



Demand Response experience from two large industrial customers

Flexible Electricity Consumption at Frigoscandia

Martin Lykke Jensen, Birch & Krogboe

OVERVIEW

- **Why having a flexible electricity consumption**
- **Frigoscandia**
- **Composition of the electricity price**
- **Use of Flex•El**
- **Results at Frigoscandia**
- **Conclusion**



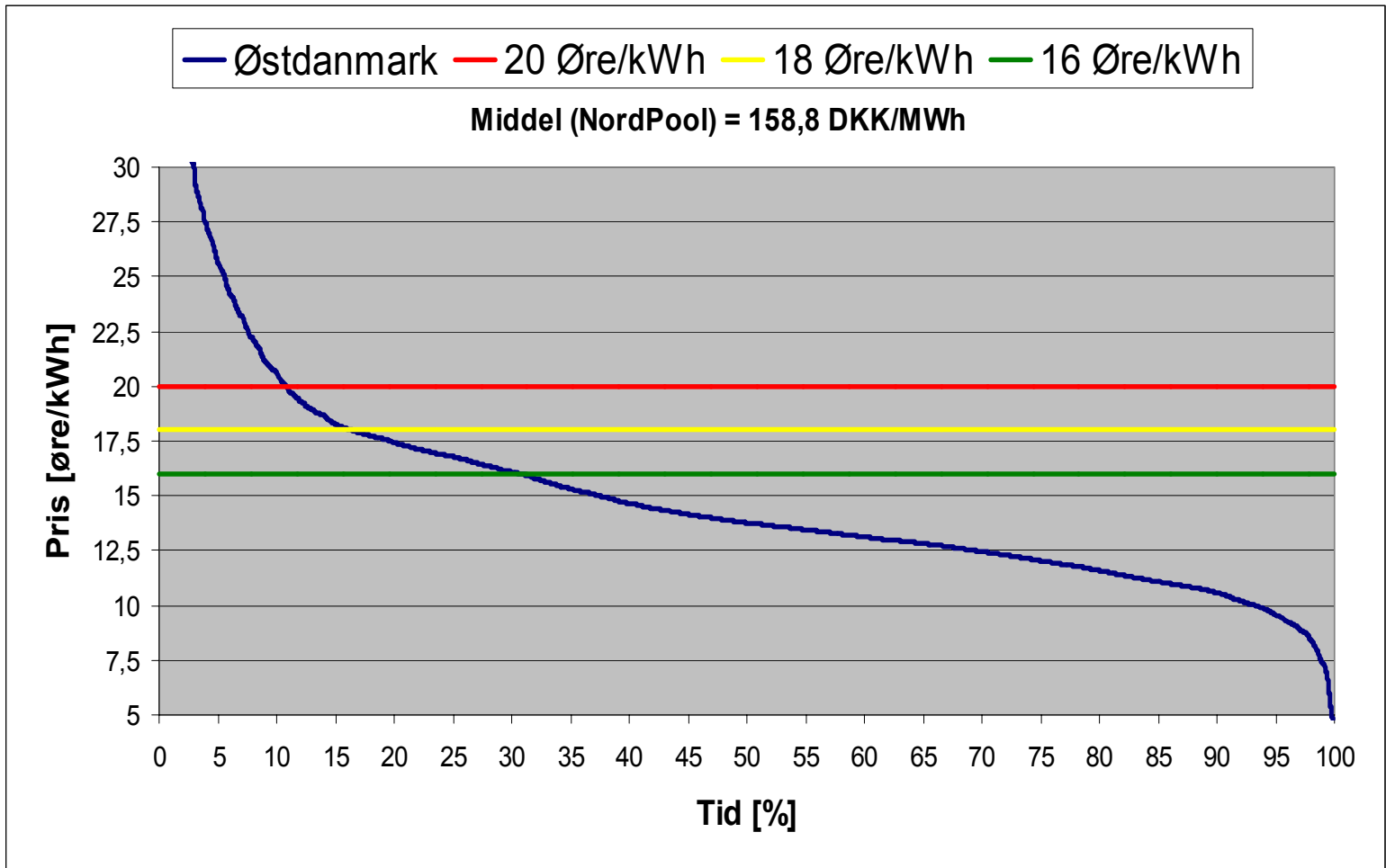
Flexible Electricity Consumption at Frigoscandia

WHY FLEXIBLE ELECTRICITY CONSUMP.?

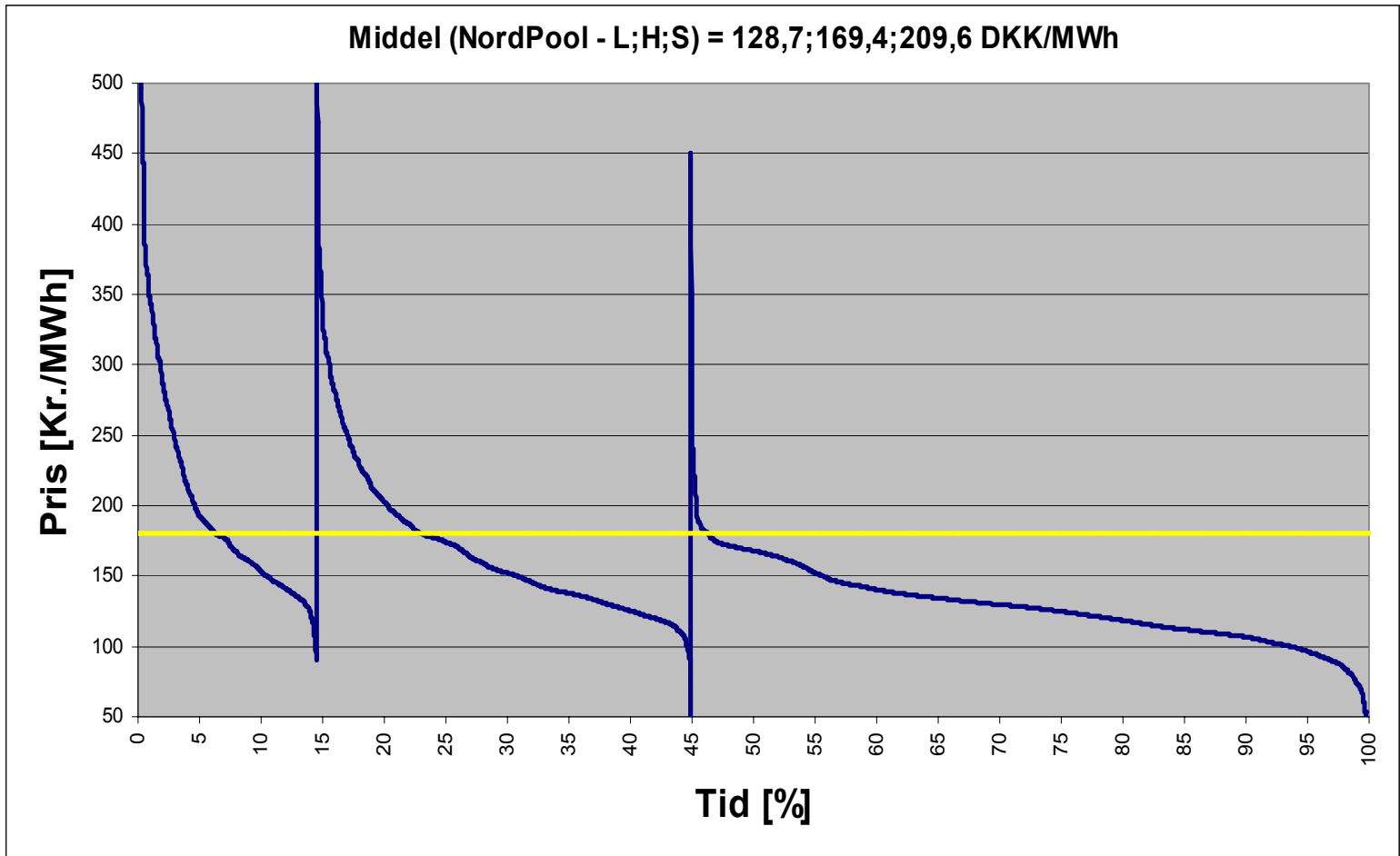
- **Avoid investment in further capacity**
- **Damp oscillating prices**

- **Lower electricity prices for companies**
- **Strengthen negotiations when buying electricity in the future**

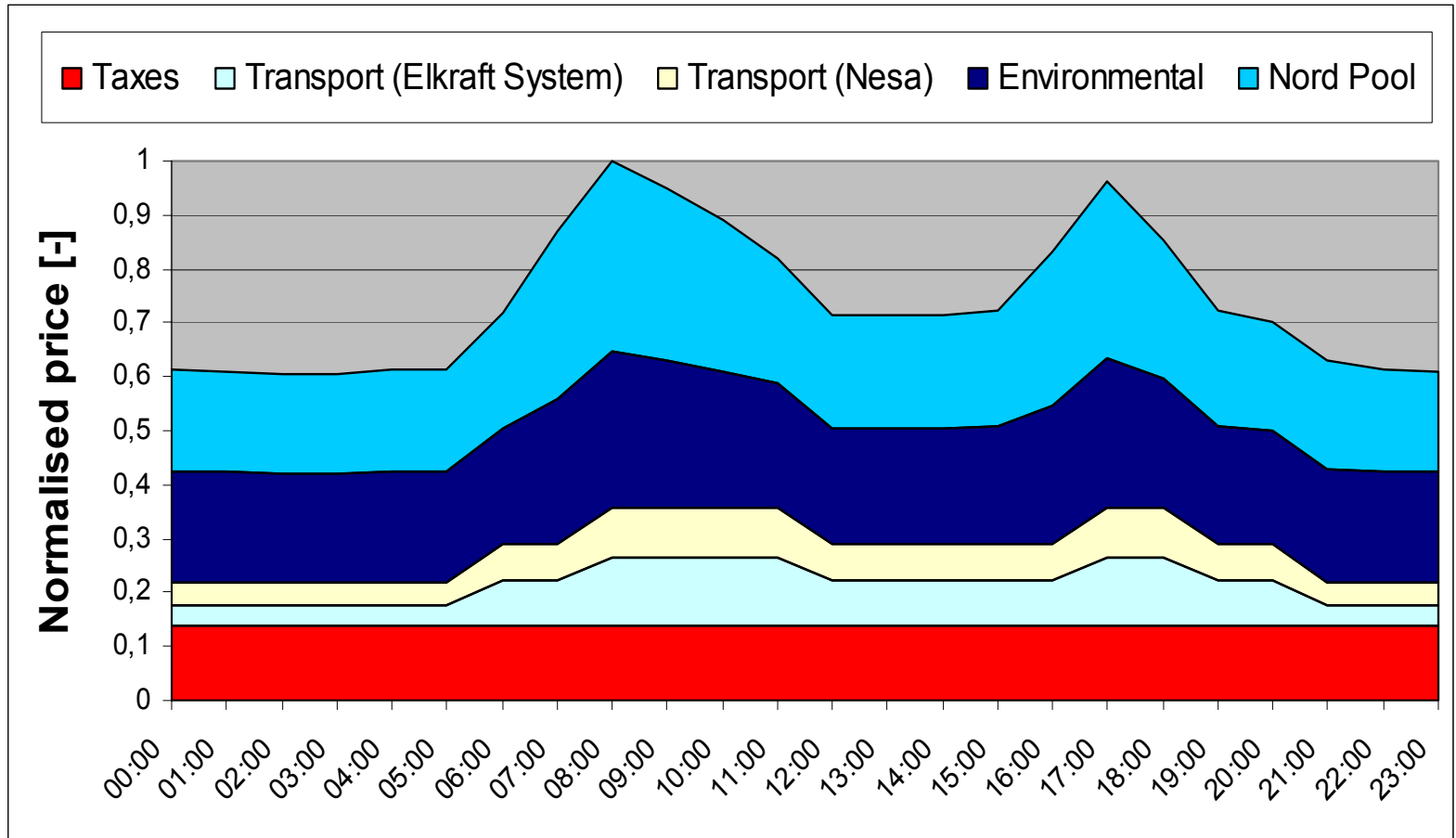
Flexible Electricity Consumption at Frigoscandia



Flexible Electricity Consumption at Frigoscandia



Flexible Electricity Consumption at Frigoscandia

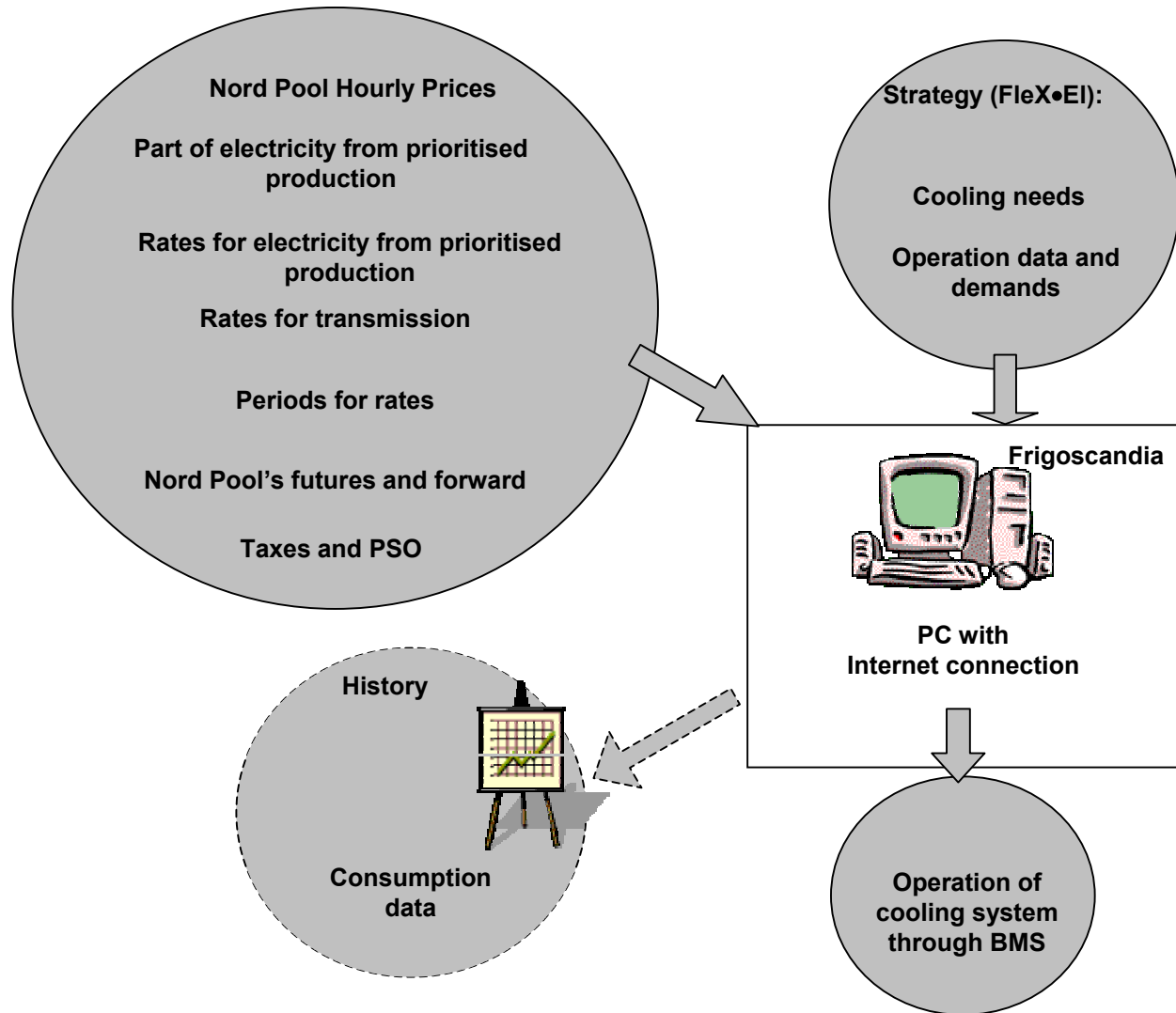


FRIGOSCANDIA

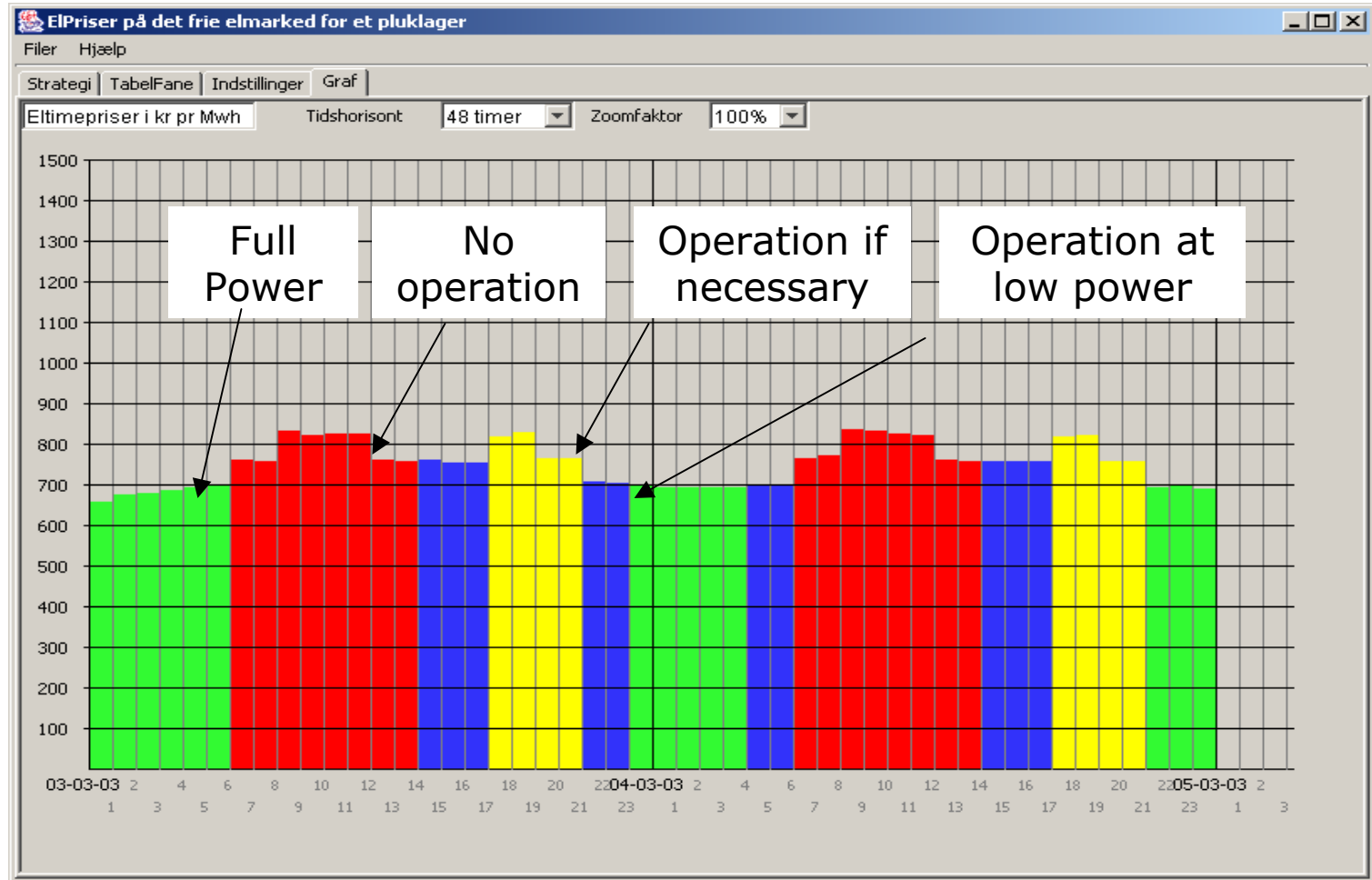
- **Electricity consumption in 2001/2002 was 5.700 and 6.200 MWh respectively**
- **Distribution until then was : 60% (low), 25% (high) and 15% (peak).**

- **Freezing in at varying periods during the day**
- **Building up further cooling in the cold stores**

Flexible Electricity Consumption at Frigoscandia

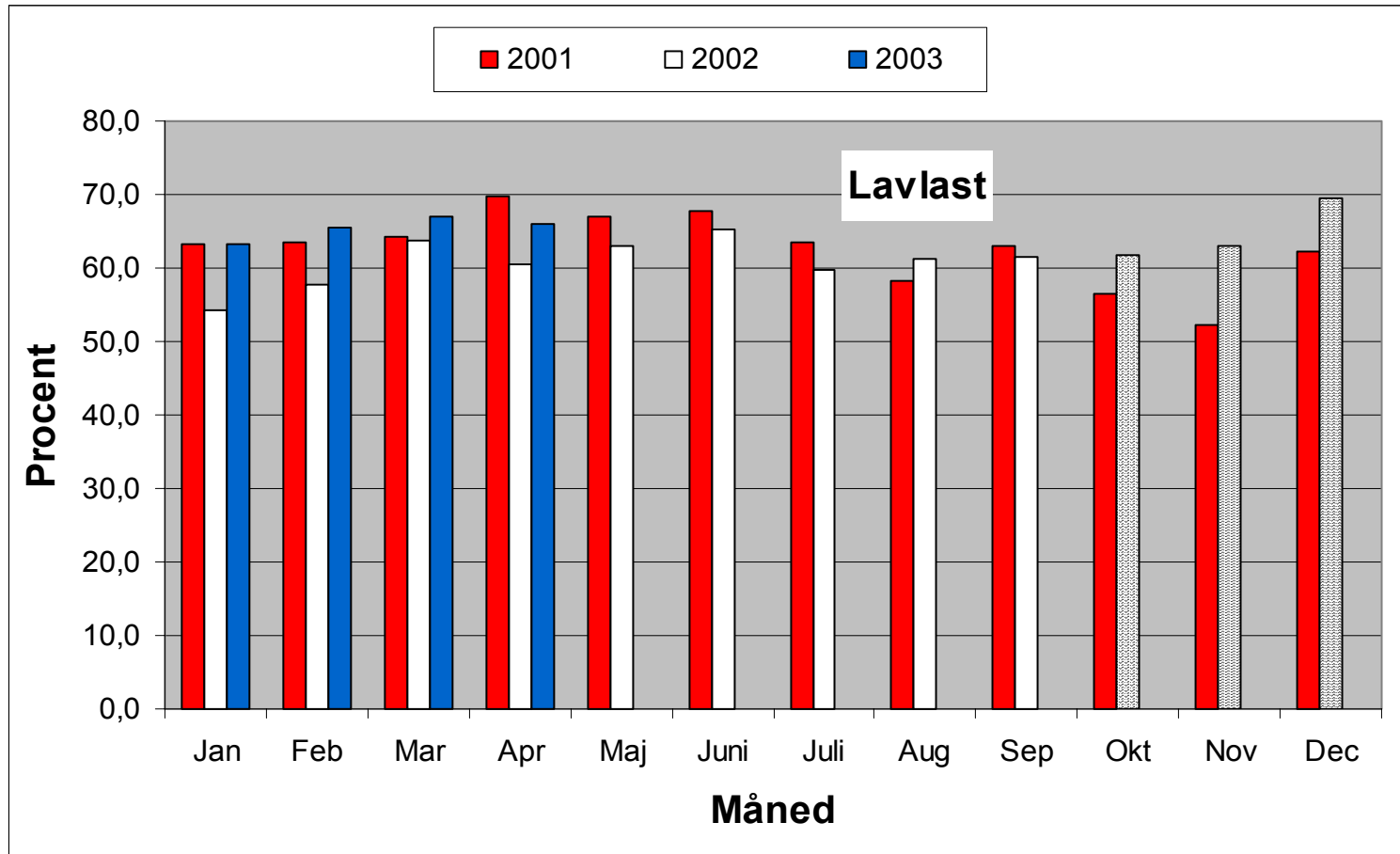


Flexible Electricity Consumption at Frigoscandia

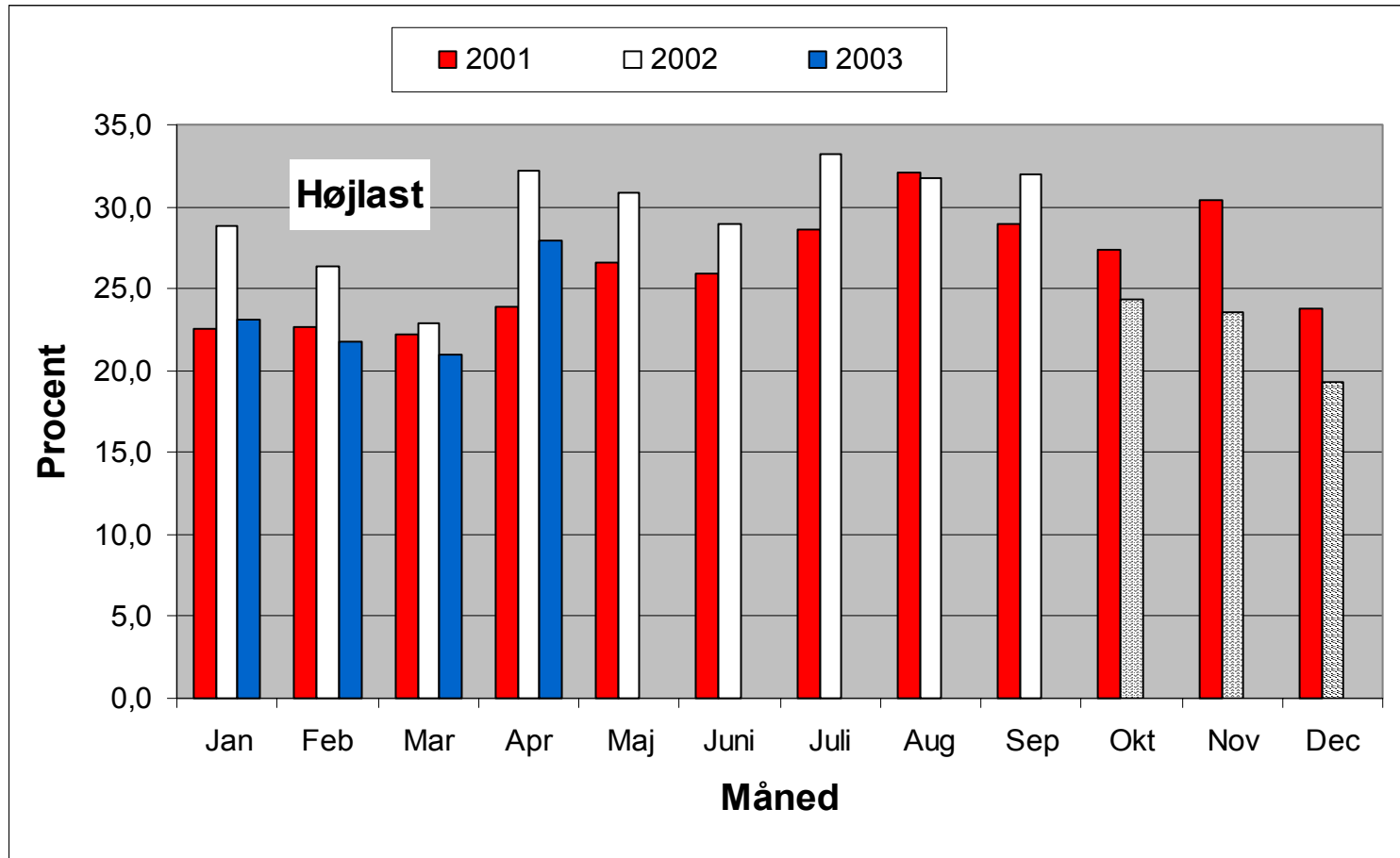


Flexible Electricity Consumption at Frigoscandia

MONTHLY RESULTS (LOW PERIOD)

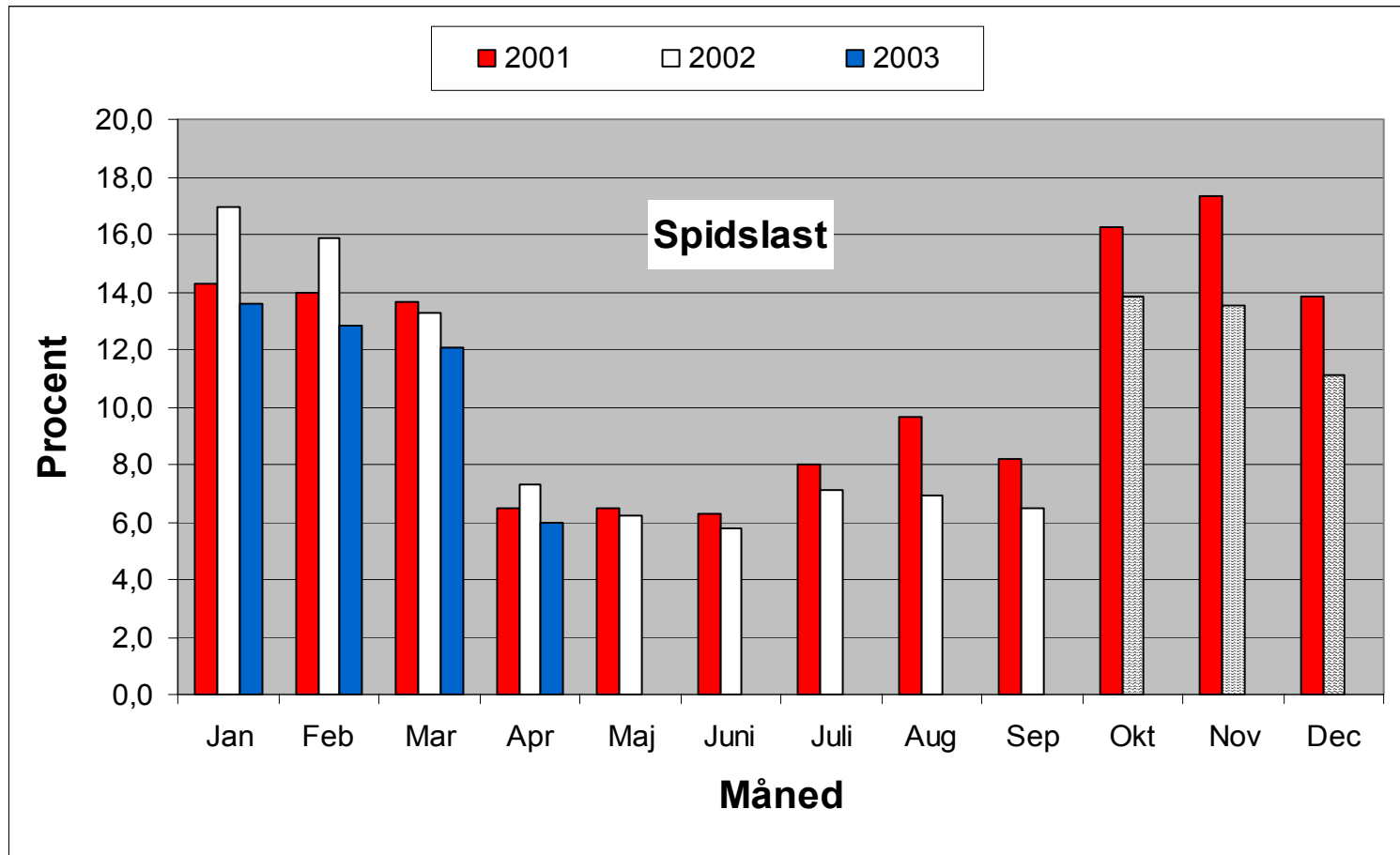


MONTHLY RESULTS (SHOULDER PERIOD)

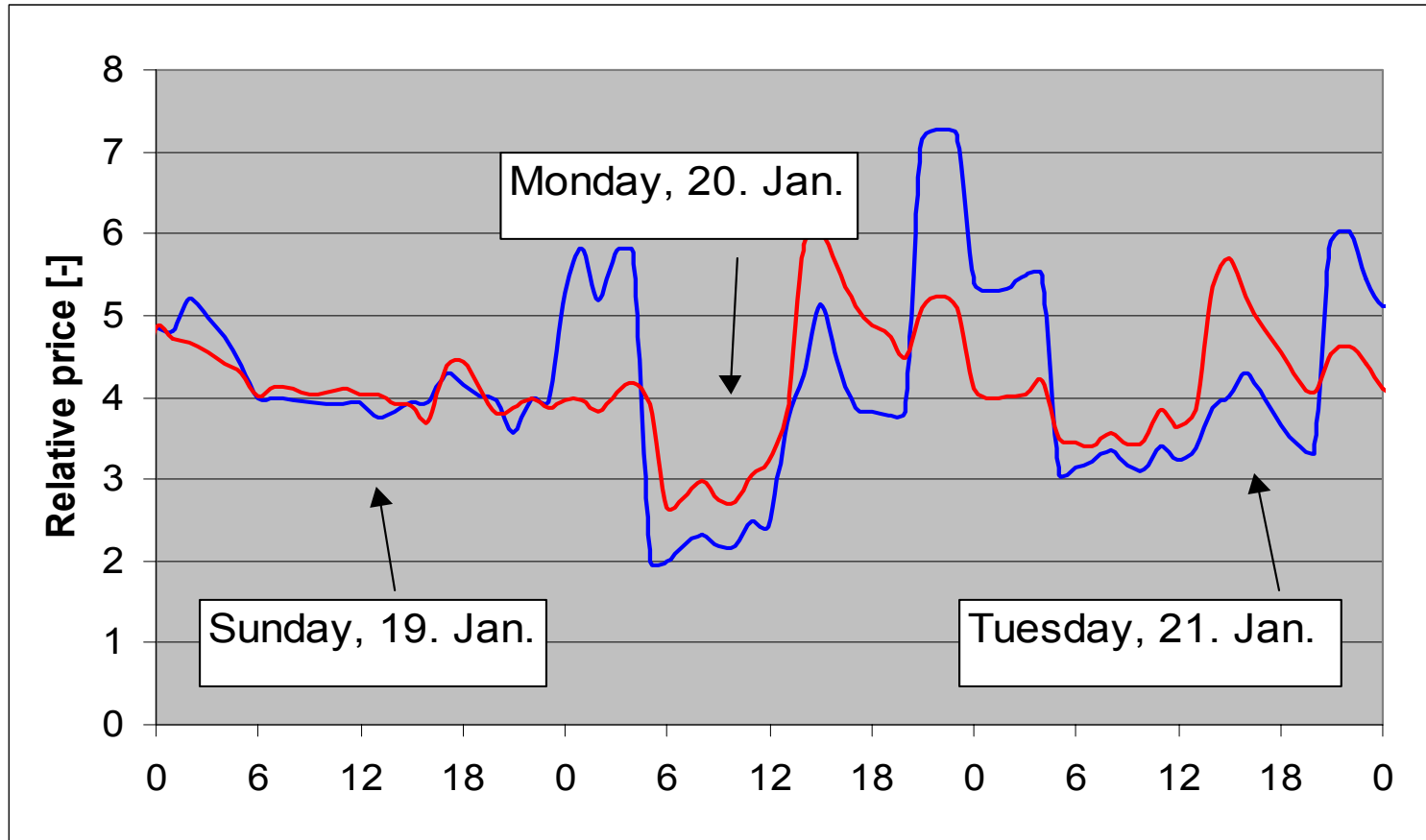


Flexible Electricity Consumption at Frigoscandia

MONTHLY RESULTS (PEAK PERIOD)



RESULTS - EXAMPLE

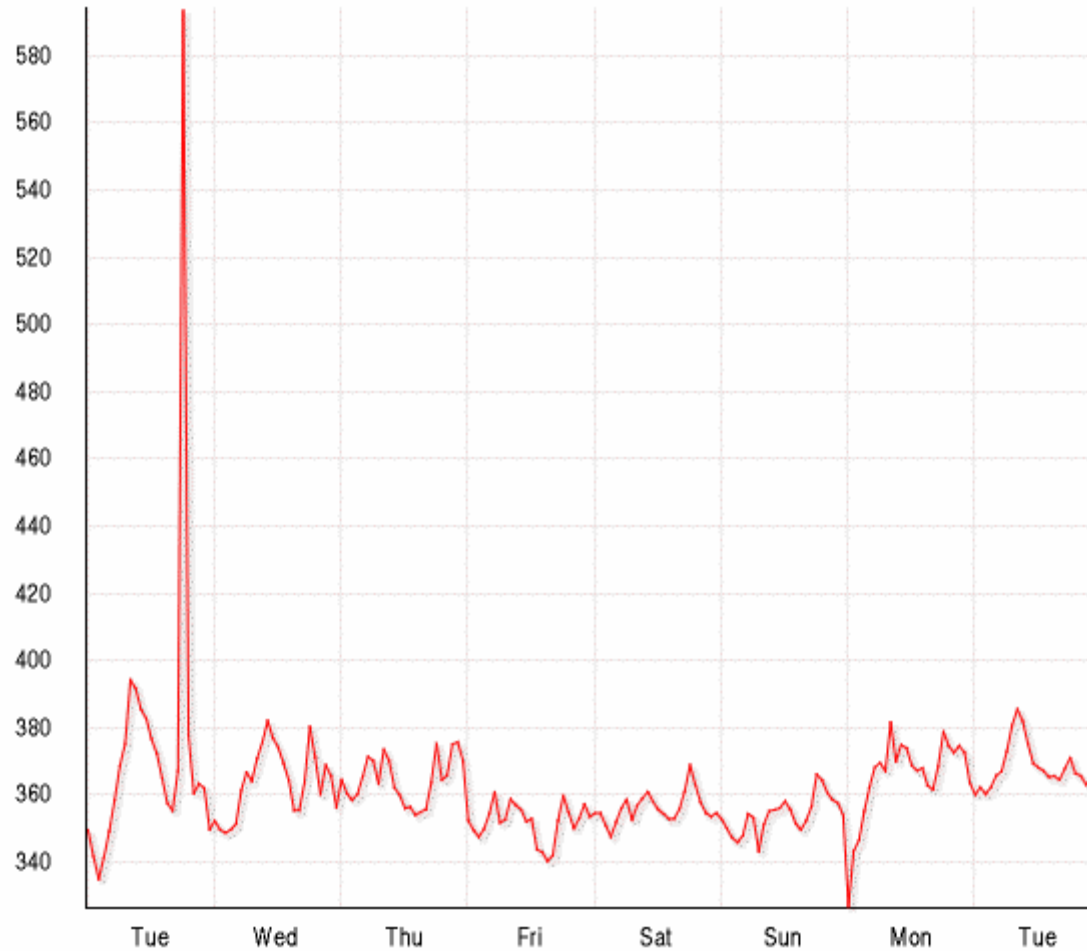


Conclusion

- **Flexible electricity consumption has led to a significant move of consumption**
- **Electricity prices at NP have had a very abnormal pattern \Rightarrow Poor economics**
- **Flexible electricity consumption resulted in further knowledge of the process of freezing-in at Frigoscandia**
- **Frigoscandia feel that their possibilities of negotiating the electricity price in the future are strengthened**

Flexible Electricity Consumption at Frigoscandia

Nord Pool spot prices week 9 (East)



Flexible Electricity Consumption at Frigoscandia

Nord Pool spot prices week 9 (West)

