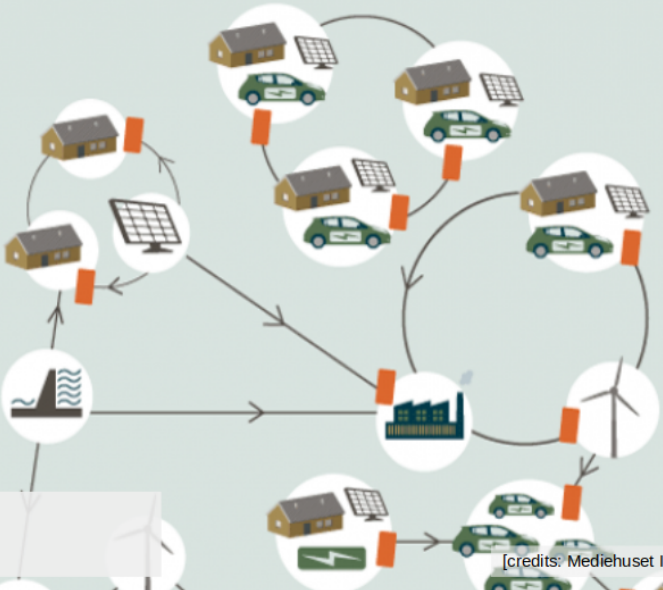
Module 2 – Electricity Spot Markets (e.g. day-ahead)

2.5 Impact of regulation and support schemes



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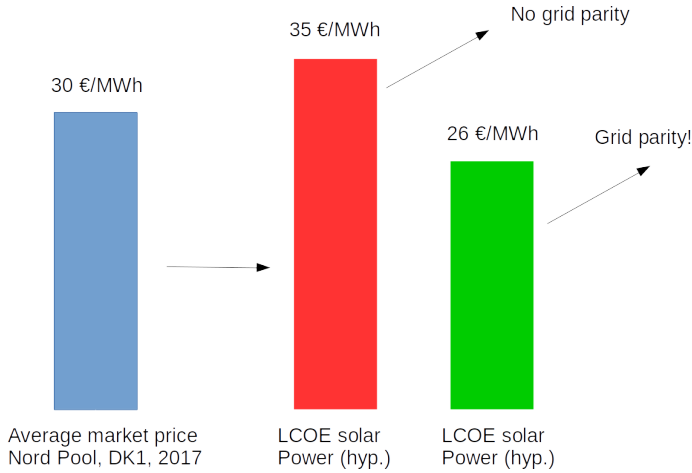
[credits: Mediehuset Ingeniøren]

Why regulation and support schemes?

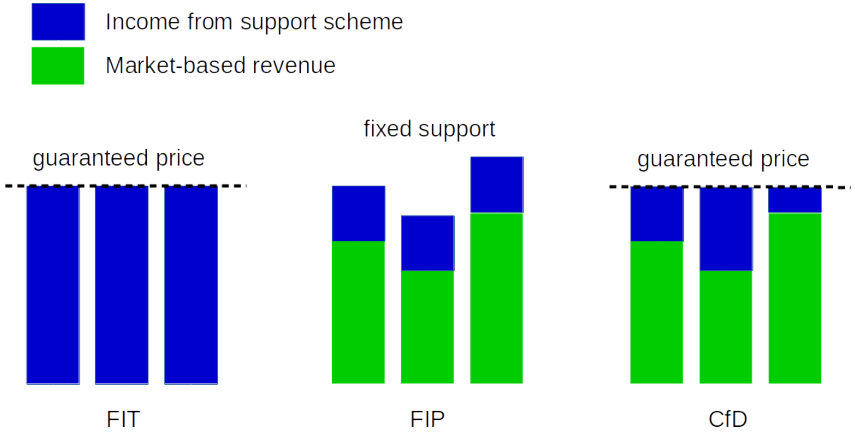
- New energy generation technologies may need support in order to reach **grid parity** (i.e., when Levelized Cost of Energy - LCOE, becomes less than market price)



- **Regulation** is then an instrument for policy makers to support their integration in the market
- **Support schemes** consist in financial support to make them competitive in the market

Alternative support schemes

- The 3 most common support schemes are:
  - *feed-in-tariff* (FIT)
  - *fixed feed-in premium* (FIP)
  - *contract for difference* (CfD, or sliding premium)

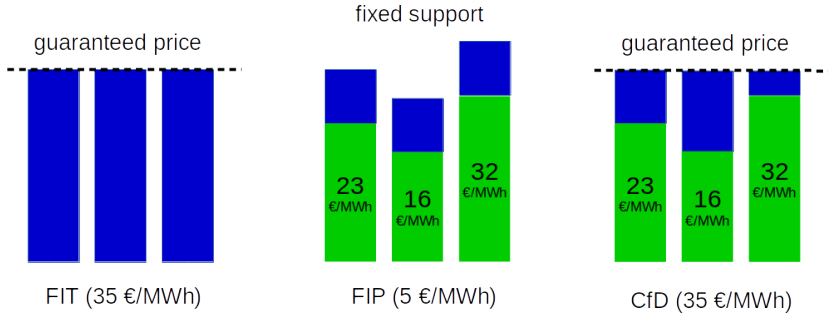


- These may have an impact on participant revenues, offering strategies and market outcomes

Participant revenues

- Let us consider the case of a renewable energy producer (wind or solar) participating in the Danish day-ahead electricity market, DK1 area (Western Denmark)

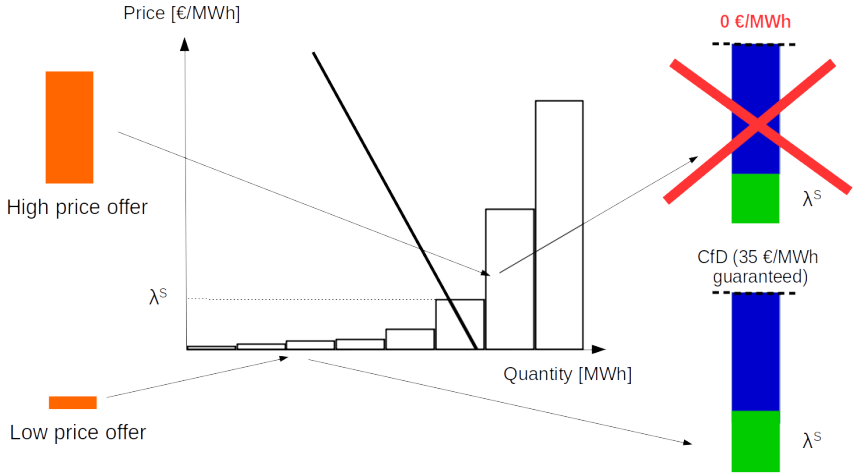
- 3 cases:
  - FIT at 35 €/MWh
  - FIP of 5 €/MWh
  - CfD to guarantee 35 €/MWh



- Revenues are:
  - FIT case: $35 \times 3 = 105$ €
  - FIP case: $(23+16+32) + 5 \times 3 = 96$ €
  - CfD case: $(23+16+32) + (12+19+3) = 105$ €

Offering strategies under CfD support scheme

- Consider a wind or solar power producer under a *CfD support scheme*



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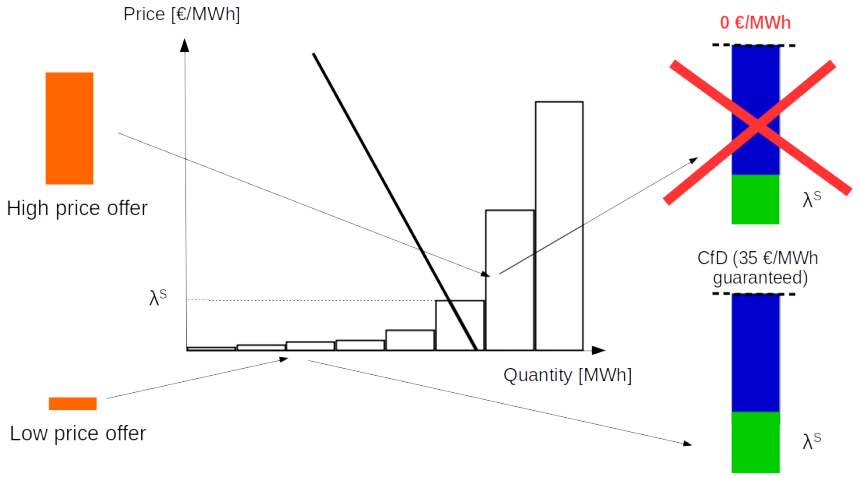
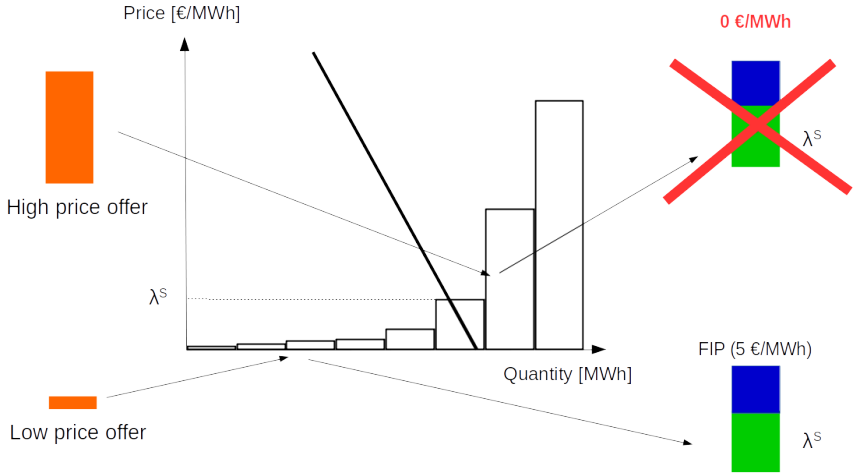


- The optimal offering strategy is to offer at minimum price, e.g., -500 €/MWh in Nord Pool

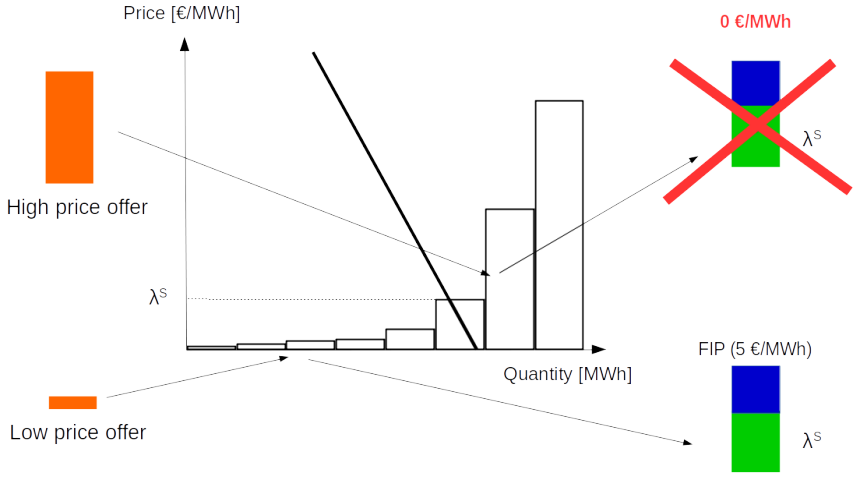
Offering strategies under FIP scheme

- Consider the same wind or solar power producer under a *FIP support scheme*



Offering strategies under FIP scheme

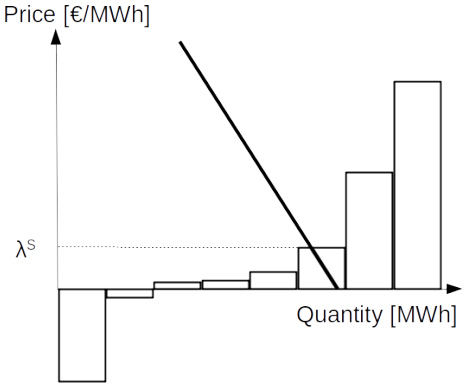
- Consider the same wind or solar power producer under a *FIP support scheme*



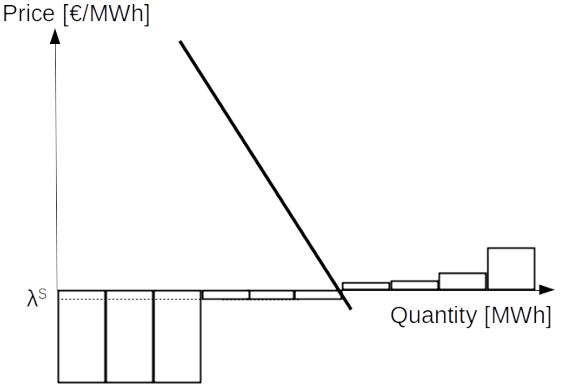
- The optimal offering strategy is to offer at minus the FIP value, e.g., -5 €/MWh in the present case

Effect on market outcomes

- Let us see the effect of having more or less market participants with different support schemes
- Only a few of them



- Quite many more



- As their share increase, clearing prices can become negative(!)

Impact of a change of regulation on the market

- The regulator states that if clearing prices are negative, market participants lose their support (CfD and FIP)
- For both support scheme, the optimal strategy is then to offer at 0 €/MWh

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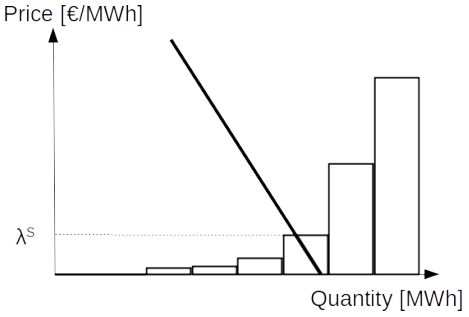

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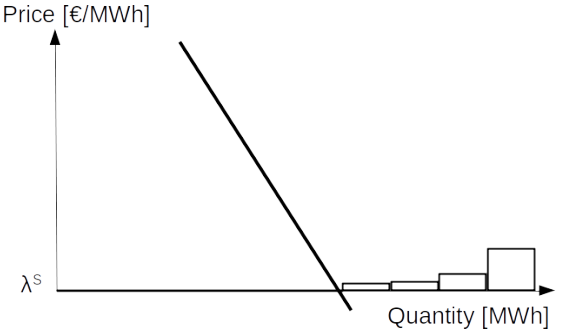
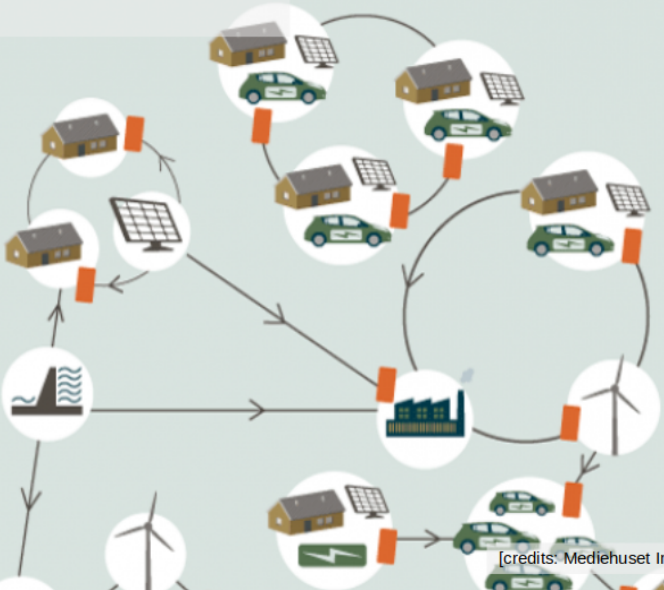


- Clearing prices still decrease, but they never become negative

Use the self-assessment quizz to check your understanding!



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