

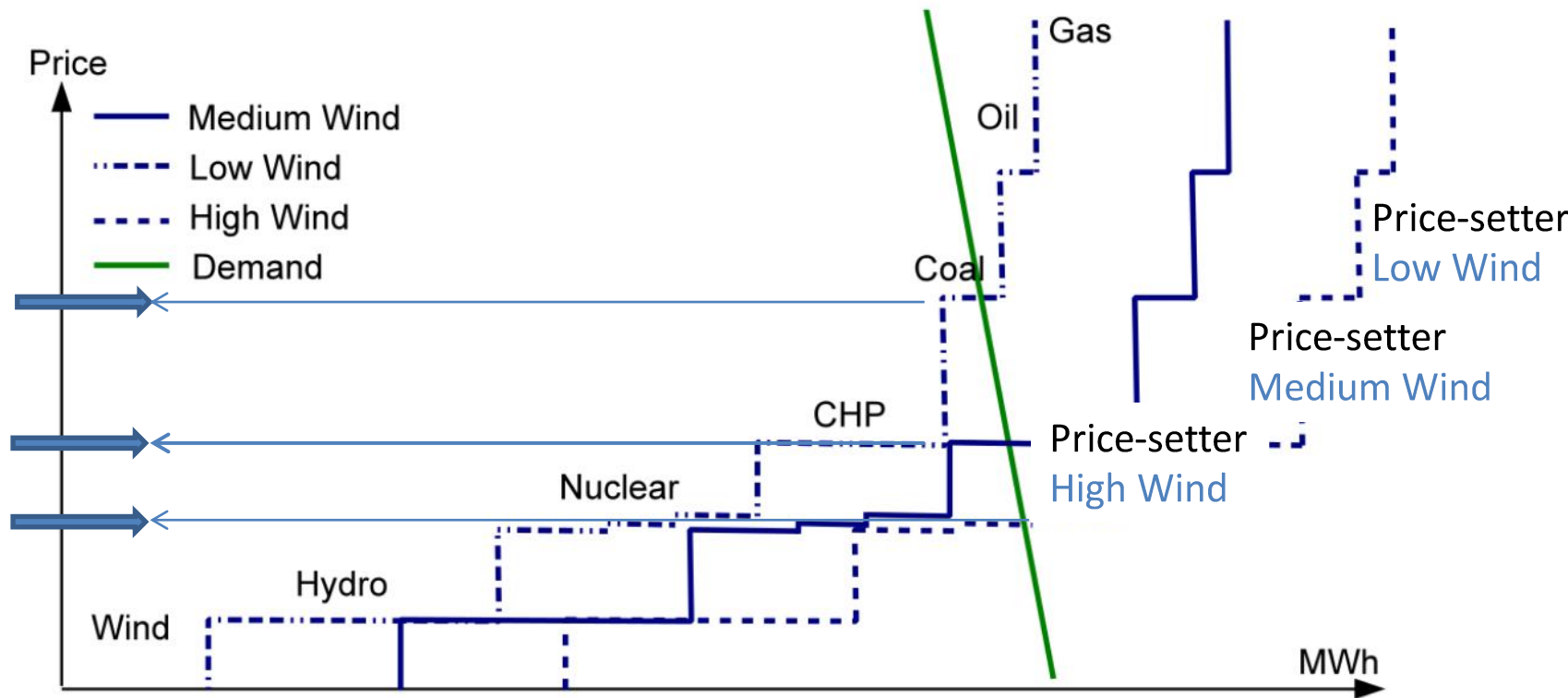
Intro: Lecture Objectives

- Practice price formation in a live “electricity market”
- Determine the impact of wind power in a day-ahead market
- Understand the impact of misreporting production costs in an electricity market



Catch up: Merit-order definition

...on the price of the day-ahead market



Mini Group Work

Live Auction



For groups of 3-4:

Pick an A4 with an electricity producer

Check your production cost and quantity (green)

Formulate a cost bid (red)

Up to 7-8 minutes group formation and **in-group** discussion

Let us clear the market!!!



Live Auction

Demand

280 MWh, 0.5

350 MWh, 0.3

420 MWh, 0.2

mean: 329 MWh

List of electricity producers

1. CPH CHP
2. Broen Wind
3. Amager Wind
4. Swedish Water and Lakes
5. Norwegian Gas
6. Stephens Colliery
7. Megaton Nuclear Co
8. North Sea Oil

STOP

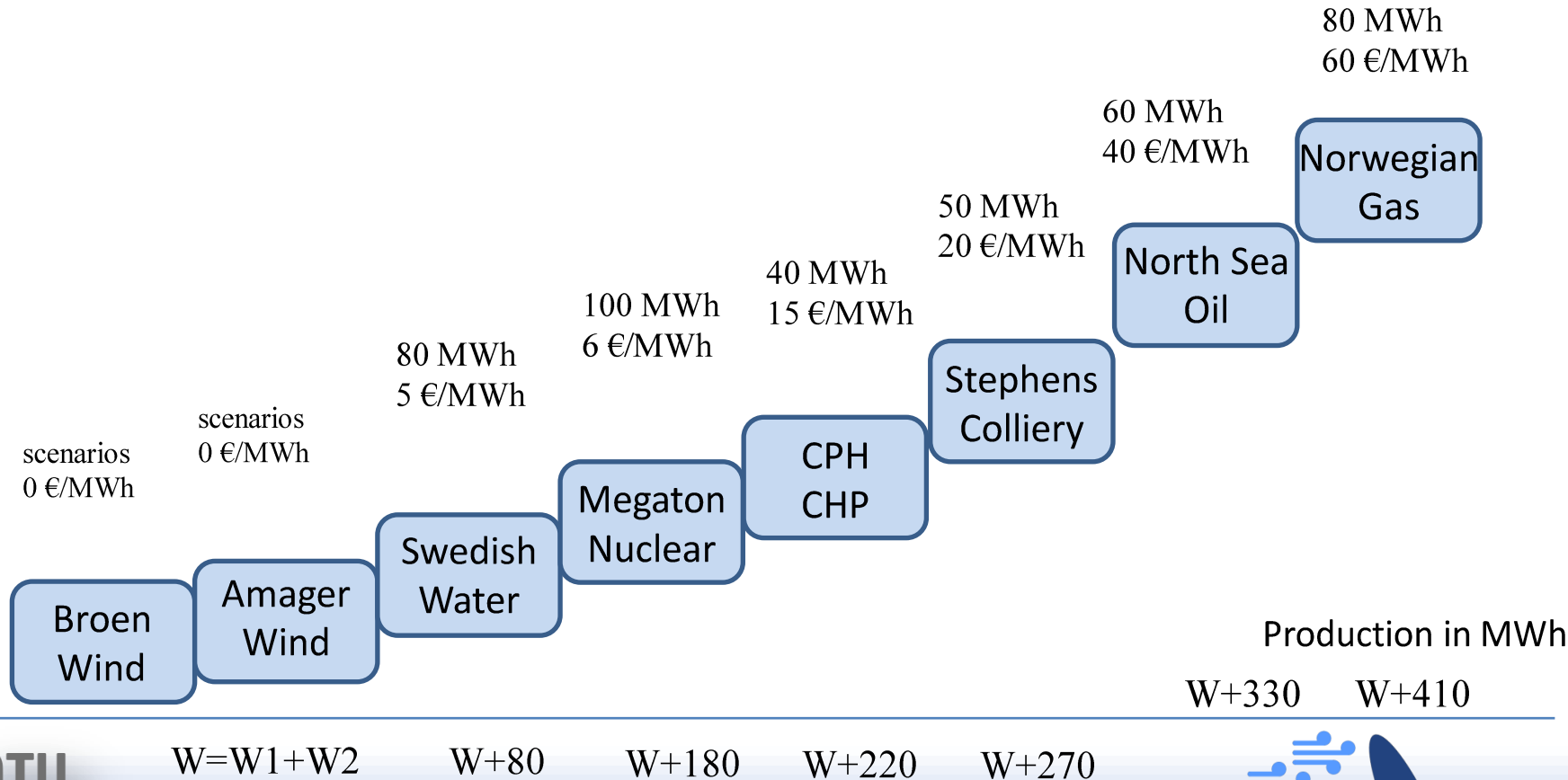


Live Auction-True Costs

Qualitative representation of the merit order:

(i.e. graph does not scale to reality for production)

Price in EUR/MWh



Live Auction: Stochastic events

Demand:

280 MWh, 0.5

350 MWh, 0.3

420 MWh, 0.2

mean: 329 MWh

Wind Power Production:

Broen
Wind

20 MWh, 0.5

10 MWh, 0.3

50 MWh, 0.2

mean: 23 MWh

Amager
Wind

10 MWh, 0.5

15 MWh, 0.3

5 MWh, 0.2

mean: 10.5 MWh

Conventional Production:

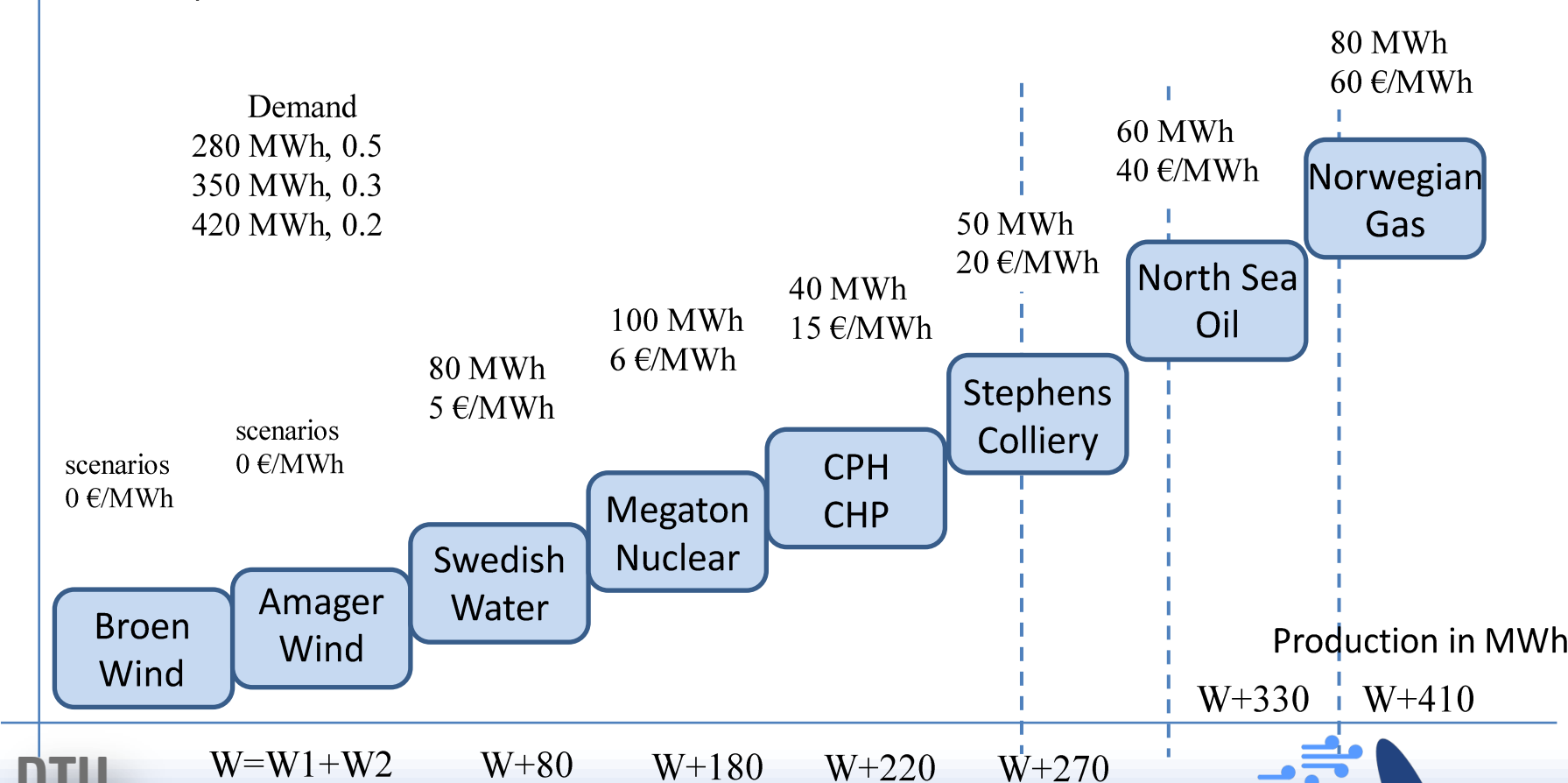
410 MWh



Live Auction-True Costs

Qualitative representation of the merit order:

Price in EUR/MWh (i.e. graph does not scale to reality for production)



Live Auction-Class discussion

Over-bidding: bid “slightly” above marginal cost

1. Those high in the merit order, may try to “squeeze” something given that they **expect** that **chances** to be selected are low
2. Those low and in the middle, may try to “squeeze” something, **in case** they end-up as price makers (if demand is very low)

Under-bidding: bid “slightly” below marginal cost

1. Those high in the merit order, may end as price makers and then face losses
2. Those low and in the middle have nothing to gain, and only to lose if they are price makers



Live Auction-Class discussion

Key words : **expect, low chances, in case** <- stochasticity

Uncertainty in Wind Power Production and Demand

Uncertainty: Inaccurate and Imprecise predictions

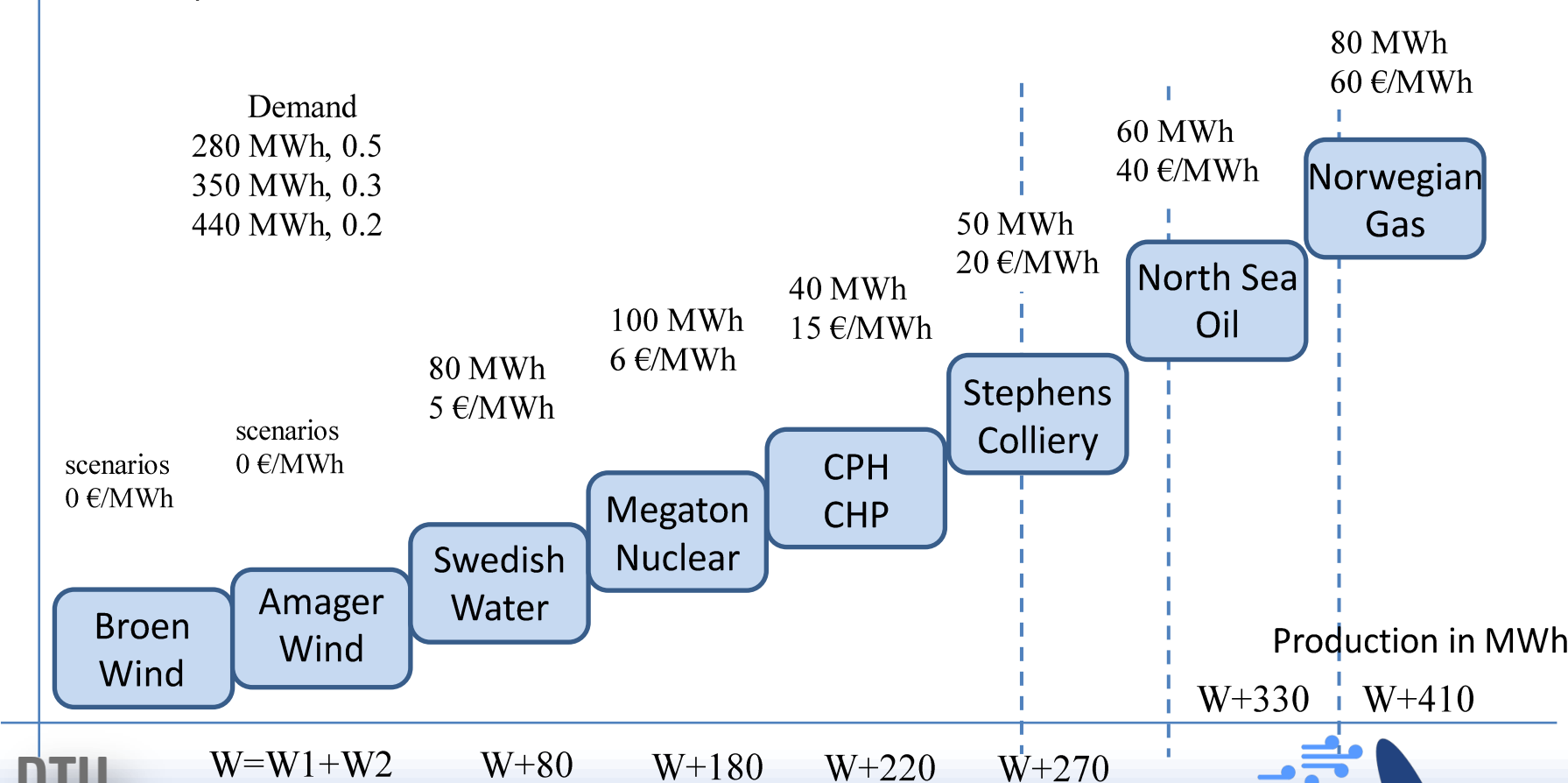
How can marginal producers be sure that they will not be pushed out of the merit-order if they strategise?



Live Auction-True Costs

Qualitative representation of the merit order:

Price in EUR/MWh (i.e. graph does not scale to reality for production)



Last year's Live Auction-Bids

Qualitative representation of the merit order:

Price in EUR/MWh (i.e. graph does not scale to reality for production)

