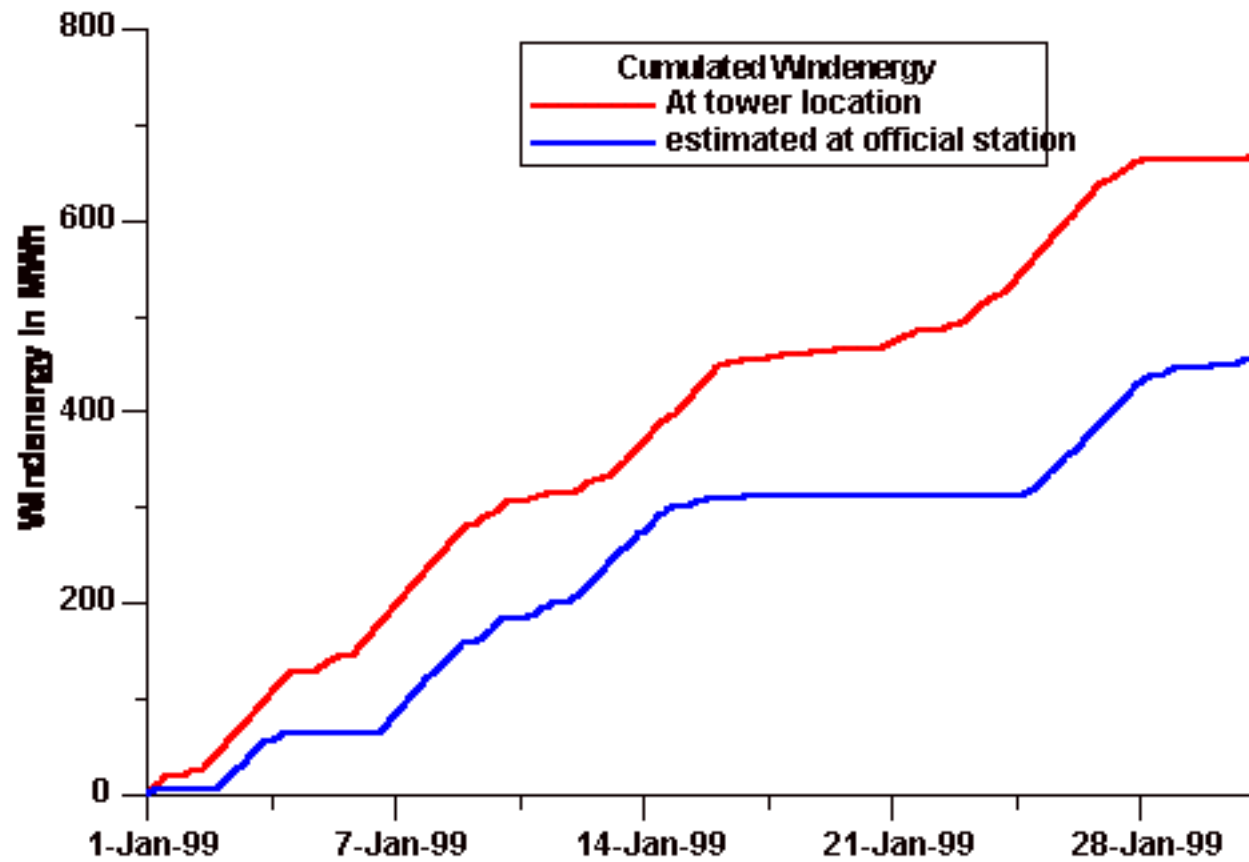
Basis Risk: wind energy example



Basis Risk: wind energy example



Basis Risk: wind energy example

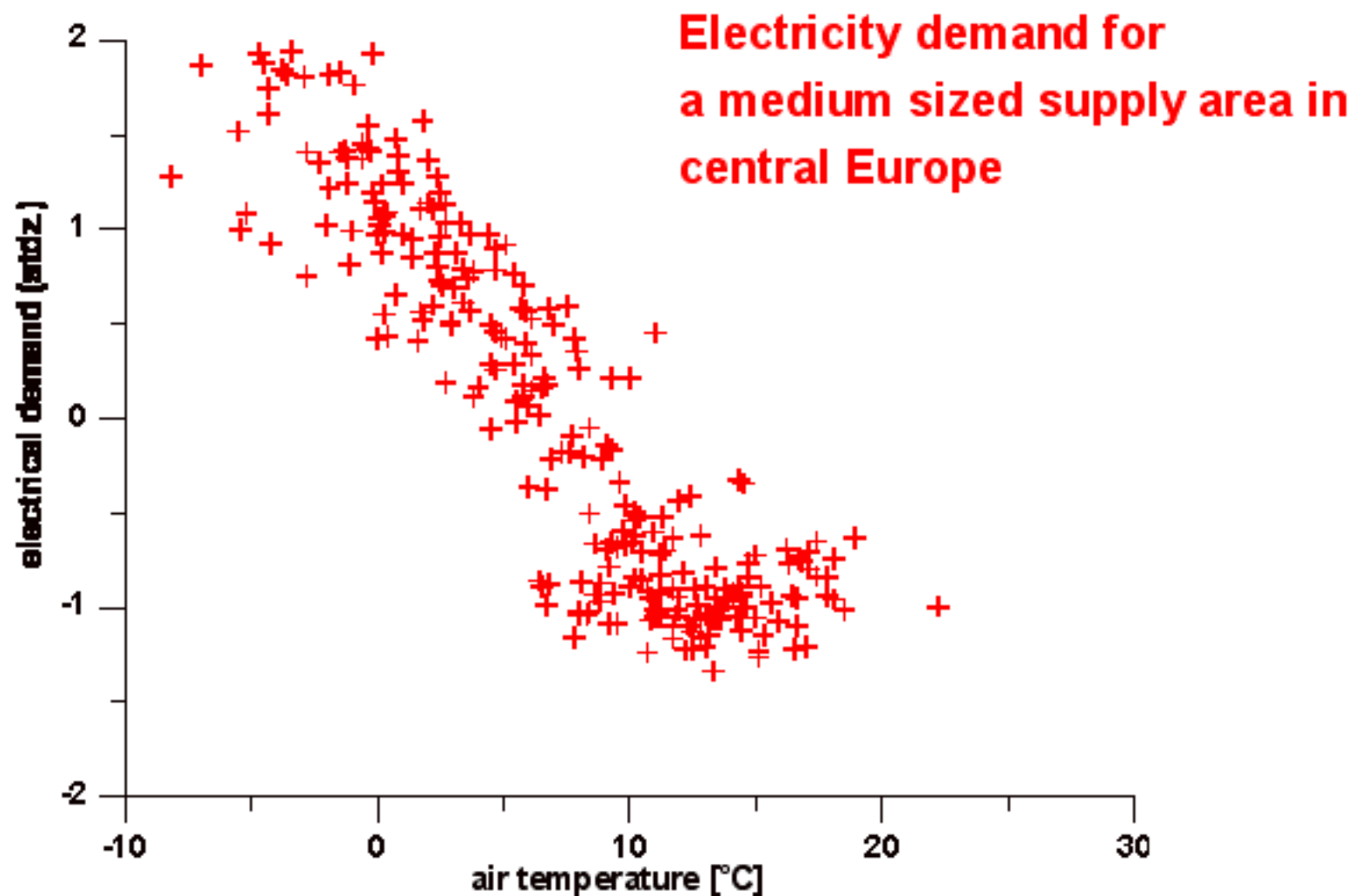


Basis Risk: wind energy example

What can we learn:

- **Location basis risk** can be considerable
- Logarithmic wind profile **not** valid over rough terrain
- Meteorological conditions **specific** for each region

Basis Risk: electricity demand example



Basis Risk: electricity demand example

What can we learn:

1. European and US demand curves **not identical**
2. Raw correlation volume to temperature can be **messy**
3. **Ratio residential/industrial** supply important
4. Meteorological and demand conditions **specific** for each region

Basis Risk

Where is the problem about basis risk?

Index has to be
for the **investor**:

- simple
- objective
- official

catbond analogy: Seismic Bond

Earthquake Magnitude and Focus Location

Basis Risk

How can we evaluate basis risk?

- Carefully test the relation **exposure** vs. **weather index**
- **Did we take the adequate index?**
- Evaluate **importance of outliers** for hedger
- Do MC - **simulations**, if statistical parameters are known

Basis Risk

How can we avoid to underestimate basis risk?

- Analyze carefully the actual problem
- Be sceptical about homogeneity of time series for business and weather data!
- Don't assume basis risk is the same everywhere!
Europe may not be the same as US
Germany may not be the same as Norway

Basis Risk

What can we learn from key examples of basis risk ?

- Be **careful** about **short** time series
- Be aware that there can be a **trend** or a **seesaw** effect
- **Inspect time series** - not only correlation coefficient

Basis Risk

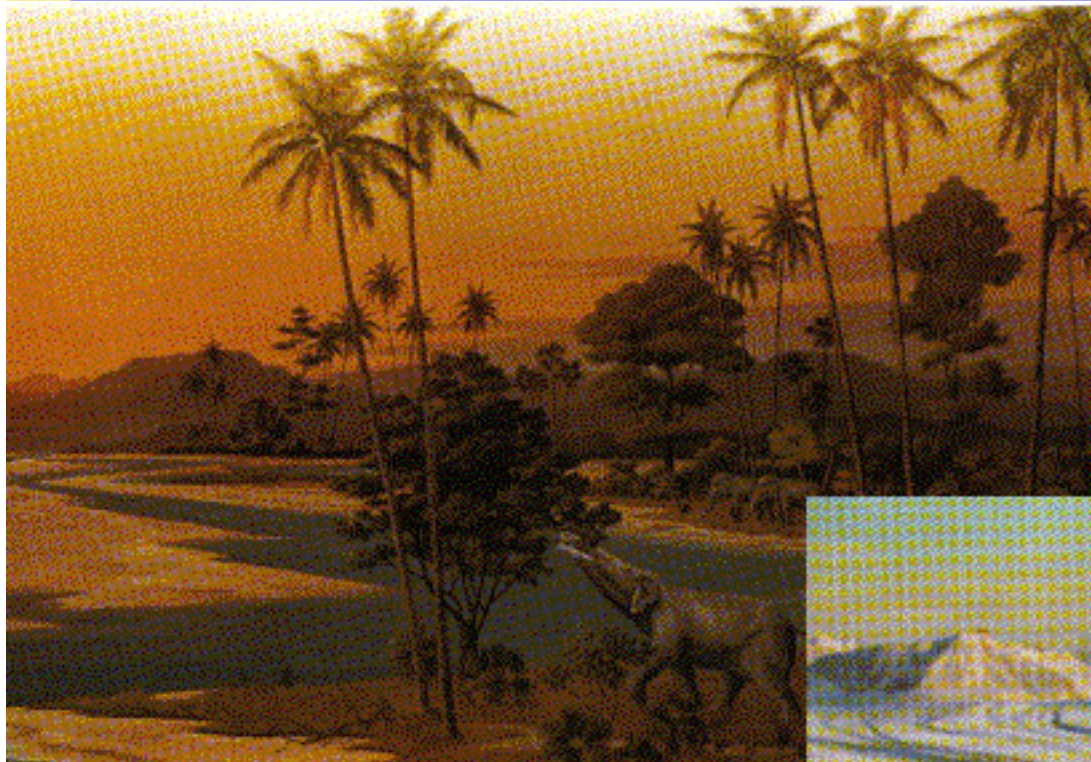
Conclusions

It is of primordial importance

to gain the hedger's confidence:

- open information policy about basis risk**
- minimize hedger's basis risk**
- an index as close to his exposure as possible**
- chances for ,basis risk insurance'**

Basis Risk



Weitere Informationen
unter info@meteodat.ch



