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An Coimisiún um Rialáil Fuinnimh

Institutional Issues

Review of Electricity Trading Arrangements

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10th April 2003

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These presentation slides were accompanied by an oral discussion, so that the slides alone do not fully represent the presentation content.

This presentation represents the views of the speakers only.

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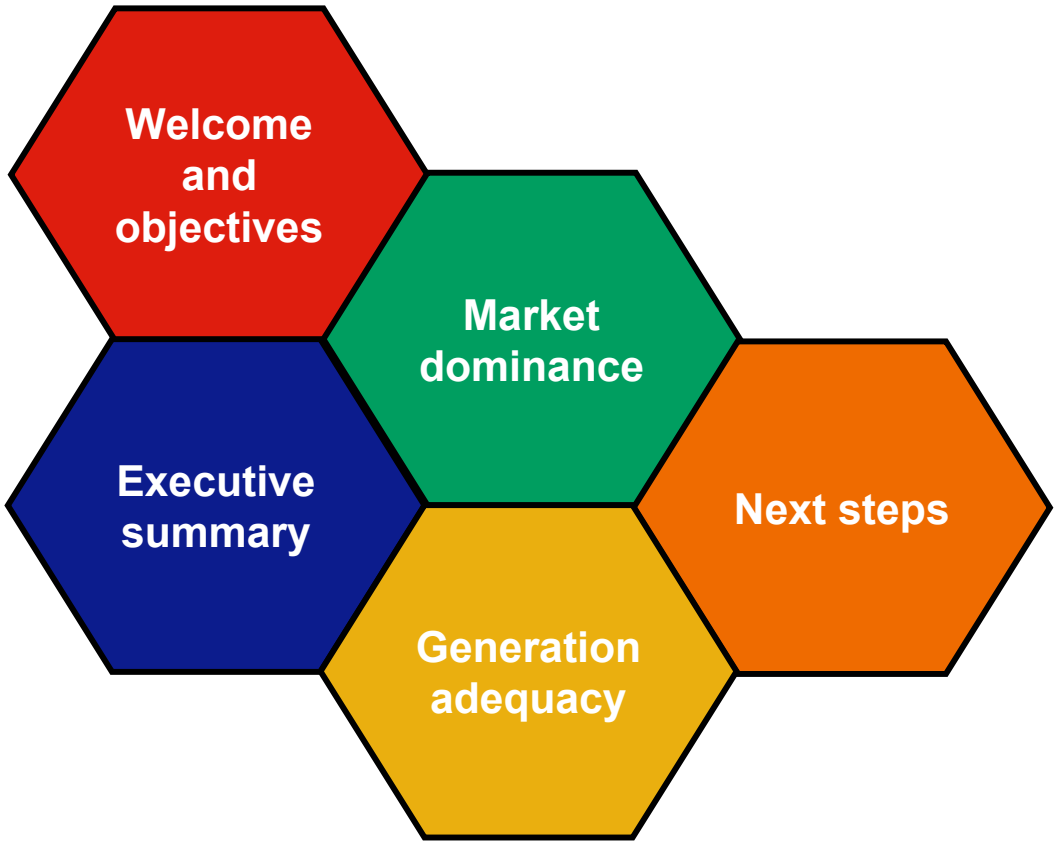
AGENDA



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Schedule for today

Topic	Timing	Presenter
Welcome and objectives	0900 – 0905	Tom Reeves, Commissioner
Executive summary of the day	0905 – 0915	Ed Kee, PA Consulting
Detailed discussion of market dominance issues	0915 – 1115	Ed Kee, PA Consulting
Tea Break	1115 – 1130	
Detailed discussion of generation adequacy issues	1130 – 1230	Ed Kee, PA Consulting
Next steps	1230 – 1235	Stuart Curson, PA Consulting

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Objectives for today

The key objectives for this morning are:

- To provide additional detail on the proposed mechanism for addressing the dominant participant issue
- To provide additional detail on the proposed mechanism for addressing the generation adequacy issue
- To answer questions from market participants on these topics

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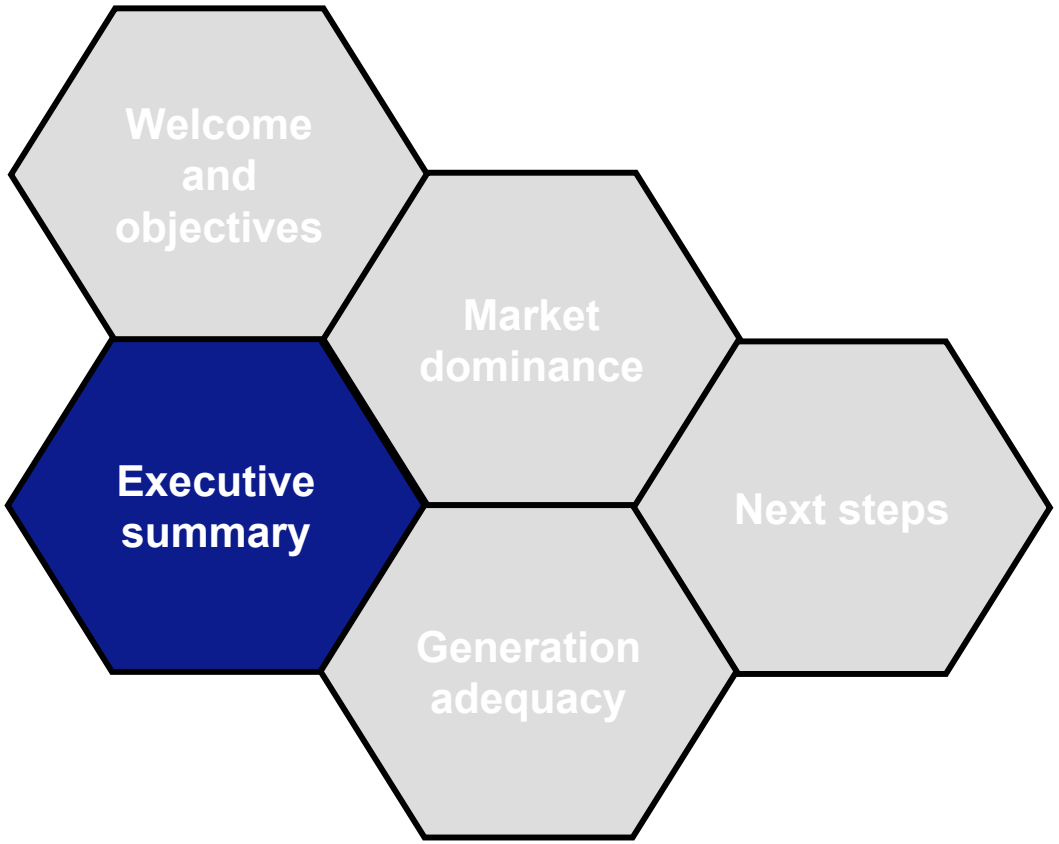
Ed Kee, PA Consulting



Executive summary

Earlier papers and industry presentations described and presented options to address the important institutional issues of:

- Market dominance
- Generation adequacy

Today's presentation provides additional details, as requested by participant comments, on how certain options would operate to address these issues:

- Imposed hedge contract (vesting contract) suite to address market dominance
- Fast build safety net option to address generation adequacy

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Market dominance

Market dominance is an important issue, with the classic solution to market dominance being structural changes currently beyond CER scope (eg, competing corporatised state owned generators or atomistic privatisation). While there is some potential that these structural changes will take place, CER will undertake measures that will help ensure that market dominance problems are minimised.

- Options under consideration
  - Vesting contract suite
  - Regulation

As discussed earlier, some regulatory action and some level of vesting contracts will need to be in place regardless of any structural change.

Generation adequacy

Ensuring sufficient generation capacity requires action prior to the shortfall. The options presented have varying degrees of flexibility and certainty, with CER preferring options that maximise flexibility, are more certain to deliver the safety net capacity, and that minimise interference with market entry.

- Safety net options
  - Default buyer
  - Development incentive
  - Fast build
- Expect market to respond; be ready if it does not
- Action triggered by CER against a set of published criteria
- CER to monitor and police gaming of any mechanisms

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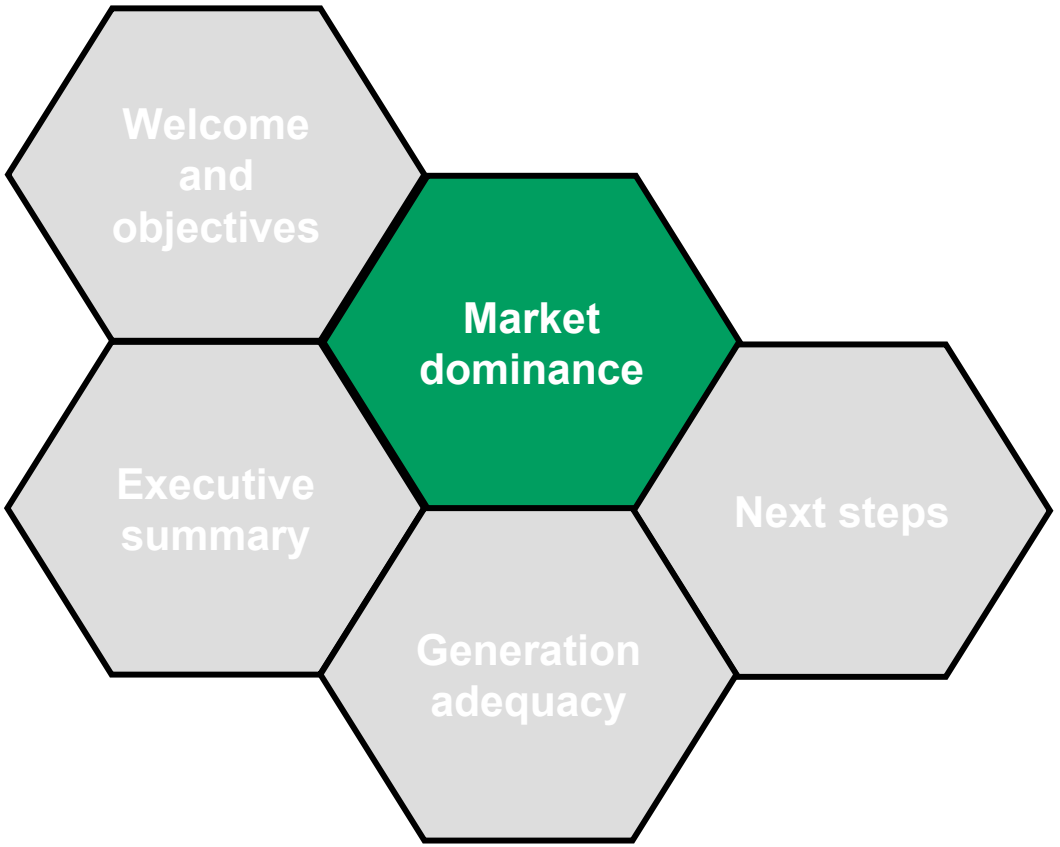

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Market Dominance

This morning, we will cover:

- Brief review of market dominance concept
- Overview of vesting contract concept
- Detailed discussion of the use of imposed hedge contracts to control market power
- Interaction of vesting contracts and the spot market
- Brief discussion of the regulation of ESB PowerGen
- Discussion of the other potential roles of vesting contracts

This session is scheduled to last for about two hours, with some time included for questions

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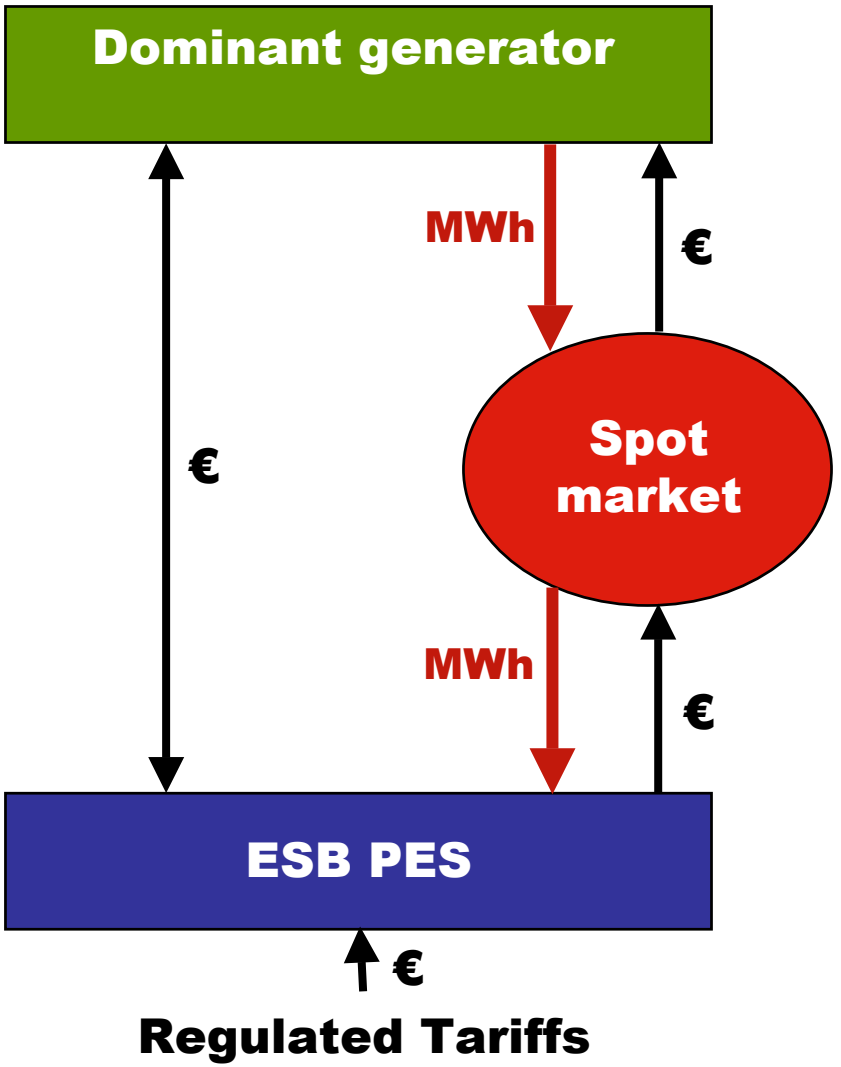
Current situation



- Dominant generator and PES are same economic entity
- PES tariffs fixed for year

Likely outcome

- ESB profits are difference between PG costs and PES tariff revenues
- ESB indifferent to spot price (eg, if spot price is high, PG makes a lot of money that covers PES losses and vice versa)

Review - Market Dominance concept

ESB PowerGen has a very large share of the generation market and is also a large presence as the regulated PES. As the combined entity is indifferent to the spot price level (implicit natural hedge), it might:

- Force prices up while maintaining PES tariff levels, driving competing supply companies to exit or avoid entry,
- Force prices down to deny generator entry while protecting profits through regulated PES tariffs, or
- A combination of both at different times throughout the year

Even if such behaviour never actually happens, the threat of such activity can be a powerful force in hedge contract negotiations and in the assessments by potential new entrants.

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Contracts as market power control

A series of hedge contracts would be imposed on PG

- Specific to each PG plant (perhaps to each unit), reflecting cost structure, operating characteristics, and expected behaviour in a competitive market
- A mix of two-way and one-way hedge contracts that may include option fee payments (ie, two-part payment contracts that allow finely tuned effects)
- No direct effect on the spot market or on the participation of any PG unit in that market – rather, financial incentives that limit the benefits of market manipulation are imposed on PG to control behaviour

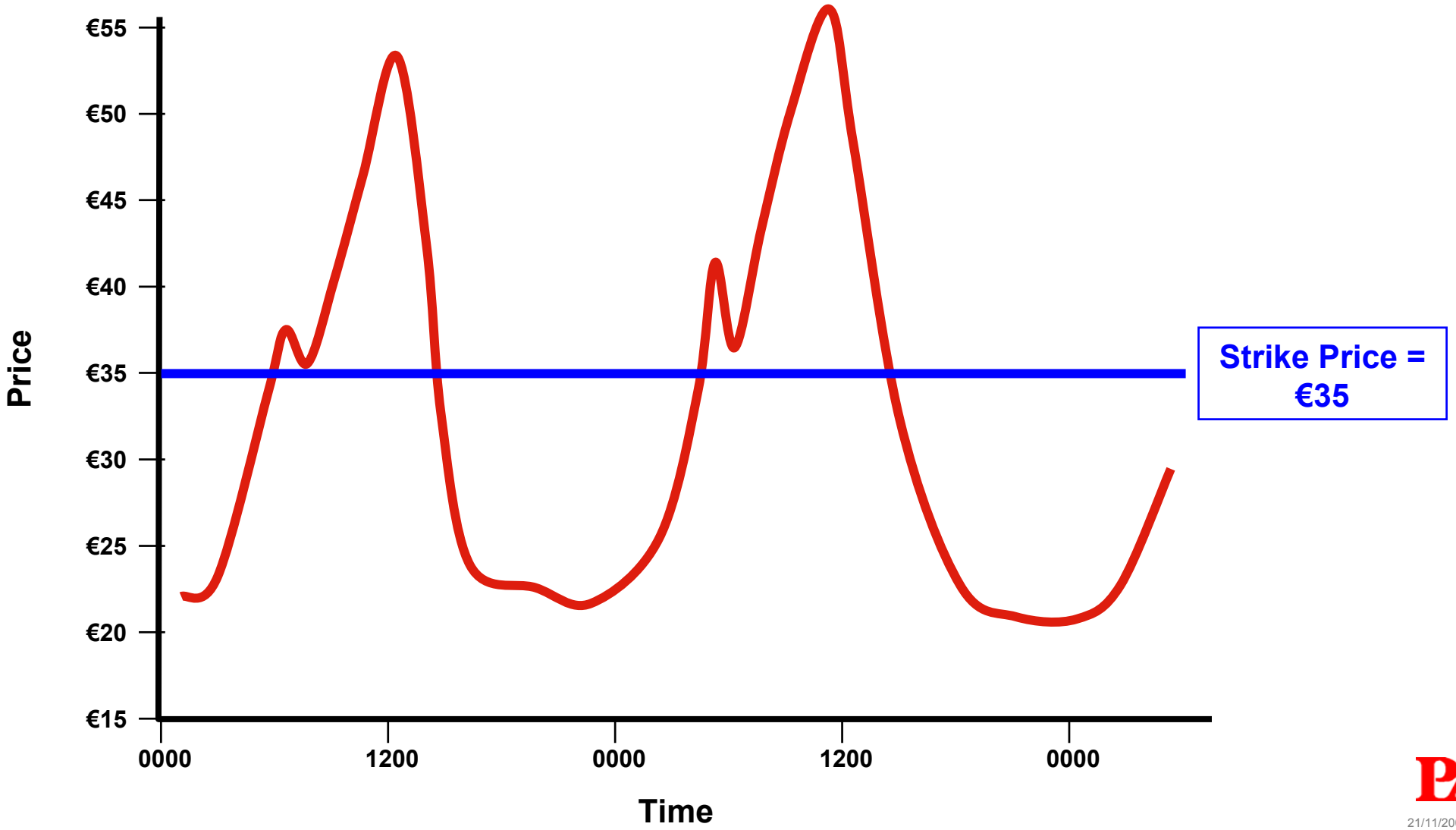
Swap contract

A common hedge contract is a swap, sometimes known as a 2-way hedge. In this type of contract, the parties agree on a strike price and a volume. Typically, a generator and a supply company would enter into such a contract. While both parties transact with the market operator in the spot market, they enter into such financial agreements in order to limit their exposure to spot price risk.

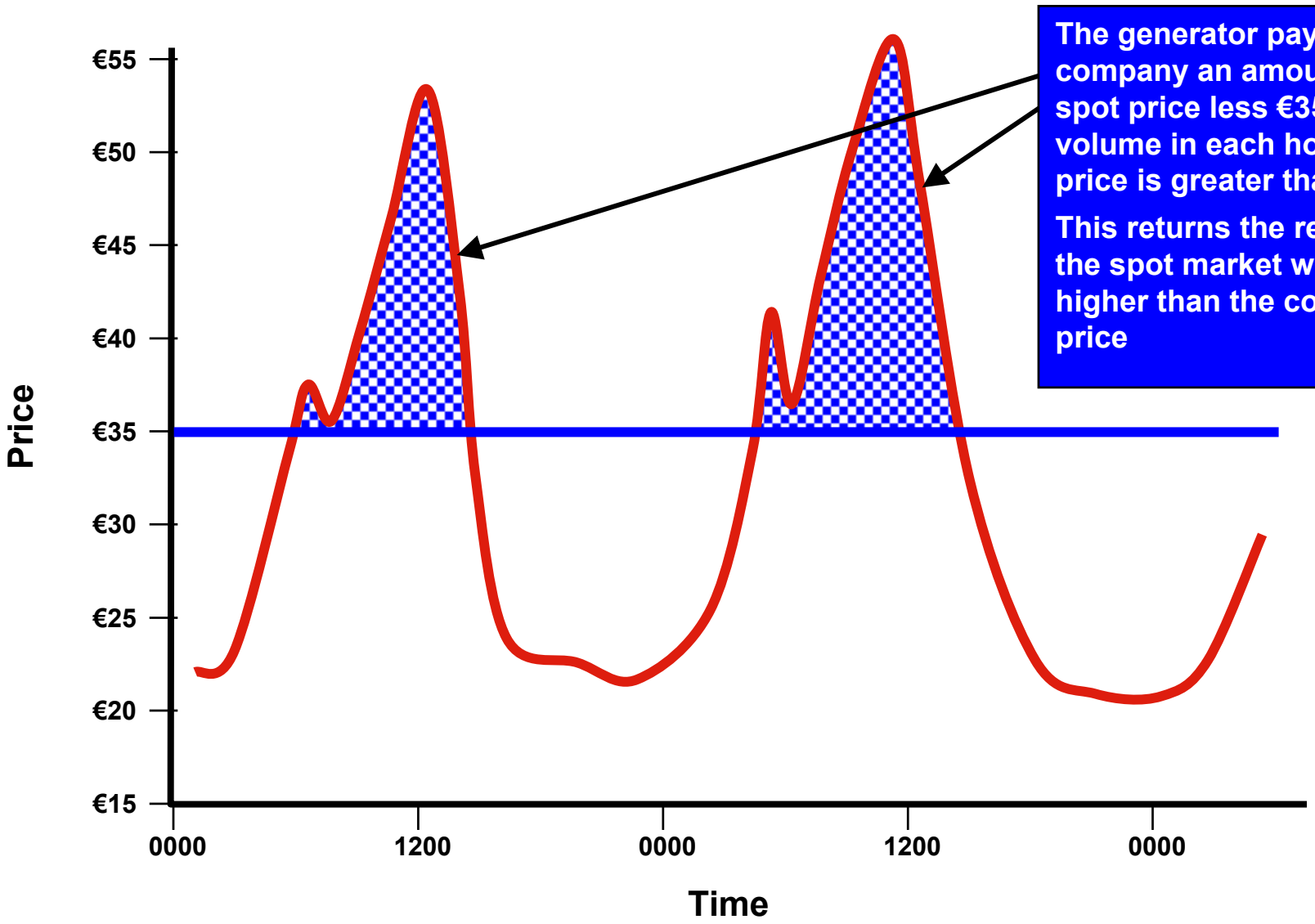
We assume a swap with a €35 strike price.

REVIEW

Swap contract



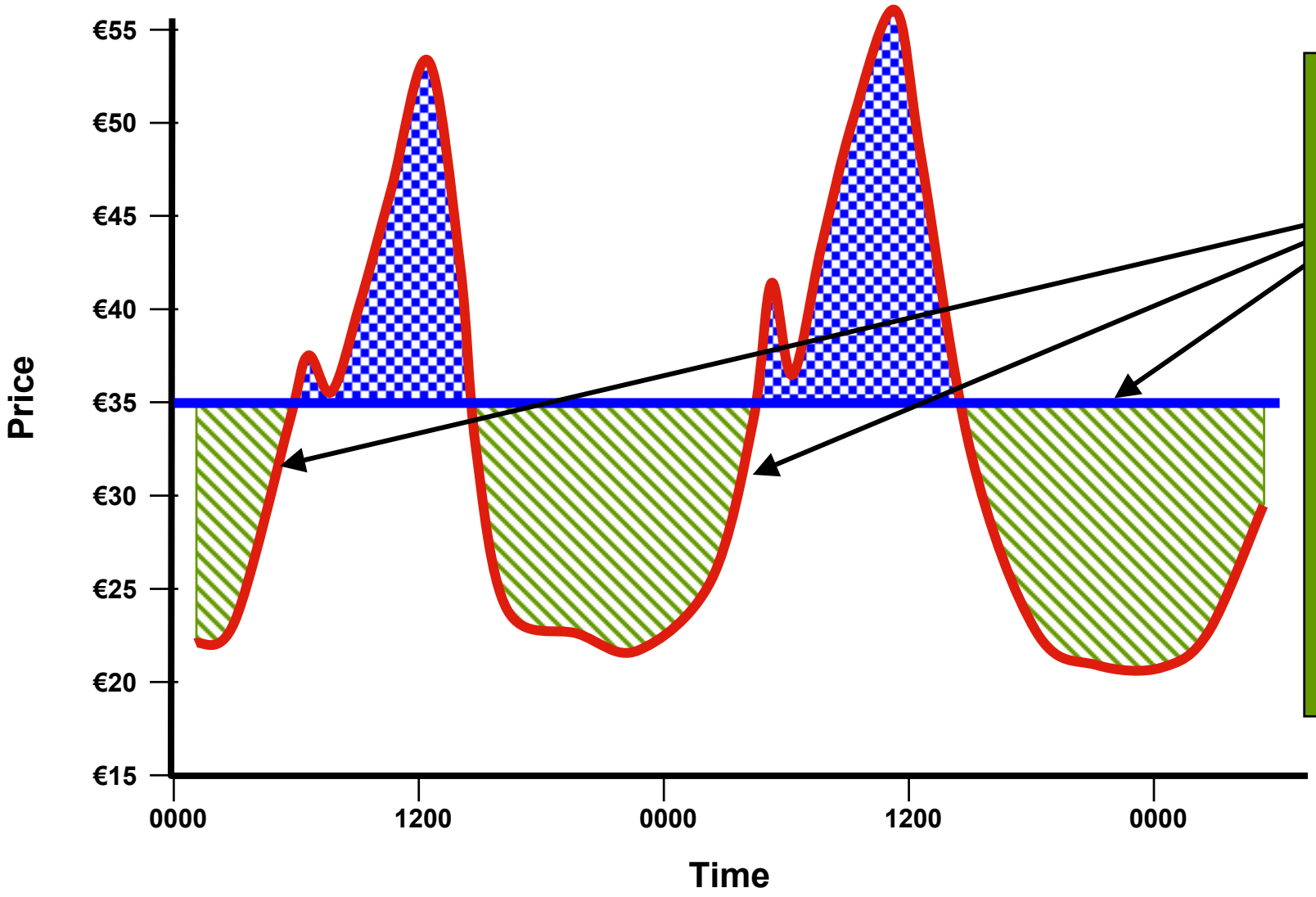
Generator difference payments



The generator pays the supply company an amount equal to the spot price less €35 times contract volume in each hour when spot price is greater than strike price.

This returns the revenue earned in the spot market when prices are higher than the contract strike price

Supplier/retailer difference payments



The supply company pays the generator an amount equal to €35 less the spot price times contract volume in each hour when spot price is less than the €35 strike price.

This returns the benefit received when spot market prices are less than the contract strike price

Swap contract – overall effect

The result of a swap contract is that the two parties have their *effective spot price* fixed at the €35 strike price for the contract volume, no matter how high or low the actual spot price goes.

A fully contracted generator would not profit from raising the spot price above the strike price. Also, a generator that bids above the strike price risks not being dispatched and losing spot market revenues that form the basis for difference payments – this provides a strong financial incentive for the generator to bid at or below the strike price.

There remains exposure when actual volumes are different from the contract volume. If a generator had some uncontracted volumes, this volume will be bid in a commercial manner. If a generator is completely hedged, however, the spot price is removed as a commercial signal.

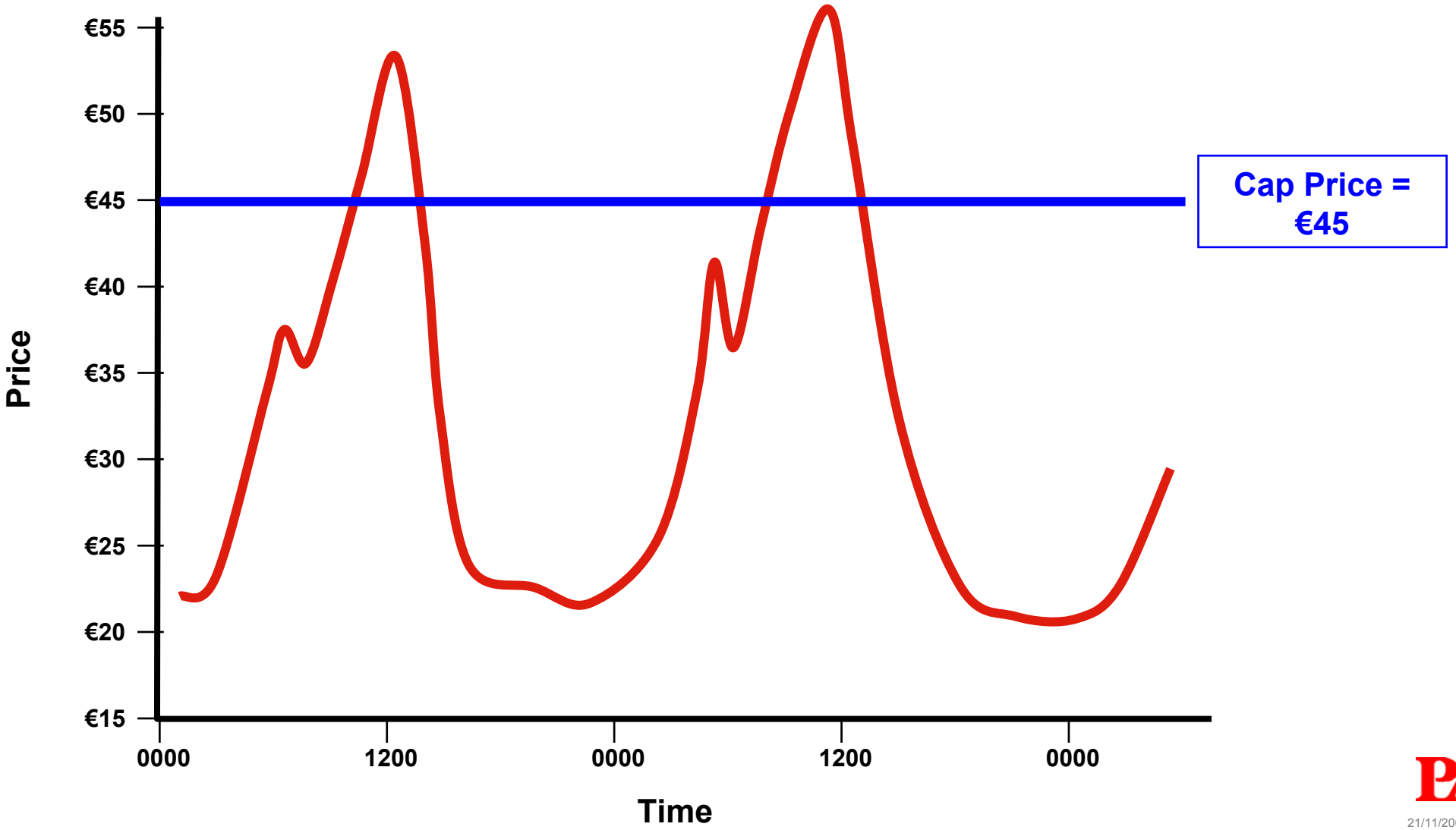
Cap contract

Another common hedge contract is a cap contract, sometimes known as a 1-way hedge. As in a swap, the parties agree on a strike price and a volume. Typically, a generator and a supply company would enter into such a contract.

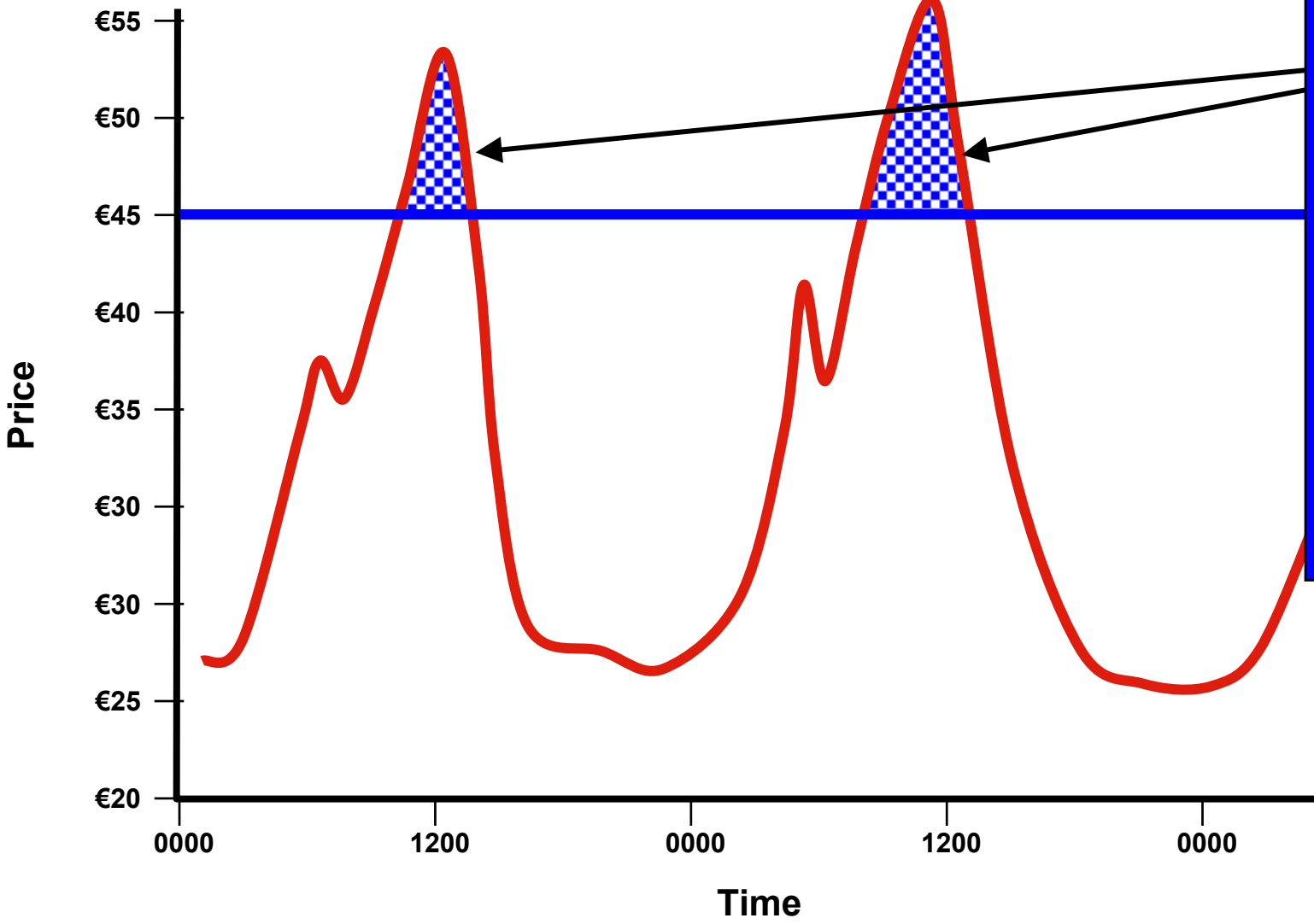
Unlike a swap contract, a cap contract only has payments from the generator to the supply company

We assume a swap with a €45 strike price.

Cap contract – overall effect



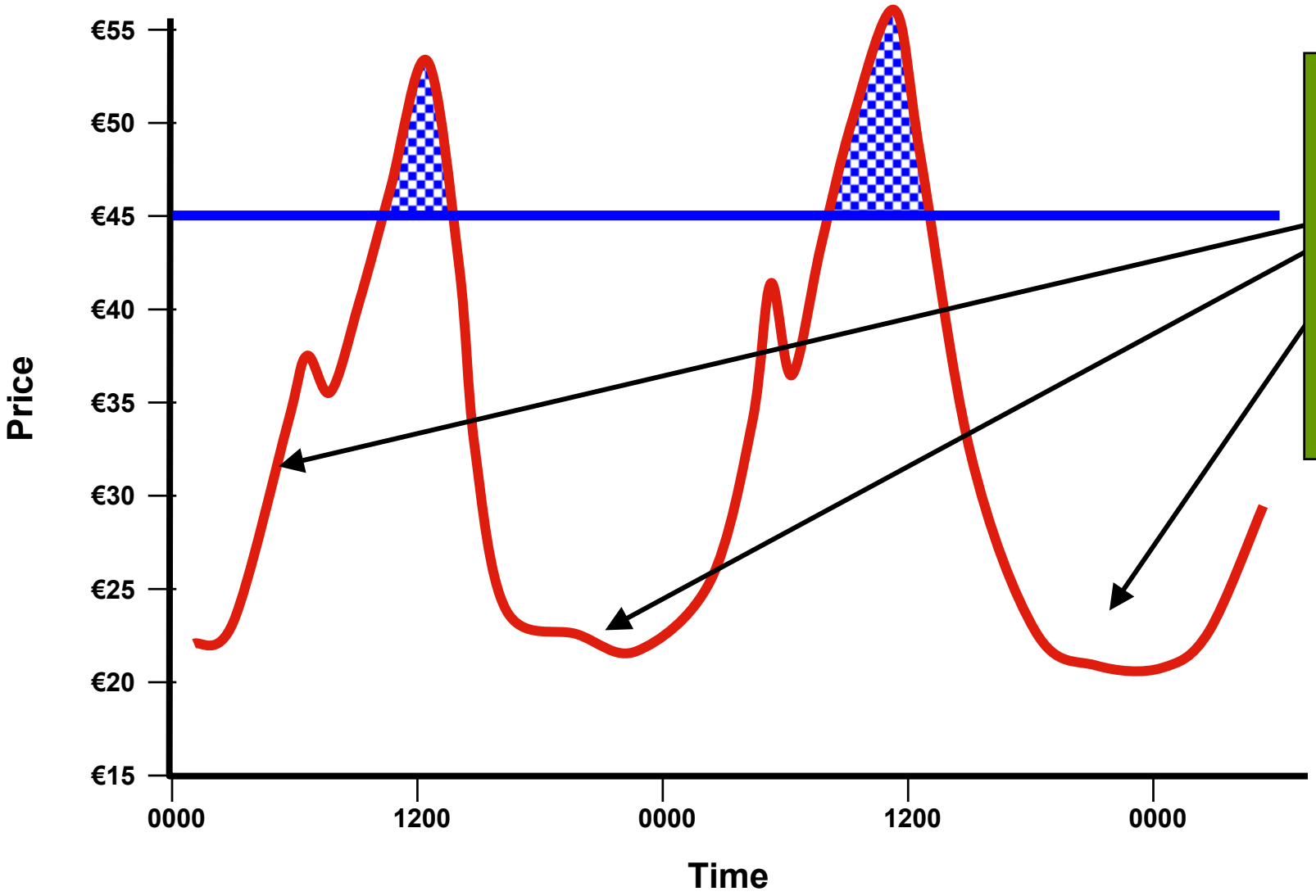
Cap contract – overall effect



The generator pays the supply company an amount equal to the spot price less €45 times contract volume in each hour when spot price is greater than strike price.

This returns the revenue earned in the spot market when prices are higher than the contract strike price

Cap contract – overall effect



When the spot price is less than the strike price, both parties have NO hedge, so that the volumes are transacted at the spot price with no offsetting financial adjustments.

Cap contract – overall effect

The effect of a cap contract is to limit the upside revenue to a generator, while providing no protection to the generator against low spot prices. Such a cap contract might be accompanied by a payment of an option fee to the generator, depending on the level of the cap price.

One potential arrangement is for a peaking plant to provide a cap contract that limits the supply company exposure to high spot prices, with an option fee that provides coverage of the peaking unit's fixed costs.

Pivotal generator concept

This concept recognises that some generators have sufficient capacity under their control to allow them to profitably set the market price most, if not all, of the time.

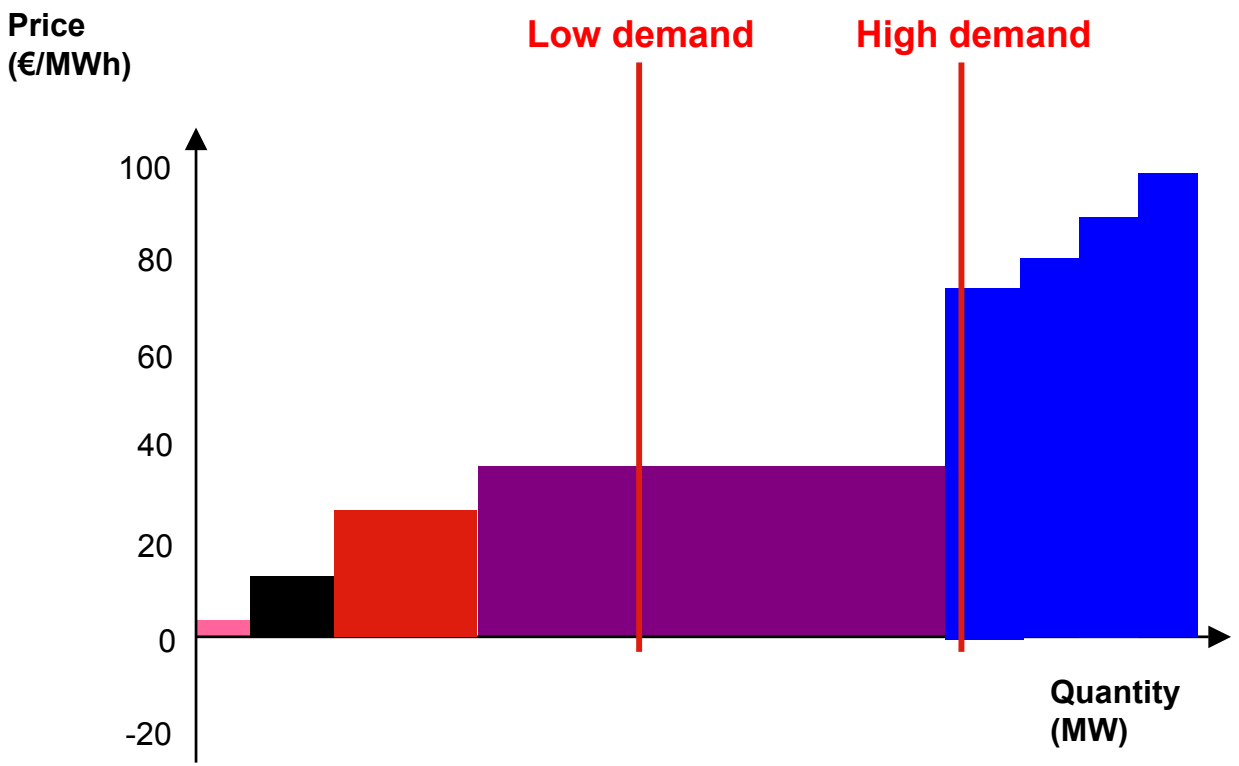
Market power is more pronounced at high demand levels.

Identifying pivotal generators and imposing hedge contracts on them is an effective mechanism to control the ability of otherwise pivotal generators to control the market.

The following illustrative example shows how this approach might work in a simple system.

Of course, the Irish situation is a lot more complicated and would require a more complex mix of contracts.

Pivotal generator concept



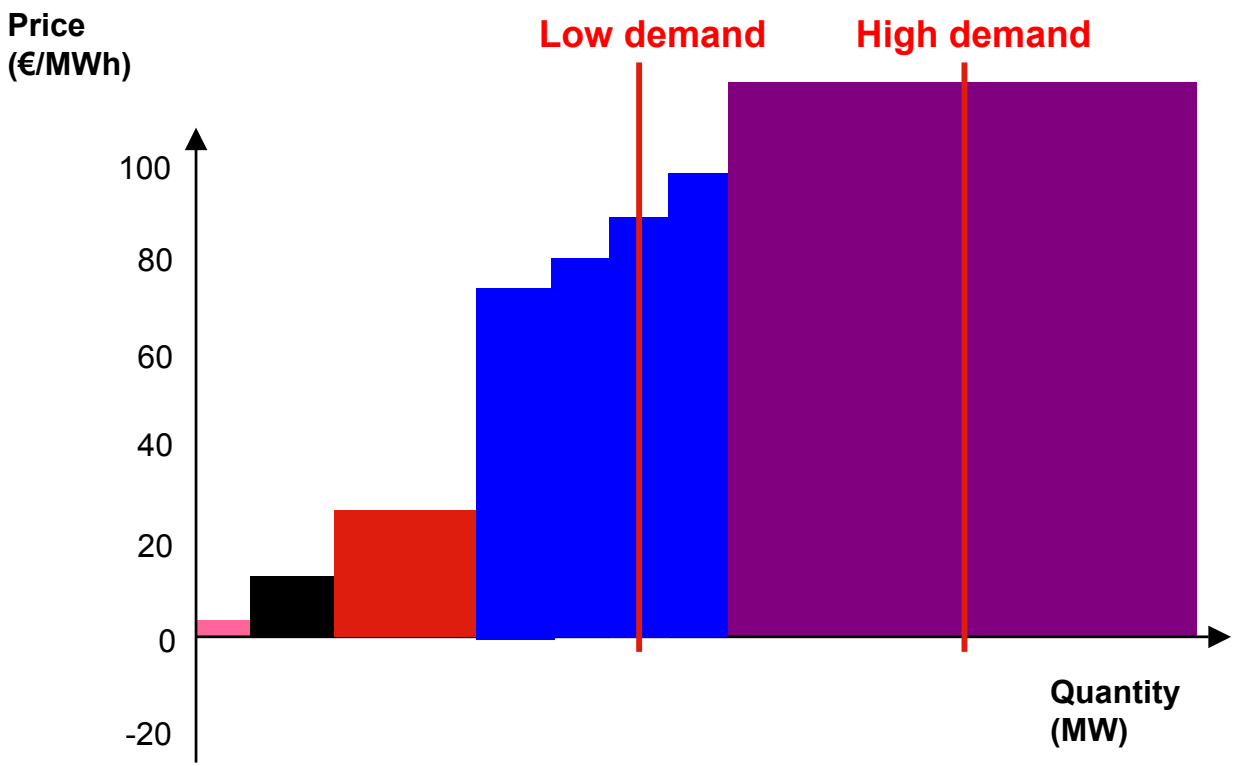
Generators 1, 2, 3, 5, 6, 7 or 8 could withdraw capacity from the market or bid a very high price without controlling the spot price.

This is because the excess capacity at all demand levels is greater than the capacity of any of these generators. Other generators could profitably replace the withdrawn capacity.

Generator 4, however, is pivotal.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

Controlling market power through hedge contracts



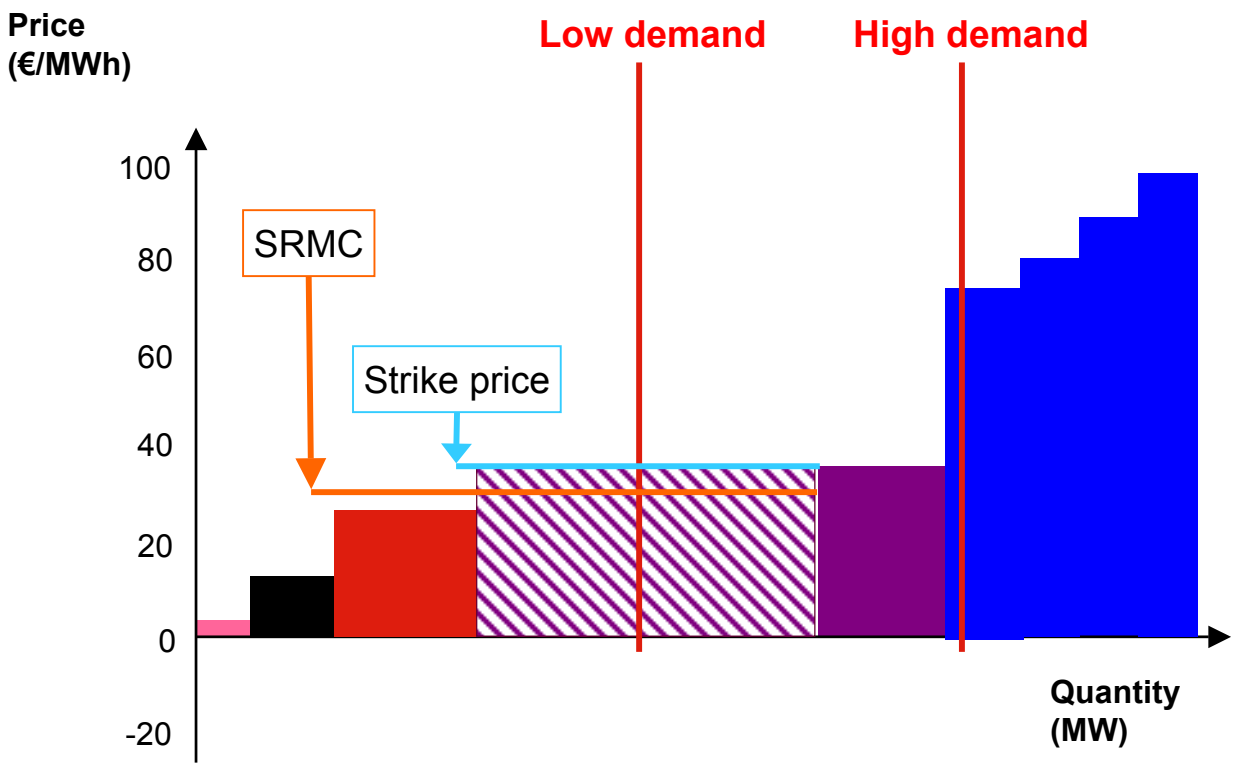
Generator 4 can profitably withdraw capacity from the market at all but low demand levels.

This is possible because Generator 4 has a sufficient share of the market to allow them to withdraw some capacity, without other capacity replacing the withdrawn capacity.

In this example, Generator 4 is pivotal and can control prices except at low demand levels.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

Controlling market power through hedge contracts



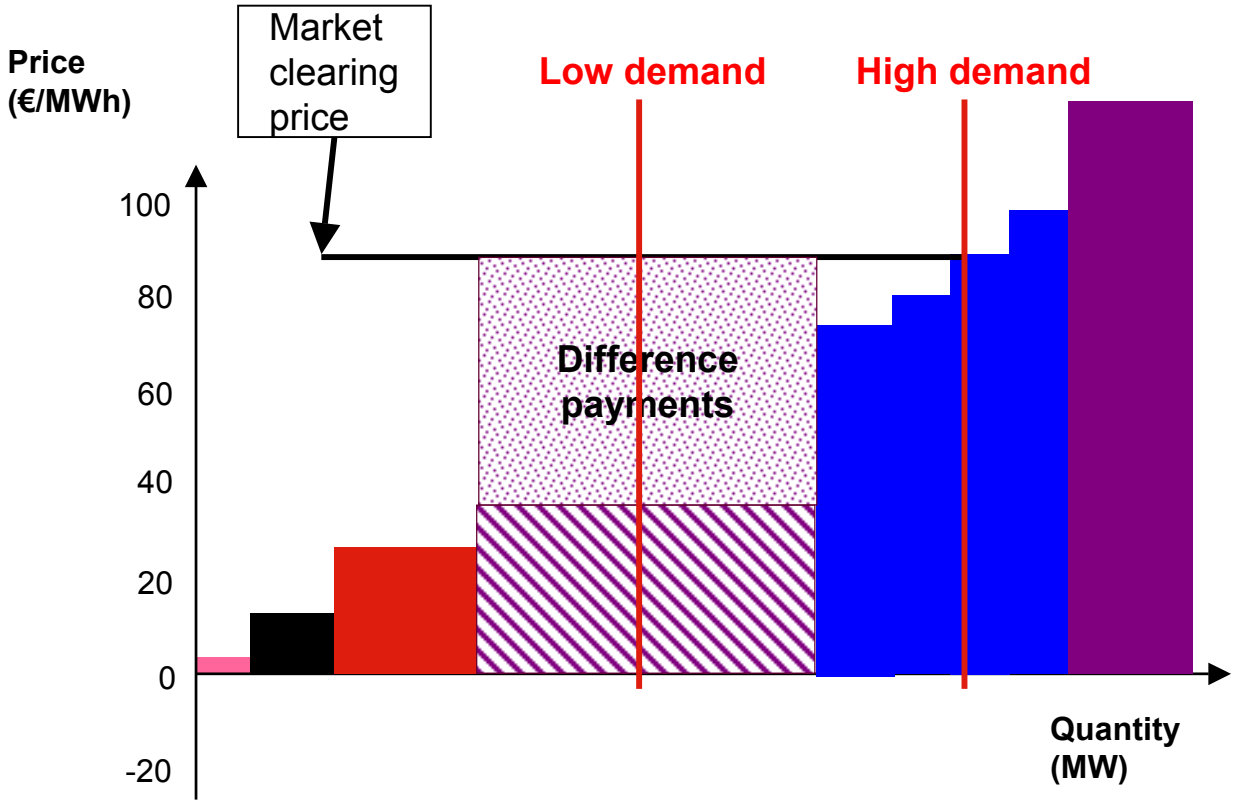
If some portion of Generator 4 (eg, 3 of 4 units) were subject to an imposed swap contract, the market power of Generator 4 would be removed.

The swap contract on a portion of Generator 4 provides strong financial incentives to bid at the strike price. The strike price would be at or above marginal production cost, with an accompanying option fee, as appropriate.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

4 (swap contract)

Controlling market power through hedge contracts



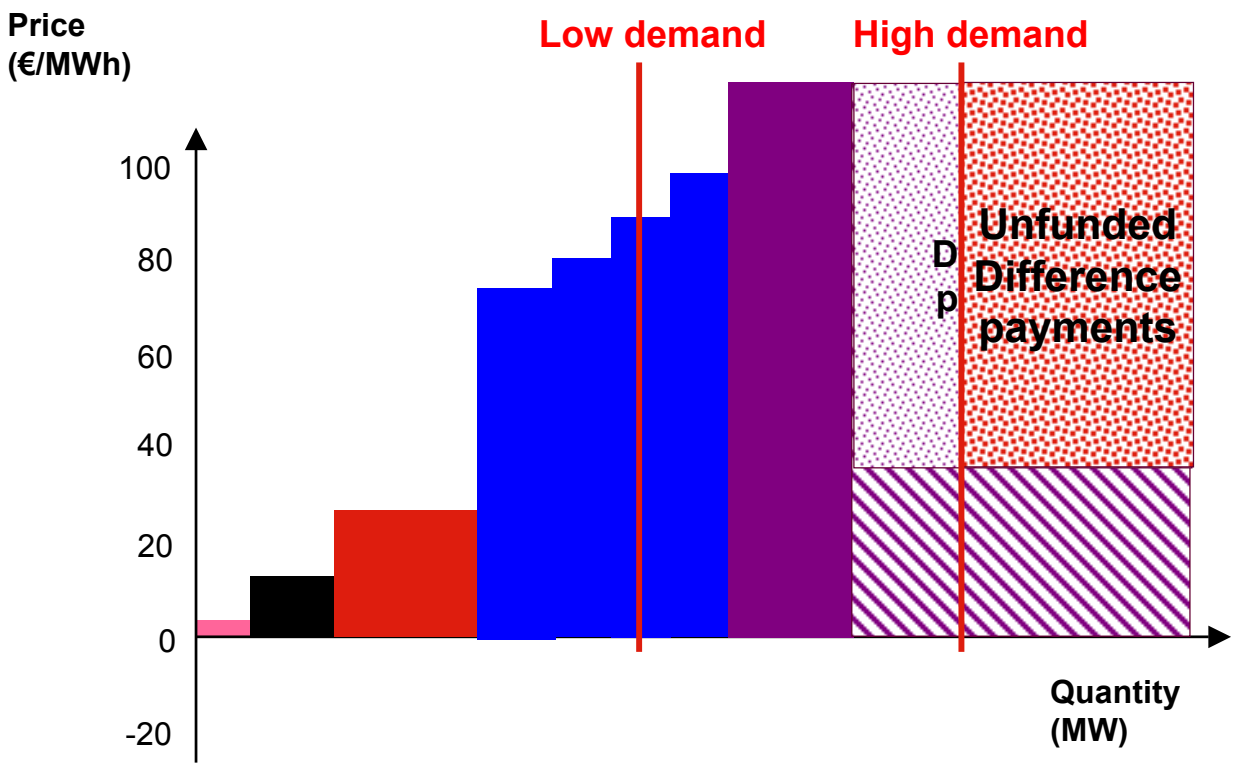
If Generator 4 attempted to withdraw the uncontracted portion of its capacity from the market by bidding high, this bid would not clear in the market and would not be dispatched even at peak demand.

However, there are other strategies that Generator 4 might follow, including raising the bid of the contracted volume in order to capture higher revenue on its uncontracted volume.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

4 (swap contract)

Controlling market power through hedge contracts



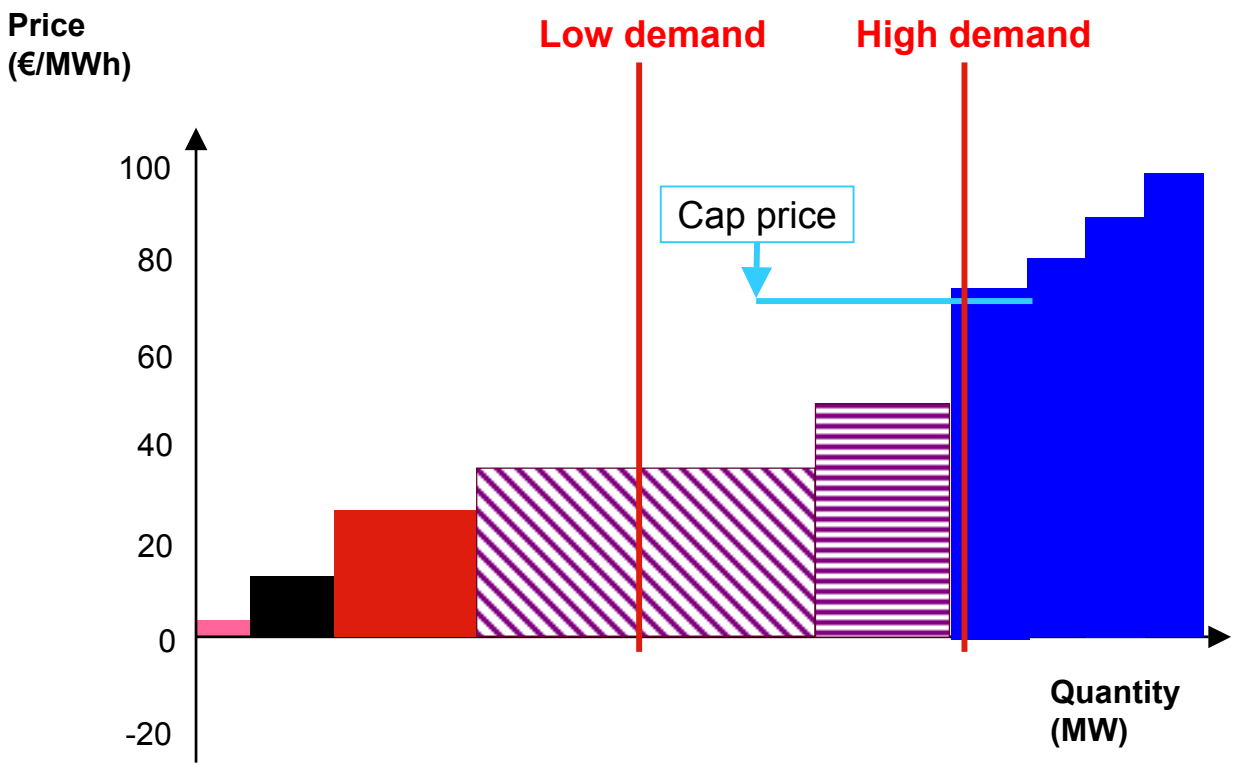
Even though Generator 4 might produce (NB: not in this example!) sufficient profits from the uncontracted portion of its capacity to outweigh the cost/risk (eg, not all contracted volume would be dispatched and result in cash shortages for difference payments).

If this is a concern, a cap contract might be put on the Generator 4 volume not already covered by the earlier swap contract.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

4 (swap contract)

Controlling market power through hedge contracts



A cap contract for the remainder of Generator 4 capacity could preclude any ability to manipulate spot prices sufficiently high to overcome losses as a result of the swap contract.

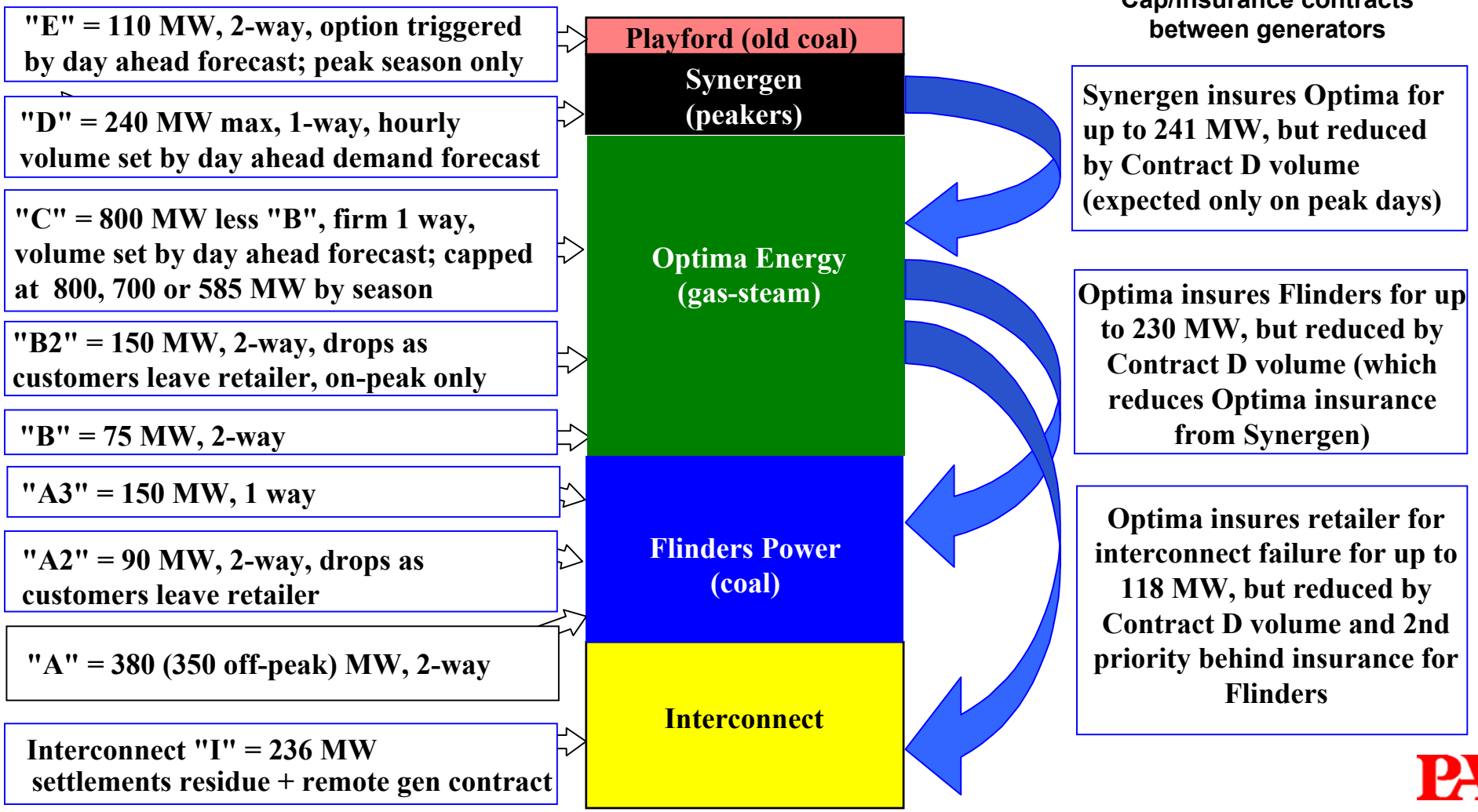
The cap contract strike price might be based on the competitive offerings of other generators. A cap contract keeps normal commercial incentives in place for the capacity not under the swap contract.

The cap contract might include an option fee.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (cap contract) 5, 6, 7 & 8 (peakers)

4 (swap contract)

Actual vesting contract package
South Australia suite of contracts



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Contracts and the spot market

Financial incentives will shape the dominant generator bidding and operating strategy – with a concomitant impact on spot market *price levels*.

The spot market is not directly affected by the operation of hedge contracts used for market power control, any more than it is directly affected by hedge contracts that are arranged in the market between generators and suppliers/retailers.

This approach deals with dominance by controlling the financial incentives for dominant generator behaviour – NOT by controlling or regulating the spot market.

When a dominant generator is no longer dominant (eg, by new entry and demand growth or by atomistic privatisation), the hedge contracts used to control market power may be removed, but NO changes to the spot market are needed as a result of these industry structure changes.

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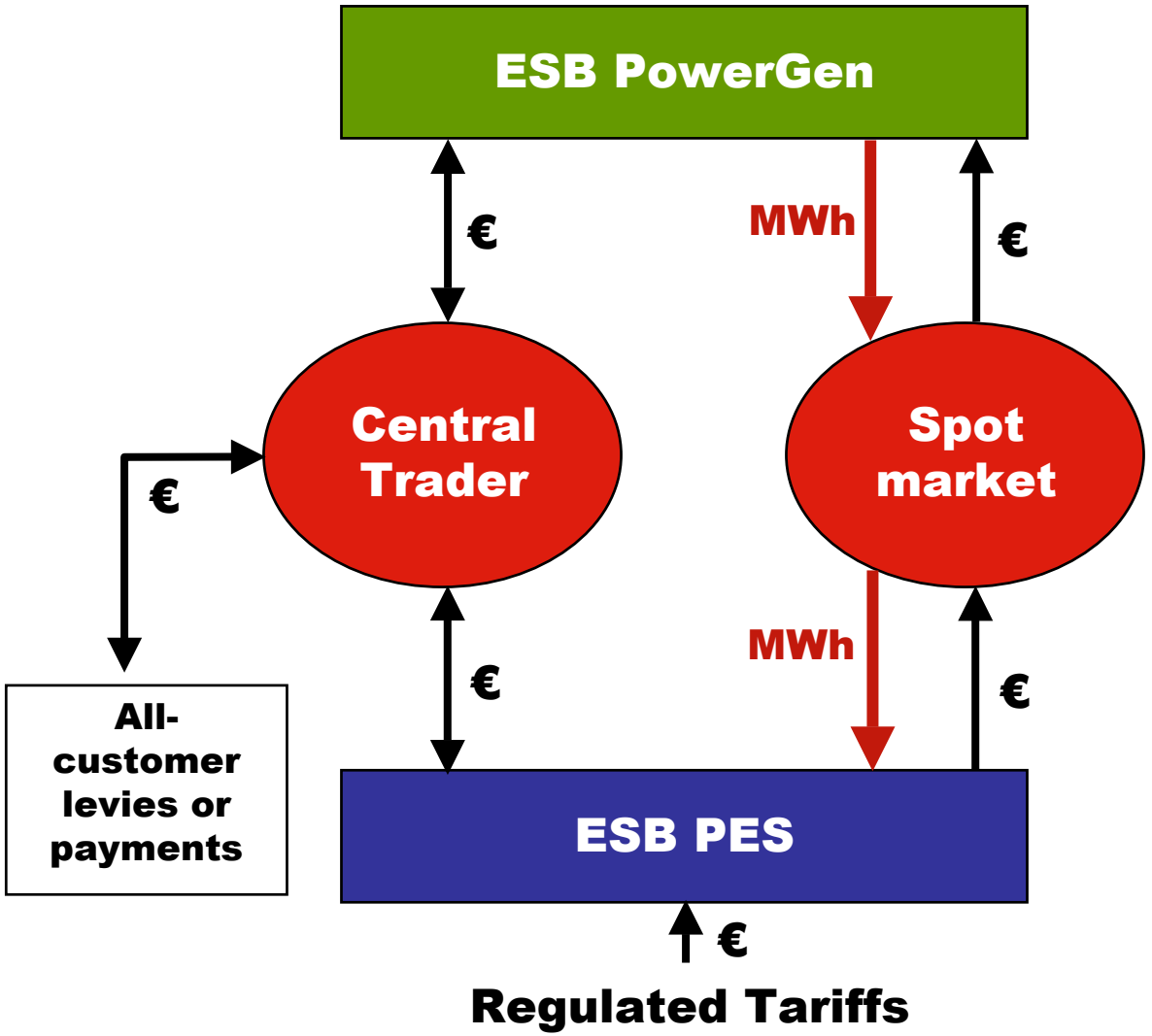
Central Trader option



- Constrains dominant generator bidding behaviour
- Breaks PG and PES economic commonality
- CER control of PG profits and PES tariffs
- Permit levies/payments that can be applied to all customers, not just PES tariffs
- Offer PG-based hedges to new suppliers

Who fills the role of Central Trader?

The Central Trader will hold a set of imposed hedge contracts that are defined by CER. While this entity will be the counterparty to these contracts, the Central Trader's activity will be closely defined by CER.

Any of a number of parties could fill the Central Trader role, with CER issuing a special licence that defines its activities and responsibilities:

- A new government-owned special purpose entity
- A private concern (eg, a bank) under a contract from CER
- A special purpose subsidiary of an existing government-owned company (eg, Eirgrid or ESB)

Objectives of Central Trader option

The Central Trader will hold a set of contracts that are defined by CER.

Primary objective is to control, through the ***volume*** of imposed hedge contracts, the market power of ESB PowerGen

Secondary objectives might include:

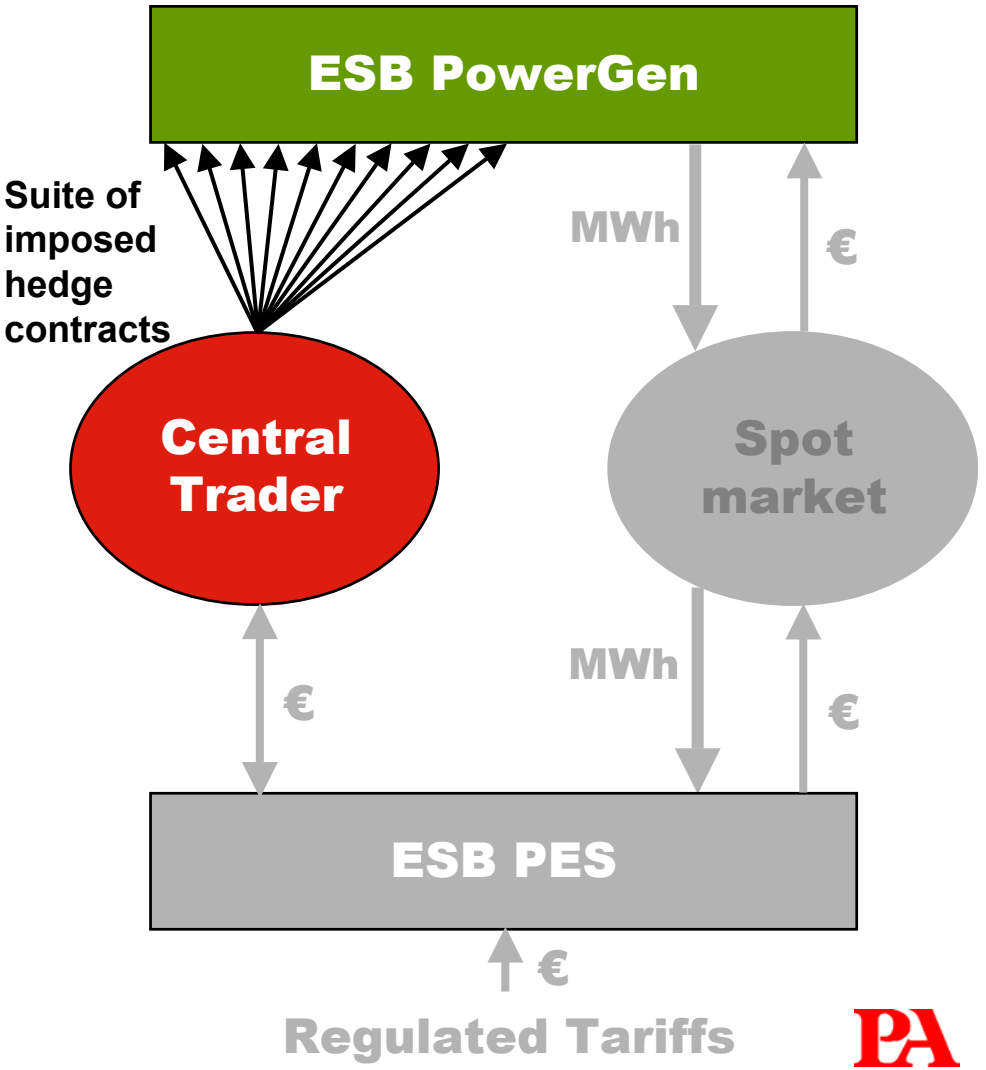
- Regulation - the ***pricing*** of the same imposed hedge contracts can be used to help CER regulate the overall returns of PG and PES
- Risk management - Provide PES with an appropriate set of hedge contracts to manage the risk of the spot market
- Provide liquidity in the hedge contract market by offering hedges to the market
- Promote enhanced competition in the supply/retail market

Regulating ESB PG through contracts

1. Volume of imposed hedge contracts controls market power through financial incentives on bidding and operational strategy

2. PG variable costs are covered by spot sales, unless bidding below variable cost (not a normal strategy)

3. PG fixed costs are covered by revenue in excess of actual marginal production costs (eg, from spot price sales at greater than SRMC, strike prices above SRMC, and option fees)



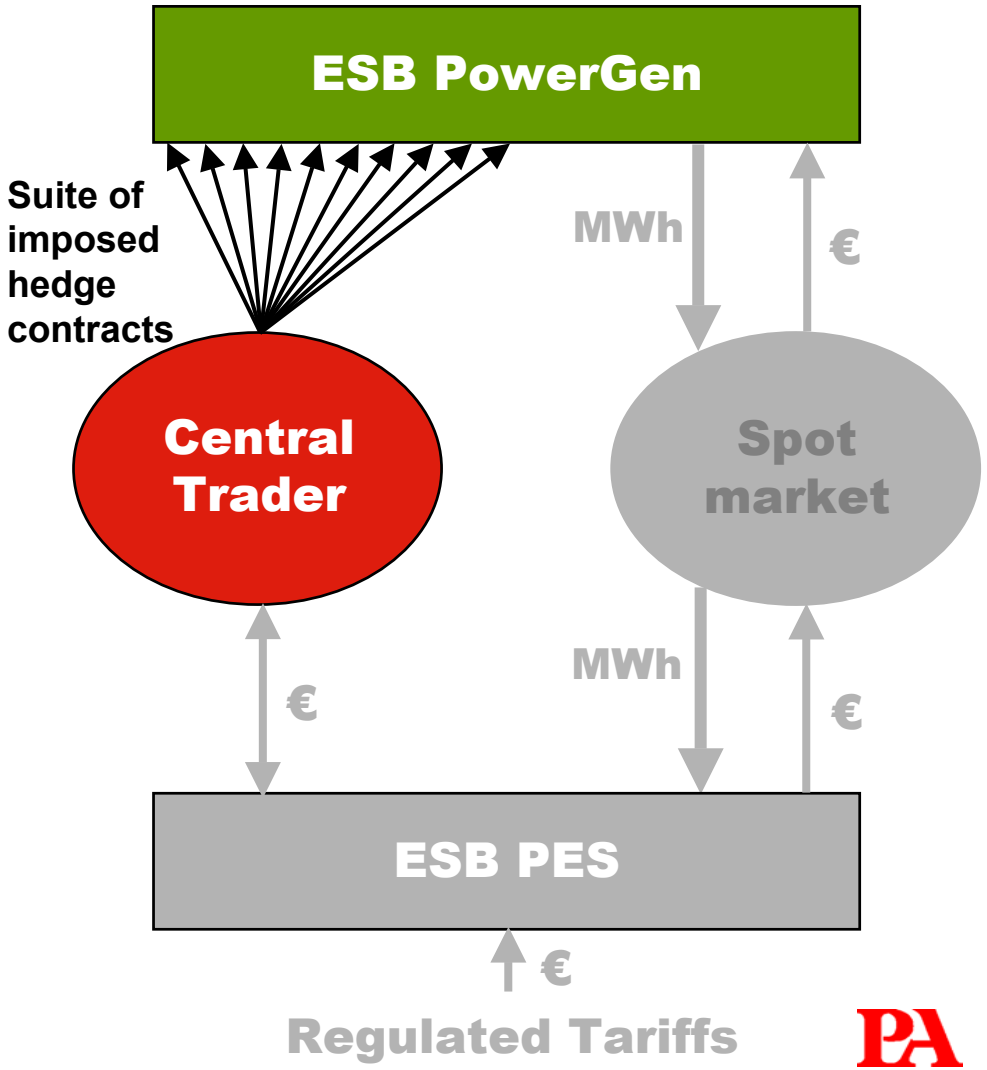
Regulating ESB PG through contracts

4. CER controls the level of contract strike prices and option fees

5. CER can, through these measures, influence much of PG's expected profits

6. PG might be able to earn additional profits through lowering fixed and variable costs, entering into profitable market contracts, or other activities

7. CER might conduct periodic reviews of overall PG profits and adjustments of contract terms

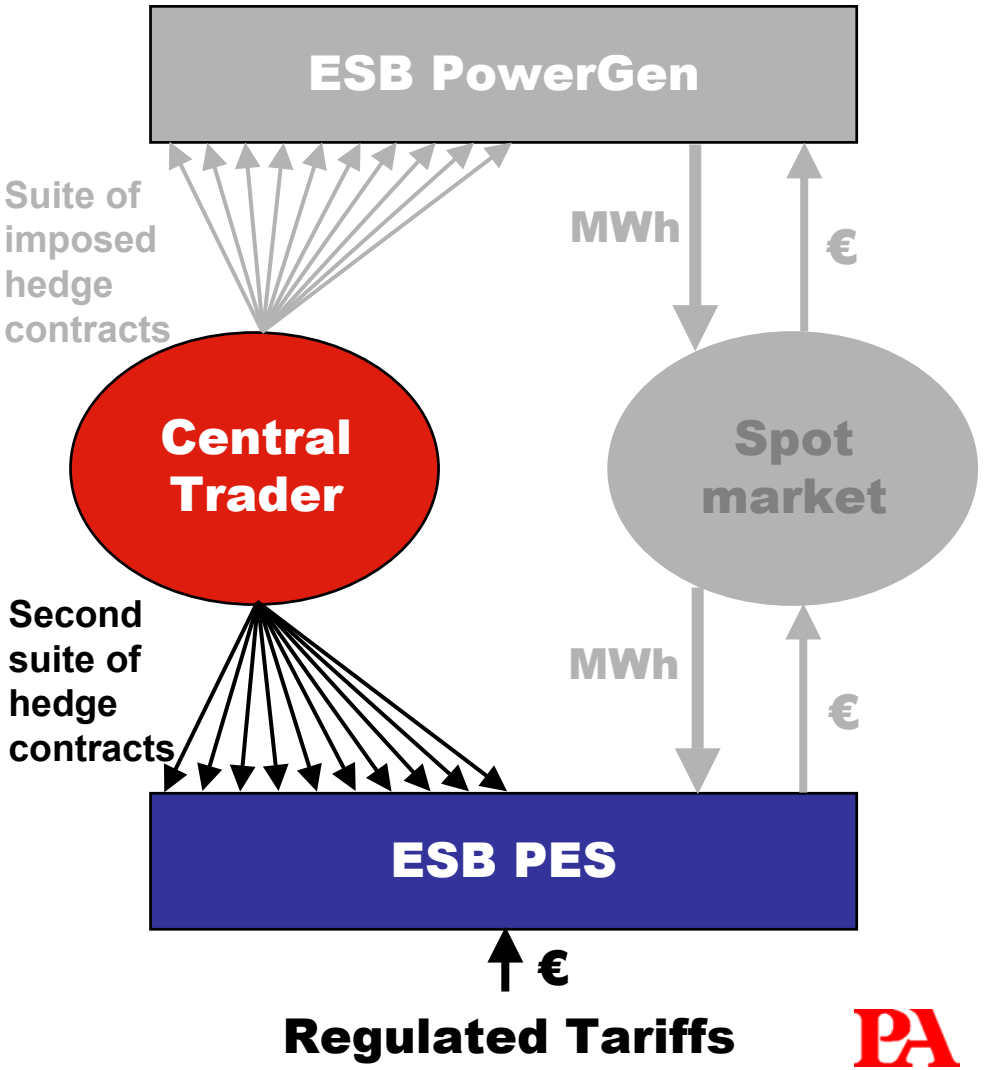


Regulating ESB PES through contracts

1. CER applies a different set of hedge contracts to PES, using the bundle of PG contracts as the basis.

2. The PES contracts are aimed at hedging PES spot market risk (ie, contract volumes) AND establishing a market-based cost basis (eg, through contract pricing)

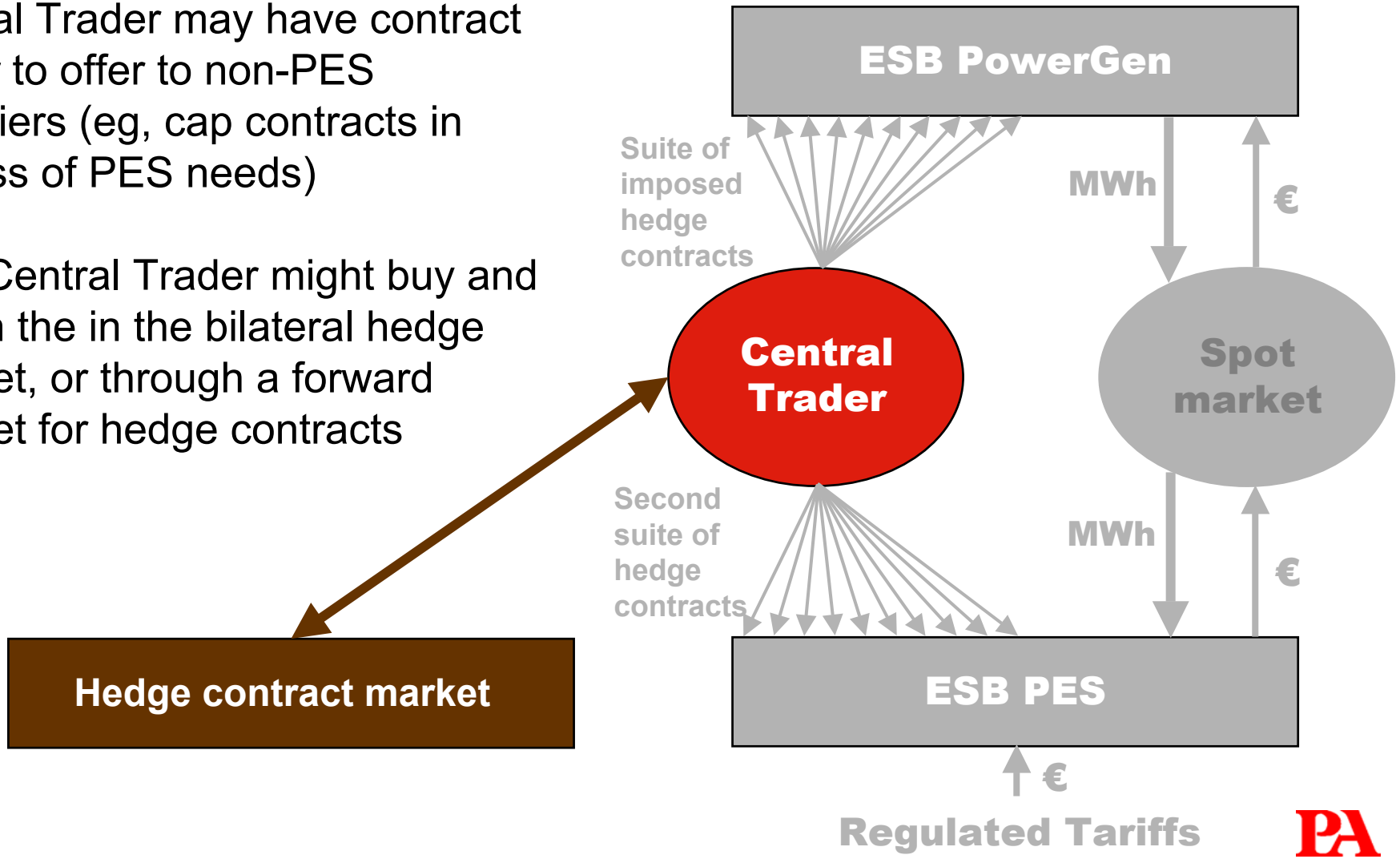
3. CER sets regulated tariffs based on the PES cost basis



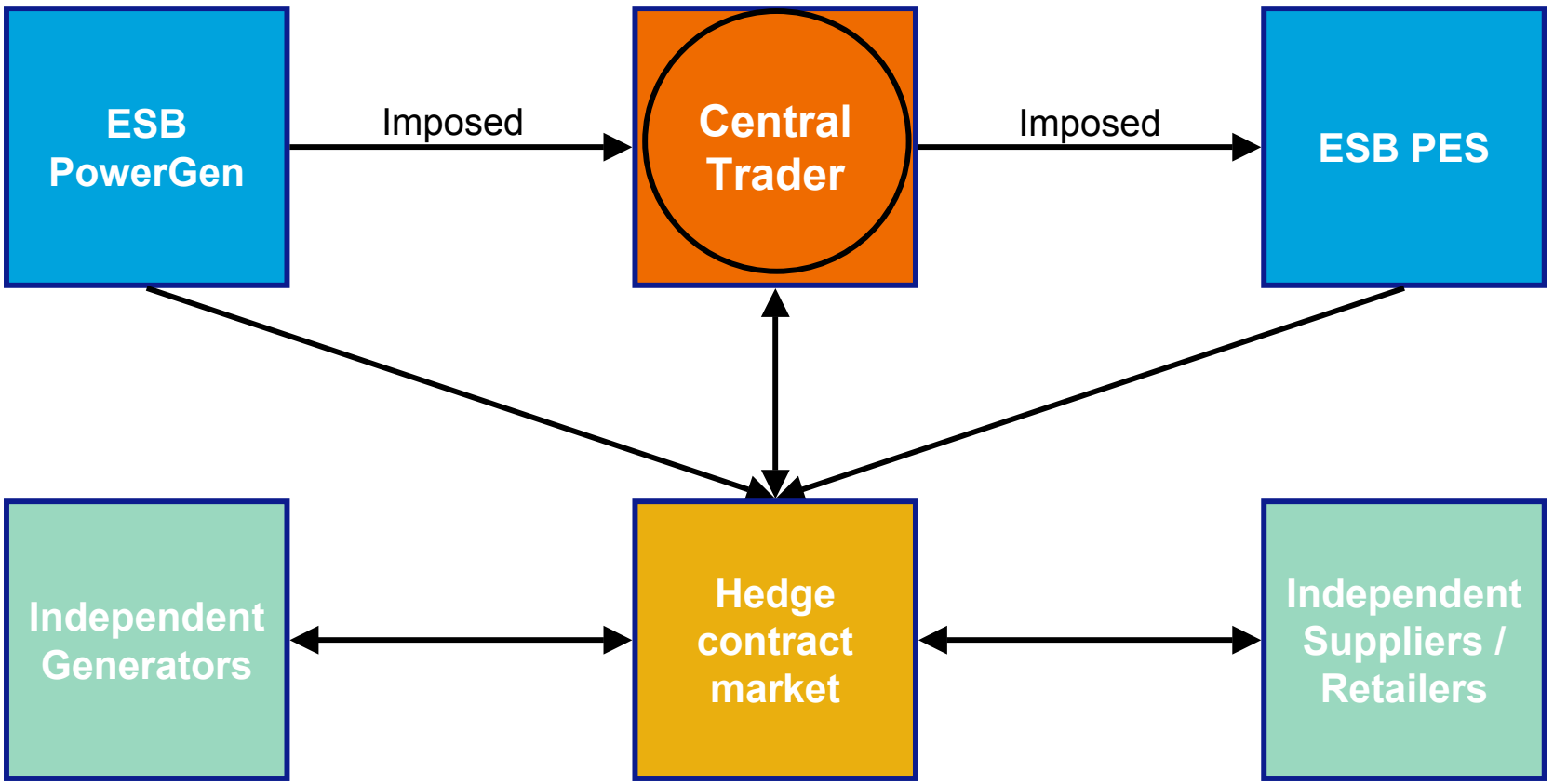
Facilitating a hedge contract market

1. Central Trader may have contract cover to offer to non-PES suppliers (eg, cap contracts in excess of PES needs)

2. The Central Trader might buy and sell in the in the bilateral hedge market, or through a forward market for hedge contracts



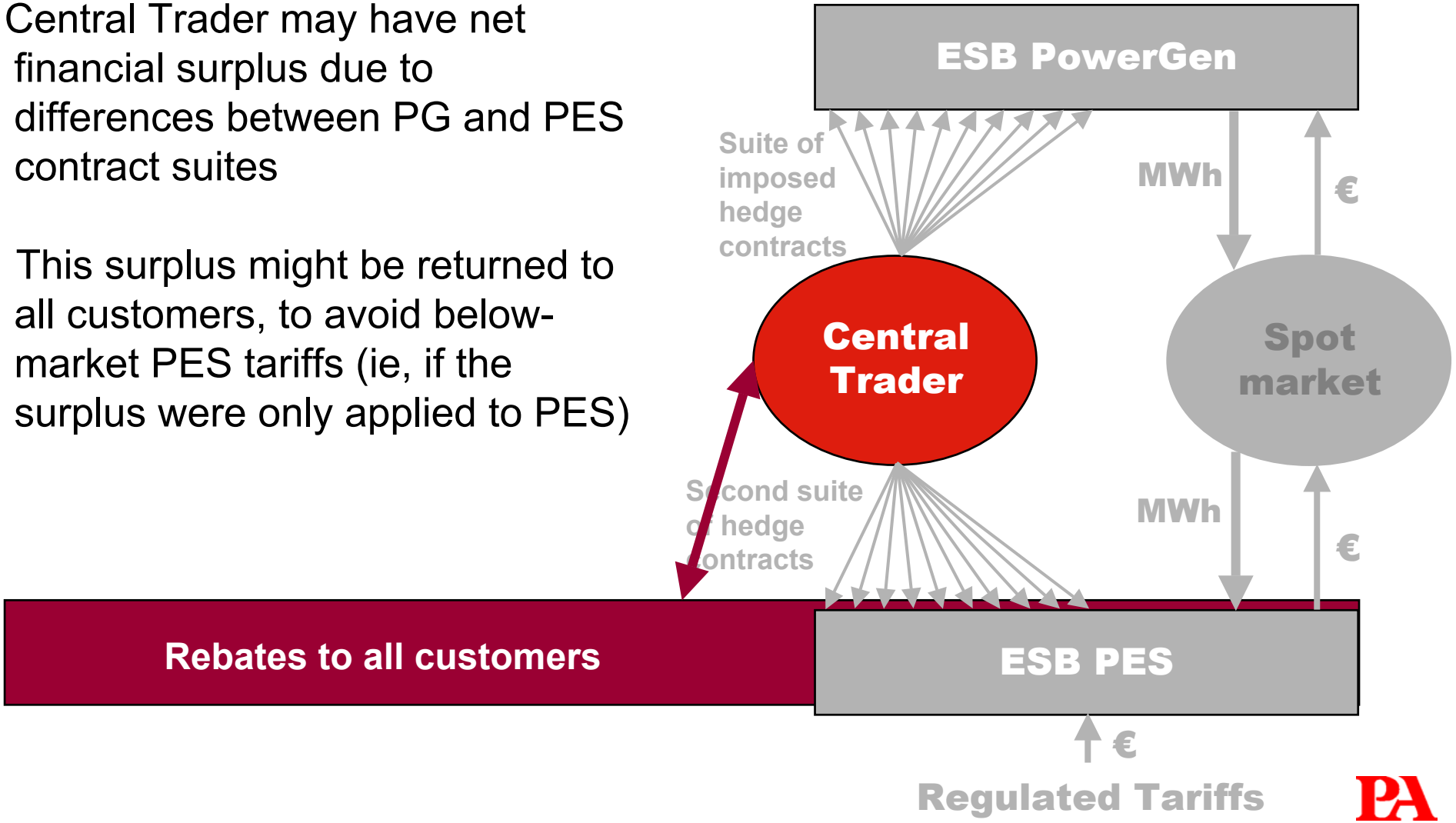
Hedge contracts in market



Facilitating supplier/retail competition

1. Central Trader may have net financial surplus due to differences between PG and PES contract suites

2. This surplus might be returned to all customers, to avoid below-market PES tariffs (ie, if the surplus were only applied to PES)



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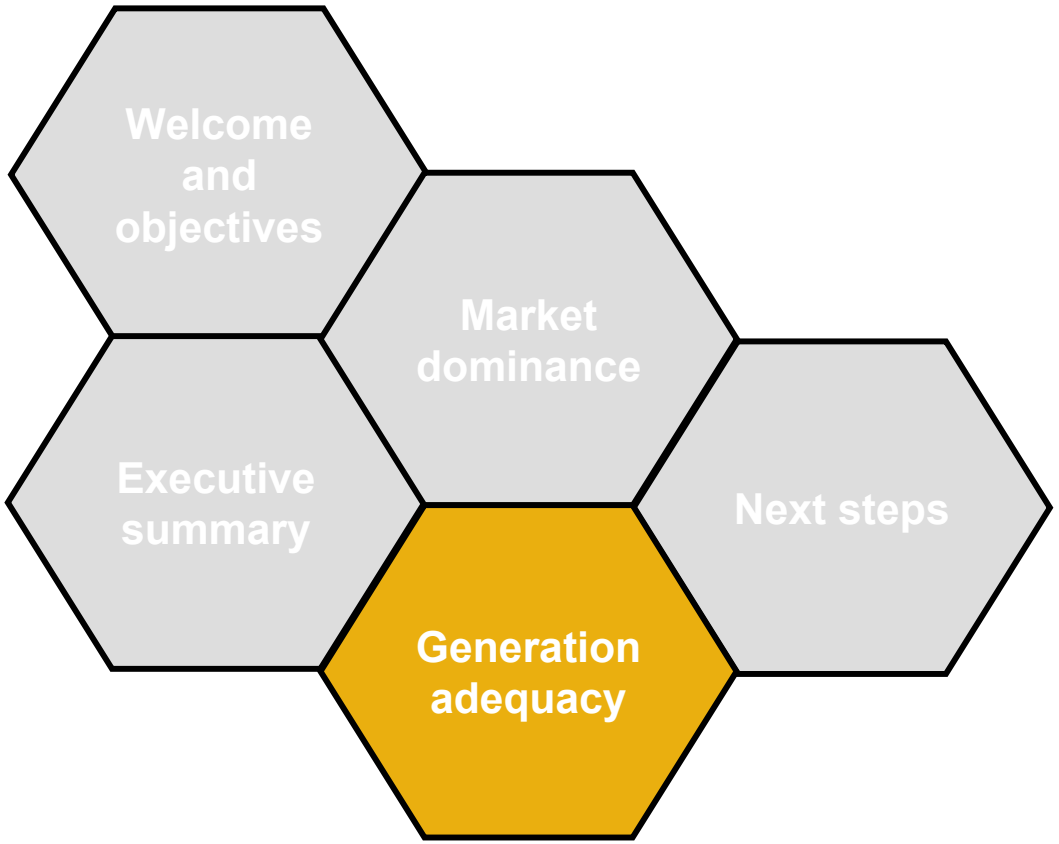
Tea Break – 15 Minutes



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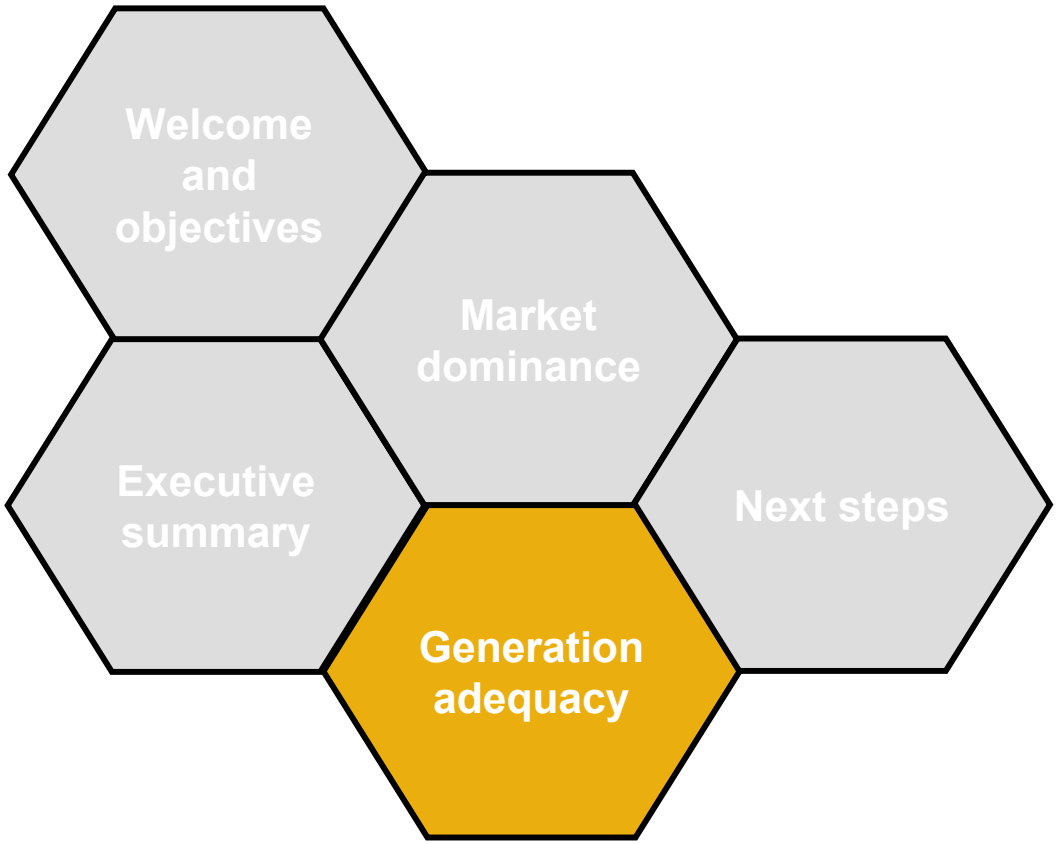

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Generation adequacy

Today, we will cover:

- Brief review of market entry concept
- Overview of Safety Net concept
- Detailed discussion of the fast build option
- Interaction of this option and market entry

This session is scheduled to last for about an hour, with some time included for questions

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Review - Generation adequacy

An uncapped spot price in a centralised market should sufficiently reward capacity, leading to new entry and an appropriate (ie, market driven) generation mix to meet market demands.

Spot prices will be uncapped; it is essential that the market (both power plant investors and customers) believe that spot prices will remain uncapped, because:

- **Customers will actively manage the risk of high spot prices through hedges**
- **Generators will trust the spot market and will enter into contracts to hedge customers.**

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Generation adequacy – Safety Nets

Electricity markets have not been in existence long and the consequences of the market not meeting demand are serious.

The consultation process undertaken before Christmas showed a clear desire for some type of capacity "safety net" to be invoked if predictions of capacity shortfall become pressing.

A safety net in Ireland will involve clearly established procedures and trigger mechanisms promulgated by CER.

Objective of the safety net is only to ensure reliability, while minimising actual or expected impact on market-driven entry decisions

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Safety net options for Ireland

Safety net options for Ireland presented in the paper of the 24th:

- Development incentive
  - Simple cash incentive for market developer
  - Auction-based upfront payment
- Default buyer
  - Contracts offered to market developer
  - Auction-based continuing financial support
- Fast build
  - Pre-development to shorten lead time
  - Auction plant off to market after completion

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Generation adequacy – market approach

The fundamental approach in Ireland is to start with a spot market that is expected to work – rather than starting with a spot market that is not likely to work (eg, with regulated marginal cost bidding).

A spot market that is not designed to work properly to provide incentives for new entry will *require* additional measures to provide those incentives. These additional measures, typically in the form of capacity obligations or capacity payments will:

- **Impose additional costs and complexity on the market**
- **May provide increased opportunities for gaming and exercise of market power**
- **May not produce the needed new entry (ie, so that a safety net is still required)**

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Safety Net preferred features

An effective safety net option would:

- Provide CER with flexibility
  - ability to accelerate, defer or cancel safety net power plant in response to market outcomes)
- Maximise certainty that needed capacity would be delivered
  - Direct build removes uncertainty with respect to commercial issues
- Have shortest possible time between trigger and plant delivery
- Minimize effect on normal market power plant development
- Have a transparent and objective trigger process

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Fast build option

The fast build option would involve:

- Identifying and specifying a peaking power plant technology
  - Lowest capital cost
  - Sized to meet shortfall in capacity
- Site banking – gain control and permit a site (perhaps at an existing power plant site)
- Completing power plant design, engineering & procurement
- Developing clear and short trigger conditions
- Hiring a turn-key contractor to remain on standby to construct the plant when trigger is met
- Developing process to sell the power plant after completion

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Fast build option – flexibility

The first two safety net options (Default Buyer and development incentives) rely on a commercial power plant developer to deliver the needed capacity. In order to provide incentives to this power plant developer, CER may need to commit to contracts or development incentives 4 or more years before the capacity is needed

The CER commitment must be firm, so as to provide the needed incentives for commercial development, so that CER may have little ability to defer, accelerate, or cancel safety net options if the level or timing of need changes.

The fast build option provides this flexibility

Fast build option – “no show” problem

The first two safety net options (Default Buyer and development incentives) rely on a commercial power plant developer to deliver the needed capacity. There is some risk that this commercial entity might:

- Undergo financial problems that would result in no power plant delivery
- Need additional incentives to complete project
- Suffer delays or other development problems that result in delayed capacity delivery

There is increased risk that the needed capacity would not be delivered as needed to fulfil the safety net purpose of maintaining reliability

The fast build option provides higher certainty

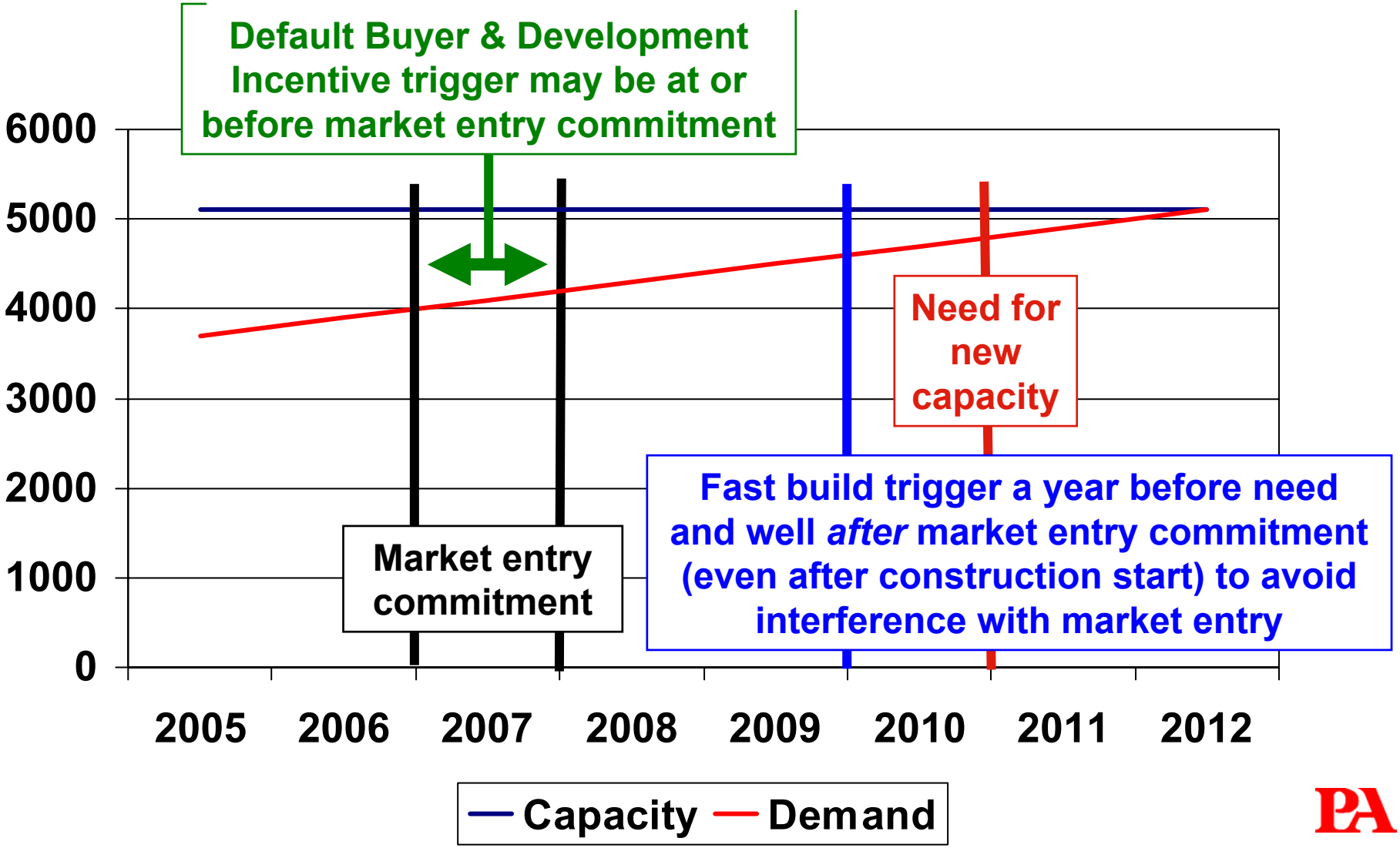
Fast build option – Shortens the cycle

Developer safety net options (Default buyer or Development incentives)

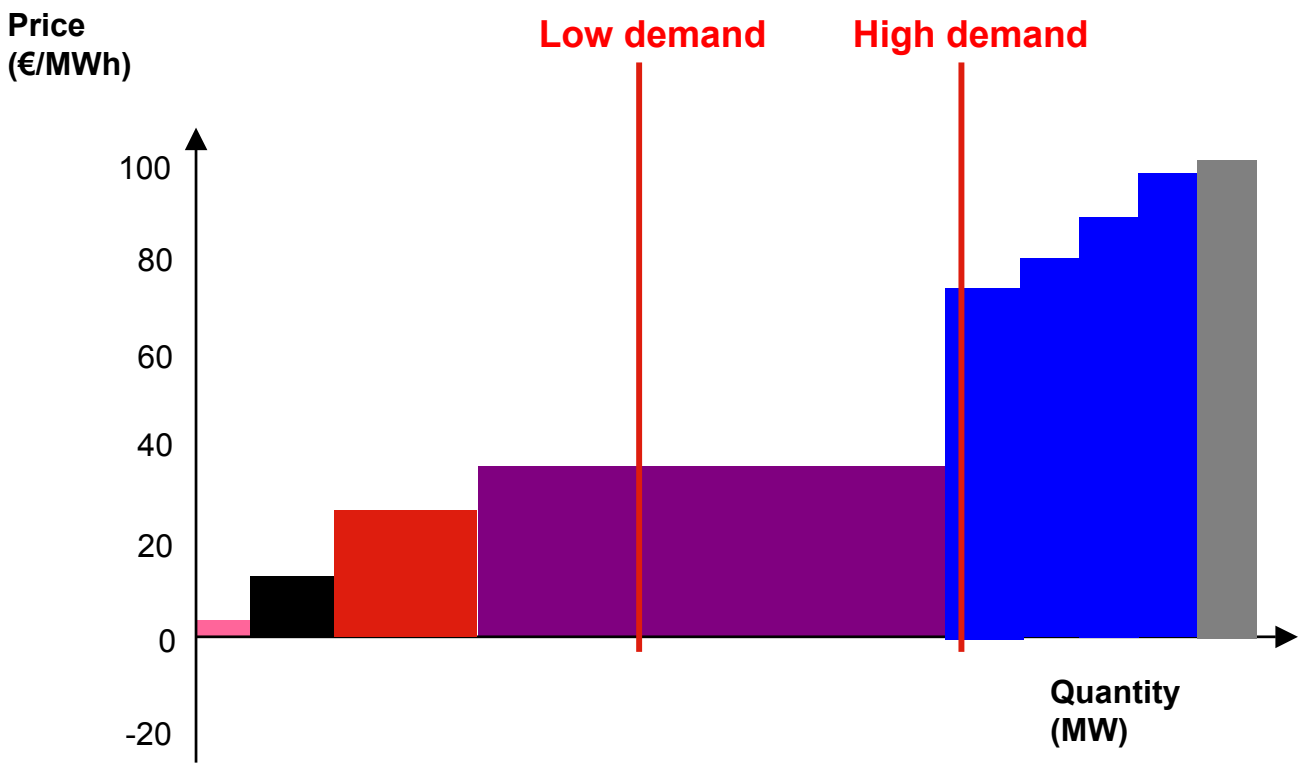
Fast build

Fast build option will complete many of these activities in advance, reducing time between trigger and delivery to about one year

Fast build option – Allow market entry



Safety net – why peaking only?



The safety net peaking plant will either be un-dispatched because it is at the top of the merit order or will set the market-clearing price at a level similar to existing peakers.

This will minimise the impact on the expected spot prices for the system, so that market entry incentives will remain if a safety net generator is built.

The safety net unit will be sold to a commercial owner after completion.

Generators 1 (hydro) 2 (coal) 3 (CCGT) 4 (gas steam) 5, 6, 7 & 8 (peakers)

Safety net plant

Fast build option – trigger

The fast build option trigger conditions would be:

- Clearly stated by CER to public
- Based on objective measures of expected reliability
  - Reserve margins
  - Demand growth
  - Existing and committed new capacity
- Publicly triggered - early notice to market that shortfall is expected
  - At or before market entry commitment window closes
  - Each year until trigger is reached

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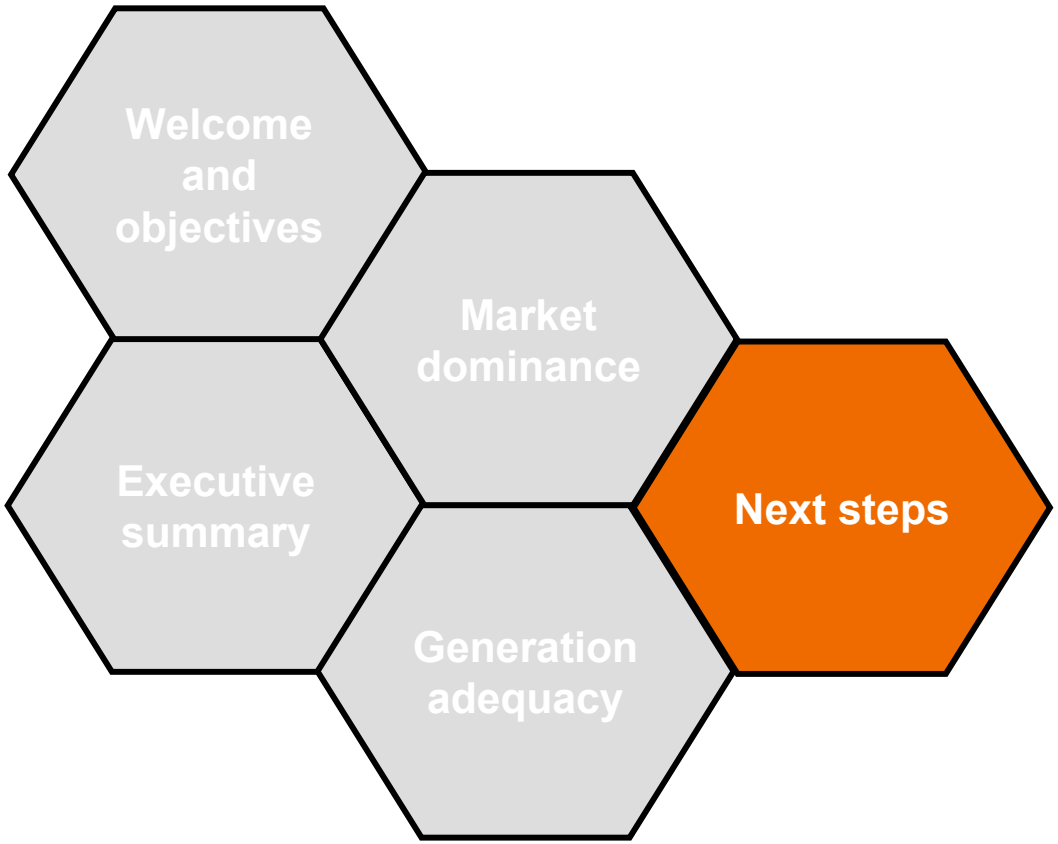
Fast build option - advantages

The fast build option would:

- Maximise CER flexibility to accelerate, delay, or cancel the project
- Deliver needed capacity with high confidence level (ie, no concerns about developer “no show” issue)
- Have the shortest time possible between trigger and plant delivery
- Be triggered by a clear and transparent set of conditions
- Minimise the actual and expected intervention in the market

AGENDA

Stuart Curson, PA Consulting



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Next steps

29 April	CER to publish a preliminary decision paper
8 May	Industry forum
16 May	Final date for industry feedback
23 May	CER decision

PA