



Subsidy-free renewables – options and limits

Strommarkttreffen

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Agenda



- 1. Definition of Renewable Energy subsidies.**
- 2. The competitive Auction Playing Field.**
- 3. Subsidy free business models become an option.**
- 4. Can the market alone deliver ambitious RES and decarbonisation targets?**
- 5. Key takeaways**

1. SUBSIDY MECHANISMS

What are renewable energy subsidies and why were they introduced in the first place?

(One) general definition (Source: Investopedia):

“A subsidy is a benefit given to an individual, business or institution, **usually by the government**. It is **usually in the form of a cash payment or a tax reduction**. [...] and it is often considered to be in the overall interest of the public, given to promote a social good or an economic policy.”

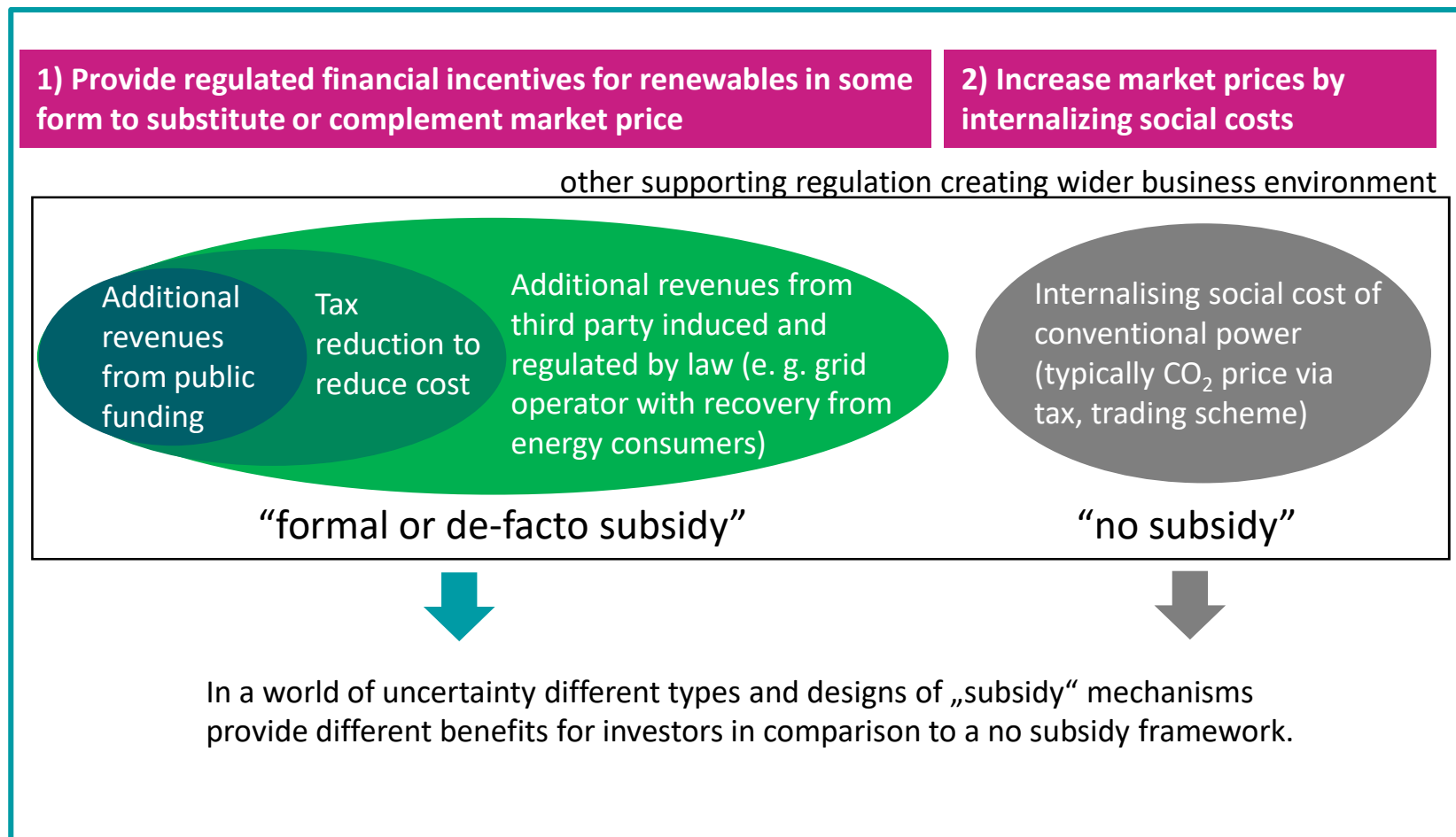
Promotion of Renewable Energy Policy:

- **Investment Challenge:** Are the expected (long term uncertain) market revenues sufficient to recover (mainly fixed and frontloaded) cost of production in competition with conventional power sources?
- **Two policy strategies** to achieve state renewable energy/climate policy targets:

1) Provide regulated financial incentives for renewables in some form to substitute or complement market price

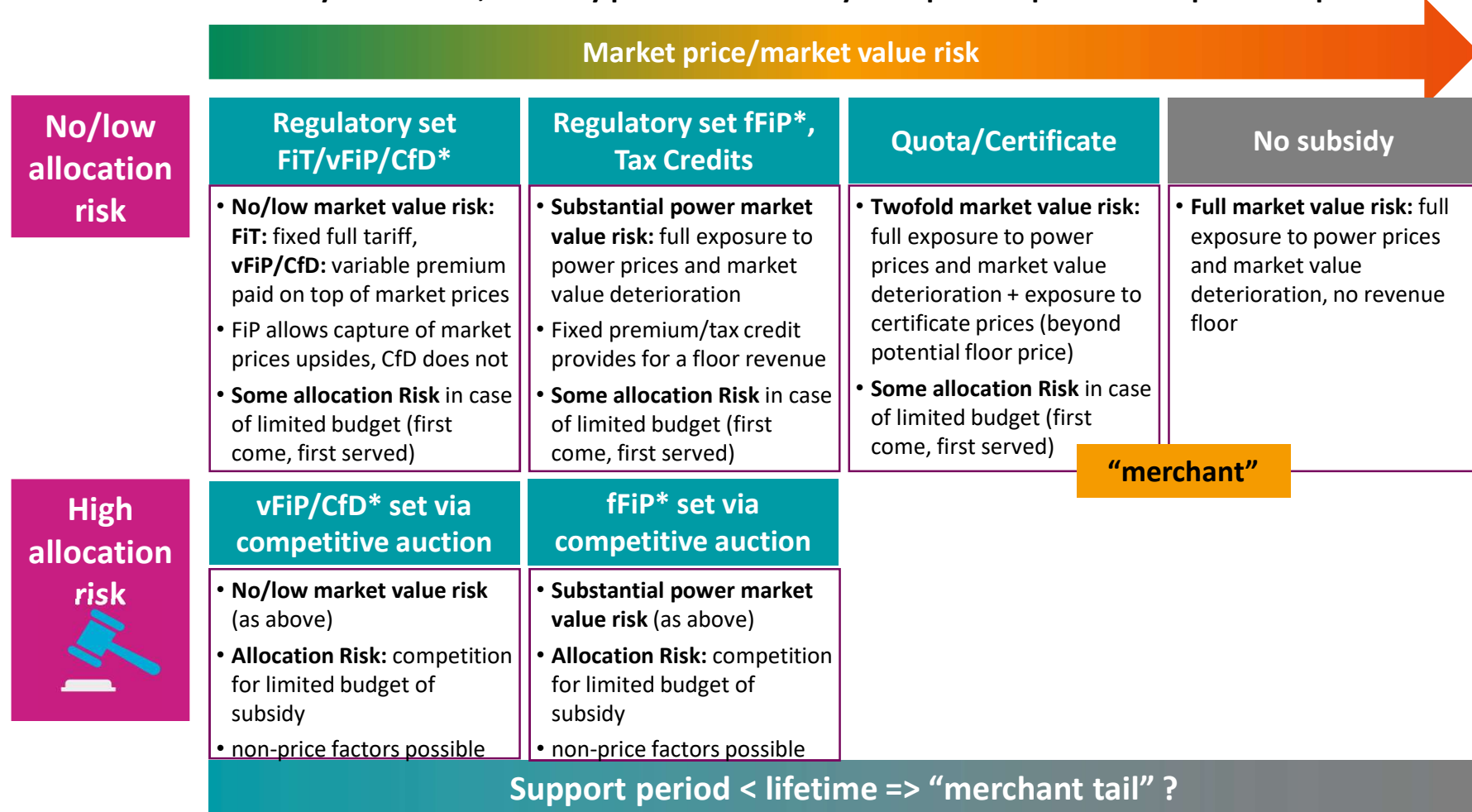
2) Increase market prices by internalizing social costs

What are renewable energy subsidies and why were they introduced in the first place? (cont)



Market value risk exposure and allocation risk are key characteristics of “subsidy” mechanisms

Investors are usually risk-averse, i. e. they prefer for less risky set-ups or require an adequate risk premium

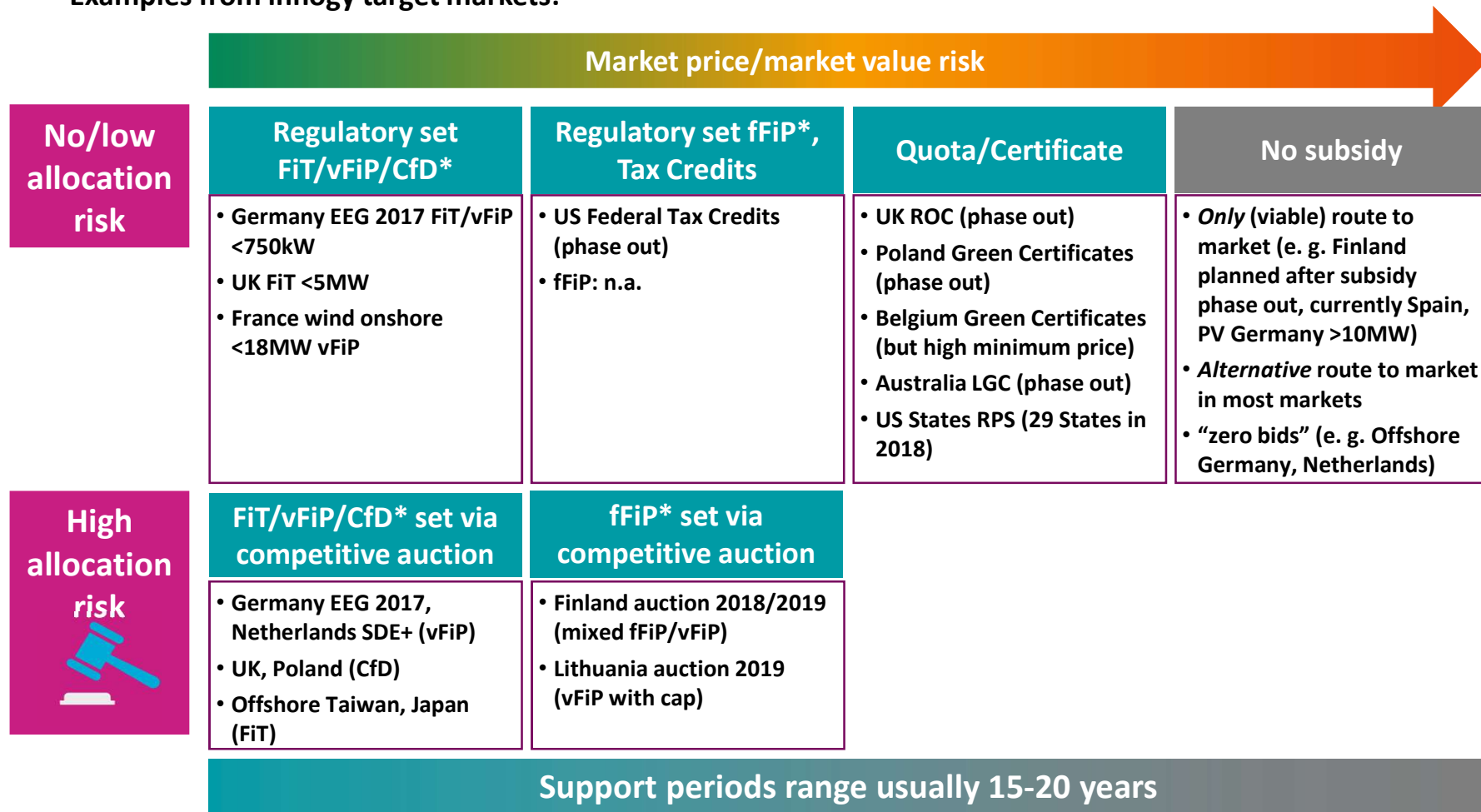


1. Subsidy Mechanisms

innogy is dealing with different frameworks and resulting market exposures in its target markets



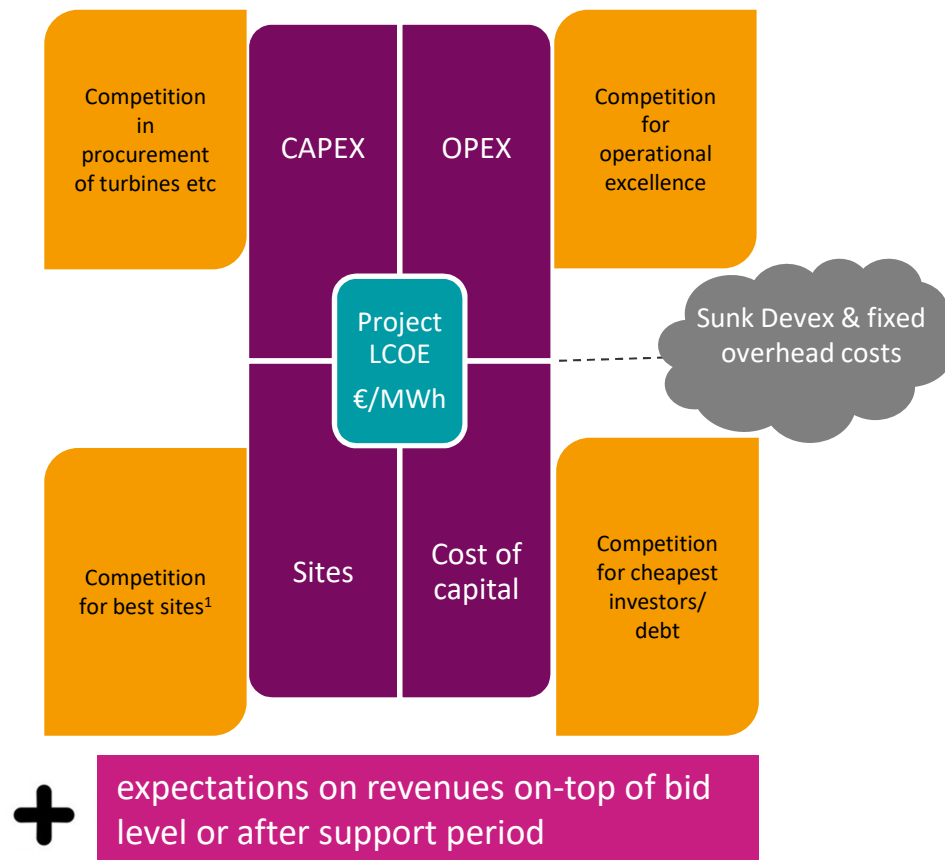
Examples from innogy target markets:



2. THE COMPETITIVE AUCTION PLAYING FIELD

State of play in many markets: auctions with intensive competition lead to substantial allocation risk

Intense competition along the value chain



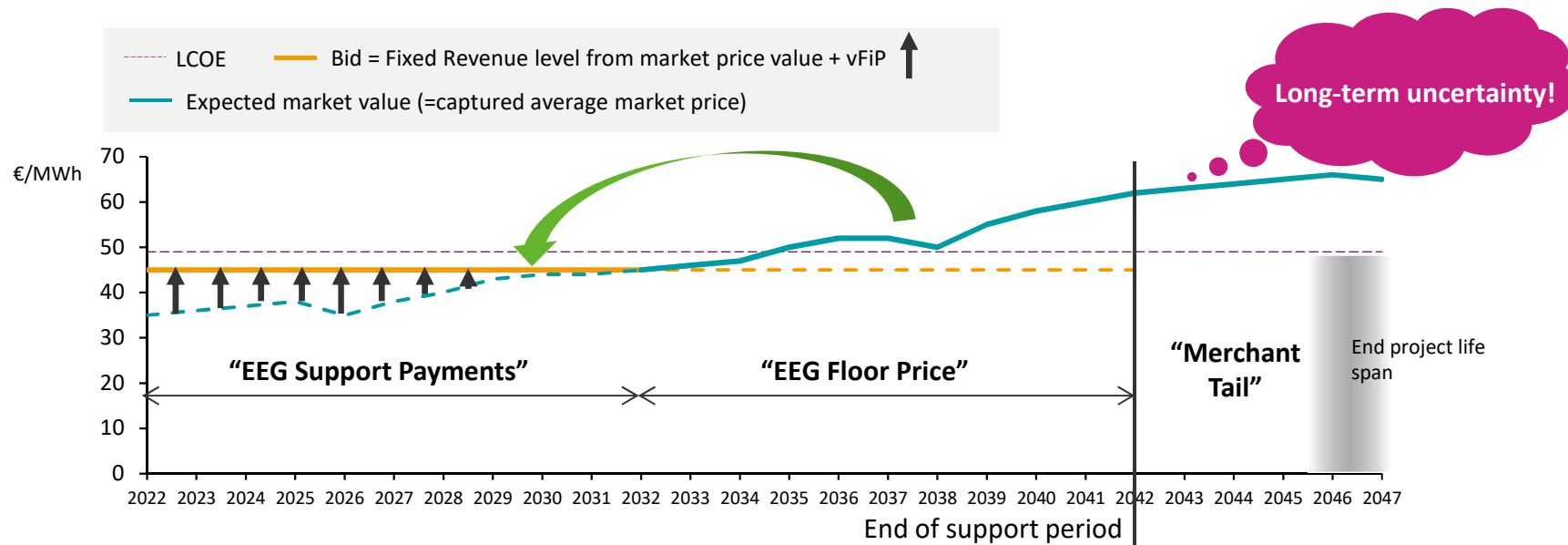
Implications for project development

- Realisation and viability dependent on **success in auction** (allocation risk and auction price risk)
- **Minimisation of project LCOE** is key success factor to win an auction, but revenue expectations can also be decisive
- Most factors uncertain!
- **Risk of being too cautious** ('P100 mentality'): projects are priced out of the market and DEVEX are lost
- **Risk of "winner's curse"**, i. e. bid based on too /optimistic assumptions expectations:
 - Potentially no project realisation, lost Devex + penalties,
 - Realised, but underperforming ('stranded investment')
- Challenge: adequate risk pricing

2. Competitive Auction Playing Field

Market value/revenue expectations are already a key driver for bids and awards in auctions

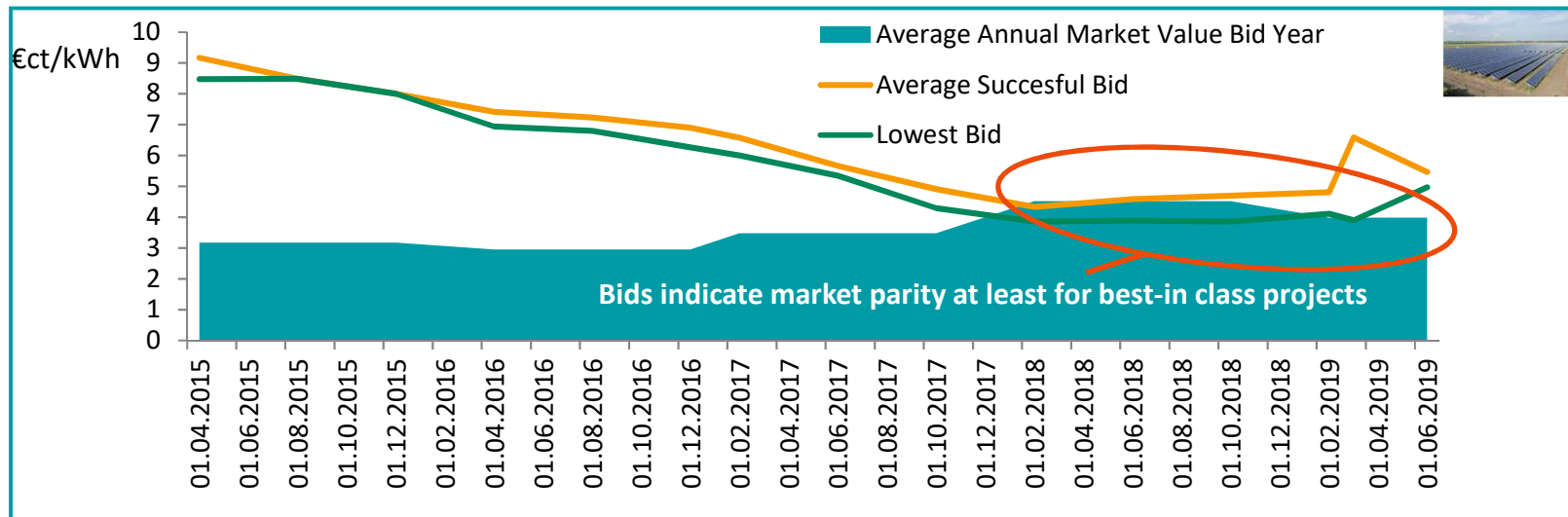
Example: EEG 2017: vFiP with market upside (simplification)



2. Competitive Auction Playing Field

Competitive auctions are a successful driver to reduce “subsidy” levels towards market parity and below

Example: Development of Auction Bids and Market Values for PV in Germany



Further examples from selected markets:

Offshore Germany
(2017): 0 €ct/kWh (vFiP)



Offshore Netherlands
(2017): 0 €ct/kWh (vFiP)



Offshore France
(2019): 4.4 €ct/kWh (CfD)



Onshore/PV Spain
(2017): 2.54 €ct/kWh (equiv.)



Renewables Finland
(2018): 0.251 €ct/kWh (fFiP)



Onshore/PV Alberta (Canada)
(2018): ~3.1 \$ct/kWh (CfD)



Close to market level and especially „zero bids“ raise the question whether „subsidy“ schemes like auctions are still necessary

3. ARE “SUBSIDY-FREE” BUSINESS MODELS VIABLE?

The investor's perspective: situations and motives to consider going „subsidy-free“

1 „Subsidy-free“ project realisation outside a subsidy scheme

- Subsidy (currently) not available, e. g.
 - Announced subsidy phase out Finland
 - Next auction round uncertain or too late, e. g. PV Alberta, PV Spain
 - Restrictions to access tender: e. g. large PV Germany
- Merchant more attractive, e. g.
 - market upside chance higher valued than fixed CfD price
 - very low auction prices, so inadequate balance of obligations/risks and floor price advantage

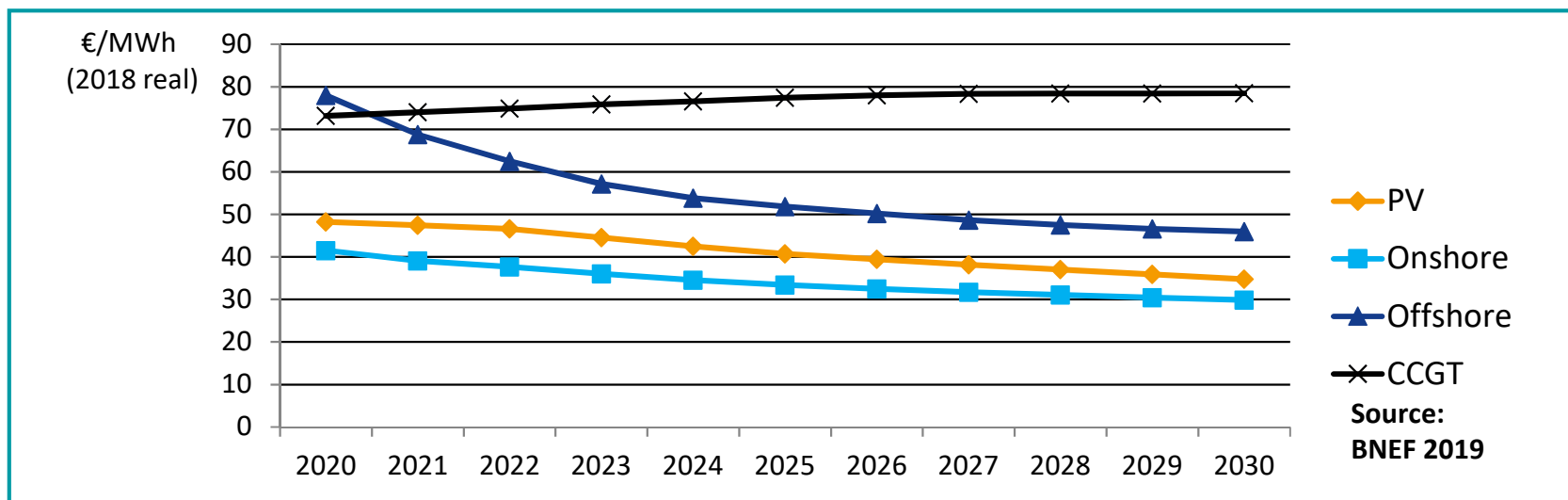
2 „Subsidy-free“ project realisation inside a subsidy scheme (“zero bid”)

- Success in auction is precondition for project realisation (e. g. grid access), but capture of market revenues possible (no CfD)
 - Offshore Auctions Germany, Netherlands
- Next stage, esp. to differentiate between several “zero bids” in bidder competition
 - Negative bids, “beauty contests” (including collateral benefits), e. g. zero bid round with “beauty contest” for Offshore Netherlands

3. Are “subsidy-Free” Business Models viable?

The opportunity: further reductions of LCOE to be expected due to technological advances

Example: Expected reduction of average LCOE levels in Germany



LCOE reductions are a positive driver for “subsidy-free” renewables, esp. for best in class projects

3. Are “subsidy-Free” Business Models viable?

The challenge: full exposure to long term revenue uncertainty with technological, economic & political drivers

“Best Guess” market forecast based on various uncertain assumptions



- Development of electricity demand (growth, efficiency, sector coupling)?
- Development of coal and gas prices?
- Development of conventional power plant portfolio? Coal exit when?
- Development of CO₂ prices and their impact on the merit order?
- LCOEs development and additions of renewables (extrinsic, intrinsic) and resulting market value cannibalisation? Negative prices?
- Development of storage technologies (batteries, Power-to-x)?
- Long term market design? Other value streams (ancillary market, capacity market?)



Fundamental
Market Model
Scenarios



- „subsidy free“ RES are highly exposed to type, magnitude & timing of political or regulatory decisions!
- Which investors (lenders, equity investors) are willing to take this risk at what risk premium?

3. Are “subsidy-Free” Business Models viable?

How can the exposure to long term market uncertainty be mitigated?



1 Business Models and Measures for risk sharing or reduction

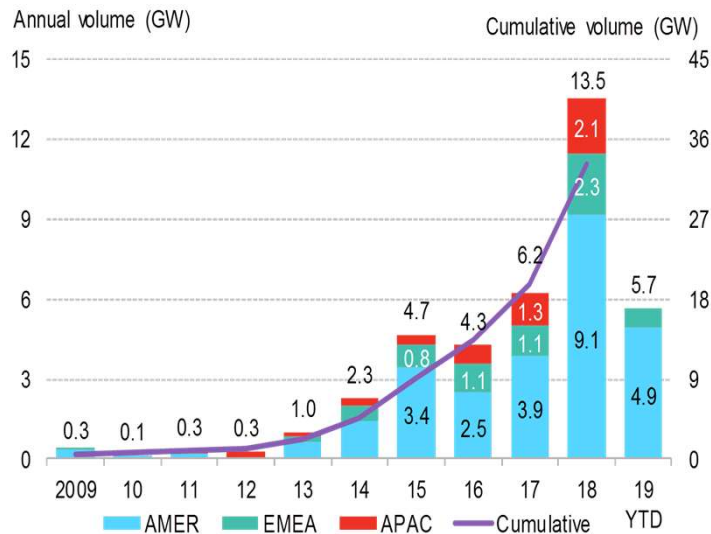
- Short/medium term hedging of power and certificate sales in forward markets
- **Corporate PPAs for risk sharing (see next pages)**
- Service oriented business models for investors

2 Portfolio Management for risk diversification and limitation

3. Are “subsidy-Free” Business Models viable?

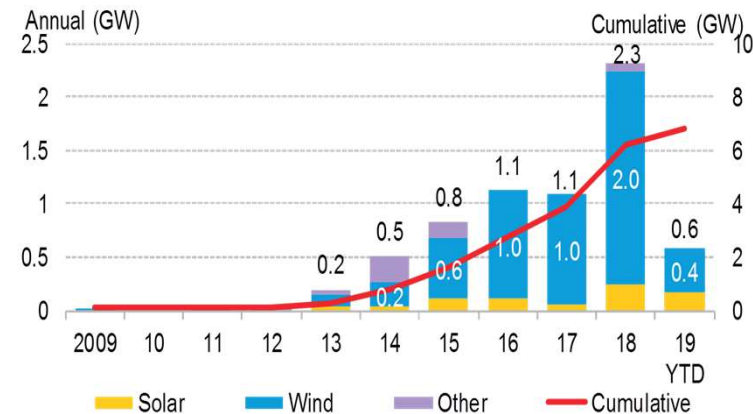
1 Corporate PPAs are picking up with 38 GW signed globally and 7 GW signed in Europe by May 2019

Global corporate PPAs by region*



- **38 GW** sold via PPAs globally
- **5.7 GW** signed in May 2019 globally

EMEA Corporate PPAs by technology*



- PPA Market in **Europe** is growing quickly with PPA capacity quadrupling in the last 2 years
- **7 GW** signed in Europe cumulative
- **Wind onshore** is the dominant renewable source

*Source BNEF 2019

4. CAN THE MARKET ALONE DELIVER AMBITIOUS DECARBONISATION TARGETS?

4. Can the market alone deliver ambitious decarbonisation targets?

Relying on subsidy-free projects alone might challenge ambitious RES growth and decarbonisation pathways

Uncertainty for investors translates into policy uncertainty

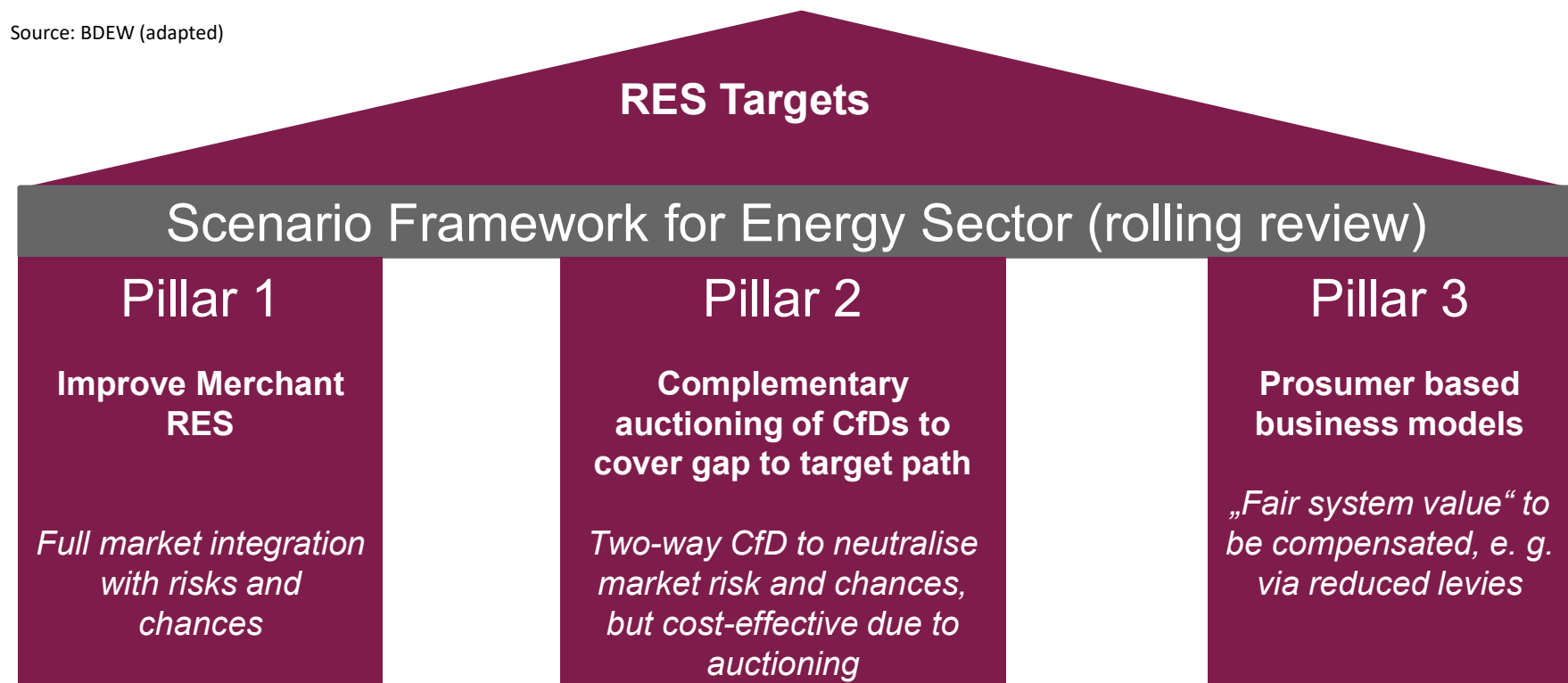


- Increasing urgency of decarbonisation progress (1.5° ambition)
- Uncertainty about risk appetite and premiums (bank financing, investor groups) could put targets at risk: lower RES growth than expected or boom-bust cycle with stranded assets
- Diversity of market participants and increased local participation desired for public acceptance of power sector transformation (what about the participation of citizen and municipalities in a fully merchant world?)
- Issues have different impact for different markets

4. Can the market alone deliver ambitious decarbonisation targets?

“Three pillar approach of BDEW” combines potential for merchant projects with effective target steering

Source: BDEW (adapted)



- Shift to CfD would enable fair sharing of market risks and chances
- CfDs with bid prices on market level: focus shifts from actually subsidy payments to risk mitigation

5. KEY TAKEAWAYS

Key takeaways

1. **Definition of Renewable Energy subsidies:** Mechanisms which provide regulated financial incentives for renewables to substitute or complement market price and which differ in terms of market exposure.
2. **The competitive Auction Playing Field:** Competitive Auction – in various designs – are the current mainstream. Competition through allocation risk was key for cost effectiveness and driving cost reductions to near to market price levels.
3. **Subsidy free business models become an option.** Key success factors are superior projects and alternative risk mitigation measures such as Corporate PPAs and portfolio diversification.
4. **Can the market alone deliver ambitious RES and decarbonisation targets?** Maybe. Merchant projects can definitely contribute, but more market risks for investors translates into uncertainty for decarbonisation policies. As decarbonisation progress becomes more pressing, policy makers should take chances and back-up merchant growth with auction schemes to secure target achievement.