I-SEM Training
Instructor Led Training
Capacity Market

Version 2

Training Guidelines

The training session will run from 9 AM to 4 PM with the following breaks:

Break	10.30-10.50
Lunch	12.30-13.15
Break	15.00-15.15

Training Guidelines

Please ensure that you allow yourself enough time to arrive at the training room both at the start of the day and after each break so that the training can finish on time.

Please limit use of mobile phones throughout the day so as not to distract other trainees and ensure that mobile phones are kept on silent mode throughout the day.

Please ensure you have left the training room before answering a phone call.

The instructor will stop at various points throughout this presentation to deal with any questions that arise.

While you are welcome to ask general and conceptual questions, please avoid asking questions about specific Qualification Applications you have submitted.

Alternatively please contact the Query Management Team through the mailbox: I-SEMproject@sem-o.com.

Agenda

Training Topic	Training Sub-Topic
Learning Objectives	
Topic 1: Capacity Market Overview	• The Need for Capacity • Ways to Procure Capacity • Basic Settlement of Awarded Capacity • Auction Types • Auction Timelines
Topic 2: Capacity Market Governance and Registration	• Order of Precedence of Codes and other Instruments • CMC Code Objectives • Roles • Registration and Fees • Modification Process • Dispute Process • Other Key Administrative Provisions: Force Majeure, Market Manipulation, Default, Suspension, and Termination
Topic 3: Capacity Requirements and De-Rating	• Terminology • Initial Capacity • De-Rating Curves for Different Technologies
Topic 4: Qualification	• Purpose of qualification • Who must / may qualify • Data required • Process • Approval / review processes • Extended Qualification • The Capacity Market Platform

Agenda

Training Topic	Training Sub-Topic
Topic 5: Capacity Auctions	• Participation Requirements • Overview of the Capacity Auction • The Unconstrained Auction • The Constrained Auction • Post Auction Processes • Timelines
Topic 6: Implementation of New Capacity	• Why the attention on New Capacity? • Implementation Plans and Progress Reporting • Termination Triggers • Remedial Actions • Performance Security and Termination Charges • Termination
Topic 7: Secondary Trade	• Interim Secondary Trade Arrangements • Secondary Trade (Enduring)
Topic 8: Conceptual Settlement Overview	
Topic 9: Course Summary	• Review of Learning Objectives • Questions • Thank You!

Learning Objectives

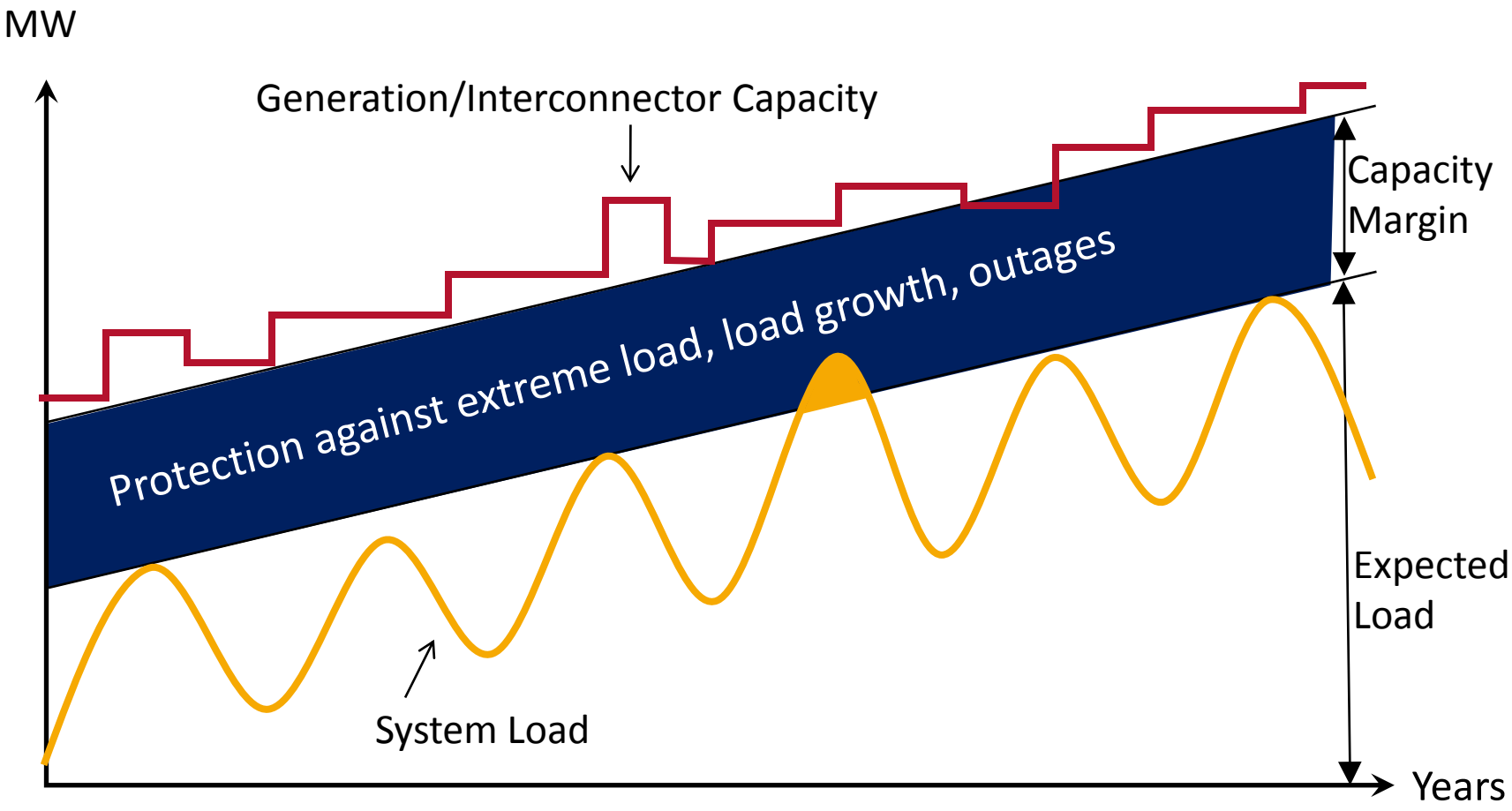
- By the end of this training session you should:
  - Have an understanding of key features and obligations of the Capacity Market Code and its relation to broader market arrangements
  - Understand the Qualification Process, including options for addressing any disagreements with Preliminary Qualification Results
  - Be in a position to understand Qualification Results and how they influence participation in a Capacity Auction and Secondary Trade
  - Understand how to offer into a Capacity Auction
  - Understand the Interim Secondary Trade Arrangements to apply from the start of the market and how longer term Secondary Trade will work
  - Understand the risks and trade offs in how you participate

Chapter 1: Capacity Market Overview

Training Topic 1 – Capacity Market Overview

- The Need for Capacity
- Ways to Procure Capacity
- Basic Settlement of Awarded Capacity
- Auction Types
- Auction Timelines

The Need for Capacity



Ways to Procure Capacity

Energy Only Markets
(potential for high price drives capacity investments)

- Texas
- Singapore
- New Zealand
- Eastern Australia

Bilateral Capacity Procurement
(Suppliers required to procure capacity bilaterally, auction held only if short)

- California
- Western Australia

Capacity Markets
(with prescribed charges for non performance)

- GB
- Eastern US (PJM, New England, New York)

Capacity Remunerations
(paid for available capacity)

- Current SEM arrangement
- **Payments you get today will stop**

Capacity Markets
(with market incentives encouraging performance)

- **New I-SEM arrangement**

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Basic Settlement of Awarded Capacity

Generator ← Paid for Awarded Capacity ← **Capacity Market** ← Fund Awarded Capacity ← **Supplier**

Paid for generation ← **Energy Market** ← Pay for consumption

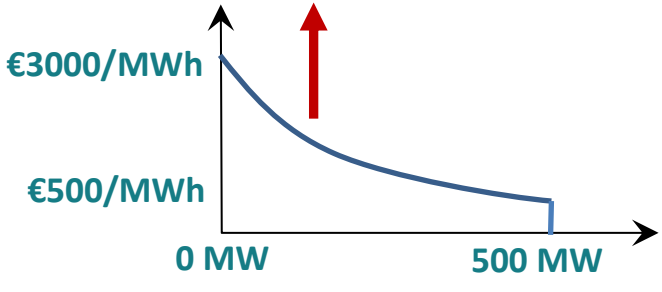
Pays difference between energy price and strike price on awarded capacity

Paid difference between energy price and strike price on consumption.

*If **energy price** above **strike price***

Exposed if not generating

Mitigations:
"Stop Loss Limits"
"Secondary Trade"



Administered Scarcity Price varies with reserve shortfall or goes to max price if demand control used.

Exposed if not enough ROs sold

Mitigations:
"Socialisation Fund"

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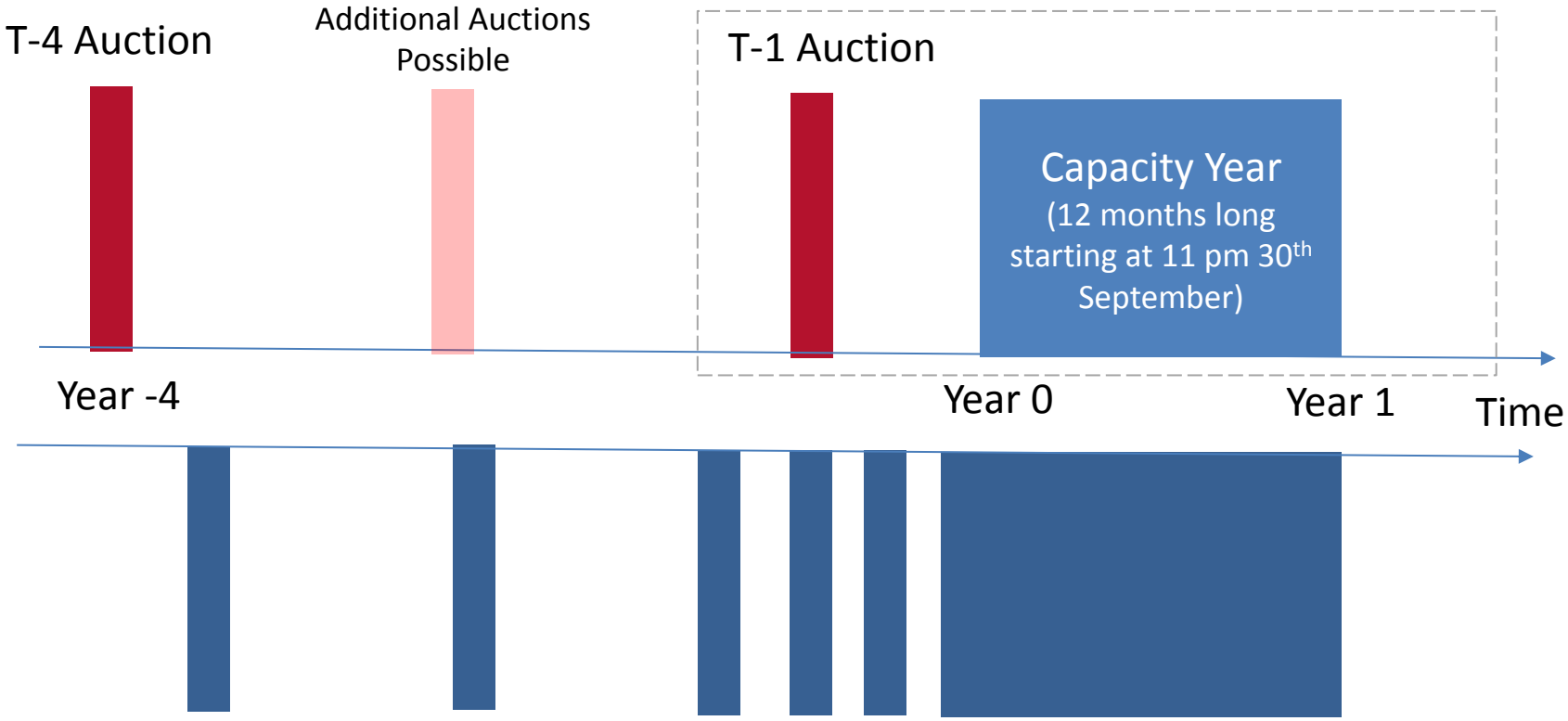
Auction Types

Capacity Auctions

For the first auction there will only be a T-1 Auction.
Due to the May 2018 market start, first Capacity Year will run for about 16 months.



Secondary Trade Auctions

A different Interim Secondary Trading Arrangement will apply from market start until Secondary Trading is implemented. It is discussed later.

Auction Timeline

- CMC Appendix C presents a generic timeline for each capacity market auction.
- The following schedule for the first auction is from the Initial Auction Information Pack.

#	Event	Nature	Date
1	Initial Auction Information Pack Date	First Auction Information Pack published by SOs	3rd Jul 2017
2	Exception Application Date	Deadline for Applying to RAs for Unit Specific Price Caps or 10yr Maximum Capacity Duration.	3rd Aug 2017
3	Opt Out Notification Date	Last date to choose not to participate in Qualification	3rd Aug 2017
4	Qualification Application Date	The last date for applying for Qualification.	3rd Aug 2017
5	Provisional Qualification Results Date	SOs release initial qualification results. Participants have recourse for reviews and then disputes.	6th Oct 2017
6	Final Qualification Submission Date	The date SOs submit final qualification results for RA approval.	17th Nov 2017
7	Final Qualification Results Date	SOs release final qualification results to participants.	1st Dec 2017

Auction Timeline

#	Event	Nature	Date
8	Qualification Results Publication Date	SOs publish qualification summary results.	1st Dec 2017
9	Locational Capacity Constraints Finalised	Locational Capacity Constraint quantities adjusted if required by SOs (given qualification results).	1st Dec 2017
10	Final Auction Information Pack Date	Final Auction Information Pack published by SOs	1st Dec 2017
11	Capacity Auction Submission Commence	Submission of Capacity Auction Offers start.	11th Dec 2017
12	Capacity Auction Submission End	Submission of Capacity Auction Offers end.	15th Dec 2017
13	Capacity Auction Run Start	Running of Capacity Auction starts	15th Dec 2017
14	Capacity Auction Run End	Running of Capacity Auction ends.	18th Dec 2017
15	Capacity Auction Provisional Results Date	SOs provide provisional auction results to participants.	18th Dec 2017
16	Capacity Auction Approval Date	RAs expected to approve auction results	25th Jan 2018
17	Capacity Auction Results Date	SOs publish approved auction results.	25th Jan 2018
18	Performance Security Date	Performance security posted for new capacity.	1st Feb 2018

Capacity Year Start Date: Market Commencement (23rd May 2018)

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Topic 2: Capacity Market Governance & Registration

Training Topic 2 – Capacity Market Governance

- Order of Precedence of Codes and other Instruments
- CMC Code Objectives
- Roles:
  - System Operators
  - Regulatory Authorities
  - Capacity Auction Monitor
  - Capacity Market Auditor
  - Participants
- Registration and Fees
- Modification Process
- Dispute Process
- Other Key Administrative Provisions: Force Majeure, Market Manipulation, Default, Suspension, and Termination

Order of Precedence of Codes and Other Instruments

Greater Precedence

- Laws
- Licenses
- Grid Code
- **Capacity Market Code**
- Trading and Settlement Code

Chapter M
Body of Code / Glossary
Appendices
Agreed Procedures

Capacity Market Code Objectives

The Code is designed to facilitate achievement of the following objectives (the "Capacity Market Code Objectives"):

(a) to facilitate the efficient discharge by EirGrid and SONI of the obligations imposed by their respective Transmission System Operator Licenses in relation to the Capacity Market;

(b) to facilitate the efficient, economic and coordinated operation, administration and development of the Capacity Market and the provision of adequate future capacity in a financially secure manner;

(c) to facilitate the participation of undertakings including electricity undertakings engaged or seeking to be engaged in the provision of electricity capacity in the Capacity Market;

(d) to promote competition in the provision of electricity capacity to the SEM;

(e) to provide transparency in the operation of the SEM;

(f) to ensure no undue discrimination between persons who are or may seek to become parties to the Capacity Market Code; and

(g) through the development of the Capacity Market, to promote the short-term and long-term interests of consumers of electricity with respect to price, quality, reliability, and security of supply of electricity across the Island of Ireland.

Roles 1/2

Role	Description
System Operators (SOs)	• Term refers both to Eirgrid and SONI who are licensed by RAs as System Operators. • Administer the Capacity Market Code and be point of contact for Participants.
Regulatory Authorities (RAs)	• By convention, references to Regulatory Authorities includes the SEM Committee. • Operate as regulators outside code but CMC can inform how they perform their function.
Capacity Auction Monitor	• An independent party contracted by the RAs to monitor SOs in carrying out qualification and auctions. Terms of reference set by RAs. • Focus is on process, non-compliance, and potential irregularities. It can require parties to CMC to provide it information (with protection for 3rd party confidentiality). • Reports to RAs on each of Qualification and Capacity Auctions. Report (with participant identities / confidential information redacted) is published by the SOs.
Capacity Market Auditor	• An independent party contracted by the RAs to audit the operation & implementation of the arrangements, procedures and processes under the CMC. Terms of reference set by RAs. • Can require parties to CMC to provide it information (with 3rd party confidentiality protection). • Provides an Audit Report to the RAs. SOs publish report with confidential information redacted.

Roles 2/2

Role	Description
Participants	A party becomes a participant under the CMC if a Candidate Unit has been registered, deemed registered, or provisionally registered under the CMC. • **Supplier Units:** A party that has registered a Supplier Unit under the TSC is deemed to have registered that Supplier Unit under the CMC. While there is no "market" action required of Supplier Units, this is required as the Supplier Units have a settlement role. • **Existing Generators/Interconnectors:** A party that has registered a Generator Unit or Interconnector under the TSC is deemed to have registered that unit as a Candidate Unit under the CMC, except in respect of Assetless Units, Trading Units, Interconnector Error Units, and Interconnector Residual Capacity Units. • **New entrants:** A party that has no units registered under the TSC can provisionally register a Candidate Unit under the CMC . This facilitates application for qualification and offering into the capacity auction in respect of New Capacity that is yet to be commissioned.

Registration as a result of deeming may not require any additional information to be provided but the CMC does allow for SOs to request additional information where required.

Accession and Registration

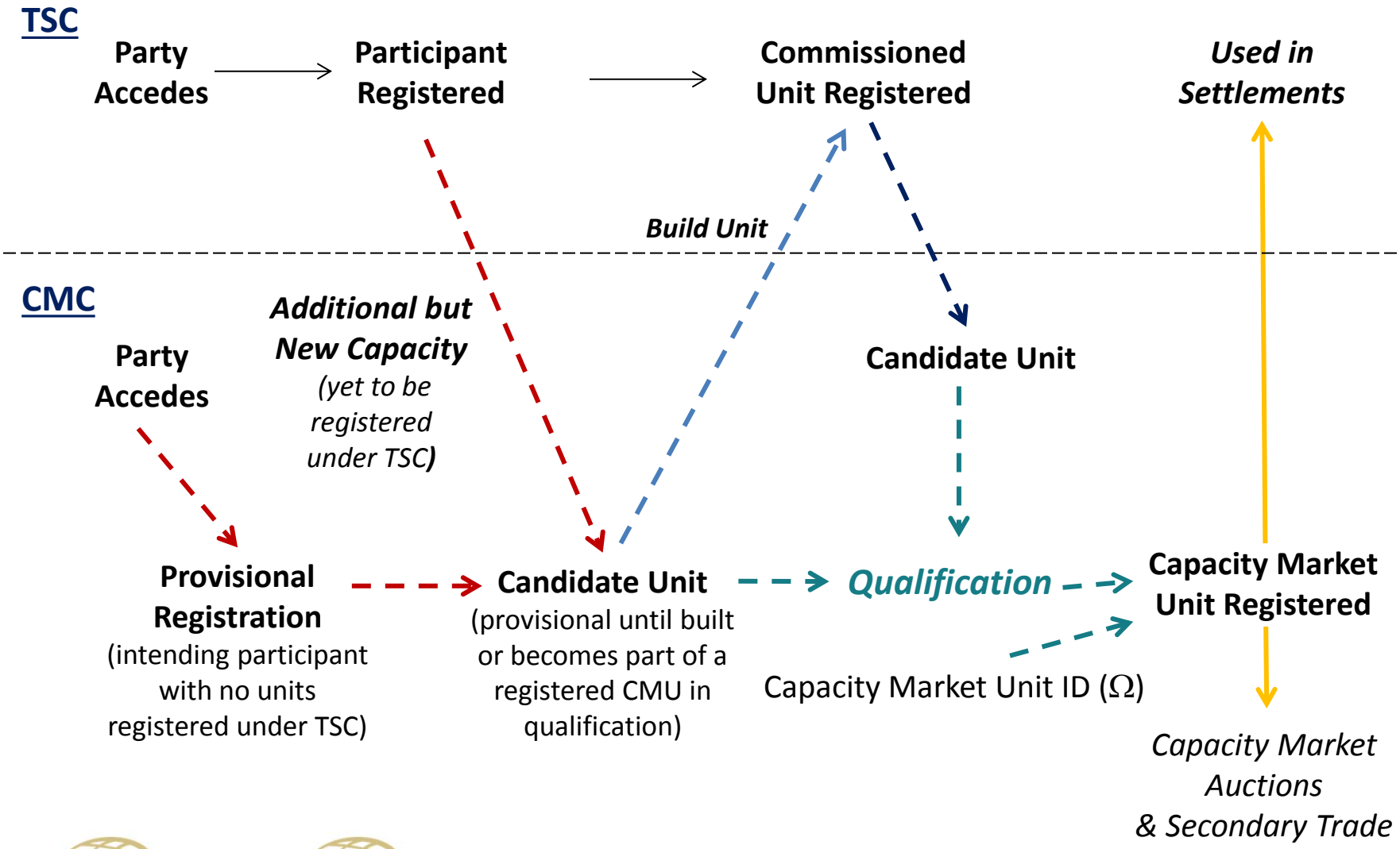
- A Party required to register under the CMC or wishing to register under the CMC must first Accede to the CMC as part of the Registration Process.

- To register as a Party to the Capacity Market Code an applicant is required to:
  - complete the Application Form available from the System Operators' website.
  - comply with eligibility requirements (see Section B.5 of the CMC) and the requirements of the Application Form.
  - pay the Accession Fee to the System Operators:
    - The Accession Fee is zero at the time of transition from SEM to I-SEM, but may be non-zero in the future.
  - when provided, execute an Accession Deed to adhere to the Capacity Market Framework Agreement and the Code. The Framework Agreement is the device by which a Party becomes bound to the CMC.
  - have already registered or intend to register as a Party to the Trading and Settlement Code (which requires Accession to the TSC).

Candidate Units and Capacity Market Units

Unit Type	Nature	Detail
Candidate Unit	Deemed	Existing Generator Unit or Interconnector registered under TSC.
Candidate Unit	Proposed	Proposed Generator Unit or Interconnector that is yet to be commissioned (and therefore cannot be registered under the TSC)
Capacity Market Unit	Pre-Qualification (no Awarded Capacity)	A place holder ID associated with Candidate Units that have not yet qualified.
Capacity Market Unit	Post-Qualification	If qualified, the CMU formally exists and is associated with an Interconnector or one or more Generator Units (i.e. the deemed or proposed Candidate Units)

Candidate Units and Capacity Market Units



System Operator Charges

- System Operator Charges under the CMC include:
  - a Qualification Fee applicable to Participants for each Application for Qualification in respect of a Candidate Unit. This is to recover the costs and expenses of the SOs in carrying out the Qualification Process.
  - a Fixed System Operator Charge applicable to Participants in respect of their Capacity Market Units.
  - a Variable System Operator Charge applicable to all Participants in respect of their Supplier Units.

  The purpose of the above two charges is to recover the costs and expenses of the SOs in performing their roles under the CMC which are not otherwise recovered.

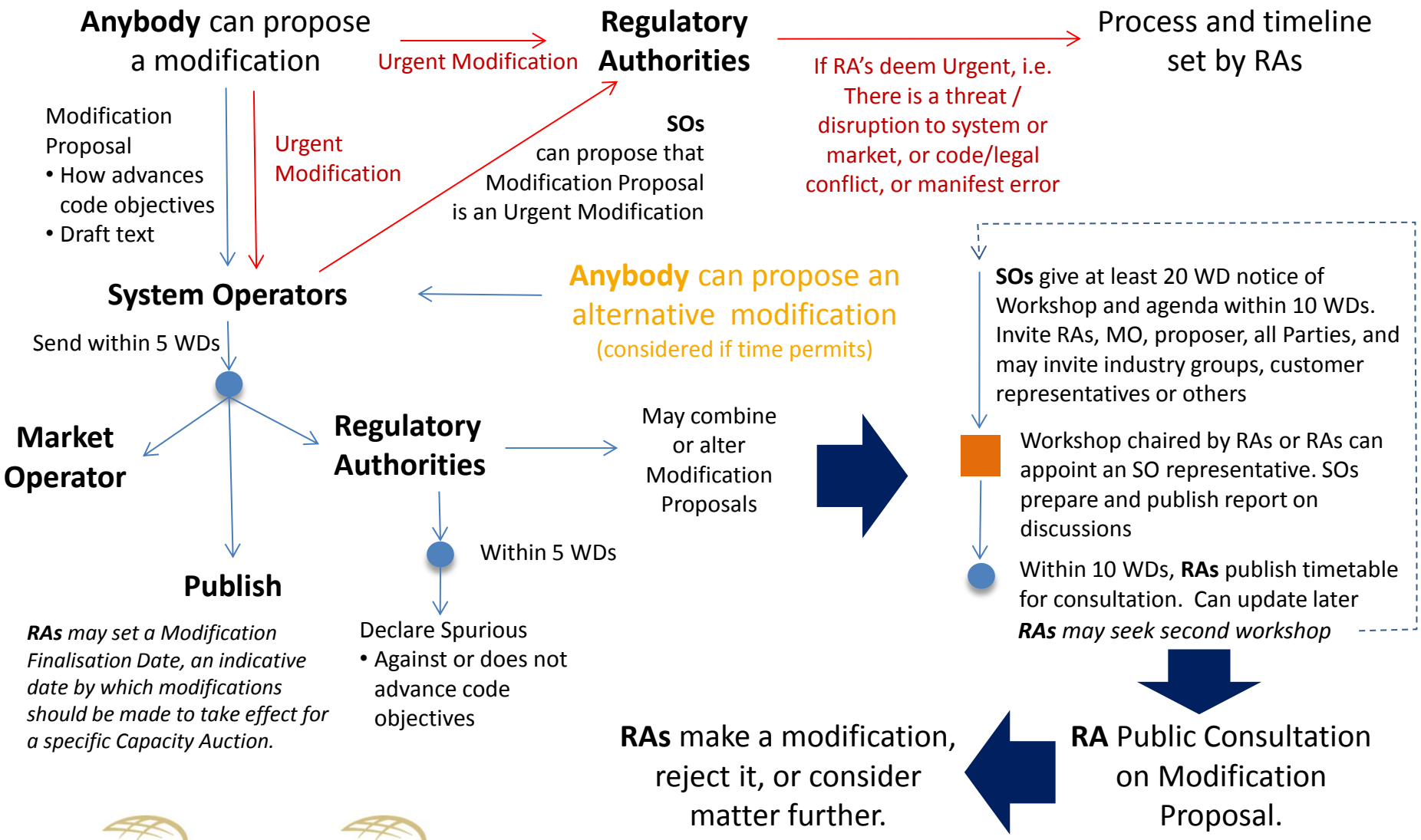
- The System Operators can propose these rates to the RA's and must published approved rates. The Annual Capacity Charge Exchange Rate is used for Euro to Sterling conversions.

- **For the first Capacity Auction these System Operator charges have been set to zero.**

Capacity Market Code Modifications

- The CMC Modification Process is broadly based on that for the existing TSC but with some fundamental differences:
  - There is no Modifications Committee:
    - Under the TSC industry representatives form this committee and assess modification proposals with the Regulatory Authorities having veto powers.
    - Under the CMC the Regulatory Authorities fill this role. As a result the change process will be closer to an RA consultation than to the TSC rule change process.
    - Auctions are held infrequently but a single auction can involve a significant part of annual market revenues (for providers) and costs (to suppliers). It therefore may be very difficult for an industry body to form and approve decisions that benefit the overall market in this context.
  - The System Operators approve changes to Agreed Procedures:
    - Under the TSC the Modifications Committee approves these, though if not passed unanimously the RAs have a power of veto and may make an alternative decision.
    - Under the CMC the System Operators develop, consult and approve changes. The RAs have a power to veto changes. Agreed Procedures can also be changed under the normal rule change process.

Capacity Market Code Modifications (Key Features Only)



Disputes

- Two types of disputes are defined under the CMC:
  - Qualification Dispute – arising out of Qualification Process.
  - General Dispute – being all other disputes.

  Disputes in respect of settlement of the capacity market must be raised under the TSC.

  The CMC states that raising a dispute is a pre-condition for referring a dispute to a Court.

- The first step is a written Notice of Dispute issued from one party to another party or parties. It must describe the nature of the dispute. A copy of the notice must be sent to the SOs, who can inform third parties impacted by the dispute of its existence, nature and progress:
  - A Qualification Dispute cannot be raised unless the Party has logged an Application for Review (within the Qualification Process – covered later).

- The SOs establish and maintain a Panel of RA approved qualified experts that can be appointed to a Capacity Market Dispute Resolution Board (CMDRB):
  - The RAs will nominate a chairperson.
  - The SOs must publish the list of members.

Dispute Types and the CMDRB

- Qualification Disputes:
  - The Panel Chairperson appoints a three member CMDRB from the Panel for Qualification Disputes (and can appoint additional three member CMDRBs if the work warrants it).
  - The SO will publish Qualification Disputes and forward them to the Panel Chairperson.
  - Qualification Disputes are automatically referred to the CMDRB (or one of the CMDRBs selected by the Panel Chairperson).

- General Dispute:
  - If parties cannot resolve dispute within 10 Working Days of meeting to discuss dispute, a party can within 20 Working Days refer matter to a CMDRB by notice to other parties, copied to the SOs (or RAs if SOs are a disputing party).
  - The parties must agree a 1 or 3 member CMDRB, with the Panel Chairperson deciding if they cannot agree.

Dispute Process

Disputing parties enter into an agreement for the CMDRB to hear and determine the dispute:

- Disputing parties shall be responsible for funding the CMDRB in equal share.

The CMDRB can set the timing of hearings and the form of submissions :

- Disputing parties must provide information to the CMDRB as they consider appropriate or as the CMDRB requires.

The CMDRB must have regard to a Capacity Auction Monitor's report and conclusions where relevant to the dispute.

Disputes must be resolved within an allowed timeline:

- for a Qualification Dispute, with time to allow inclusion in final Qualification Results
- for a General Dispute, within 30 working days for two disputing parties or 40 working days if more, or such other period as may be proposed by the CMDRB and approved by the disputing parties.

In resolving the dispute the CMDRB can award costs which are binding on parties.

If a party is not satisfied with a CMDRB dispute resolution or if the decision is much later than expected, it may issue a notice of dissatisfaction to other disputing parties. Only then may Court proceedings be commenced.

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Force Majeure (FM) – (1/2)

- "Force Majeure" means any event that satisfies all of the following criteria:
  - the event is beyond the reasonable control of a Party and could not have been reasonably prevented or the consequences of which could not have been prevented by Prudent Electric Utility Practice;
  - the event is not due to the act, error, omission, breach, default or negligence of the Party, its employees, agents or contractors; and
  - the event has the effect of preventing the Party from complying with its obligations under the CMC.

- The CMC specifies in section B.16.1.2 a range of FM events – e.g. war, natural disaster. Except where those specified conditions apply, it excludes the following from FM events:
  - Inability to pay any amount owed under the CMC or lack of Performance Security.
  - Mechanical or electrical breakdown of plant owned or operated by the Party.
  - The failure or inability of the Party's IT systems or manual processes to perform any function necessary for that Party to comply with the code.

Force Majeure (FM) – (2/2)

- A Party must notify the System Operators of an FM event's commencement and end, and the SOs will inform the Regulatory Authorities and all Parties of such notifications.

- The SOs can request reports outlining the FM event which must be provided even during the FM event and the details of such reports shall be provided to the Regulatory Authorities and all Parties by the SOs.

- The effect of declaring a (valid) FM event is to relieve a Party from its obligations arising during the period of the FM event, though:
  - An FM event does not relieve a Party from obligations that existed prior to declaring the FM event.
  - An FM event does not in any situation relieve a Party from any of its settlement obligations under either the TSC or CMC.

- FM events can also apply to System Operators.

Market Manipulation

- The CMC includes explicit prohibitions on Market Manipulation, including with respect to bids, offers or opt-out notifications.

- The definition of Market Manipulation is based on the REMIT definition. In the following paraphrased version "trade" relates to Capacity Auctions & Secondary Trades:
  - Giving false, misleading or deceptive signals or using fictitious devices (including via any media) as to supply, demand or price of traded capacity.
  - Collaborating with others to artificially influence prices or trades of traded capacity (allowing for legitimate or accepted market practices).
  - Acts, omissions, practices or agreements to prevent, restrict or distort competition in trade.
  - Breach of laws that prohibit or restrict anti-competitive practices relevant to capacity trade.
  - Or act or omission prescribed in Applicable Law as constituting market manipulation.

- There is a requirement for REMIT reporting of trading data to the European Agency for the Cooperation of Energy Regulators. Participants can appoint the System Operators to report REMIT data on their behalf.

Default (of a Party)

- A Party is in Default if it is in material breach of the CMC or the Capacity Market Framework Agreement:
  - Parties have the obligation to notify the SOs of being in default and of its nature.
  - The SOs can issue a Default Notice, whether or not notified, indicating the actions to be taken to remedy the default (if any) and the timeframe for remedy.

- The issuance of a Default Notice and the failure to resolve that default may lead to the issuance of:
  - A Suspension Order.
  - And, ultimately, a Termination Order.

Suspension (of CMUs) – (1/2)

- A Suspension Order is an order issued by the SOs, with RA approval, that:
  - Specifies the Capacity Market Units to which the Suspension Order applies.
  - Suspends those CMU from trading in a Capacity Auction or in Secondary Trade to the extent and subject to such restrictions as the SOs specify in the Suspension Order.
  - Specifies the date and time from which the suspension under the order will take effect.

- A Suspension Order may be issued in respect of any Party's CMU for a range of conditions including where (and these are paraphrased):
  - The Party cannot legally fulfil its obligations or has its licenses revoked.
  - The Party is insolvent or suspends or ceases business.
  - Awarded capacity is terminated.
  - The Party has failed to remedy a Default Notice in sufficient time.
  - The Party is suspended under the TSC or a NEMO's Rules.

- Failure to post sufficient Performance Security requires that the SOs issue a Suspension Order in respect of all the Party's CMUs.

Suspension (of CMUs) – (2/2)

- The SOs must copy a Suspension Order to the RAs and to the Market Operator.

- While a Suspension Order is in place a party remains liable for all debts and obligations under any Market Code:
  - A Suspension Order does not affect the continuing obligations of the relevant Party under the CMC or TSC in relation to Awarded Capacity, including, where applicable, to maintain the required Performance Security.

- The SOs can update or lift a suspension order.

- Failure by a Party to address a Suspension Order may lead to the SOs issuing a Termination Order.

Termination (of a Party and/or CMUs)

- The SOs may, with RA approval, and must if requested by the RAs, issue a Termination Order to a Party where the Party:
  - Has breached a Suspension Order or has not remedied a Default giving rise to that order.
  - Has been issued a Termination Order under a NEMO's rules or the TSC or has voluntarily terminated its participation under the TSC:
    - This requirement exists because a Capacity Market Unit with Awarded Capacity cannot meet its obligations under the CMC without being able to schedule energy.

- A Termination Order may direct the deregistration of any or all of a Party's Capacity Market Units or the Termination of a Party as a party to the CMC.

- Termination as a Party to the CMC will result in the deregistration of all of the Party's Capacity Market Units.

- The SOs must inform the RAs and the Market Operator of the issuance of a Termination Order.

Topic 3: De-Rating Basics

Training Topic 3 –De-Rating Basics

- Terminology
- Initial Capacity
- De-Rating Curves for Different Technologies

Terminology – Capacity Requirement and De-Rating

- **SEM Security Standard -** is a standard determined by the Regulatory Authorities which is based on hours of loss of load expectation per annum. Current value is 8 hours of LOLE per year.

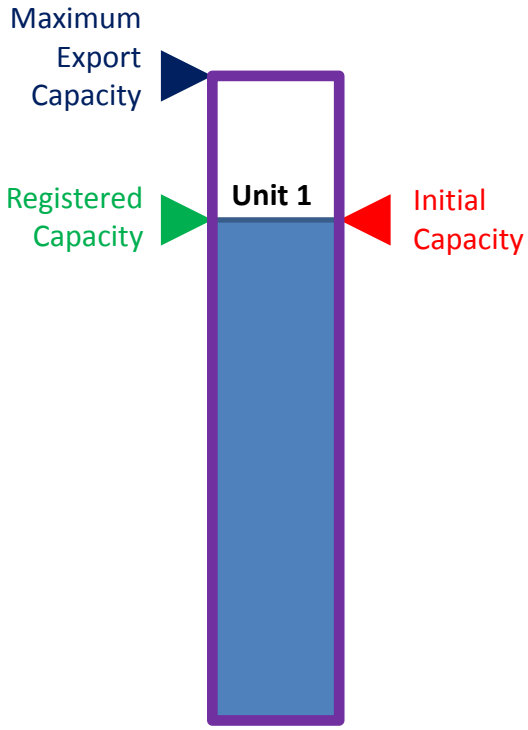
- **Initial Capacity -** the capacity available from a Generator, Generator Unit or Interconnector (or a Capacity Market Unit that comprises those units) without applying any de-rating factor.

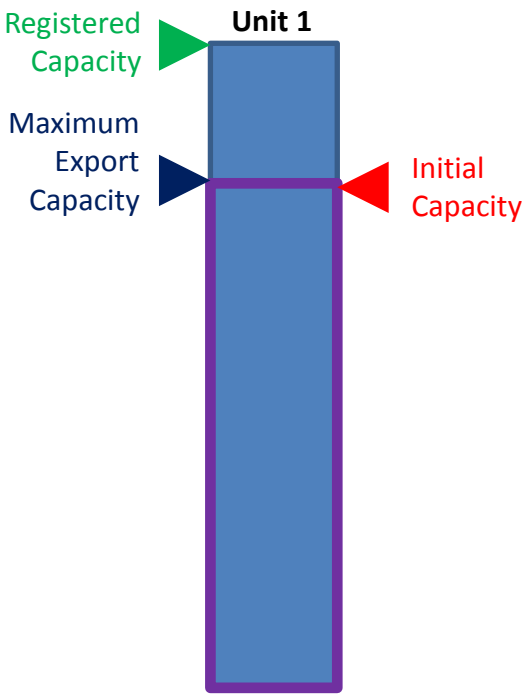
- **Technology Classes -** The nature of the technology used to provide energy from Generators, Generator Units and Interconnectors.

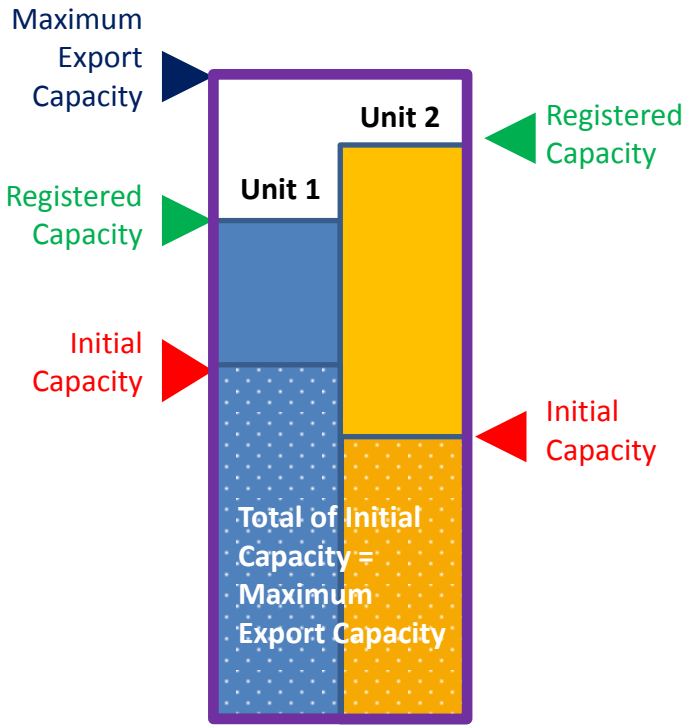
- **De-rating Factor -** a factor between zero and one, which is applied to Initial Capacity to lower the capacity available from a Generator, Generator Unit or Interconnector so in aggregate they have enough capacity beyond their de-rated level to allow the SEM security standard to be achieved even allowing for some of them being unavailable.

- **Capacity Requirement -** the total de-rated capacity expected to be required to satisfy the SEM security standard.

Initial Capacity – Some Basic Concepts







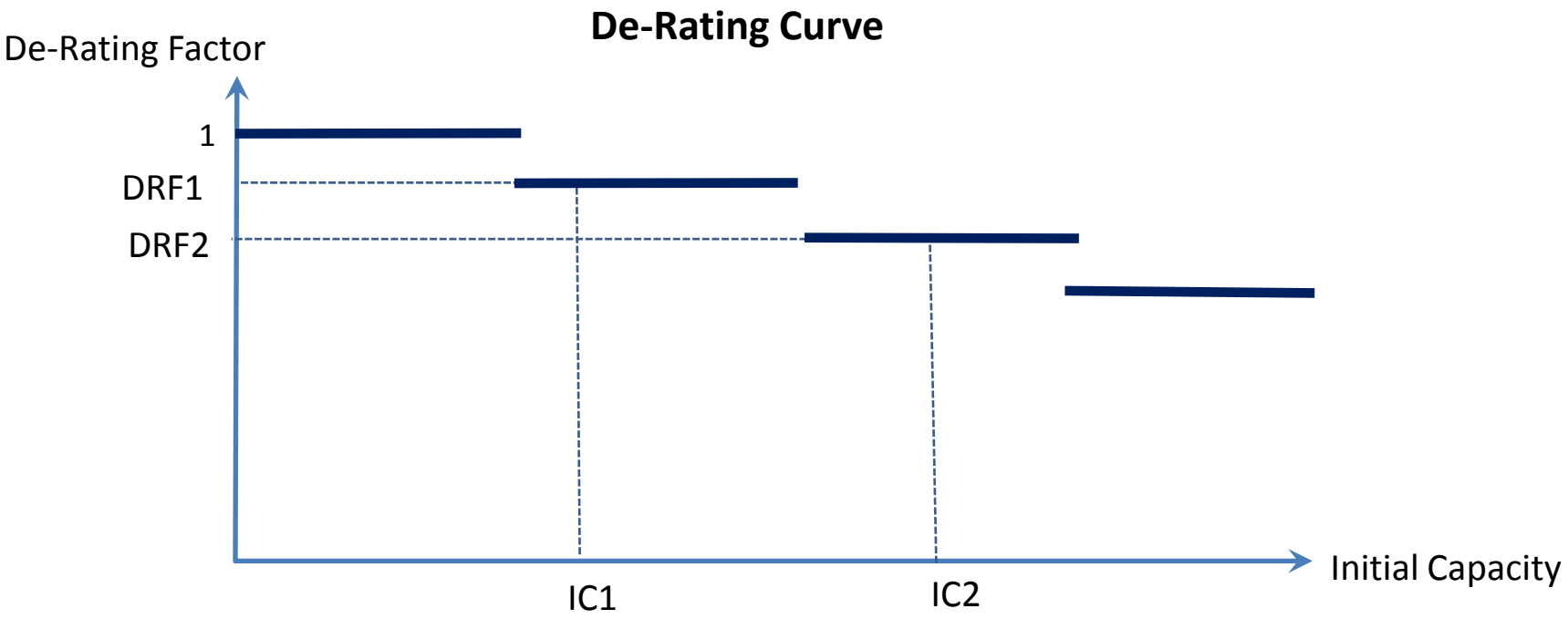
The idea is that Initial Capacity reflects the capacity that the physical unit can deliver to the grid.
Hence for a single unit it is capped by the Maximum Export Capacity, while multiple units that share a connection must set their unit Initial Capacities to values that in aggregate do not exceed the Maximum Export Capacity.

For a DSU the Initial Capacity = DSU MW Capacity.

For Total Capacity (Existing Capacity + New Capacity) the Initial Capacity is the expectation of what the value will be.

De-Rating Factors for New And Existing Capacity

- Different de-rating factors are applicable to both new and existing capacity. The reason is that the de-rating factor declines with increasing capacity.



- A unit has capacity Initial Capacity 1 (IC1) and proposes to increase this to IC2. Its Gross De-Rated Capacity (Existing) is GDRC(Existing) = DRF1 × IC1. The expanded unit has GRDC(Total) = DRF2 × IC2, so the contribution of New Capacity is GRDC(New) = GRDC(Total) – GRDC(Existing).

Topic 4: Qualification

Training Topic 4 – Qualification

- Purpose of qualification
- Who must / may qualify
- Data required
- Process
- Approval / review processes
- Extended Qualification
- The Capacity Market Platform

Purpose of Qualification

- Qualification is a System Operator run process which establishes:
  - The eligibility of Candidate Units (generators and interconnectors) to be qualified.
  - The Gross De-Rated Capacity for Candidate Units, for both Existing and New Capacity.
  - The mapping of Candidate Units to Capacity Market Units.
  - The Gross De-Rated Capacity and Net De-Rated Capacity (after allowing for previously Awarded Capacity) of Capacity Market Units, for both Existing and New Capacity.
  - Data with which to validate Capacity Market Unit offers in Capacity Auctions, including:
    - Whether capacity is Existing Capacity or New Capacity.
    - The minimum quantities that must be offered (Firm Offer Requirements).
    - The maximum quantity that may be offered (Net De-Rated Capacity).
    - The price caps for those offers. Some special cases must have RA approval.
    - Whether any Awarded Capacity will have a term of more than one Capacity Year. All durations beyond one capacity year require RA approval.
  - Data with which to validate Secondary Trades, including:
    - The maximum quantities that can normally be delivered (Gross De-Rated Capacity).
    - The limits on trade-above de-rated capacity, which is given by Initial Capacity.

Requirements to Qualify

- Qualification for a Capacity Year is mandatory for a Candidate Unit that is:
  - Dispatchable Generator Unit with a Registered Capacity ≥ the De Minimis Threshold (DMT) which is 10 MW (or is a DSU with a DSU MW Capacity ≥ DMT).
  - A proposed Dispatchable Generator Unit (other than a DSU) or an existing Dispatchable Generator Unit proposing to increase capacity, and expected to have a Registered Capacity ≥ DMT prior to the start of the Capacity Year.
  - An existing or proposed Interconnector expected to be operational prior to the start of the Capacity Year.
  - Contributing to a Capacity Market Unit that holds Awarded Capacity for the Capacity Year.

  Unless an Opt-out Notification has been accepted by the System Operators.

- Qualification for a Capacity Year is voluntary for a Candidate Unit that is:
  - A proposed DSU.
  - An existing or proposed Variable Unit, non-dispatchable Generator Unit, or dispatchable Generator Unit with an (expected) registered capacity < DMT.

Opt-Out Notifications – (1/2)

- A participant may submit an Opt-out Notification to the SOs in respect of a Candidate Unit that would otherwise be required to Qualify for a Capacity Year, if:
  - The Candidate Unit will close down by the end of the Capacity Year; or
  - If the RAs determine it does not need to Qualify due to Planned Outages exceeding three months or due to mothballing of the unit, during the Capacity Year.

- An Opt-out Notification must include:
  - Details of any Awarded Capacity,
  - Where applicable, closure dates and if required by the SOs evidence of notifications under the Grid Code or to the RAs of the closure
  - Where applicable, a copy of the RA determination in respect of Planned Outages or mothballing.
  - A director's certificate indicating the information is true and correct and that the notification is not for the purpose of, or connected with, market manipulation.

- Participants should not submit Opt-out Notifications in respect of Candidate Units that are not required to Qualify.

Opt-Out Notifications – (2/2)

- The SOs can reject an Opt-out Notification if:
  - The notification is incomplete.
  - The Candidate Unit contributes to a CMU with Awarded Capacity for the Capacity Year.
  - Satisfactory evidence of notifications of intended closure of a Candidate Unit have not been provided.
  - Required evidence of RA determinations have not been provided.

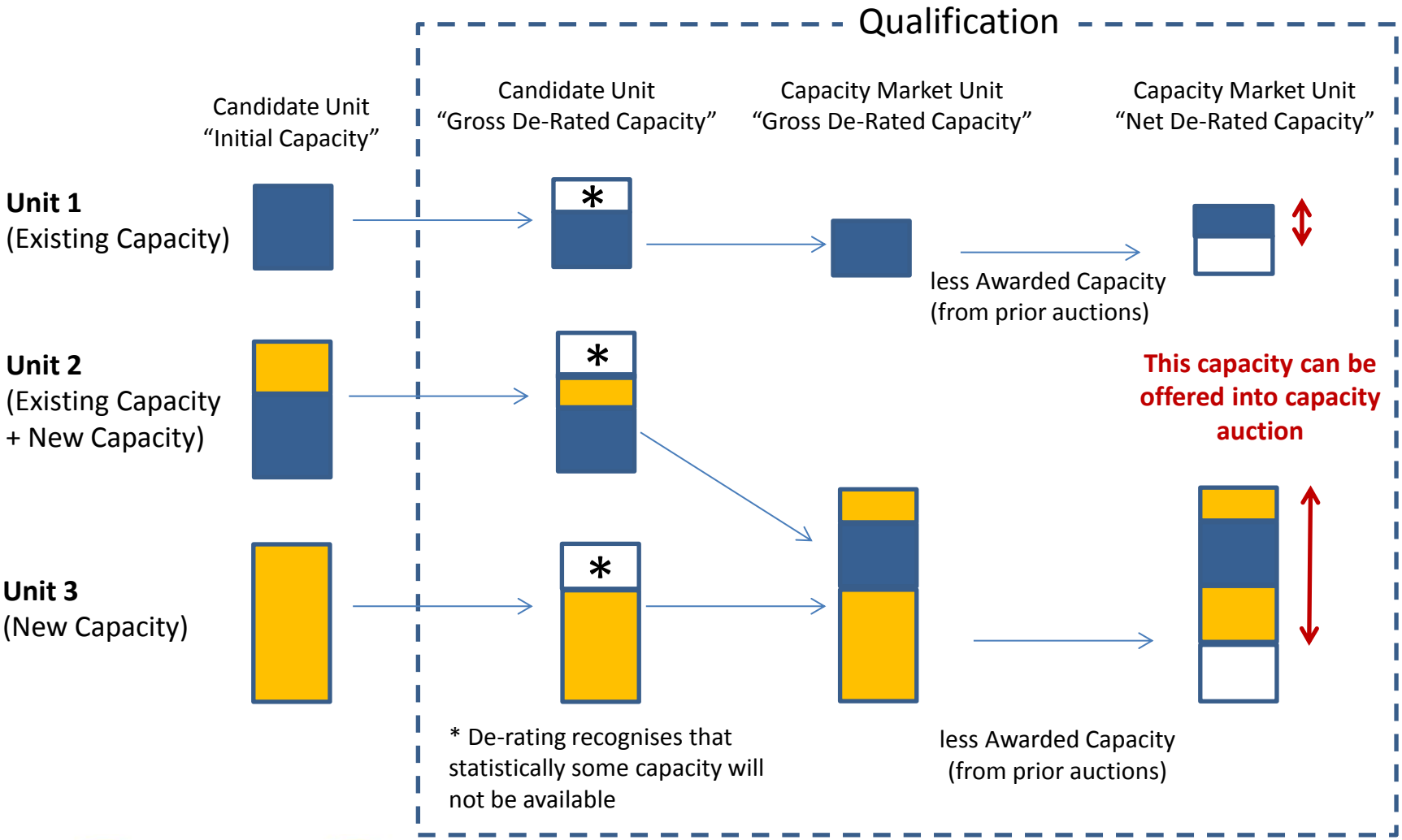
- If an Opt-out Notification is rejected then the Participant must submit an application for Qualification in respect of the Candidate Unit.

Note – if no application for Qualification is submitted or accepted for a Candidate Unit required to Qualify, then the Alternative Qualification Process will be applied. The SOs will use their own data as input data for the determination of qualification results in respect of:

- Existing Capacity.
- New Capacity which holds Awarded Capacity from a prior auction.

New Capacity that does not hold Awarded Capacity will not be qualified.

The Basics of the Qualification Process



Exchange Rates

- Capacity Market Units in Northern Ireland are provided with cost related information relevant to Qualification, the Capacity Auction and Secondary Trade in Sterling while participants in the Republic of Ireland operate in Euro. All auction processes operate in Euro.

- The SOs determine exchange rates based on an RA approved methodology.

- An Annual Capacity Payment Exchange Rate determined for a Capacity Year is used in regard to all activities relating to a Capacity Auction, including settlement plus all Secondary Trades for periods more than 12 months in the future:
  - It is first determined for the first Initial Auction Information Pack for any Capacity Year and is updated periodically.
  - Once set in the Final Auction Information Pack the exchange rate never changes for capacity awarded in that auction.

- A Monthly Capacity Payment Exchange Rate is also determined for the next 12 months and is periodically updated. It is used for Secondary Trades for periods less than 12 months in the future.

- The applicable exchange rate is recorded (and fixed) for all Awarded Capacity.

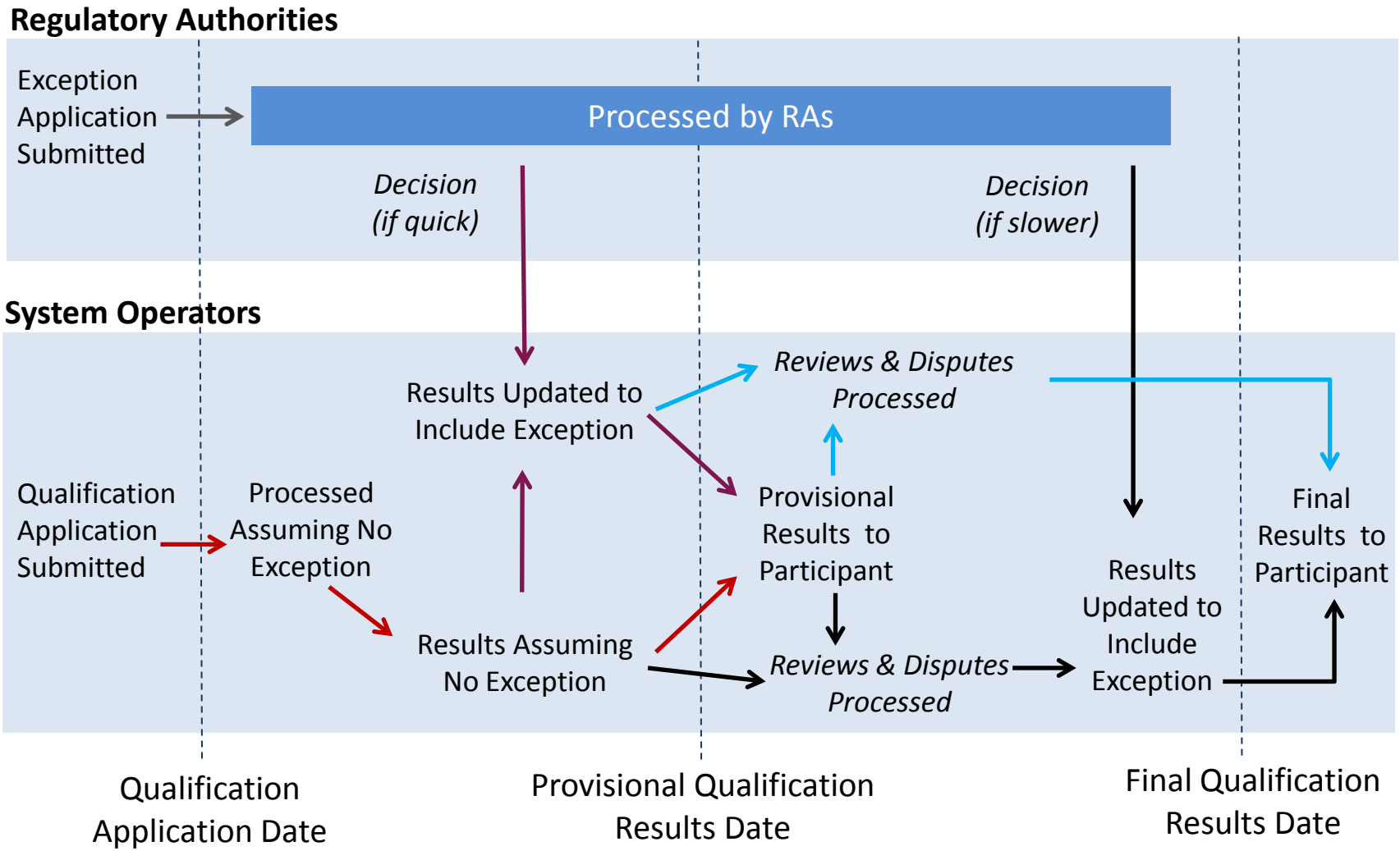
Exception Applications

- In parallel to Qualification, the RAs operate an Exception Applications process, the decisions resulting from which will feed back into Qualification Results.

- Participants can apply to the RAs for proposed New Capacity to have a Maximum Capacity Duration of 10 years rather than the normal one-year:
  - The participant will need to demonstrate the cost of the New Capacity will exceed a New Capacity Investment Rate Threshold.
  - The Initial Auction Information Pack has this threshold set to €300,000/MW or £269,010/MW.

- Participants can apply to the RAs for all or a part of Existing Capacity to have a Unit Specific Price Cap. This is a higher price cap, set on a case by case basis, between the normal Existing Capacity Price Cap and the Auction Price Cap. It is applicable to:
  - Candidate units with net going forward costs that are not supported by the normal Existing Capacity Price Cap.
  - Candidate units which have a dual capacity rating. E.g. they *normally* provide X MW on one fuel and Y > X MW on another fuel. Such units must Qualify based on the maximum capacity (Y MW) but can seek a Unit Specific Price Cap on the range above X MW to reflect the risks and costs associated with that capacity not always being available.

How Exceptions come into Qualification Results



Requirements to be Qualified – (1/3)

Administrative Considerations (for which SOs may reject application)

- Application submitted after the Qualification Application Date.
- The information submitted is deficient or incorrect.
- The participant is Suspended or in Default or is not the participant for the Candidate Unit.
- The proposal in respect of New Capacity is not feasible (technically or in the available time).
- In respect only of the next Capacity Year to begin, the unit has had Awarded Capacity for that year recently terminated as a result of a T-1 Implementation Progress Report.

Trading and Settlement Code Requirements (for which the SOs shall reject application)

- SOs not satisfied that Candidate Unit can participate under TSC.
- The Candidate Unit will not be connected to a transmission or distribution system in the SEM.

Aggregated Generator Units and Demand Side Units (The SOs shall reject application unless..)

- An existing AGU has a Generator Aggregator System Operator Agreement in place with SO and otherwise can show it is authorised to include units in AGU.
- The New Capacity is from a DSU but a plan and directors declaration in respect to how that capacity will be delivered has not been provided.

Requirements to be Qualified – (2/3)

Requirements for New Capacity (The SOs shall reject application unless …)

- The SOs are satisfied that:
  - The information provided reflects an accurate state of the development of the project.
  - Implementation plan dates are achievable.
  - Substantial Completion can be achieved prior to the start of the Capacity Year, and
  - The data provided is complete and accurate.

- An exception is that if capacity has been awarded to new capacity then that component of the New Capacity shall be qualified by the SOs.

Requirements to be Qualified – (3/3)

Requirements for Combining Candidate Units in a CMU (where if not satisfied the SOs shall reject application / or exclude some ineligible Candidate Units …)

- The Candidate Units are:
  - Generator Units or proposed Generator Units (i.e. not an Interconnector)
  - Registered or will be separately registered under the TSC
  - Registered or will be registered to the same Participant and in the same Currency Zone.
- The Candidate Units are either Variable Generator Units or have or will have a Registered Capacity or DSU MW Capacity below the De Minimis Threshold.
- To maintain consistency with settlement treatment of different technologies:
  - If any of the Candidate Units are DSU then all must be DSU units.
  - If any of the Candidate Units are Autoproducers then all units must be Autoproducers.
- All Candidate Units have the same Maximum Capacity Duration.
- None of the Candidate Units:
  - Have a Unit Specific Price applicable to them.
  - Are included in an application to be part of any other CMU.
  - Contribute to another CMU holding Awarded Capacity for the Capacity Year from a prior auction
- If the CMU associated with the Candidate Unit holds Awarded Capacity for the Capacity Year then it must continue to (at least) comprise the same Candidate Units.

Qualification Calculations – (1/3)

- Within their Qualification Applications participants effectively specify:
  - All the data required to calculate their qualification outcomes.
  - The de-rated capacity that the participant expects.

- System Operators use the participant data to derive the de-rated capacities, or the allowed range of de-rated capacities. If the de-rated capacity that the participant expects is outside the allowed range then the SOs will apply the nearest allowed values.

- The following slides illustrate the calculation for Candidate Units other than AGUs.

- Similar equations apply for AGU's, the difference being that the calculations are applied to the Generators comprising the AGU, with the de-rated results for each Generator summed to give the de-rated capacities of the AGU:
  - As de-rating factors fall with increasing capacity this approach ensures that AGU de-rated values are higher than they would be if the total AGU capacity was de-rated.

Qualification Calculations – (2/3)

Equations for determining Gross De-Rated Quantities

Existing Capacity

GDRCE = MIN[DRFE × ICE× (1 + INCTOL), MAX[DRFE × ICE × (1- DECTOL), NDRVE]]

100	=	MIN[	100	, MAX [	90	,	150	]]
95	=	MIN[	100	, MAX [	90	,	95	]]
90	=	MIN[	100	, MAX [	90	,	0	]]

De-rated factor (DRFE) scaled initial capacity for **existing** capacity (ICE), increased based on a % increase tolerance (INCTOL)

De-rated factor (DRFE) scaled initial capacity for **existing** capacity (ICE), reduced based on a % decrease tolerance (DECTOL)

Nominated Gross De-Rated Capacity (Existing)

Except for a Variable Unit in which case:

GDRCE = MIN[DRFE × ICE × (1 + INCTOL), NDRVE]

100	=	MIN[	100	,	150	]	
95	=	MIN[	100	,	95	]	
0	=	MIN[	100	,	0	]	*Can Qualify To Zero*

Qualification Calculations – (3/3)

Equations for determining Gross De-Rated Quantities

Gross De-Rated Capacity (Existing)

New Capacity

GDRCN = MAX[0, MIN[DRFT × ICT × (1 + INCTOL), MAX[DRFT× ICT× (1 - DECTOL), NDRVE + NDRVN]] - GDRCE]

90	=	MAX[0,	MIN[	190	, MAX [	180	,	150 + 70 =220	]]	-	100	]
87	=	MAX[0,	MIN[	190	, MAX [	180	,	95+ 87 = 182	]]	-	95	]
90	=	MAX[0,	MIN[	190	, MAX [	180	,	0+ 0 = 0	]]	-	90	]

De-rated factor (DRFE) scaled initial capacity for **total** capacity (ICT), increased based on a % increase tolerance (INCTOL)

De-rated factor (DRFE) scaled initial capacity for **total** capacity (ICT), reduced based on a % decrease tolerance (DECTOL)

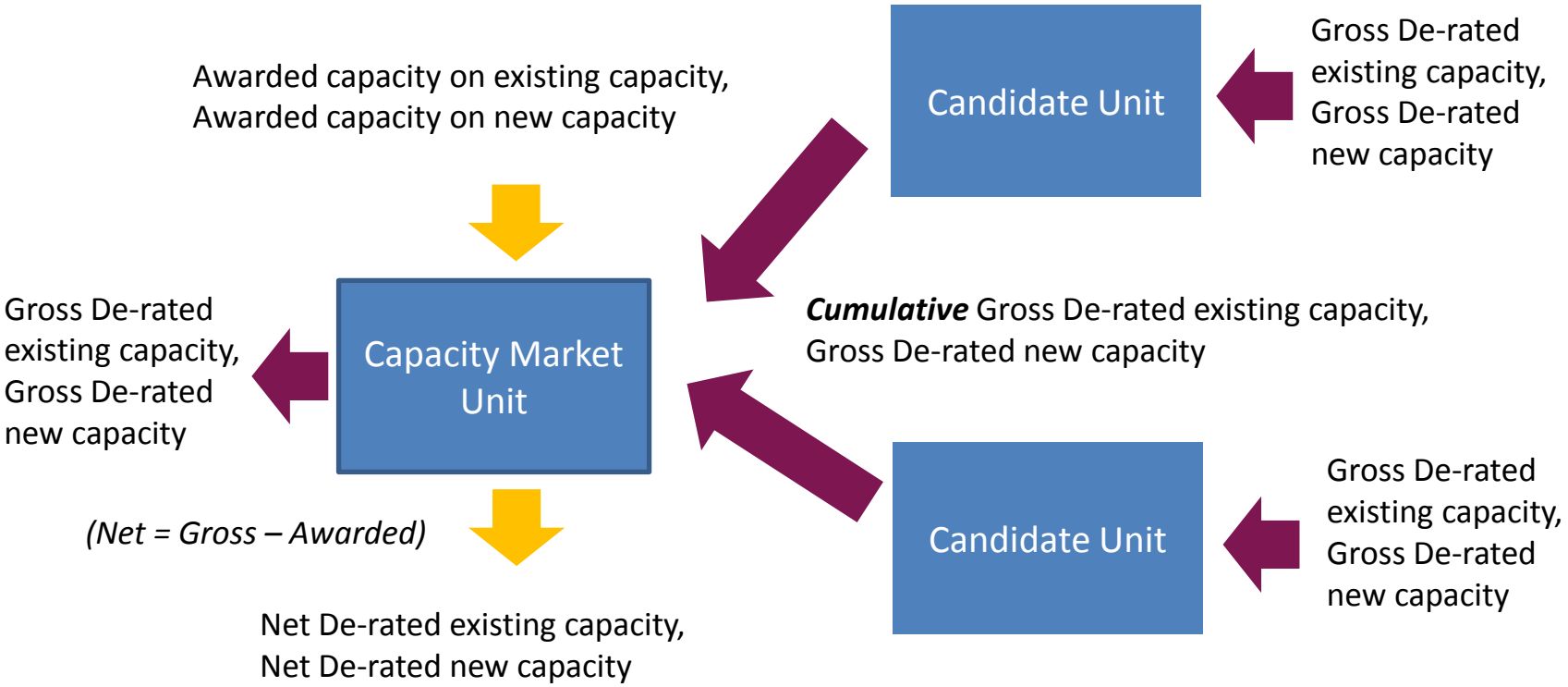
Nominated Gross De-Rated Capacity (Existing) + Nominated Gross De-Rated Capacity (New)

Except for a Variable Unit in which case:

GDRCN = MAX[0, MIN[DRFT × ICT × (1 + INCTOL), NDRVE + NDRVN] - GDRCE]

90	=	MAX[0,	MIN[	190	, 150 + 70 =220	]	-	100	]	
87	=	MAX[0,	MIN[	190	, 95 + 87= 182	]	-	95	]	
0	=	MAX[0,	MIN[	190	, 0 + 0 = 0	]	-	0	]	*Can Qualify To Zero*

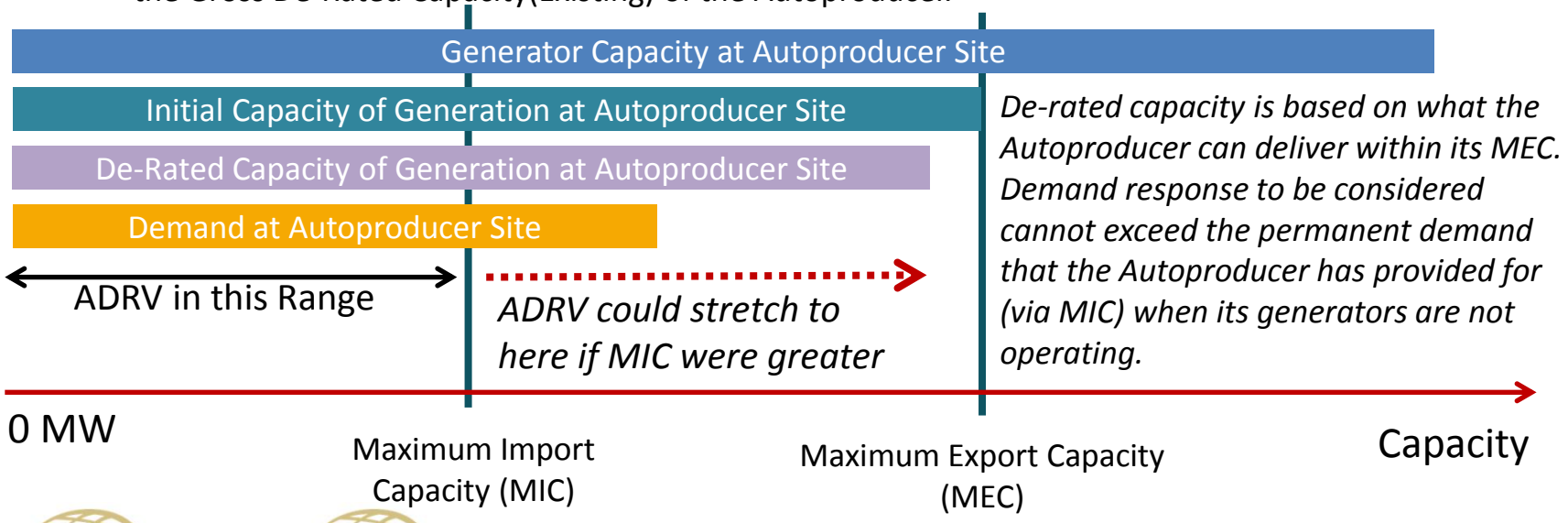
Net De-Rated Capacity



A Candidate Unit could be an Interconnector or Generating Unit which is a CMU in its own right, or (as shown) a Candidate Unit that is a Generator Unit could be one of a number of such Candidate Units that are aggregated to one CMU

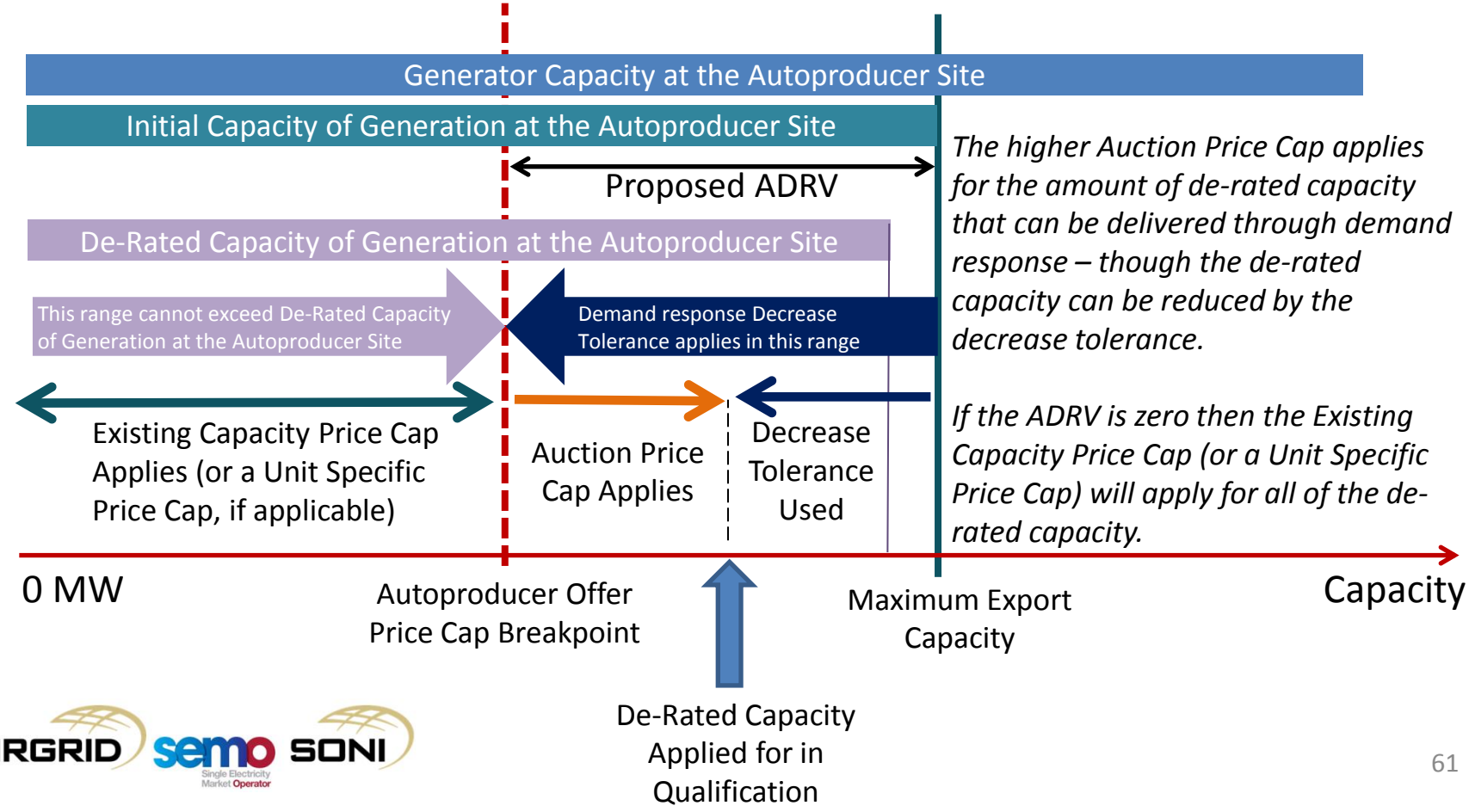
Autoproducer Demand Reduction Volumes – (1/2)

- The Autoproducer Demand Reduction Volume (ADRV) is a measure of capacity than can be delivered by reducing demand:
  - This (and only this) part of the Autoproducer's de-rated capacity is treated similarly to a DSU. It can be offered at the Auction Price Cap.
  - The Initial Auction Information Pack for the first auction allows the Autoproducer the option to not qualify capacity covered by the ADRV (via a form of DECTOL).
- In Qualification, the Autoproducer has to propose an Autoproducer Demand Reduction Volume (ADRV), reflecting their demand response capability, between 0 and the lesser of:
  - Its Maximum Import Capacity (MIC) and
  - the Gross De-Rated Capacity(Existing) of the Autoproducer.



Autoproducer Demand Reduction Volumes – (2/2)

- The ADRV is used by the SOs to create an Autoproducer Offer Price Cap Breakpoint:
  - Capacity beyond this breakpoint can be provided by reducing demand at the site.
  - The Auction Price Cap applies to this demand response.
  - The DECTOL on the demand response also applies in this range.



Firm Offer Requirements

- Firm Offer Requirement reflect a de-rated view of Firm Network Access Capacity, representing the firm access that a Candidate Unit has to a Transmission or Distribution system:
  - The Firm Network Access Capacity is based on Connection Agreements or Connection Offers, except for Demand Side Units which are deemed to have fully firm capacity.
  - The de-rating factor used is based on a unit of the same technology as the Candidate Unit with a capacity equal to the Firm Network Access Capacity.
  - Any previously Awarded Capacity associated with the Candidate Unit is netted off of Firm Offer Requirement.
  - For AGU's the Firm Offer Requirement is the sum of the Firm Offer Requirements of all Generators comprising it.
  - For a Capacity Market Unit, the Firm Offer Requirement is the sum of the Firm Offer Requirement of all Candidate Units comprising it.

- The Firm Offer Requirement of a CMU is important, as it is mandatory for Qualified Existing Capacity to offer a quantity of capacity into the Capacity Auction not less than the lesser of its Net De-rated Capacity (Existing) and its Firm Offer Requirement.

Qualification Results – (1/2)

- "SO Qualification Decisions" in respect of a Capacity Market Unit include:
  - Its identity.
  - Whether or not it is clean (used only in auction tie-breaking).
  - the Firm Offer Requirement (as applicable).
  - The Awarded Capacity it holds already for the Capacity Year.
  - Details of Initial Capacity, Gross De-Rated Capacity, Awarded Capacity held already, and Net De-Rated Capacity in respect of Existing and New Capacity.
  - For each Candidate Unit comprising the Capacity Market Unit:
    - Similar information to that above which was used to derive the data for the Capacity Market Unit (though not Awarded Capacity as this is only awarded to Capacity Market Units.
    - Whether the Alternative Qualification Process was applied and details of any changed data used.
  - The Autoproducer Offer Price Cap Breakpoint (where applicable).
  - A curve called the Existing Capacity Offer Price Cap Curve, which describes the price cap at different points of existing capacity (but not Unit Specific Price Cap data).

Qualification Results – (2/2)

- "Other Qualification Decisions" in respect of Existing Capacity and New Capacity provided by a Capacity Market Unit reflect data that may be changed by RA Exception Application decisions:
  - The applicable Maximum Capacity Duration;
  - The applicable Offer Price Cap(s); and
  - Any Unit Specific Offer Price Cap Breakpoint(s).

- The multiple Offer Price Caps and breakpoints are required because Existing Capacity could have two or three different price caps over a different ranges. For example:
  - An existing Autoproducer would by default have the Existing Capacity Price Cap for its generation, but the RAs could approve a Unit Specific Price cap for some of that capacity, while its demand response capability can be priced at the Auction Price Cap.
  - A dual capability unit might have an Existing Capacity Price Cap on its more commonly used fuel (which has a lower capacity) and a Unit Specific Price Cap on its more rarely used fuel (on for which it has a higher capacity).

Qualification Review

#	Event	Nature	Date
5	Provisional Qualification Results Date	SOs release initial qualification results. Participants have recourse for reviews and then disputes.	6th Oct 2017
6	Final Qualification Submission Date	The date SOs submit final qualification results for RA approval.	17th Nov 2017

- If you disagree with qualification results then you want this resolved between 6th October and 17th November.
- The first step is to submit an Application for Review to the SOs providing:
  - a concise statement identifying the Reviewable Decision concerned;
  - a concise statement explaining how the Participant believes the SOs have not followed the process under the CMC; and
  - copies of relevant documents.
- Timeframes are covered on next slide.
- If an Application for Review was submitted by a Participant, and that Participant was not happy with the outcome then, and only then, can the Participant raise a Qualification Dispute.

Qualification Review and Dispute Timeframe

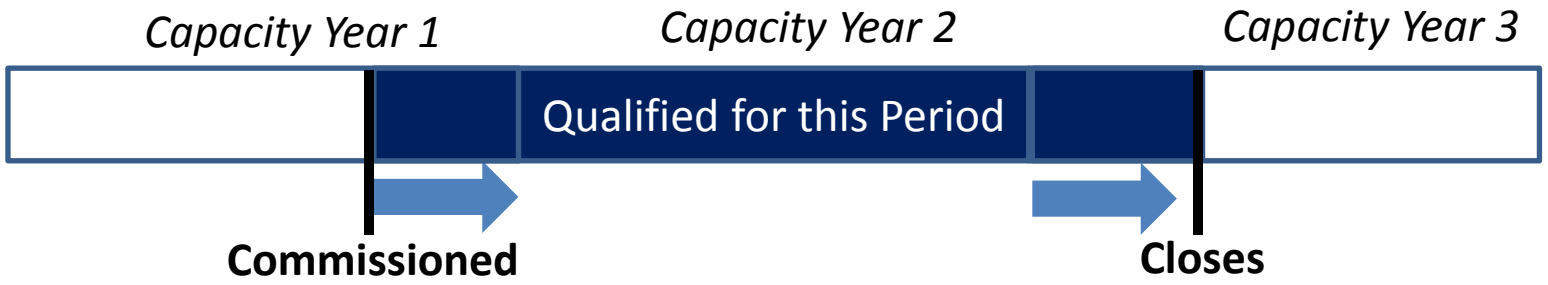
#	Event	Nature	Date
5	Provisional Qualification Results Date	SOs release initial qualification results. Participants have recourse for reviews and then disputes.	6th Oct 2017
19	Prescribed Timeframe	Timeframe within which Applications for Review must be lodged	Release date + 2WD *(By 10 Oct 2017)*
20	Prescribed Timeframe	Timeframe within which System Operators may reject a non-complying Application for Review	Event 19 + 2WD *(By 12 Oct 2017)*
21	Prescribed Timeframe	Timeframe within which Participant must comply with a request for further information	2nd WD after request *(By 16 Oct 2017)*
22	Prescribed Timeframe	Timeframe within which System Operators must notify Participant of outcome of their reconsideration	Event 19 + 5WD or Event 21 + 5WD. *(By 23 Oct 2017)*
24	Prescribed Timeframe	Latest date for giving a Dispute Notice in relation to a Qualification Dispute	Event 22 + 3WD *(By 26 Oct 2017)*
25	Prescribed Deadline	Latest date by which the CMDRB shall give its decision in relation to a Qualification Dispute	17th Nov 2017 (4 weeks before auction)
6	Final Qualification Submission Date	The date SOs submit final qualification results for RA approval.	17th Nov 2017

From Table B in Appendix C of the CMC. Note that there is no event 23 in the CMC.

Extended Qualification

- If a Capacity Market Unit is commissioned during the Capacity Year prior to the first Capacity Year in which it is Qualified, it can apply to the SOs to have its future year Qualified Capacity extended back to start from a point after it is commissioned in the current Capacity Year.

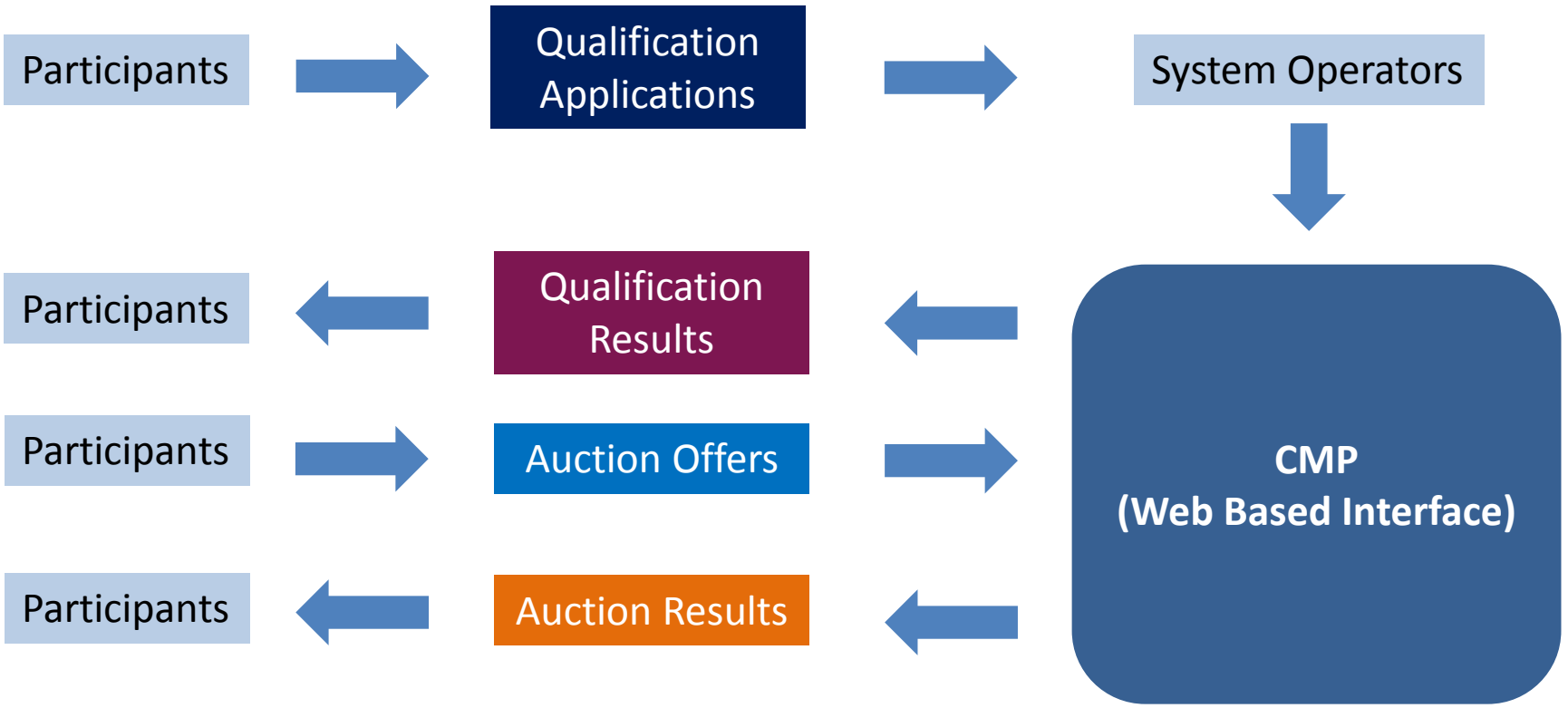
- If a Capacity Market Unit is closing in the Capacity Year after the last Capacity Year in which it is Qualified, it can apply to the SOs to have its current year Qualified Capacity extended through to the time it closes.



- Extended qualification allows Secondary Trading but not participation in a Capacity Auction (as not qualified for a full Capacity Year).

- Where an extension is granted, the SOs will publish a notice identifying the Capacity Market Unit and the extended dates of its qualification.

The Capacity Market Platform



Non CMP Processes

- Reviews and Disputes of Qualification Results are via Notices submitted to relevant parties. Published results are released via the System Operator website.
- Procedures allow for alternative processes for offer submission if issues arise with offer submission.

Topic 5: Capacity Auction

Training Topic 5 – Capacity Auctions

- Participation Requirements
- Overview of the Capacity Auction
  - Unconstrained Auction
  - The Constrained Auction
- The Unconstrained Auction
  - Inputs
  - Working
  - Interim and Enduring Process
- The Constrained Auction
  - Additional Inputs
  - Working
  - Interim and Enduring Process
- Post Auction Processes
- Timelines

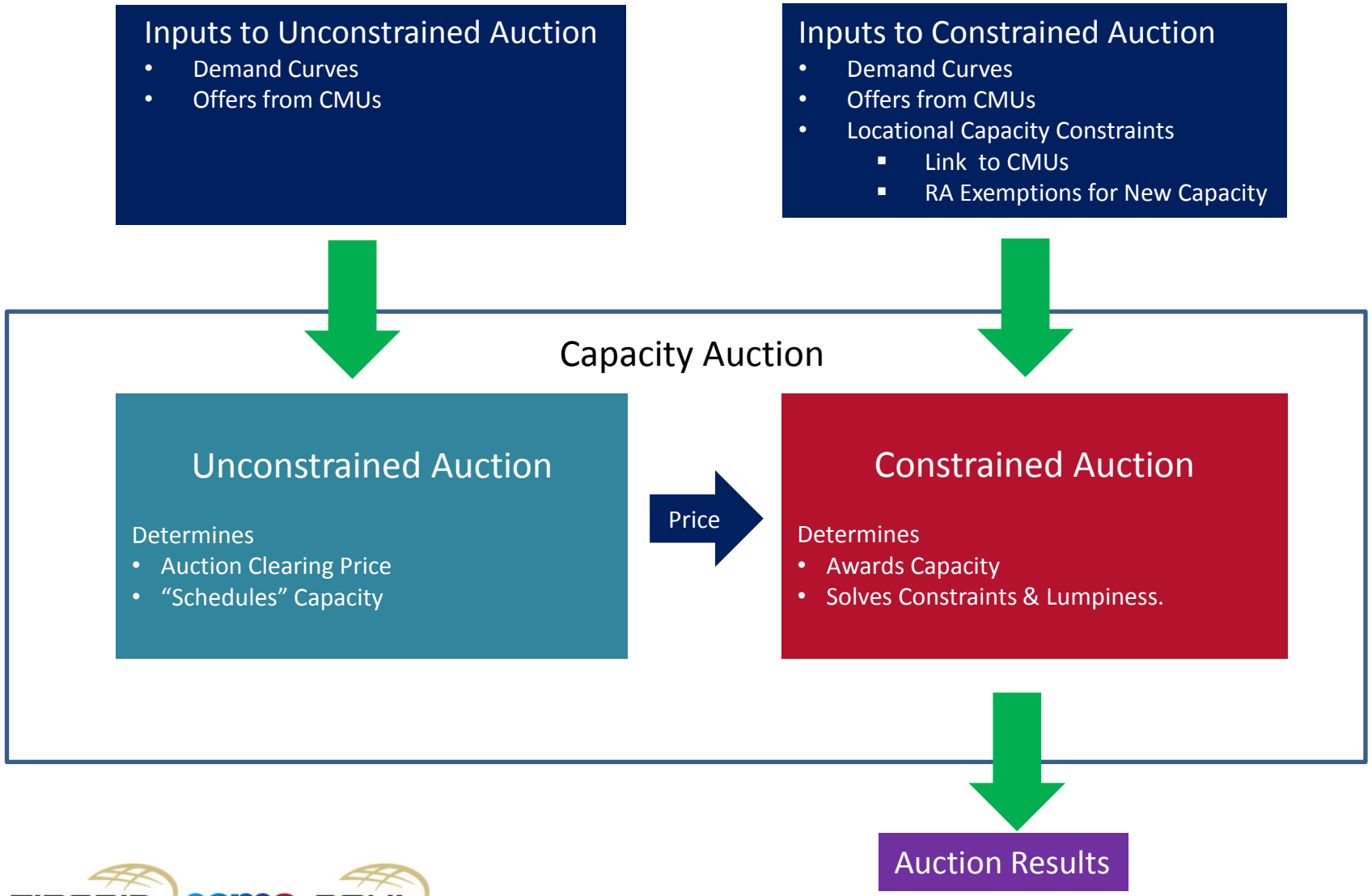
Capacity Auction Participation Requirements

- A Participant that has qualified for a capacity auction must participate in a Capacity Market Auction in respect of Existing Capacity for which it has a (non-zero) Net De-Rated Capacity (Existing):
  - The minimum quantity required to be offered is the lesser of its Firm Offer Requirement (its de-rated Firm Network Access net of Awarded Capacity) and the value of Net De-Rated Capacity (Existing).
  - A DSU is deemed to have Firm Network Access.
  - If a valid offer is not received by the time that the auction submission closes an offer will automatically be generated equal to the minimum quantity required to be offered at a price equal to the applicable price cap for that capacity. This offer will be flexible with a duration of 1 year.

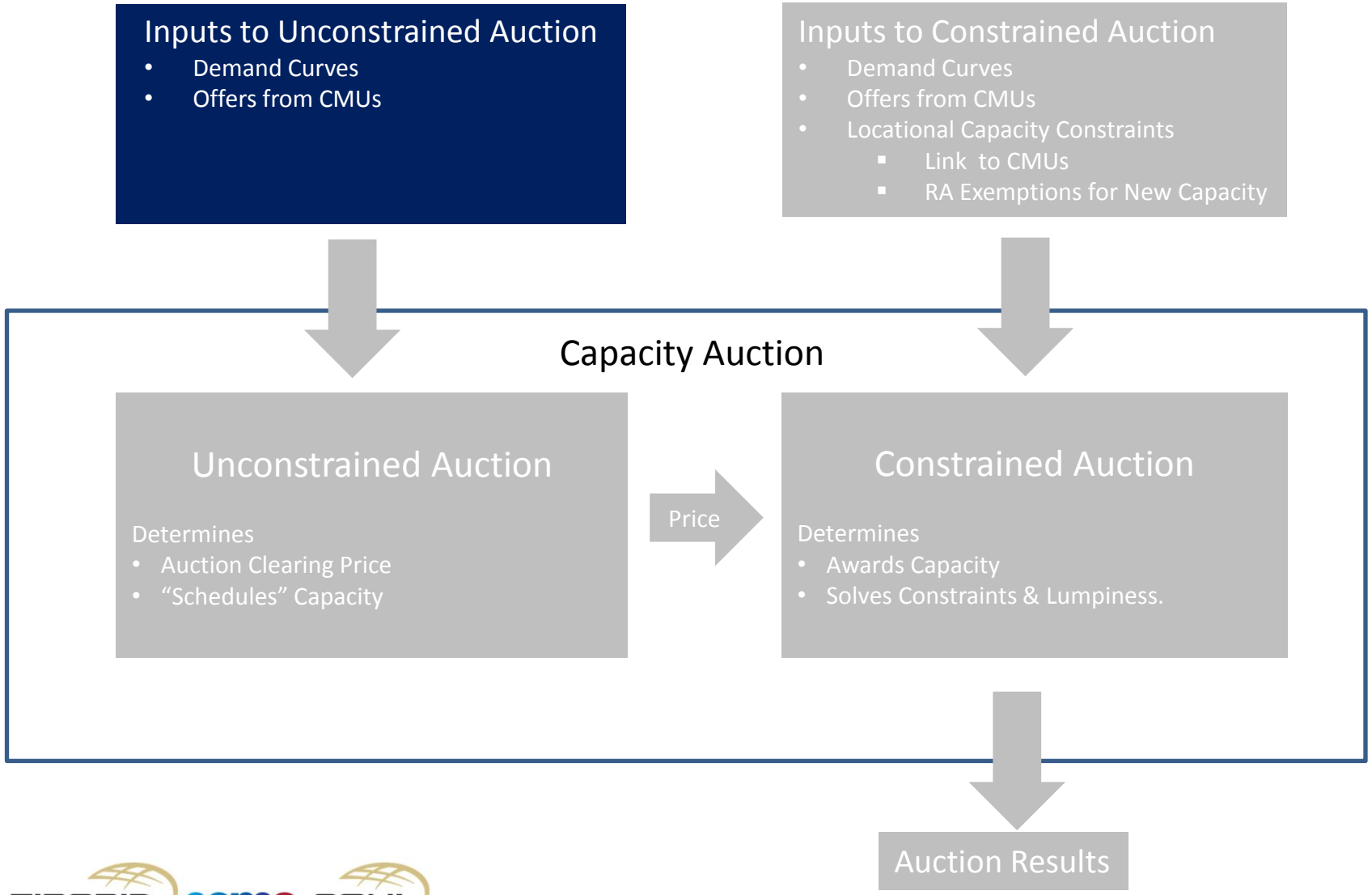
- For Existing Capacity, participation in the auction beyond the minimum quantity is voluntary:
  - The maximum quantity that can be offered is the Net De-Rated Capacity (Existing).
  - This recognises that the capacity does not have Firm Transmission Access so has less certainty about getting scheduled.

- For New Capacity participation in the auction is voluntary:
  - The maximum quantity that can be offered is the Net De-Rated Capacity (New).
  - Voluntary nature recognises projects could fail between qualification and the auction.

Overview of the Capacity Auction



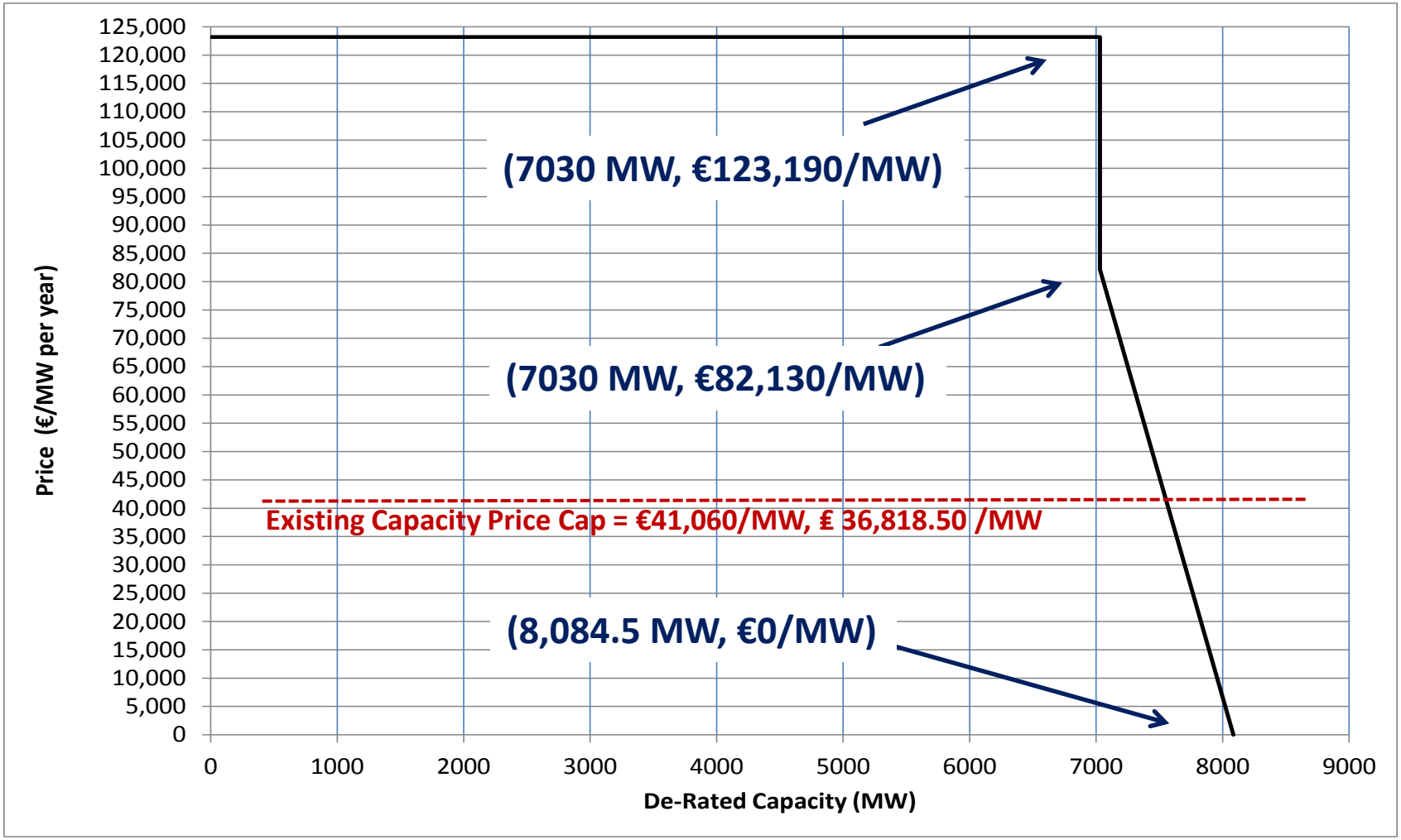
Unconstrained Auction Inputs



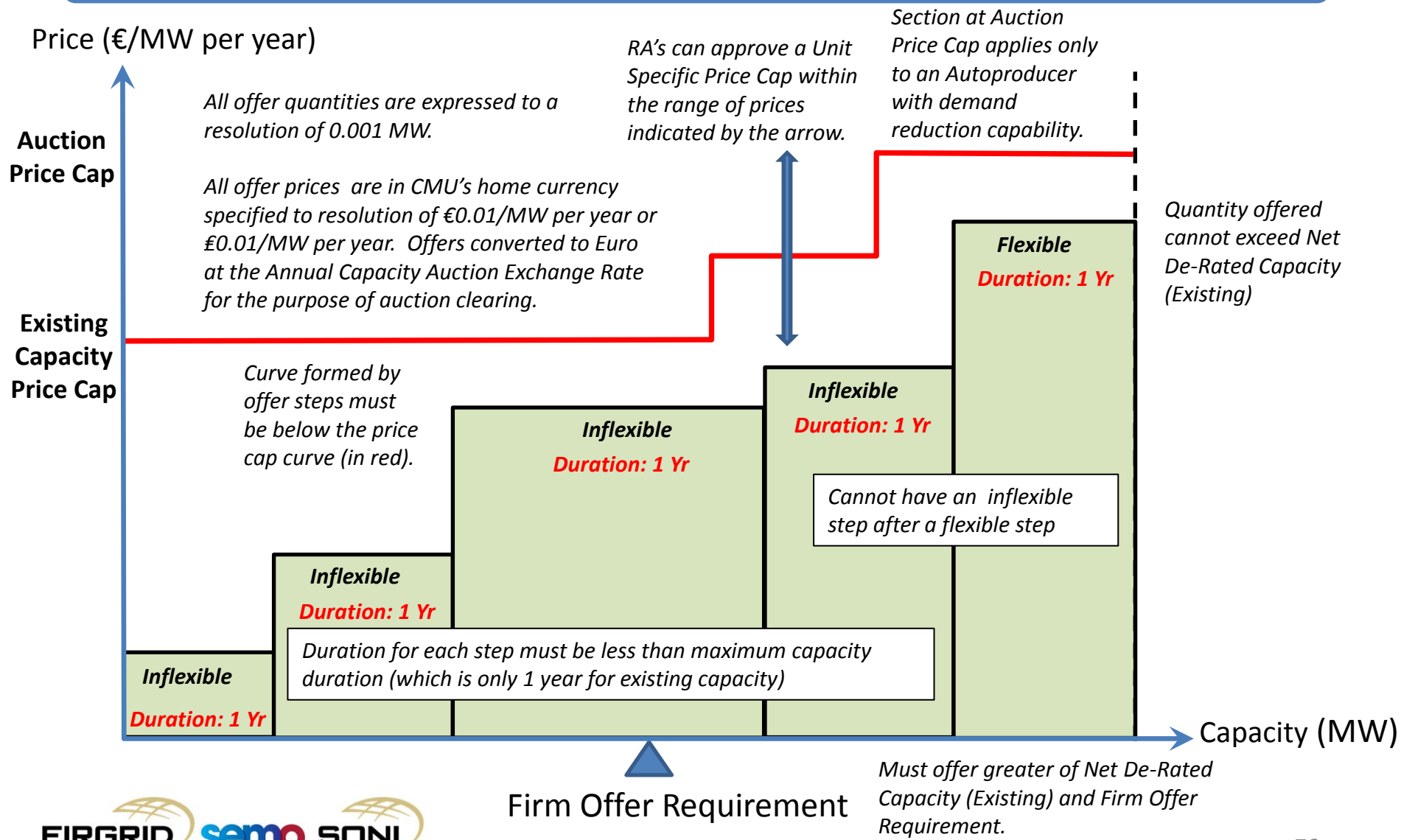
The Demand Curve

- The Demand Curve is built around a point being the Capacity Requirement adjusted for:
  - Existing Awarded Capacity for the capacity year:
    - There will be none for the first auction.
  - An allowance for any demand forecast uncertainty:
    - More an issue for auctions prior to a T-1 auction. E.g. as a T-4 auction is held approximately 4 years before delivery there is a risk that demand forecasts could change by the delivery year.
  - An allowance for capacity to be procured at a later auction:
    - This is particularly important for providers such as demand side unit operators who may have relatively short term contracts (e.g. 1 year) with end use customers.
    - There are risk that if capacity is over-procured in a T-4 auction there may be no need for a T-1 auction.
  - An allowance for (the de-rated value of) capacity that will be operating during the delivery year but which is not participating in the Capacity Market:
    - This will include variable units that choose not to participate or demand side units which choose to qualify for a lesser de-rated capacity than they are eligible for.
    - Estimates of embedded generation are accounted for in determining the Capacity Requirement.

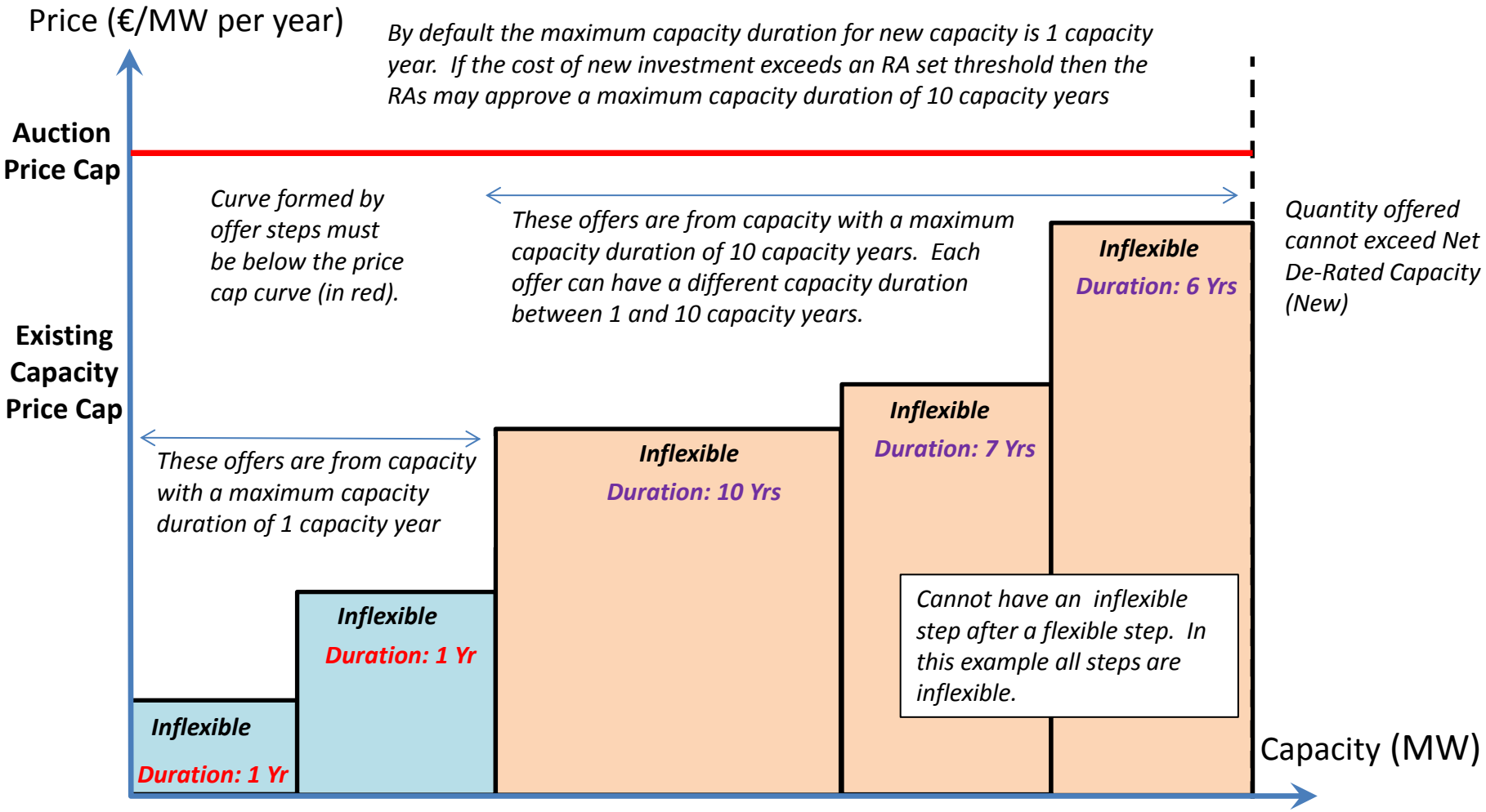
Indicative Demand Curve for First T-1 Auction



Capacity Auction Offers - Existing Capacity (excluding DSU)

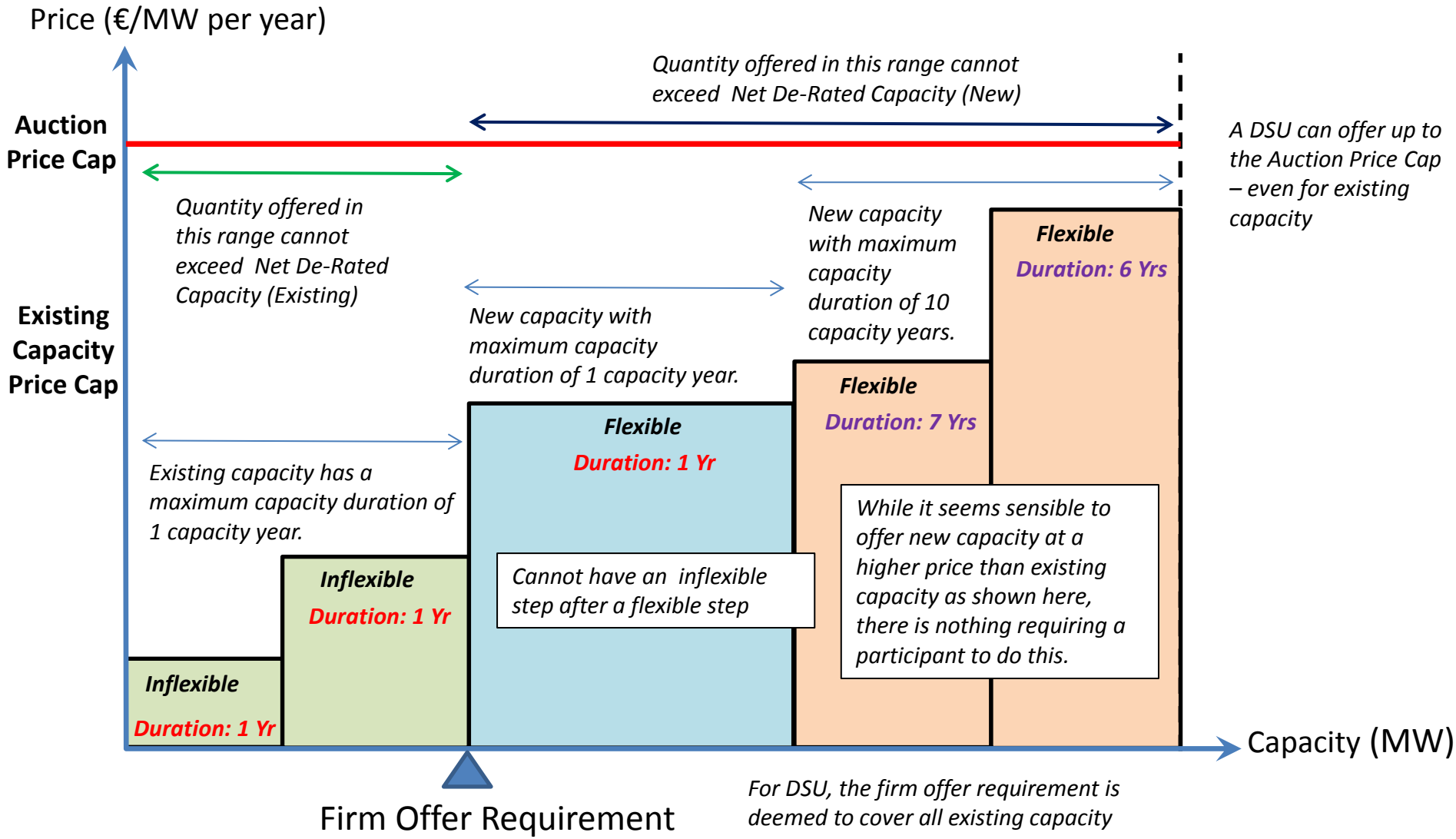


Capacity Auction Offers - New Capacity (excluding DSU)

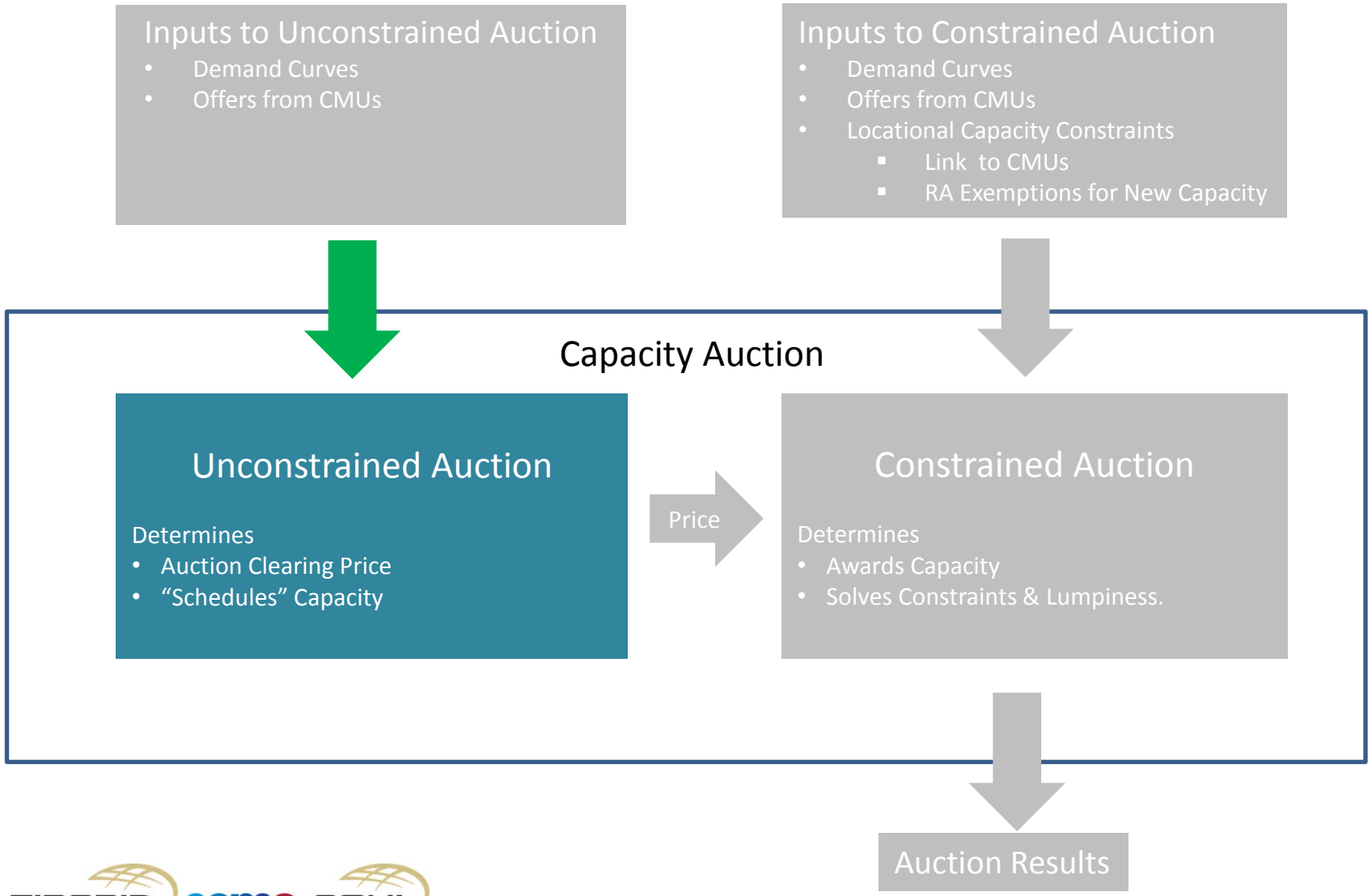


The test against firm offer requirement is not applied to New Capacity as it is not required to be offered into the Auction.

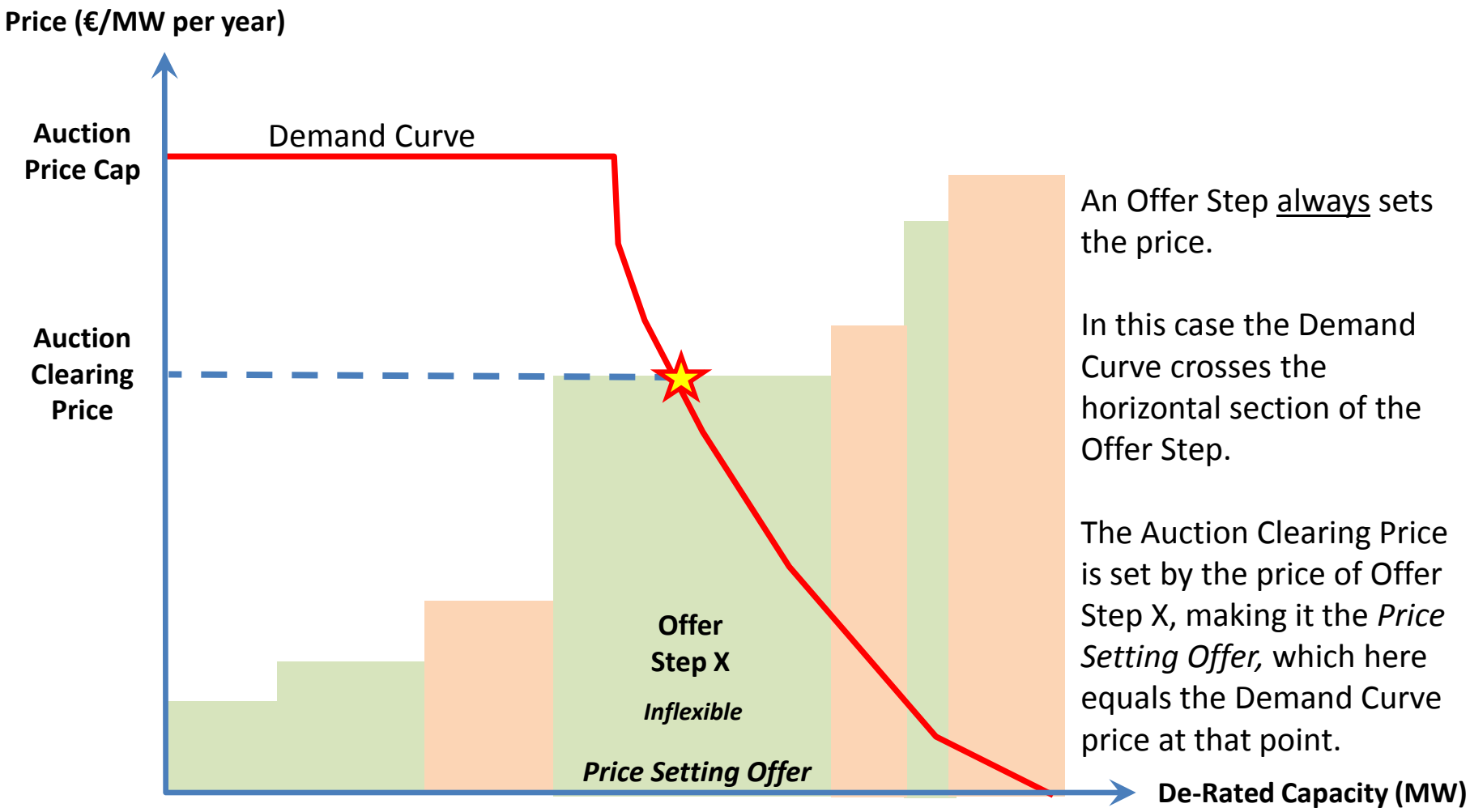
Capacity Auction Offers - DSU Units (New and Existing)



Unconstrained Auction



Unconstrained Auction Clearing



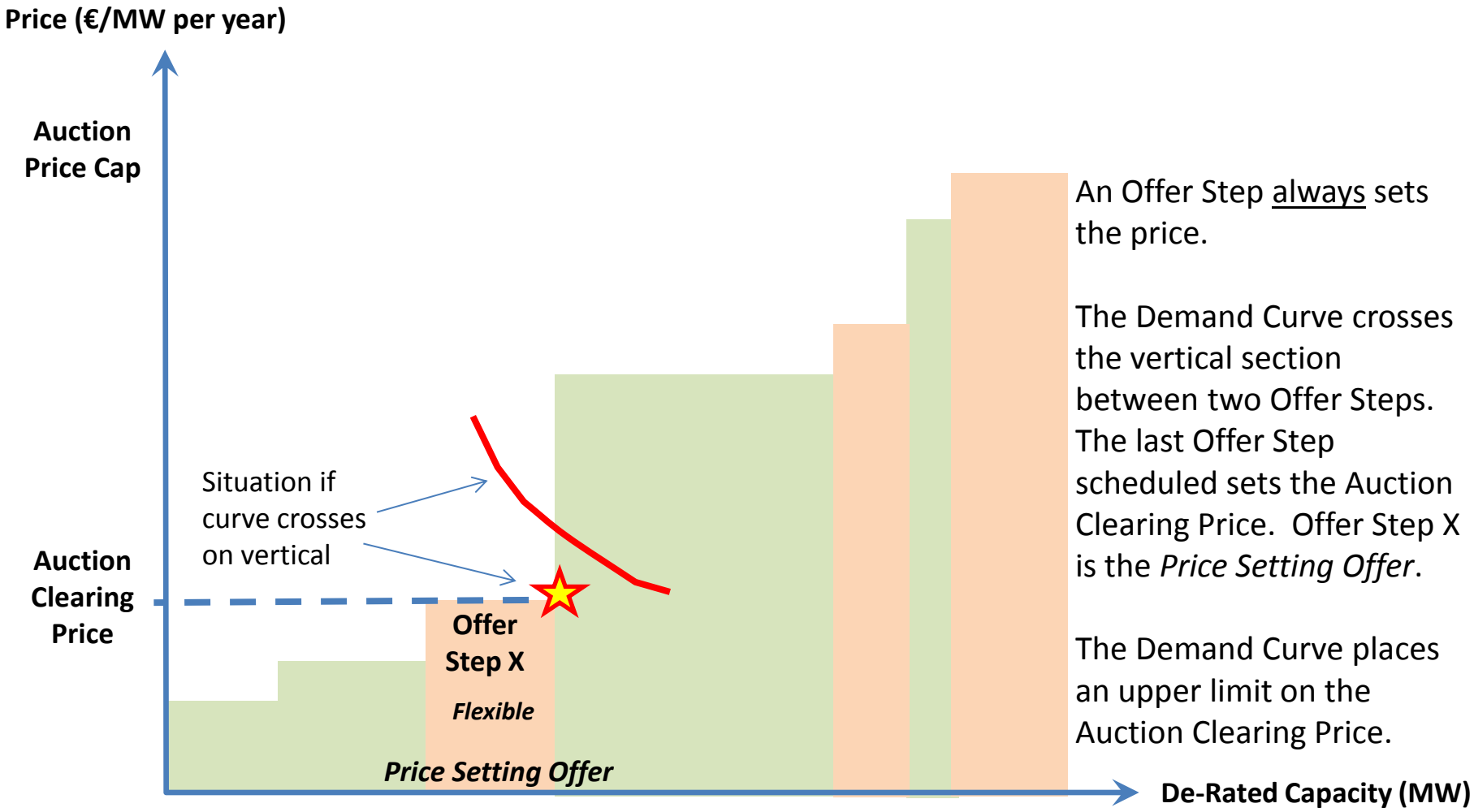
An Offer Step <u>always</u> sets the price.

In this case the Demand Curve crosses the horizontal section of the Offer Step.

The Auction Clearing Price is set by the price of Offer Step X, making it the *Price Setting Offer,* which here equals the Demand Curve price at that point.

All Offer Steps are treated as being Flexible.

Unconstrained Auction Clearing



An Offer Step always sets the price.

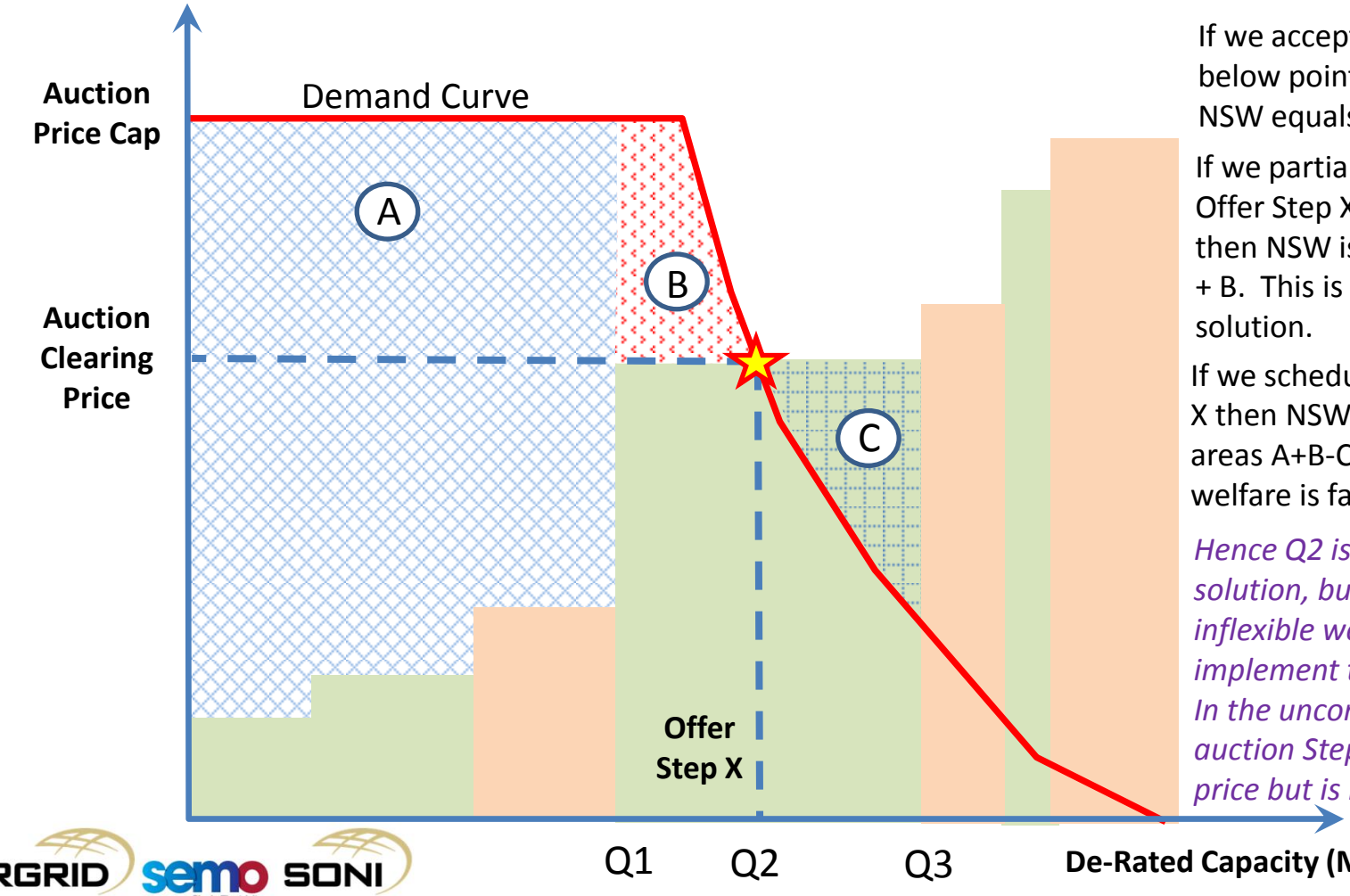
The Demand Curve crosses the vertical section between two Offer Steps. The last Offer Step scheduled sets the Auction Clearing Price. Offer Step X is the *Price Setting Offer*.

The Demand Curve places an upper limit on the Auction Clearing Price.

All Offer Steps are treated as being Flexible.

Net Social Welfare

Net Social Welfare (NSW) is the area under the demand curve for a given total cleared quantity, less the cost of those offers cleared.



If we accepted all offers below point Q1 then NSW equals the area A.

If we partially schedule Offer Step X to point Q2 then NSW is the area of A + B. This is a better solution.

If we schedule all of Offer X then NSW equals the areas A+B-C. Net social welfare is falling.

Hence Q2 is the optimal solution, but if Step X is inflexible we cannot implement that solution. In the unconstrained auction Step X can set the price but is not cleared.

Interim vs Enduring Design

- The Enduring Design:
  - The standard auction design of Chapter F of the CMC is the Enduring Design.
  - Under the Enduring Design the Unconstrained Auction does nothing more than set the Auction Clearing Price.
  - All the Awarded Capacity will be determined in the Constrained Auction.

- The Interim Design:
  - The interim auction design is enabled under Chapter M.
  - The first auctions will be run under this Interim Design (until the RAs require a switch to the Enduring Design).
  - Under the Interim Design:
    - The Unconstrained Auction sets the Auction Clearing Price.
    - The offers scheduled must be Awarded Capacity in the Constrained Auction, except for an inflexible Price Setting Offer if it is only partially scheduled.
    - Tie-breaking rules are used to schedule offers tied at the Auction Clearing Price.

Unconstrained Auction (Interim) - Tie Breaking

- A tie exists if two or more price quantity pairs have the same price. For the interim unconstrained auction this can influence what is ultimately cleared so is important to resolve.

- In the unconstrained auction the tie breaking order is:
  - Schedule "Clean" Capacity Market Units first:
    - This is based on a Qualification determination of a use of clean technology.
  - If this does not resolve the tie then offer steps are schedule based on the highest value of Incremental Net Social Welfare:
    - See next four slides.
  - If this does not resolve the tie then offer steps with short capacity durations are scheduled first.
  - If this does not resolve the tie then offer steps are taken in random order.

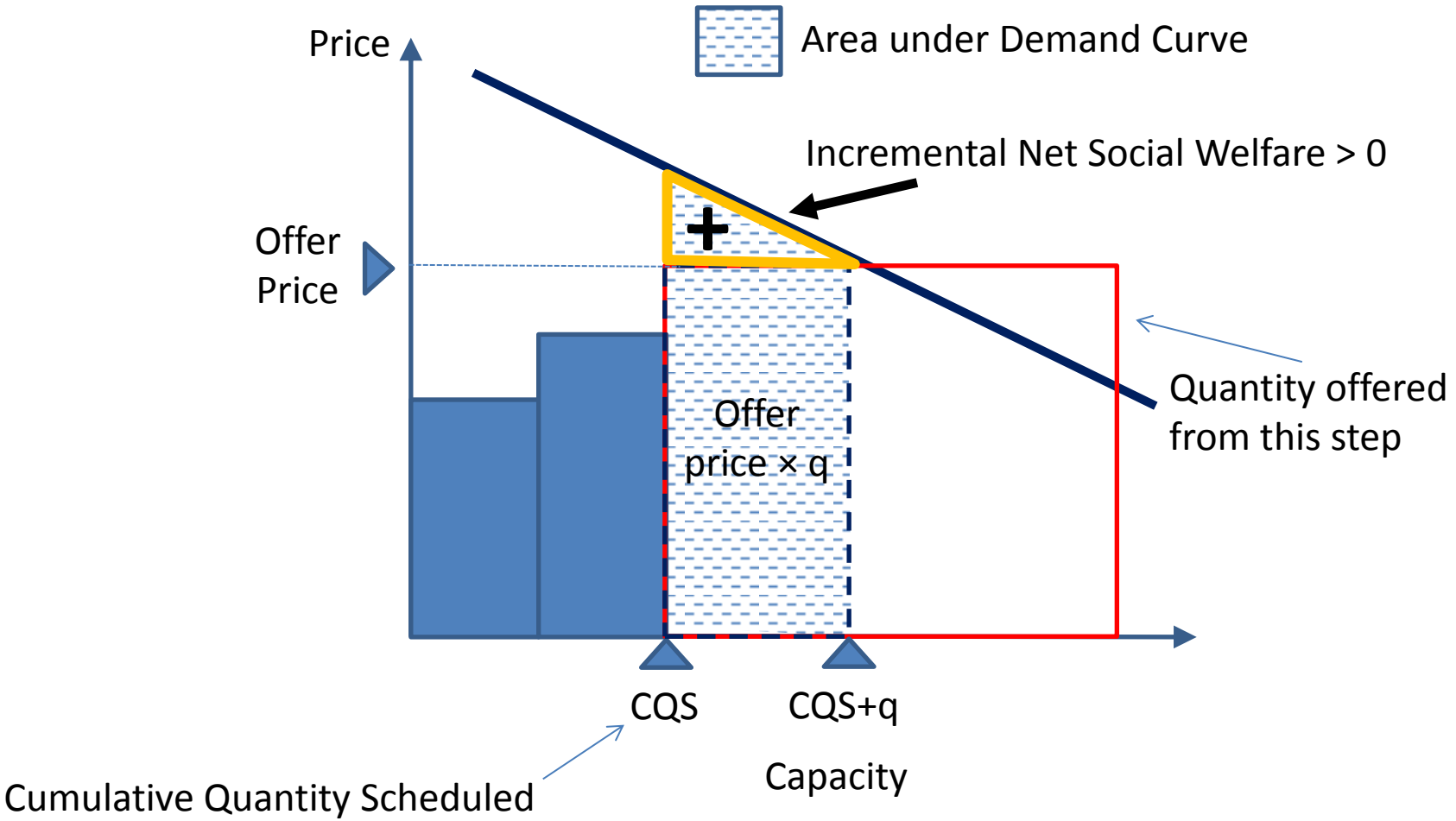
- Tie-breaking only actually impacts the solution if the tied price is the price that the unconstrained auction clears at. This is because all lower priced tied price-quantity pairs will be fully scheduled anyway.

Tie Breaking – Incremental Net Social Welfare

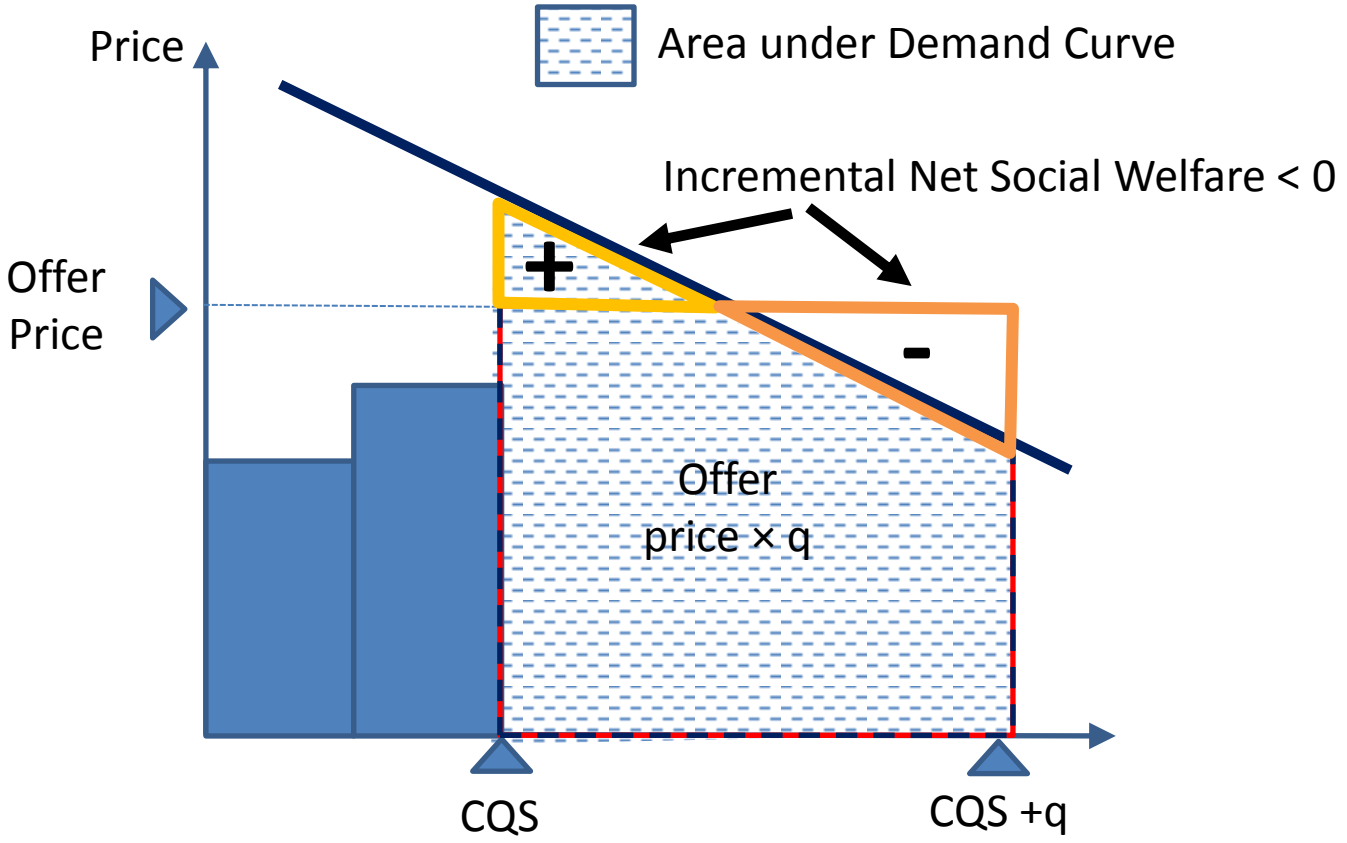
- The "Incremental Net Social Welfare" provision is a rule that:
  - Accounts for the trade-off between cost & benefit for each price-quantity pair.
  - Provides a means of ordering Inflexible and Flexible price-quantity pairs in the Unconstrained Auction where otherwise we are ignoring Inflexibility.

- If we have 5 tied price-quantity pairs, all of different offered quantities, and some Flexible and some Inflexible:
  - Given what has already been scheduled we evaluate the Incremental Net Social Welfare of each offer in isolation:
    - For a flexible offer we can vary the quantity scheduled to maximise Incremental Net Social Welfare. See next slide.
    - For an Inflexible offer its Incremental Net Social Welfare is that associated with fully scheduling it. See subsequent slides.
  - Assuming the tie is broken we would then schedule that one which has the highest Incremental Net Social Welfare.
  - We then repeat this process with the remaining 4 tied price-quantity pairs, having added the 5th to what has already been scheduled.

Incremental Net Social Welfare – (1/3)

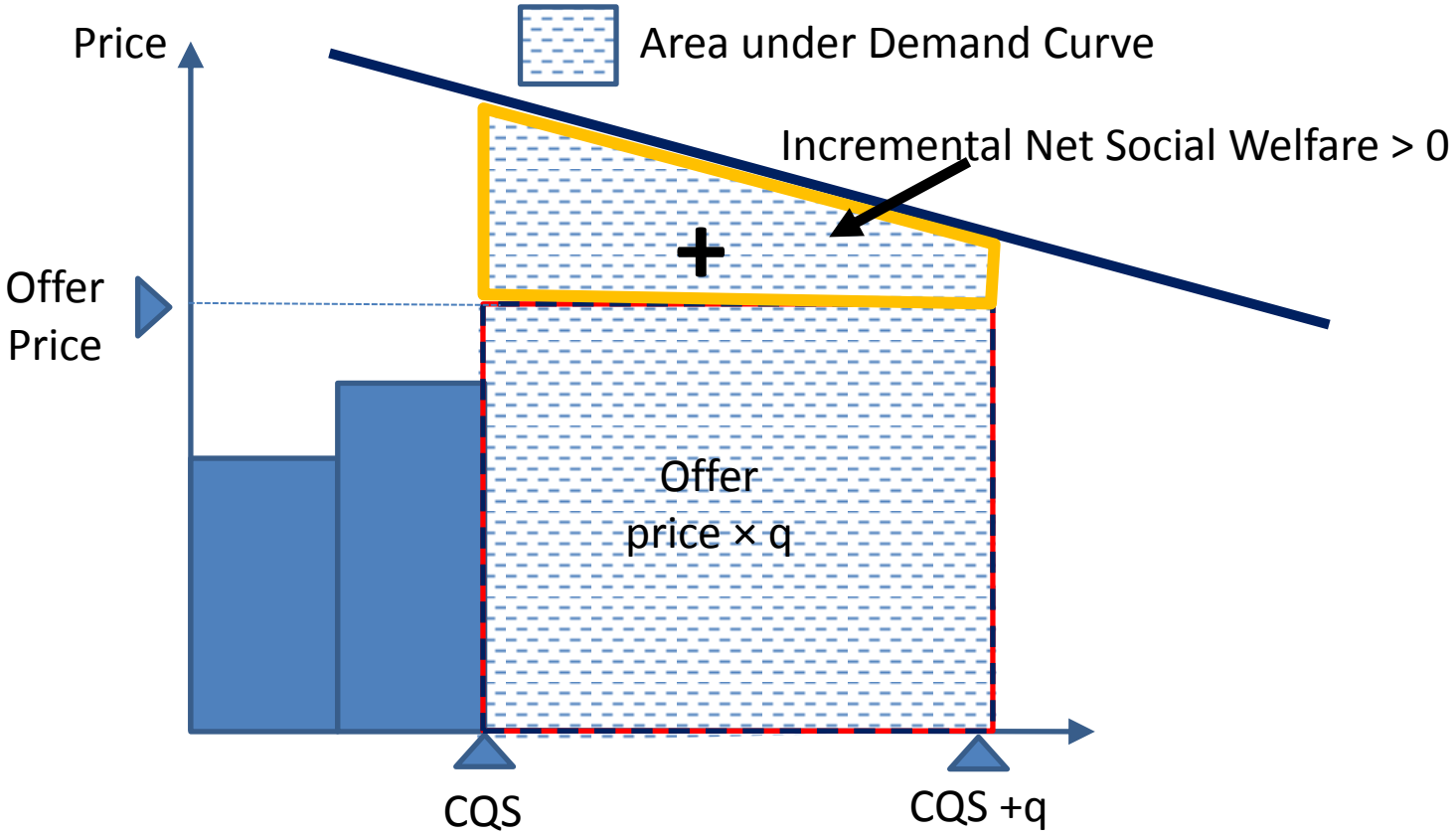


Incremental Net Social Welfare – (2/3)



An Inflexible Offer Price Quantity Pair

Incremental Net Social Welfare – (3/3)

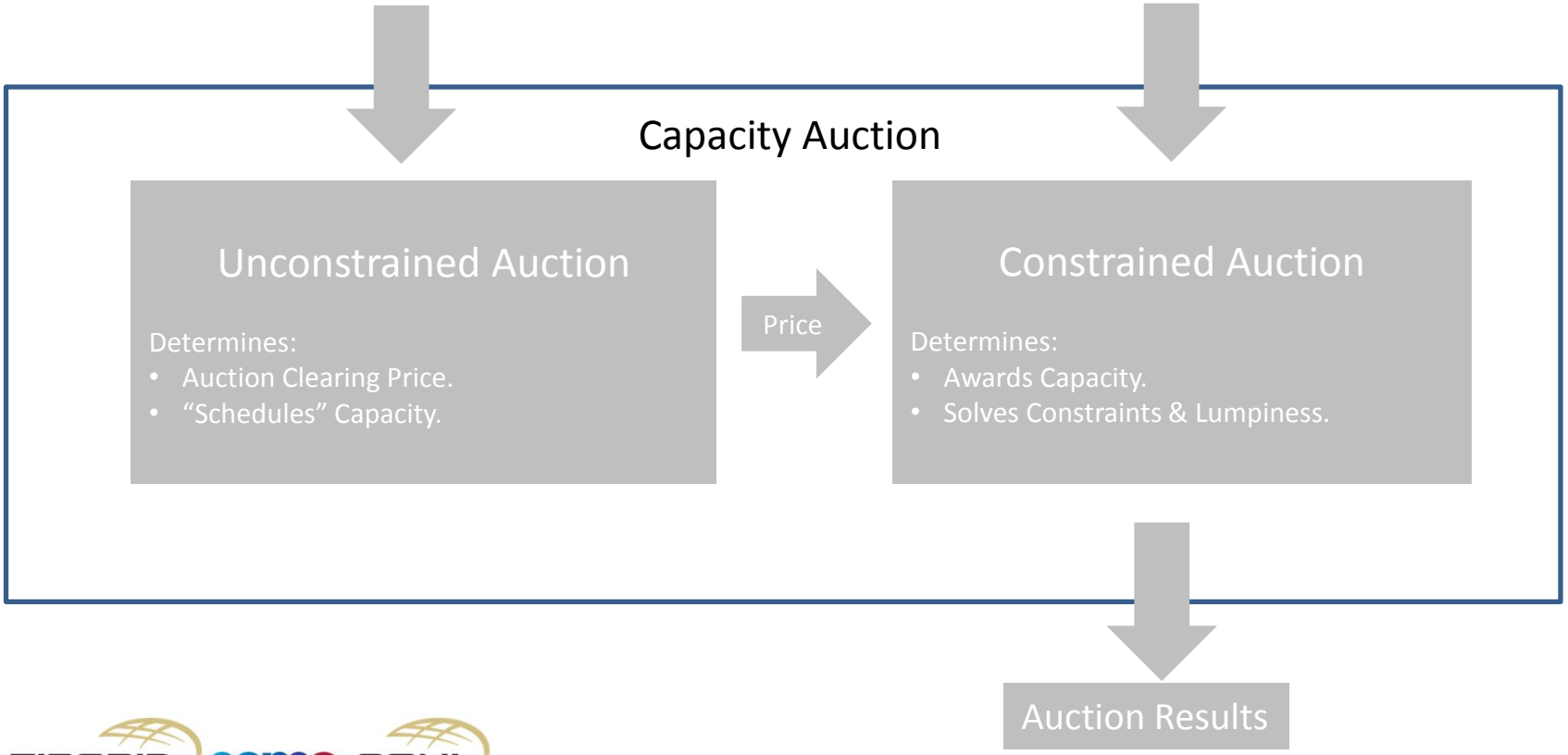


An Inflexible Offer Price Quantity Pair

Constrained Auction Inputs

Inputs to Unconstrained Auction:
- Demand Curves.
- Offers from CMUs.

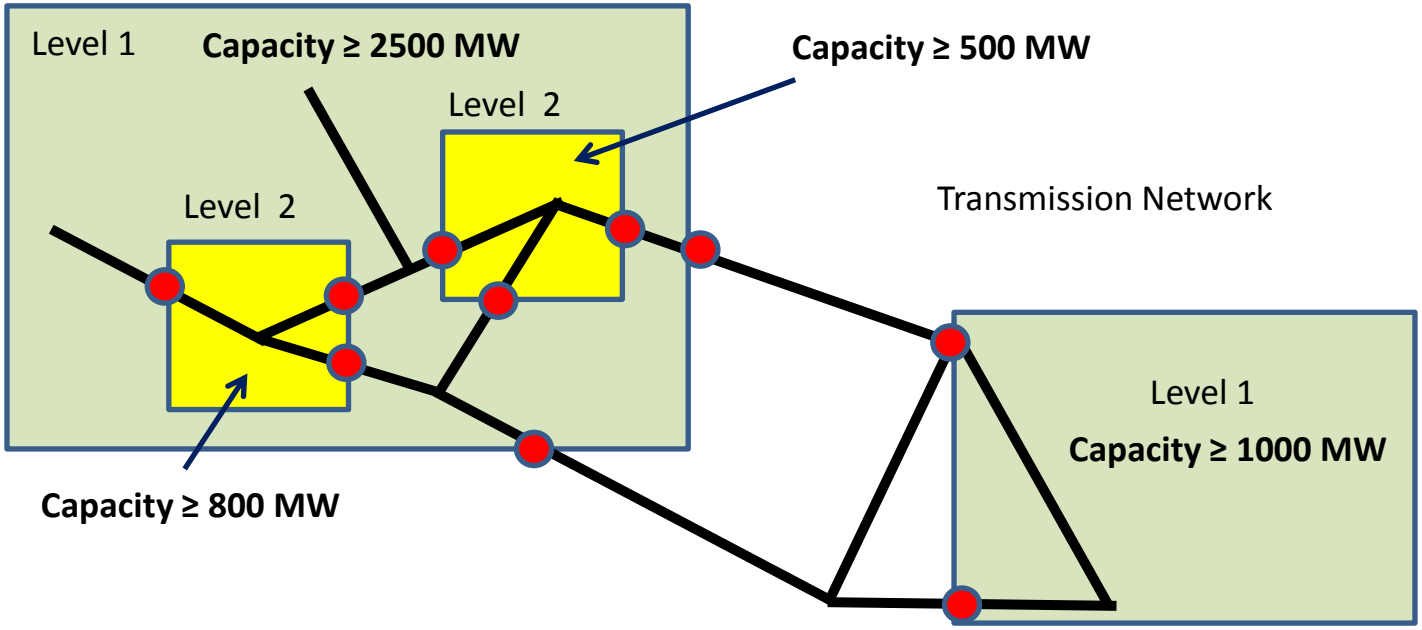
Inputs to Constrained Auction:
- Demand Curves.
- Offers from CMUs.
- Locational Capacity Constraints:
  - Link to CMUs.
  - RA Exemptions for New Capacity.



Locational Capacity Constraints

- In the auction, Locational Capacity Constraints ensure a reasonable distribution of capacity across the island of Ireland for the purpose of maintaining system security:
  - These require a minimum amount of capacity to clear in defined geographic regions.
  - They help in maintaining power system security given network constraints.
  - One constraint (a Level 2 constraint) can be within another (a Level 1 constraint).

- The SOs determine the constraints to apply based on a methodology approved by the RAs.



Locational Capacity Constraints – First Auction

Level	Constraint	Within Constraint	Geographic Area
1	L1-1	N/A	Northern Ireland
1	L1-2	N/A	Republic of Ireland
2	L2-1	L1-2	Greater Dublin

- This information is from the Initial Auction Information Pack and relate to the first Auction:
  - There can be no overlap between Level 1 constraints or Level 2 constraints.
  - A Level 2 constraint must be wholly within a Level 1 constraint.
  - A CMU that contributes to a Level 2 constraint also contributes to the associated Level 1 constraint:
  - A CMU not associated with any constraint can still clear in the auction, but will not be cleared explicitly to satisfy a constraint.

- The actual lower MW limits on capacity for each constraint will only be revealed in the Final Auction Information Pack.

Locational Capacity Constraints and Exemptions

- During qualification each CMU wholly within a constraint area will be associated with constraints it can satisfy.

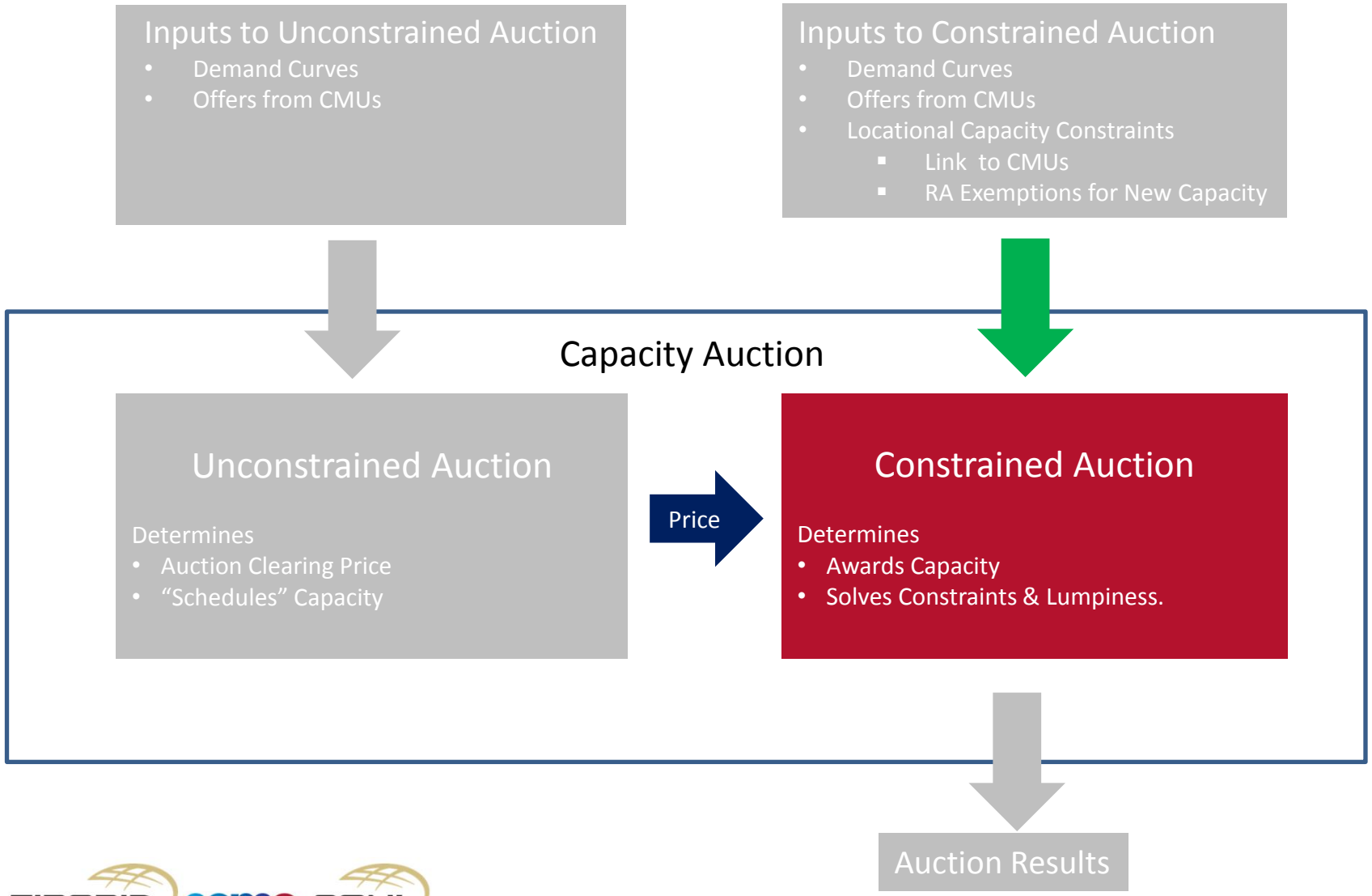
- If qualification shows insufficient capacity to satisfy a constraint then the SOs can lower the constraint to the level that can be cleared.

- New transmission investment may remove the need for a Locational Capacity Constraint within a few years. But while it is in place it can create local market power. As a result the Constrained Auction ***excludes***:
  - New Capacity that is seeking an award of greater than 1 year; and
  - Has an offer price greater than the Auction Clearing Price; and
  - Has not been exempted by the RAs.

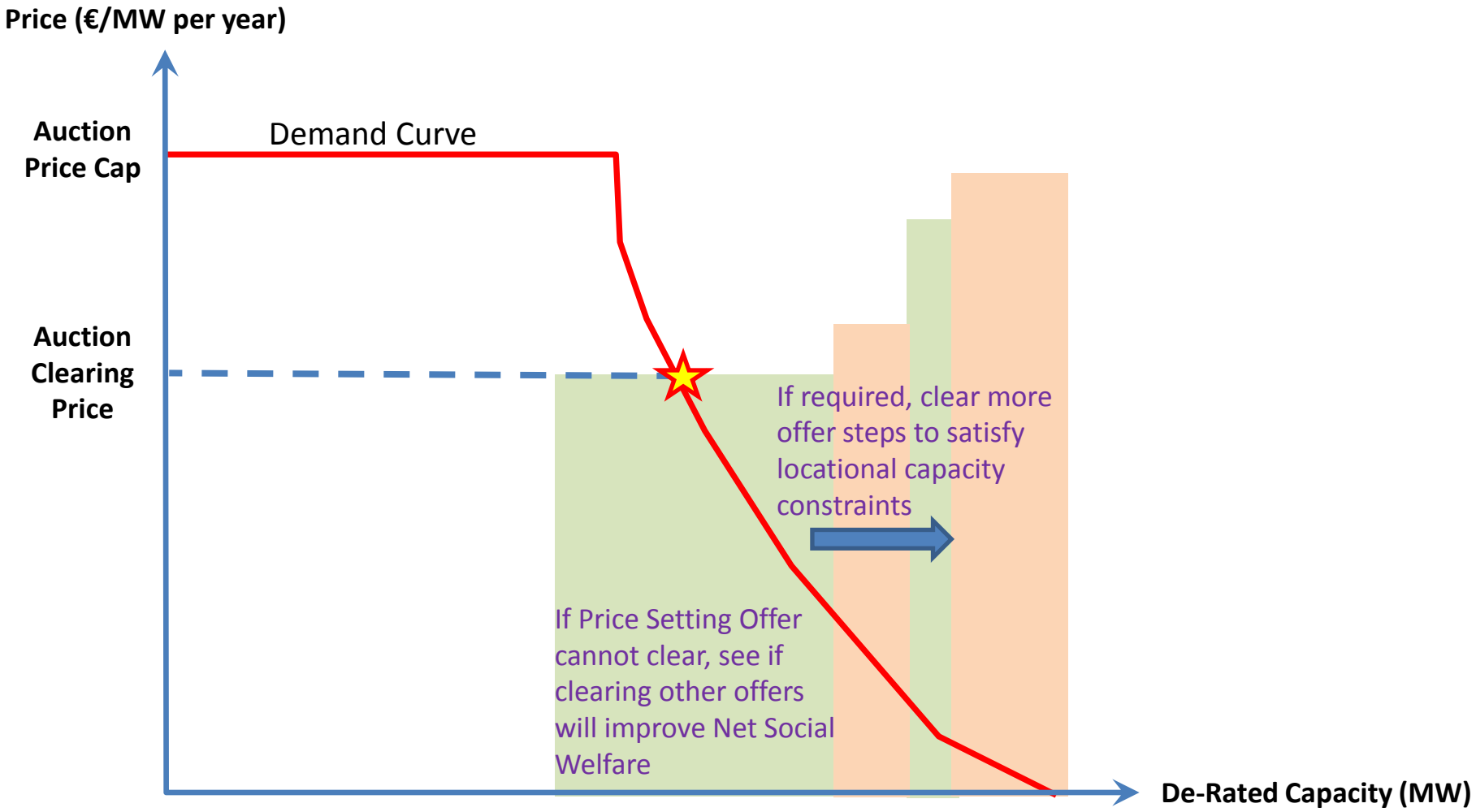
- If qualification shows a constraint can only be satisfied by clearing New Capacity, the SOs will inform the RAs who may exempt New Capacity so it can be cleared to satisfy the constraint, but only after running out of other offers to cover the constraint.

- RAs have the power to set a constraint limit to zero if they consider constraint unnecessary.

Constrained Auction



The Basic Concepts



The Constrained Auction Problem

- Exclude New Capacity with a duration > 1 year if offer price exceeds Auction Clearing Price and not exempted by RAs.

- Maximise Net Social Welfare subject to:
  - Flexible offers clear between 0 and maximum quantity.
  - Inflexible offers clear to 0 or maximum quantity.
  - Within a Capacity Market Unit, offers cleared in order of increasing price.
  - Quantity cleared from Capacity Market Units contributing to a Locational Capacity Constraint must cover the MW capacity required (or all be cleared).
  - Any New Capacity with a duration > 1 year and exempted can only be cleared to satisfy a Locational Capacity Constraint once all other capacity contributing to that constraint has cleared.
  - Automatically clear some offers based on:
    - Unconstrained scheduled offers except for partially scheduled inflexible Price Setting Offer (for interim design).
    - Offer Price Setting Ratio if greater than 0% (for enduring auction design)
  - Tie breaking rules are satisfied.

Offer Price Clearance Ratio (Enduring Auction Only)

- The enduring process by default does not clear any offers based on unconstrained auction results.

- The Offer Price Clearance Ratio is a feature of the Capacity Market Code that would allow some limits to be imposed at a later stage if required.

- This ratio can be set by the RAs to a value not exceeding 100%. If set to, say, 90% then all offer steps with a price strictly less than 90% of the Auction Clearing Price would be cleared in the constrained auction:
  - This reduces the risk of not clearing a large but low cost offer step in preference for a small but higher cost offer step.

- By default the ratio will be 0%. This will have no impact as it would only clear Capacity Market Units with a negative offer price, which is not allowed.

Interim vs Enduring Design

- The Enduring Design:
  - This design is based on using mathematical optimisation methods to solve the auction.
  - It simultaneously clears offers to satisfy all the relevant constraints.
  - Solutions can be non-intuitive. The optimisation approach can mean that a small capacity, high cost offer could be accepted ahead of a large capacity, lower cost inflexible offer if this produces a greater net social welfare (benefit less cost) for the market.

- The Interim Design:
  - This uses a rule based approach, i.e. no optimisation, to clear the auction.
  - Clears additional "out of merit" offers only to serve locational capacity constraints and to address "lumpiness".

- Both Design:
  - May incur costs beyond the benefit implied by the Demand Curve so as to satisfy locational constraints and inflexibility constraints.
  - This may mean a lower Net Social Welfare than the ideal unconstrained solution.

Constrained Auction – Why this Problem is Hard!

- The constrained auction is "combinatorial" because of the need to consider Inflexible offers.

- I.e. if we have 3 inflexible offers A, B, C then potential solutions are to schedule: A, B, C, A and B, A and C, B and C, all three, or none of them (8 options):
  - For each combination we would then schedule the Flexible offers.
  - Only some of these will be feasible and fewer will be optimal.

- Why is this a hard problem?:
  - With 3 inflexible offers there are 8 possible combinations for clearing them. That could be solved by simply trying all combinations.
  - With 100 units (even with just 1 offer step each) there will be $2^{100} \approx 10^{30}$ possible combinations. Testing 1 billion solutions per second would take 3000 times the age of the Universe!

- Off-the-shelf commercial "Mixed Integer Programming" (MIP) solvers can solve these sorts of problems, though for even moderate problems may only find a close to optimal solution within the time available.

Constrained Auction – Tie Breaking

- Tie-breaking is only applied to the (otherwise) final solution of the constrained auction.

- If a set of flexible offers are tied and if they have the same price and some are scheduled and some are not then the logic is as follows:
  - Reallocate quantities to cover Level 2 constraints, and given those.
  - Reallocate quantities to cover Level 1 constraints, and given those.
  - Reallocate quantities not associated with any constraint.

- Inflexible offers are tied if they have the same price AND the same quantity. If one (or more) is scheduled and one (or more) is not and reallocated which ones are fully scheduled without changing any of the quantities scheduled to satisfy each constraint.

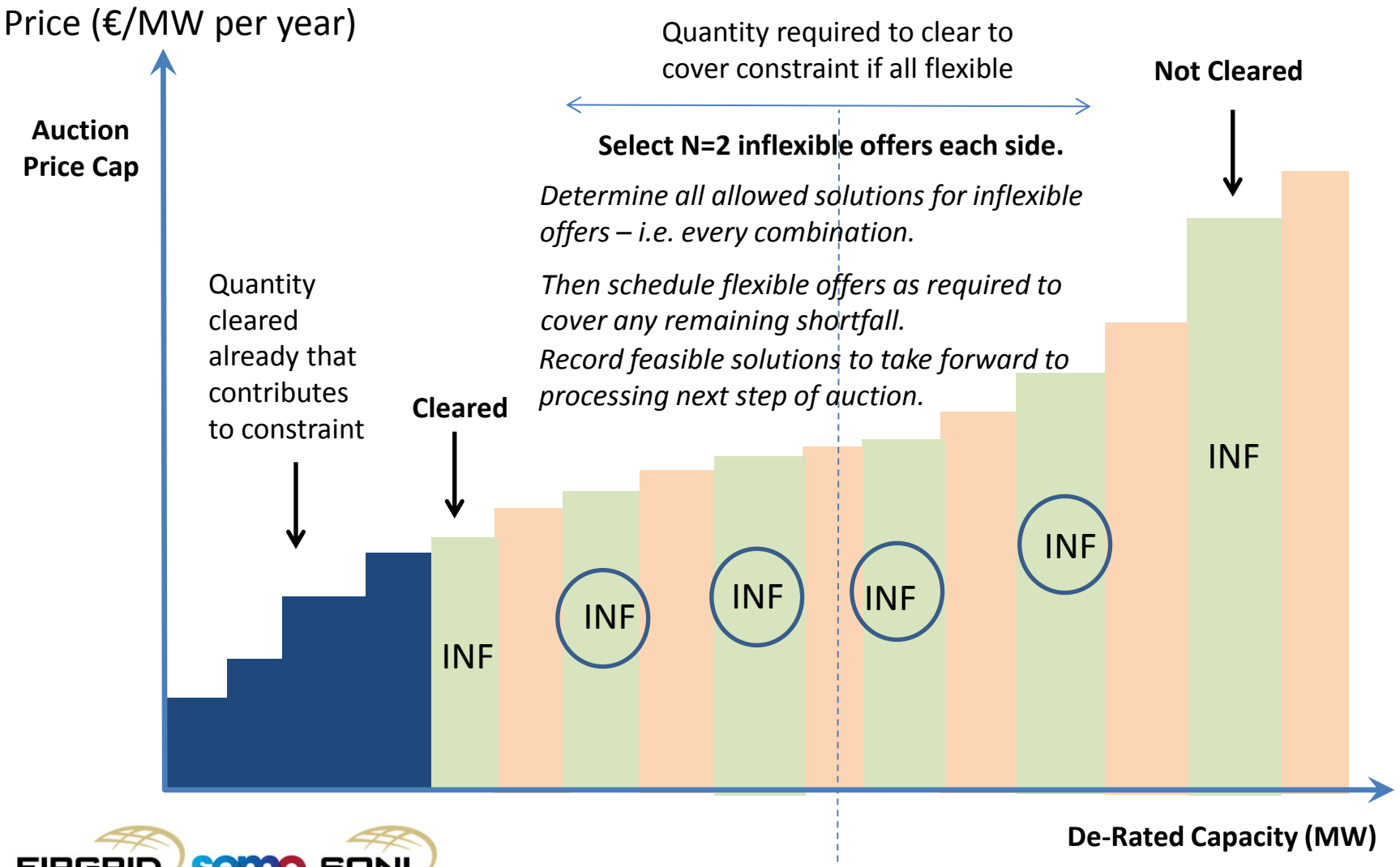
- The quantities that are subject to the tie should be scheduled in order of clean status, duration, and then randomly.

The Interim Constrained Auction Approach

- Differences allowed for the interim auction solution include:
  - Everything cleared in the unconstrained auction – except a partially cleared inflexible Price Setting Offers – is automatically cleared.
  - Then clear more to satisfy the Locational Capacity Constraints (to extent possible).
  - Then if the Price Setting Offer was a partially scheduled inflexible offer, see if a better solution can be found by scheduling more.
  - The number of combinations of Inflexible offers that must be explored can be limited, but the optimal solution should still be found for problems small enough that the limits need not be enforced to get a solution in the allowable time.

- Interim approach does not implement the offer price clearance ratio.

Illustrative Approach for Satisfying a Constraint



Simple Description of Interim Approach

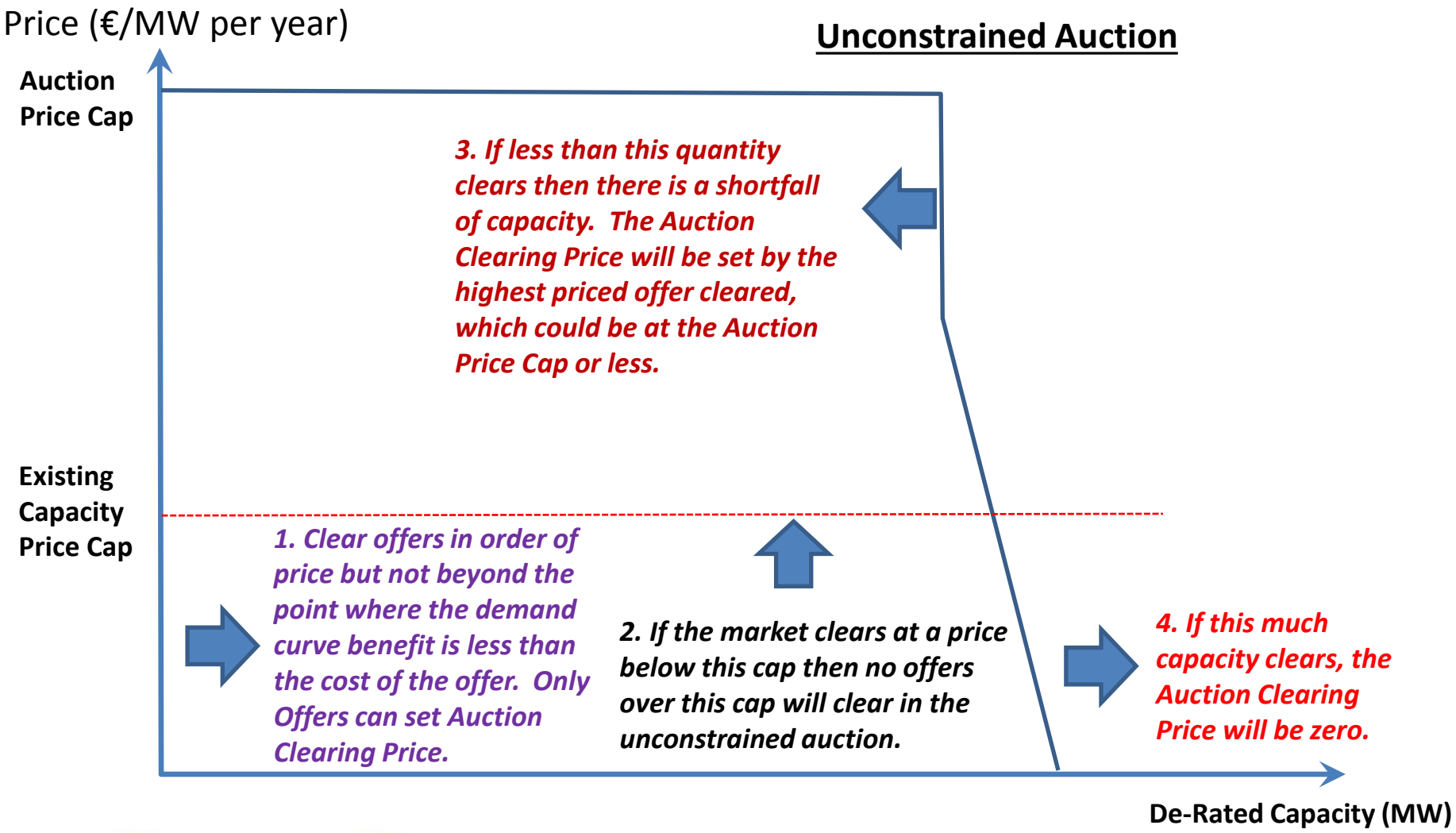
- Solve unconstrained auction.
- Treat all offers other than a partially cleared inflexible price setting offer as cleared.
- Exclude new capacity offer steps with a duration > 1 year & an offer price > Auction Clearing Price, unless CMU is exempted. If exempted, make price more expensive than other offers.
- For each Level 2 constraint
  - Identify the starting solution based on the unconstrained auction results.
  - Apply the method on prior slide to identify a range of potential solutions.
- For each Level 1 constraint
  - Identify multiple starting solutions by combining unconstrained auction results with combinations of Level 2 constraint solutions.
  - For each starting point apply the method on the prior slide to identify a range of potential solutions.
- Given all the possible solutions generated thus far:
  - Test each solution, identifying combinations of additional inflexible offers to schedule (similar to prior slide) and then schedule flexible offers to the point that maximises net social welfare.
- Identify the best solution based on net social welfare.
- Apply tie-breaking.

A Recap of the Story So Far

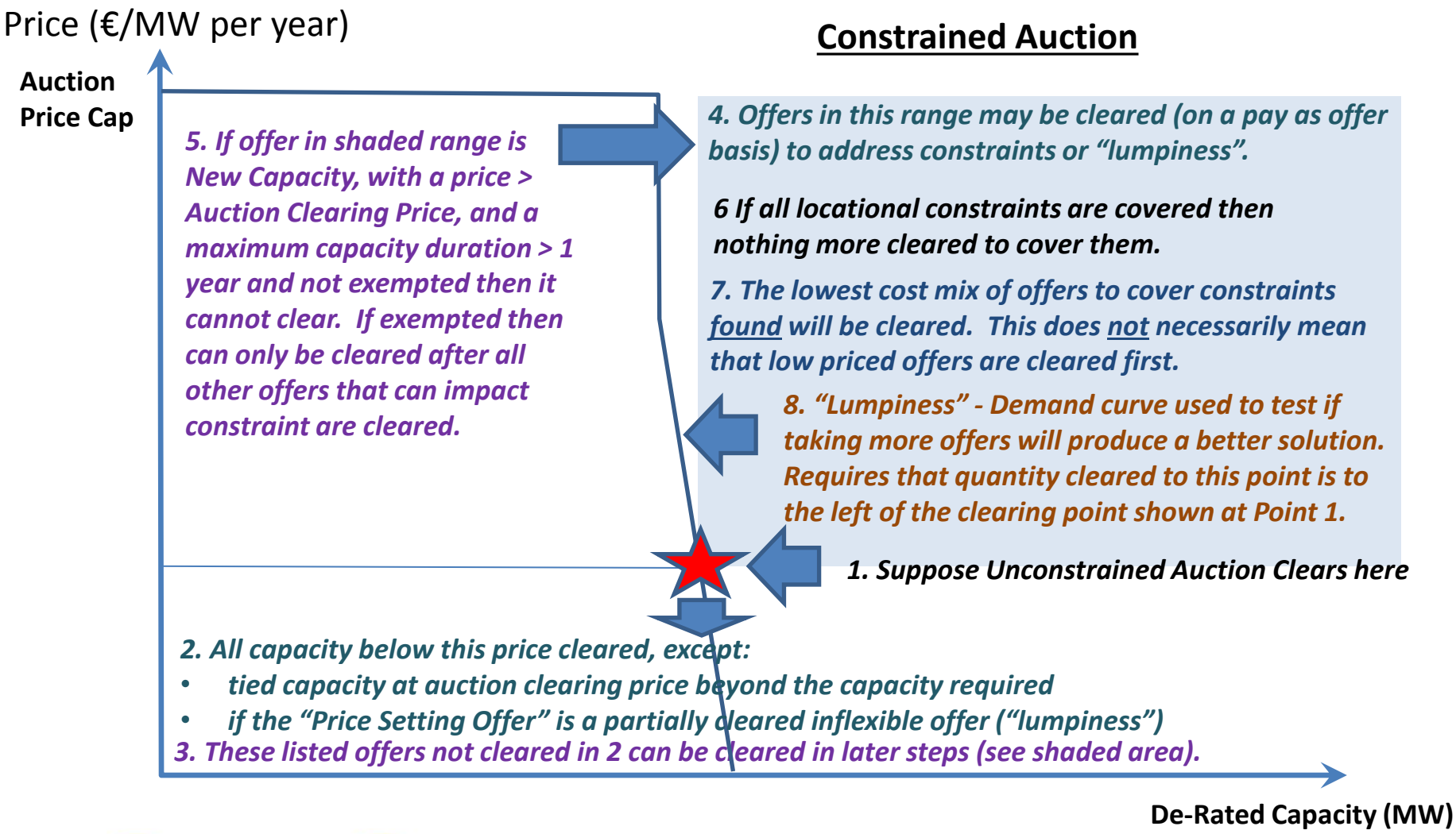
Feature	Enduring Design	Interim Design
Auction clearing price	Based on an unconstrained auction that treats all offers as flexible and ignores locational capacity constraints.	
Unconstrained auction solution	Accept offers that maximise net social welfare NSW = Value of accepted offers (based on demand curve) less their cost.	
What cleared based on unconstrained auction?	By default, nothing.*	All scheduled offers, except partially scheduled inflexible Price Setting Offer.
Constrained auction solution	Optimisation accepts offers that maximise net social welfare while respecting inflexibility and locational capacity constraints.	A simpler, more approximate, algorithm clears additional offers to satisfy constraints and respect flexibility. Accepts solution with greatest net social welfare.
What cleared based on constrained auction?	All of quantities cleared.	Additional quantities to satisfy constraints and lumpiness.
Awarded quantities and prices	All cleared offer steps get awarded capacity. Price for capacity is the greater of its offer price and the auction clearing price.	

* The CMC does include a process that can be used to automatically clear some unconstrained auction offers based on price but it is not active by default.

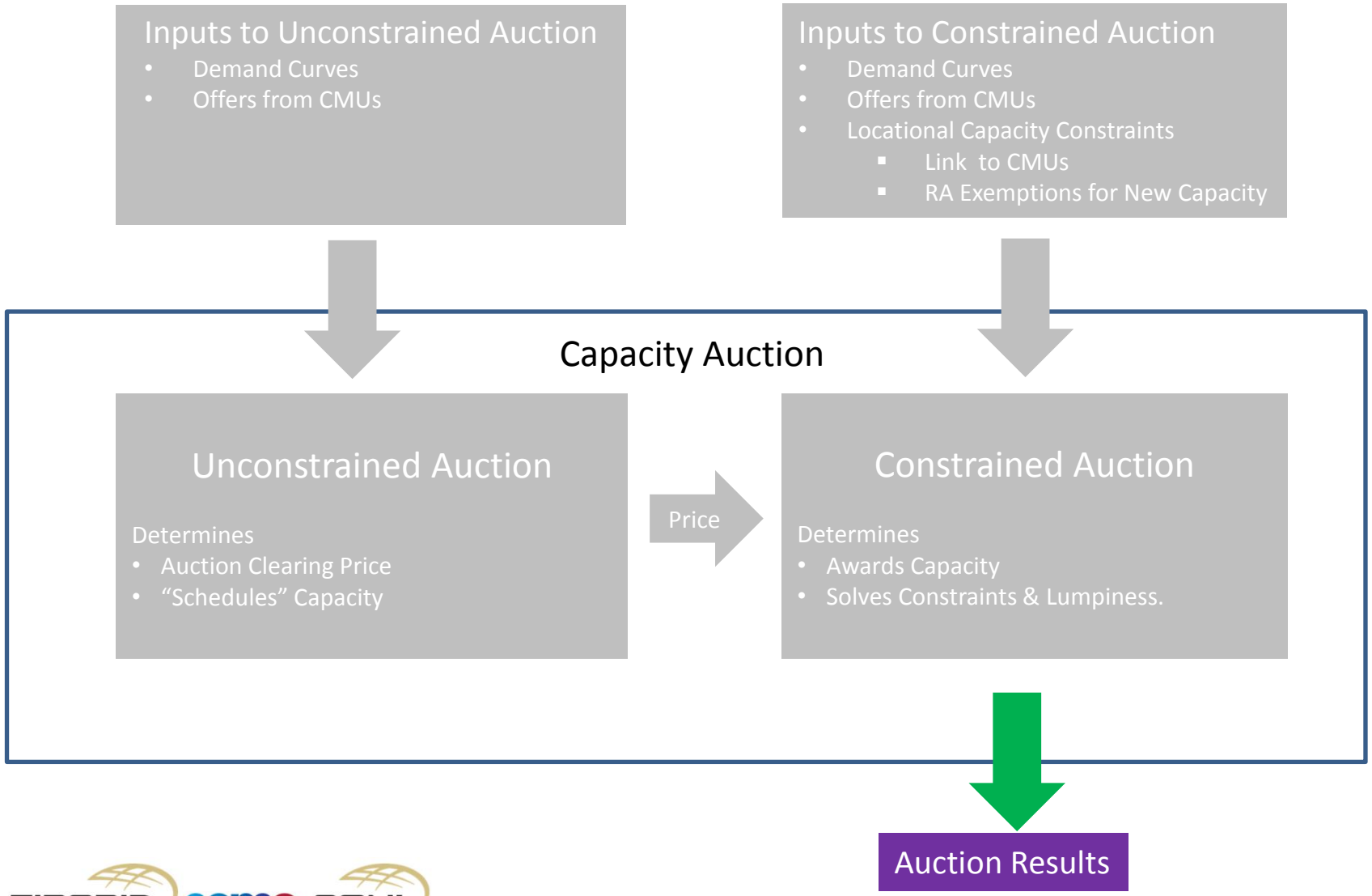
The First Capacity Auction – Key Points



The First Capacity Auction – Key Points



Constrained Auction



Post Auction Processes – (1/2)

- Provisional Capacity Auction results:
  - The SOs release provisional auction results to each Participant in the auction.
  - The information includes:
    - detail for each of that participant's CMUs of the Awarded Capacity, prices, and updated implementation plans reflecting results for new capacity.
    - detail of any locational capacity constraint that was not satisfied.
- Approval of auction results:
  - Regulatory Authorities may approve or reject provisional results.
  - If the RAs suspect irregularities that impacts the results they may annul the auction up to the time that approval of provisional results is required. The reasons for this must be published.
  - If an auction is annulled the RAs can instruct the SOs to run the auction again.
- Final auction results (once approved by RAs):
  - The SOs release final auction results to each Participant in the auction.
  - Trades entered into the Capacity & Trade Register – each cleared offer step is a trade:
    - These are marked as "active" for existing capacity.
    - These are marked as "pending" for new capacity.

Post Auction Processes – (2/2)

- Final Capacity Auction Results for a participant are final and binding.

- The CMC clause F.9.4.6 specifies that the very act of submitting an offer in regard to New Capacity means that the participant "acknowledges and agrees" a range of conditions which taken together give the right for the SOs to impose a termination fee if that New Capacity is not delivered in accordance to the requirements of the CMC.

- No later than the Performance Security Date, each participant awarded new capacity must:
  - Notify the SOs that its agrees to the Implementation Plan for the awarded new capacity.
    - Failure to notify the SOs within 10 working days of release of the final auction results will result in deemed acceptance of the implementation plan.
  - Provide the required performance security in respect of that new capacity:
    - Failure to provide this may result in termination of the awarded capacity.
  - *Once both the above two steps are satisfied then the Capacity and Trade Register will be updated to make the awarded capacity "active". If capacity is terminated then a Termination Charge can be imposed on the participant.*

The Capacity and Trade Register

- All Awarded Capacity, whether a trade from a Capacity Auction or a Secondary Trade is recorded in the Capacity and Trade Register. This is the source of data for settlement.

- The Capacity and Trade Register tracks whether or not capacity is commissioned in respect of Awarded Capacity. If it is not commissioned then it cannot be settled or Secondary Traded.

- Commissioned capacity is a property of a unit, not a trade. So when New Capacity is commissioned under the Grid Code to become Existing Capacity the SOs determine the Proportion of Delivered Capacity in respect of traded awarded capacity:
  - These proportions are important in situations where New Capacity is terminated, as discussed later.

Publication of Auction Results

- Once auction results are finalised the TSOs will publish the following information:
  - The Auction Clearing Price (in Euro and Sterling)
  - The average price of Awarded Capacity (in Euro and Sterling)
  - The Final Qualification Decision for each qualified CMU.
  - A list of CMUs for which opt out notifications were accepted.
  - The number of CMUs for which capacity offers were submitted.
  - The number of CMUs which were Awarded Capacity.
  - The capacity auction results for each CMU:
    - This includes Awarded Capacity and the price for each trade.
    - *While the offers are not published, in practice this means any capacity offer step that is "constrained on" (above the auction clearing price) will have its offer price published.*
  - The total Awarded Capacity in the auction.
  - Details of any Locational Capacity Constraints that were not satisfied.

Net Capacity Quantity vs Obligated Capacity Quantity

- The **Net Capacity Quantity** held by the CMU is:
  - the net Awarded Capacity held by a CMU on Existing Capacity;
  - plus, any Awarded Capacity sold in Secondary Trade (a positive valued quantity);
  - plus, any Awarded Capacity purchased in Secondary Trade (a negative valued quantity).

- The **Obligated Capacity Quantity** held by the CMU is the quantity which must be delivered against for the purpose of TSC settlement. Difference charges are based on this. The Obligated Capacity Quantity is determined under section F.18.2 of the TSC and can primarily differ from the Net Capacity Quantity because of:
  - scaling down of the Net Capacity Quantity at times of lower system demand:
    - This is done by half-hour so the Obligated Capacity Quantity changes constantly.
    - This scaling frees up awarded capacity to provide secondary trade coverage for planned outages at times of low demand.
  - the application of loss factors.

- When New Capacity is commissioned it becomes existing capacity which therefore causes the Net Capacity Quantity and Obligated Capacity Quantity of the CMU to change.

Capacity Auction Timelines

#	Event	Nature	Date
8	Qualification Results Publication Date	SOs publish qualification summary results.	1st Dec 2017
9	Locational Capacity Constraints Finalised	Locational Capacity Constraint quantities adjusted if required by SOs (given qualification results).	1st Dec 2017
10	Final Auction Information Pack Date	Final Auction Information Pack published by SOs	1st Dec 2017
11	Capacity Auction Submission Commence	Submission of Capacity Auction Offers start.	11th Dec 2017
12	Capacity Auction Submission End	Submission of Capacity Auction Offers end.	15th Dec 2017
13	Capacity Auction Run Start	Running of Capacity Auction starts	15th Dec 2017
14	Capacity Auction Run End	Running of Capacity Auction ends.	18th Dec 2017
15	Capacity Auction Provisional Results Date	SOs provide provisional auction results to participants.	18th Dec 2017
16	Capacity Auction Approval Date	RAs expected to approve auction results	25th Jan 2018
17	Capacity Auction Results Date	SOs publish approved auction results.	25th Jan 2018
18	Performance Security Date	Performance security posted for new capacity.	1st Feb 2018

Topic 6: Implementation of New Capacity

Training Topic 6 – Implementation of New Capacity

- Why the attention on New Capacity?
- Implementation Plans and Progress Reporting
- Termination Triggers
- Remedial Actions
- Performance Security and Termination Charges
- Termination

Why the Attention on New Capacity?

- In procuring New Capacity the market is covering some of its expected capacity requirement with capacity that does not exist today:
  - There are risks that the project to develop the New Capacity will fail or be delayed.
  - This can require that the RAs run additional auctions closer to the delivery year (with more limited options for procurement) or, in extreme cases, could lead to a capacity shortfall and a higher risk of unserved energy.

- The CMC (particularly Chapter J) imposes requirements on New Capacity which:
  - Provide transparency to the SOs on the schedule and key milestones for delivery of New Capacity.
  - Provides the SOs a degree of visibility and input into changes to major contracts and key parties involved in the implementation of New Capacity.
  - Provides measures to give financiers of New Capacity comfort that major changes can be made – e.g. replacing the Participant – without loss of Awarded Capacity.
  - Place a strong financial incentive for New Capacity to be delivered, with the market receiving some compensation in the form of Termination Charges if a project fails.

Implementation Plans

- An Implementation Plan includes dates for the following milestones:
  - ***Substantial Financial Completion:***
    - Meaning major contracts and financing are in place, including sufficient finances to fund the total project spend; the directors of the participant (or equivalent) have approved for the work to occur to deliver the awarded capacity, and that all required licenses, permits, consents, etc. have been secured.
  - **Commencement of Construction Works***:
    - Meaning an Engineering, Procurement and Construction (EPC) contract (or equivalent) is in full force and actual construction (excluding design and site preparation work) has commenced.
  - Mechanical Completion*;
  - Completion of Network Connection;
  - First Energy to Network*;
  - Start of Performance/ Acceptance Testing*;
  - Provisional acceptance or Completion of Performance Testing*; and
  - **Substantial Completion:**
    - Meaning at least 90% of the Awarded Capacity is commissioned and the unit has meet all requirements to participate in the Balancing Market.

Bold items are major milestones with reporting obligations associated with them.

Milestones marked * do not apply for AGUs and DSUs, while modified definitions may apply for some other milestones. E.g. Completion of Network Connection means systems are in place for SOs to monitor site.

Implementation Progress Reports

- Participants provide Implementation Progress Reports to the SOs to allow progress to be monitored based on an RA set schedule. These will normally be:
  - Every 6 months,
  - Upon achievement of a major milestone, and
  - Prior to the last T-1 auction for a Capacity Year.

- The RAs have set no schedule for the provision of Implementation Progress Reports for the first T-1 auction (as the Capacity Year starts soon after the auction).

Termination Triggers

- Awarded Capacity can be terminated if:
  - Substantial Financial Completion is not achieved within 18 months of the Capacity Auction Results Date (or such later date as may result from an application to the RAs to delay this deadline).
  - If capacity is awarded for multiple Capacity Years then Awarded Capacity for the first year may be terminated if the RAs do not expect delivery for the first Capacity Year. No Termination Charges will apply for this termination.
  - Substantial Completion is not achieved by the Long Stop Date being 18 months after the start of the Capacity Year for which the Awarded Capacity is to be provided:
    - Substantial Completion requires delivery of 90% of the Awarded Capacity.
    - If less than 50% is delivered then it will all be terminated.
    - If between 50% and 90% is delivered then all Awarded Capacity apart from that delivered will be terminated.
  - There are also a range of administrative triggers for termination in Section J.6.1.3 including loss of connection agreement, suspension or termination under the TSC, various breaches of law or rule conditions under which capacity was awarded, and a range of financial triggers including insolvency or inadequate Performance Security.

Other Key Rules

- The SOs may waive the requirement for a Participant to satisfy or issue reports in respect of any of Milestones other than Major Milestones if it is not applicable to the technology of the Generator / Interconnector or is otherwise not appropriate in the circumstances.

- The SOs may request additional information or an inspection to assess progress, if a Participant fails to meet any of the Milestones, and the Participant shall comply with the request. The System Operators may appoint an appropriately qualified person to do an inspection.

- A Participant shall not do the following without notifying the SOs and having due regard for comments or suggestions by the SOs:
  - Amend, vary or terminate a Major Contract or other document if to do so would Undermine the accuracy of Qualification information or delay achievement of any Major Milestone, or
  - Transfer its interest in a Major Contract or similar documents identified in the CMC.

- A participant must notify the SOs and have due regard for comments or suggestions by the SOs if it proposes to change its EPC Contractor or the supplier of a major component of the new or refurbished Generator Unit or Interconnector before appointing the new EPC Contractor or supplier.

Performance Security and Termination Charges

- Performance Security provides credit support for any Termination Charges that may become payable in respect of New Capacity that is terminated.
- Performance Security can be in the form of:
  - A Letter of Credit issued by relevant bank as defined in the CMC.
  - Cash held in reserve account at the SEM Bank.
- The level of Performance Security to be maintained is linked to the quantity of awarded new capacity and must be maintained until Substantial Completion is achieved for New Capacity.
- In the event that New Capacity is terminated, the SOs will invoice the participant for the value of the applicable Termination Charge (which may not be the full value of the Performance Security if only part of the awarded capacity is terminated). If the participant fails to pay the invoice then the SOs will draw on Performance Security.
- Termination Charges (or Performance Security funds drawn on by the SOs) are credited to the socialisation balance under the TSC which absorbs differences between payments and charges in capacity market settlement.
- Performance Security no longer needs to be maintained from the time of achievement of Substantial Completion

Level of Performance Security and Termination Charges

Date / Event	Performance Security Rate (€/MW)	Termination Charge Rate (€/MW)
More than 13 months prior to beginning of Capacity Year	10,000	10,000
From 13 months prior to beginning of Capacity Year	30,000	30,000
From beginning of Capacity Year	40,000	40,000

- These are the values from the Initial Auction Information Pack for the first T-1 Auction

Remedial Actions

Remedial actions that a participant (or enforcing party) may take include:

- Apply to the SOs for an extension to the date by which a Milestone (other than the scheduled date for Substantial Financial Completion) to minimise delays in the completion of Awarded New Capacity or due to an Insolvency Event or material breach by the EPC Contractor which would entitle the Participant to terminate or replace the appointment of the EPC Contractor
  - The SOs shall approve a request if they consider that the change will not decrease the likelihood of delivery of the Awarded New Capacity prior to the Long Stop Date.

- Apply to the RAs for an extension prior to the date of achieving Substantial Financial Completion to extend that date to a new date later than 18 months after the Capacity Auction Results Date:
  - The RAs are to consult with the SOs in considering such an application.

- In accordance with contractual arrangements between the Participant and its financiers an enforcing party make seek approval to transfer the Participant's interest under the CMC, the Capacity Market Framework Agreement, its Awarded Capacity and/ or a Generator Unit or Interconnector to another party:
  - The SOs and the RAs shall promptly notify each other if they receive such a request and consult with each other on the request.

Topic 7: Secondary Trade

Training Topic 7 – Secondary Trade

- Interim Secondary Trade Arrangements

- Secondary Trade (Enduring)

Interim Secondary Trading Arrangement – (1/2)

- The Interim Secondary Trading Arrangement (ISTA) applies until the First Secondary Trading Day (set by the RAs). Secondary Trading will apply after that.
- During the period of the ISTA, Participants have the option to seek protection from difference charges for Planned Outages.
- System Operators will adjust the **Net Capacity Quantity** held by the CMU:
  - This is the net awarded capacity held by a CMU on existing capacity.
  - The Net Capacity Quantity cannot become negative.
  - This quantity is adjusted for demand level and other factors in the TSC to give the **Obligated Capacity Quantity**, the amount of capacity that must be delivered on the day.
- A Participant provides the System Operators with an "Interim Secondary Trade Notification" (ISTN) indicating for a given CMU:
  - Whether the ISTN is to activate or deactivate the interim secondary trade arrangements (ISTA) (effectively an On or Off switch). By default the ISTA is inactive for a CMU.
  - The month from which the ISTN is to apply - it will actually take effect from the later of the stated month or the next month starting after 10 working days in the future.
  - The change in Net Capacity Quantity desired by the Participant in respect of existing capacity for its CMU.

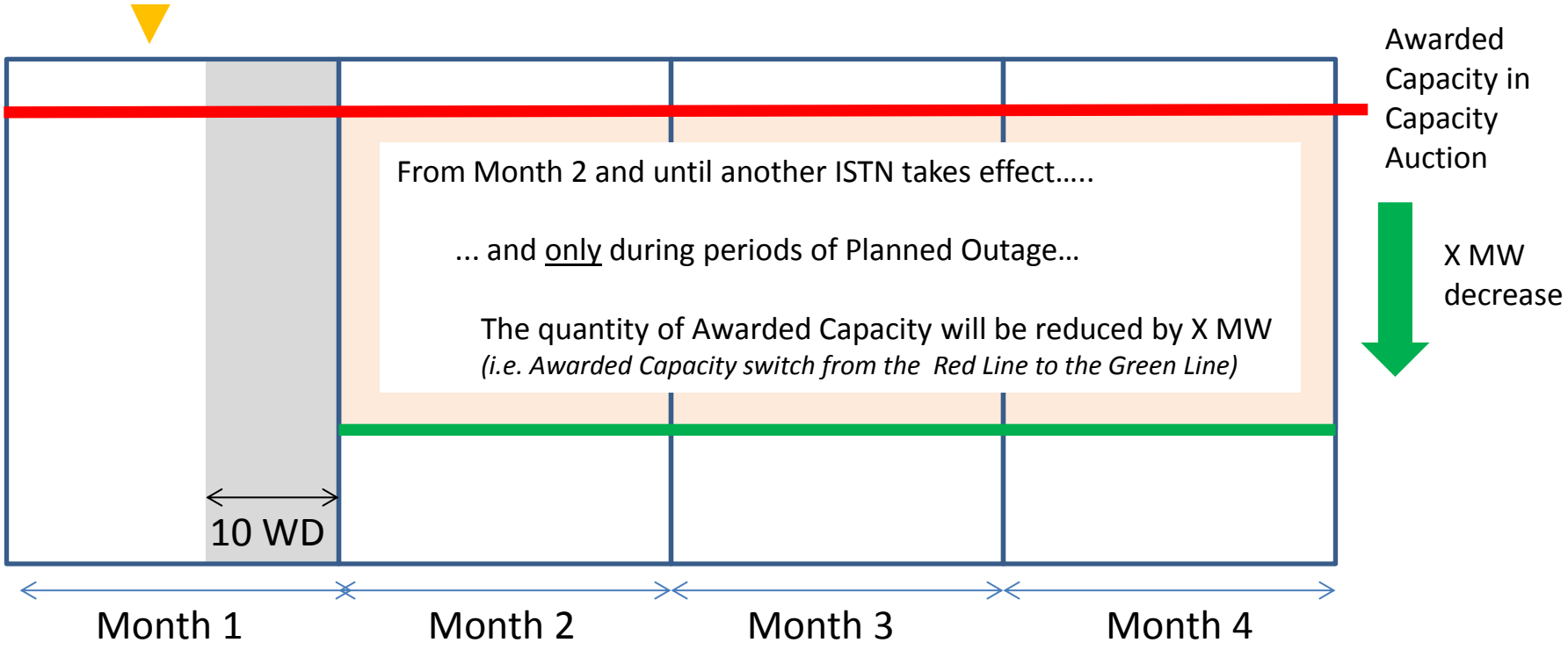
Interim Secondary Trading Arrangement – (2/2)

- Planned outages include reduction in availability of CMUs due to:
  - An outage in the Committed Outage Program (Ireland) or the Final Outage Program (Northern Ireland).
  - Planned outages of part of the transmission system under the Grid Code.
  - For a generator, the result of an outage of the plant that it is the sole source of fuel for the plant (e.g. in case of a Combined Heat and Power plant).

- The change is implemented by the System Operators creating an offsetting secondary trade for the duration of the Planned Outage with:
  - A price equal to the volume weighted average price of capacity awarded in the primary auction to that CMU.
  - A Capacity Duration Exchange Rate as specified in the Final Auction Information Pack for the Primary Auction.

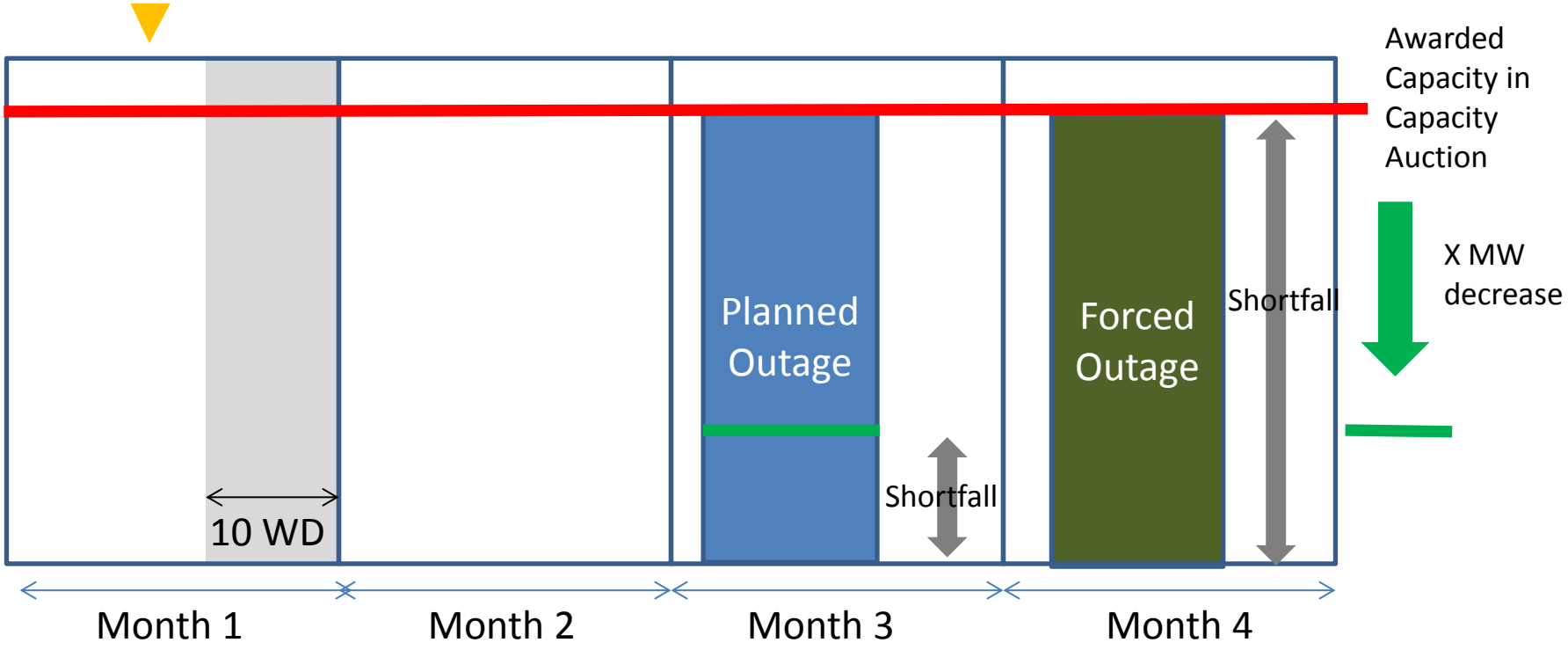
Impact of an Interim Secondary Trade Notification

SOs receive/accept an Interim Secondary Trade Notification (ISTN) to apply from Month 2, specifying a reduction of Awarded Capacity by X MW for the CMU.



When an Outage Occurs…

SOs receive/accept an Interim Secondary Trade Notification (ISTN) to apply from Month 2, specifying a reduction of Awarded Capacity by X MW for the CMU.



Enduring Secondary Trade Arrangements

- The Secondary Trade platform will allow participants to trade products that alter their awarded capacity for the periods covered by the trade:

- E.g. a product might include working day peak hours for each week of a Capacity Year:
  - An auction for each week would allow participants to trade that product for that week.
  - The trade would adjust their awarded capacity for all peak hours during that week.
  - The buyer would pay the market for that trade and the seller would be paid by the market.
  - That product could be traded over different time frames – e.g. from 4 years ahead to just before the week of delivery.

Products

- A **Product Type** describes key features of a Secondary Trade product, e.g.:
  - Duration (e.g. weekly, daily)
  - Time Interval (e.g. 10 PM to 7 AM, or all hours)
  - Forward period of which it will apply (e.g. auctioned by week for each week in the Capacity Year).

- An auction will be for a specific instance of a Product of a given Product Type. I.e. that instance of a weekly product for a given week in the capacity year. In practice, prior to the start of a capacity year, an auction may be held for all Products in that capacity year in one process, though they are different auctions.

- The price cap for each Product Type shall be as set by the RAs from time to time. The RAs may request analysis from the SOs to support such settings.

Product Design and Auction Scheduling

- SOs will design the products and must review them 12 months after commencement of arrangement and then every 3 years (and at such other times considered appropriate):
  - Consultation is to include publication of a consultation paper and invitation to interested parties to make written submissions.
  - A final report must be published by the SOs and provided to the RAs.

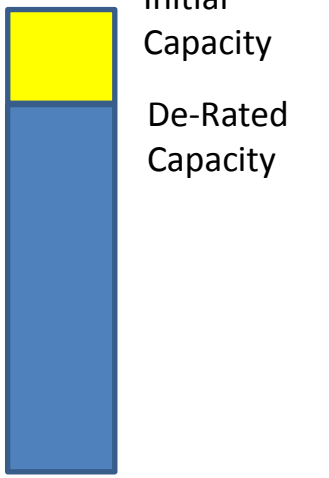
- All Product Types must be approved by the RAs.

- The SOs must publish a **Product Design** specifying the design features, price cap etc.

- Each year the SOs must publish a calendar as to when they expect to run Secondary Trade Auctions. This will identify when participants can procure each Product Type in respect of each Capacity Year for which Secondary Trade occurs within that year. This can be updated.

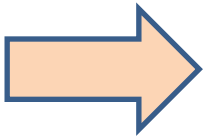
Product Load Following Factor

At peak times the SEM may need all the de-rated capacity.
At off-peak times capacity providers will want to take planned outages but how do they do this if they need to be able to back awarded capacity?



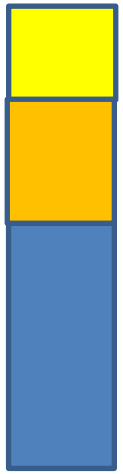
Initial Capacity

De-Rated Capacity



Load following factor applied in settlement.

Demand is half of peak, then only half capacity needed.



Allowed to "trade above de-rated capacity" for 70 days per year.

Can be secondary traded to offset obligations of others.

The load following factor gets applied to <u>all</u> primary and secondary trades, even to secondary trade capacity freed up by applying the load following factor.

This means that de-rated capacity available to be sold in a secondary trade must be scaled up by a **product load following factor**, to counter the fact that the resulting secondary trade will then be scaled down by the real-time load following factor in settlement.

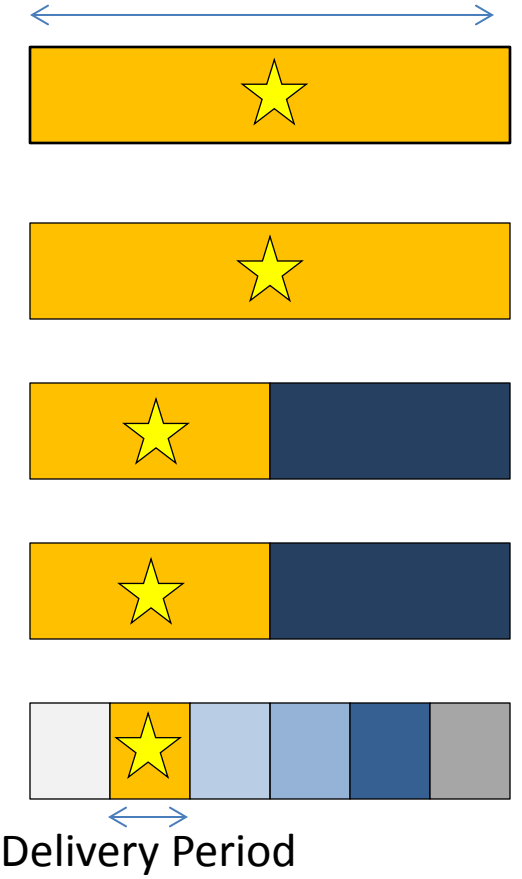
The RAs will produce a forward forecast of these load following factors. The RAs will separately determine a methodology with which to derive the "product load following factor" to apply to each instance of each product. E.g. one approximate load following factor to apply across a weekly peak product for a given week.

Secondary Trade Information Pack

- This pack is published not less than 20 WD before each auction. It includes:
  - The date and time of auction runs.
  - The earliest and latest times at which bids and offers can be submitted.
  - The time and date when the auction results will be published.
  - The Product Types to be traded.
  - For each Product to be auctioned:
    - The applicable exchange rate:
      - The current Annual Capacity Exchange Rate for the Capacity Year if the auction is held more than one year before the Capacity Year starts, else;
      - The current Monthly Capacity Exchange Rate for the Month in which the product duration commences.
    - The Product Load Following Factor:
      - Set by the RAs.

Secondary Trade Products Over Time

Auction for Product		Product Traded
	The intention of the rules is that products can be defined and changed, and auction times set and changed to suit the requirements of the market.	Delivery Period
Auction – Three Years Out	→	
Auction – One Years Out	→	
Auction – Six Months Out	→	
Auction – One Month Out	→	
Auction – One Week Out	→	Delivery Period



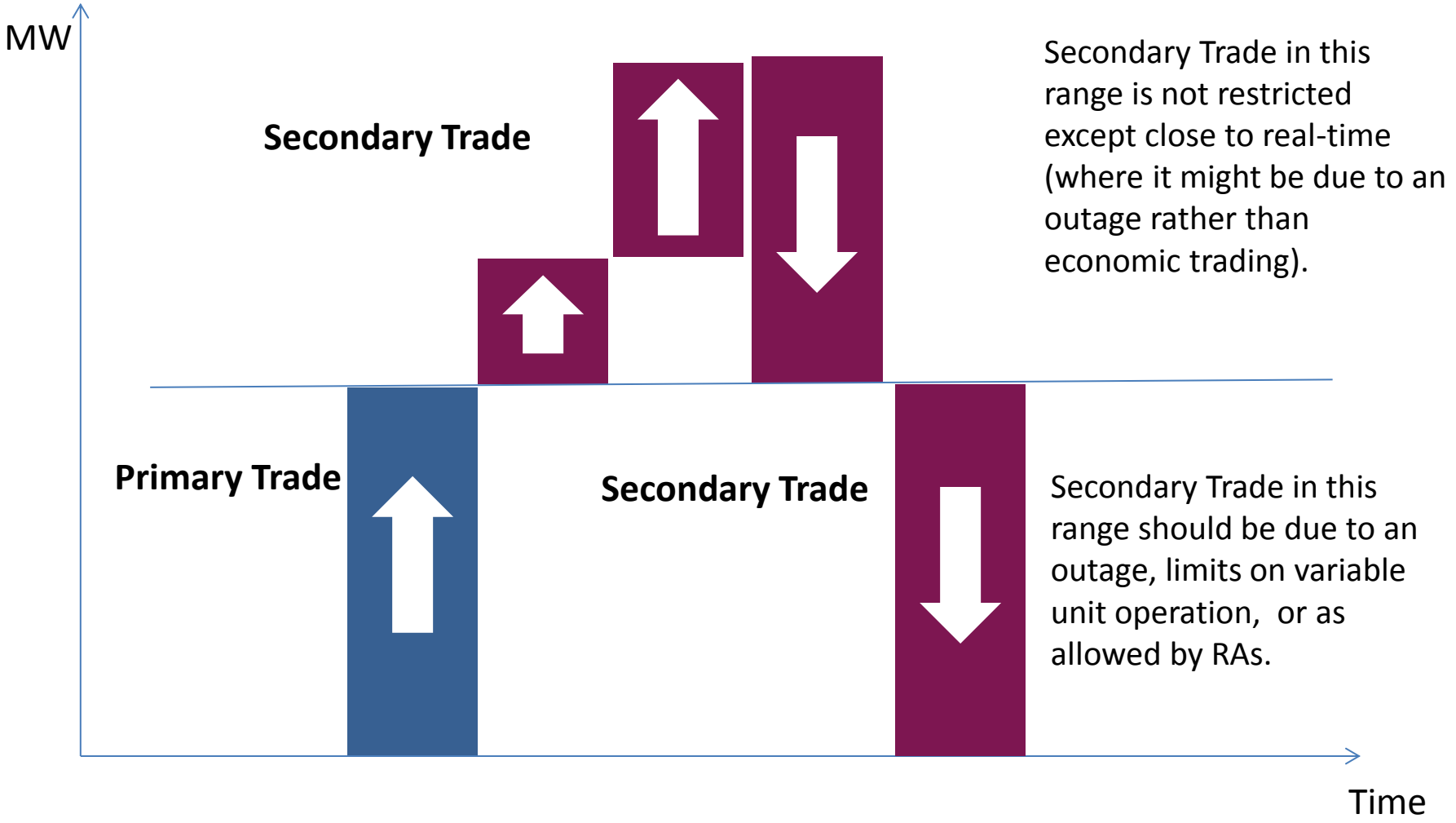
Restrictions on Secondary Trade

- A participant submitting a Secondary Auction Bid must confirm in the bid (via ticking a box) that any trade resulting from the bid is for a **Legitimate Reason**. This is required because such trade will reduce the participants obligations to deliver capacity.

- **Legitimate Reasons** include:
  - Planned, Forced and Ambient Outages.
  - For variable units, limitations or fluctuations in output arising from lack of energy source or legal restrictions (e.g. hydrological restrictions) on use of that resource.
  - The participant has applied to, and the RAs have approved, the trade to cover unusual events like a long term planned outage or the plant becoming uneconomic.
  - The trade is not less than two working days prior to the period to which the trade will apply, and cancels prior secondary trade positions to bring its Net Capacity Quantity in line with its capacity auction awarded capacity. *I.e. the participant wants to lower its obligation to a level it can cover having entered into some economic trades previously*.

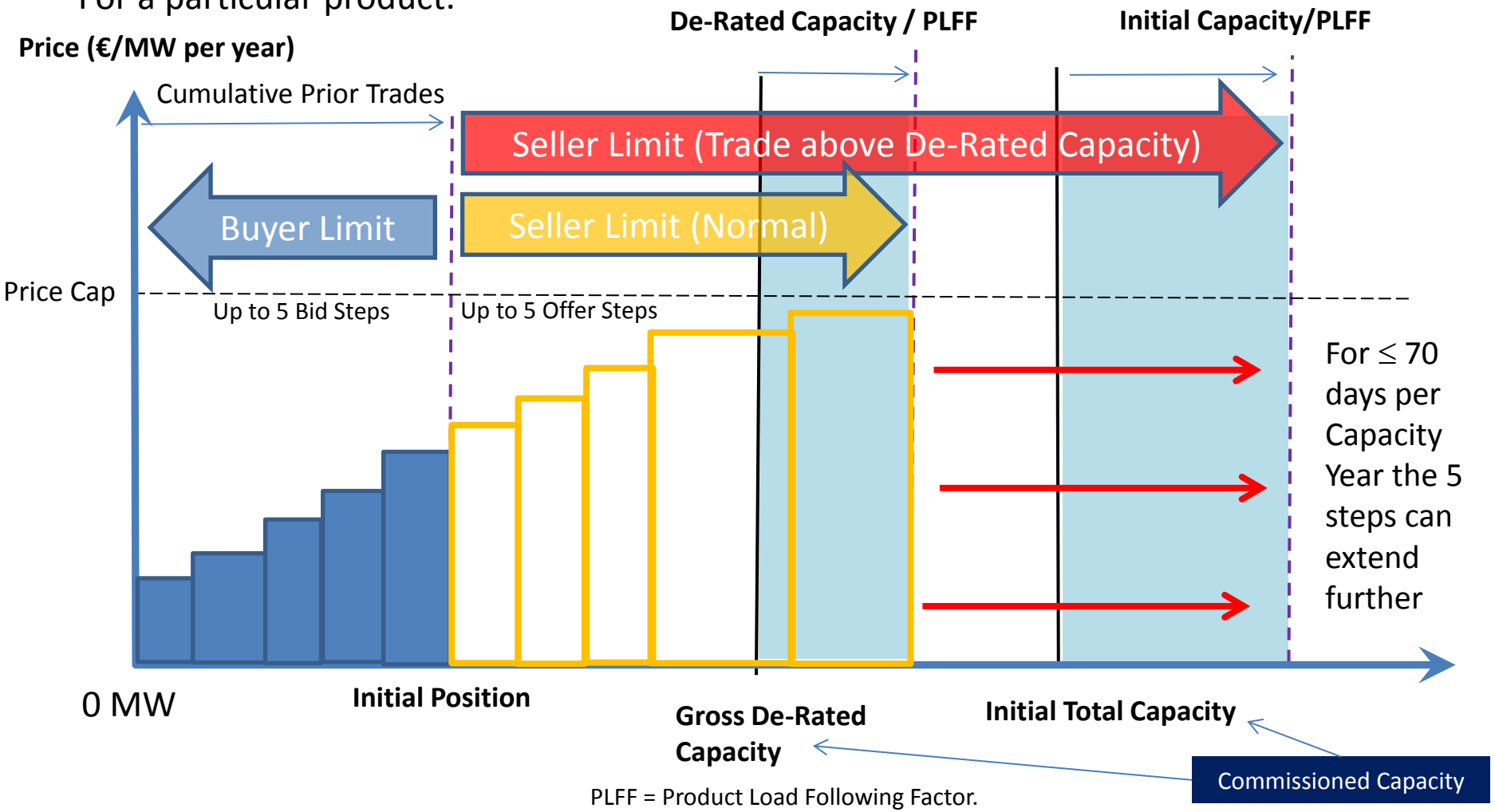
- A Participant is required to use reasonable endeavours to keep its Net Capacity Quantity for each CMU at a level not less than the Awarded Capacity from a Capacity Market Auction except as allowed for by Legitimate Reasons.

Legitimate Technical Reasons



Secondary Trade Bids and Offers

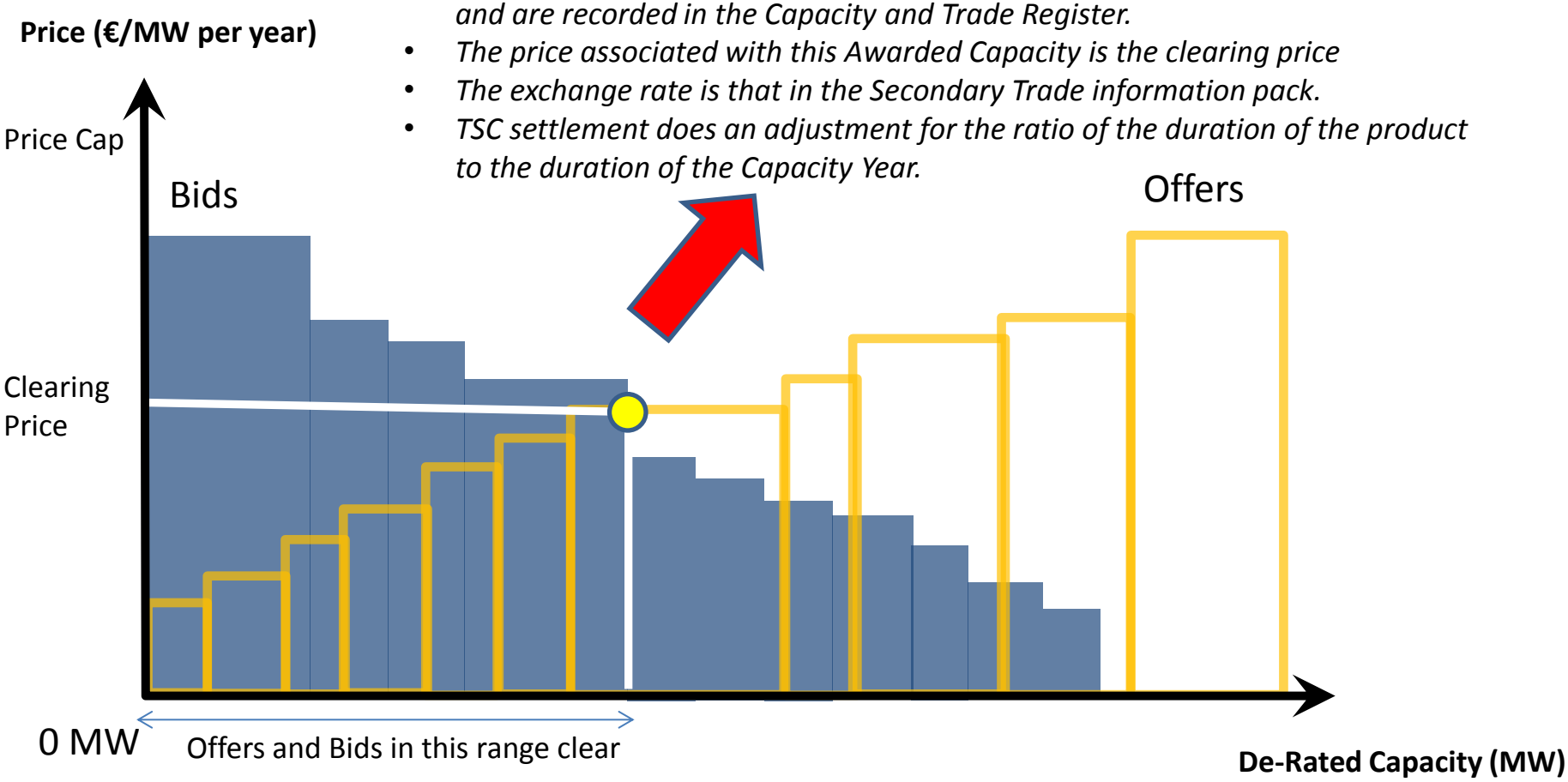
For a particular product.



PLFF = Product Load Following Factor.
This scales up capacity, which in TSC settlement is scaled down by the Capacity Quantity Scaling Factor (FSQC).

Secondary Trade Clearing

- *Cleared quantities become Awarded Capacity for the duration of the Product and are recorded in the Capacity and Trade Register.*
- *The price associated with this Awarded Capacity is the clearing price*
- *The exchange rate is that in the Secondary Trade information pack.*
- *TSC settlement does an adjustment for the ratio of the duration of the product to the duration of the Capacity Year.*

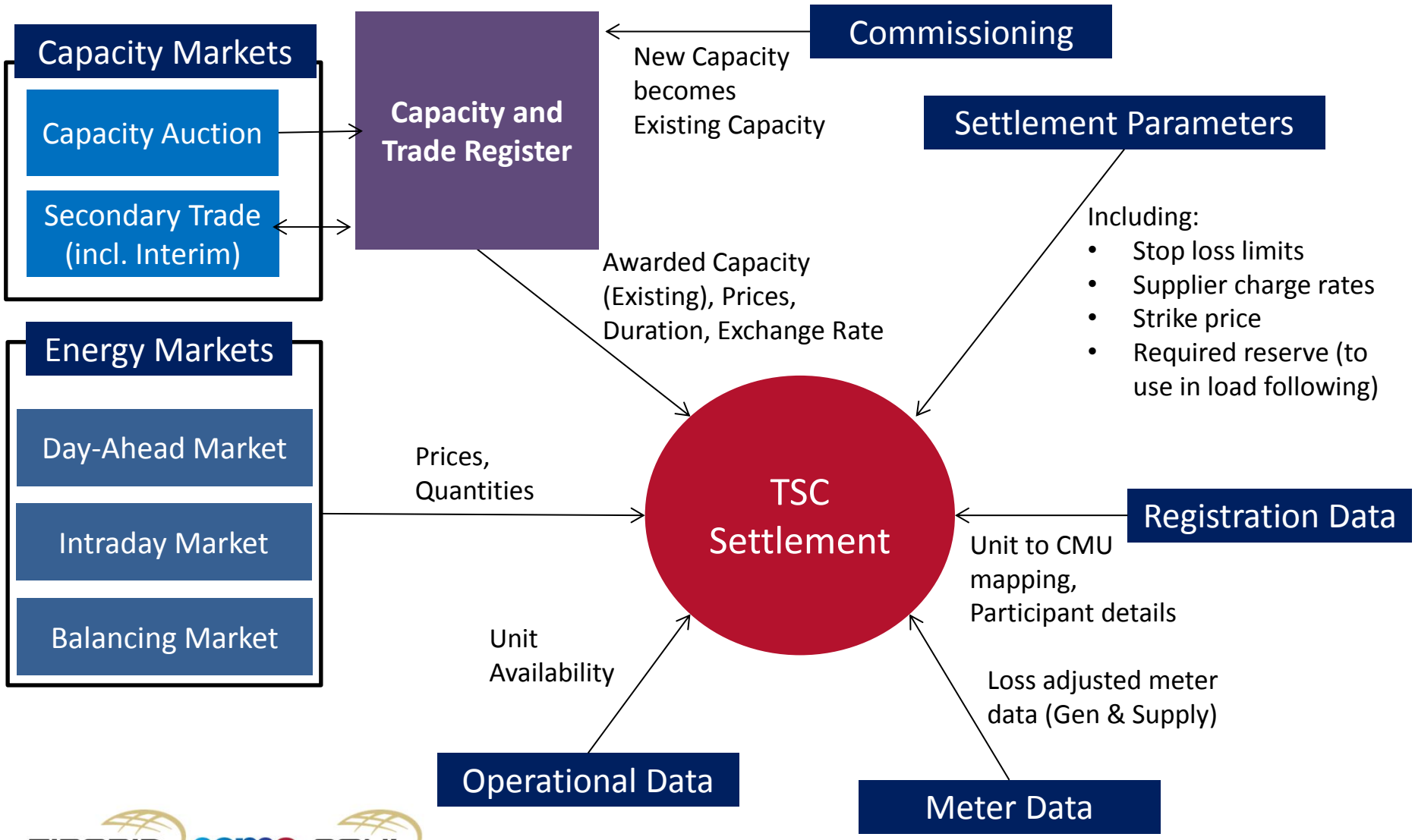


Topic 8: Conceptual Settlement Overview

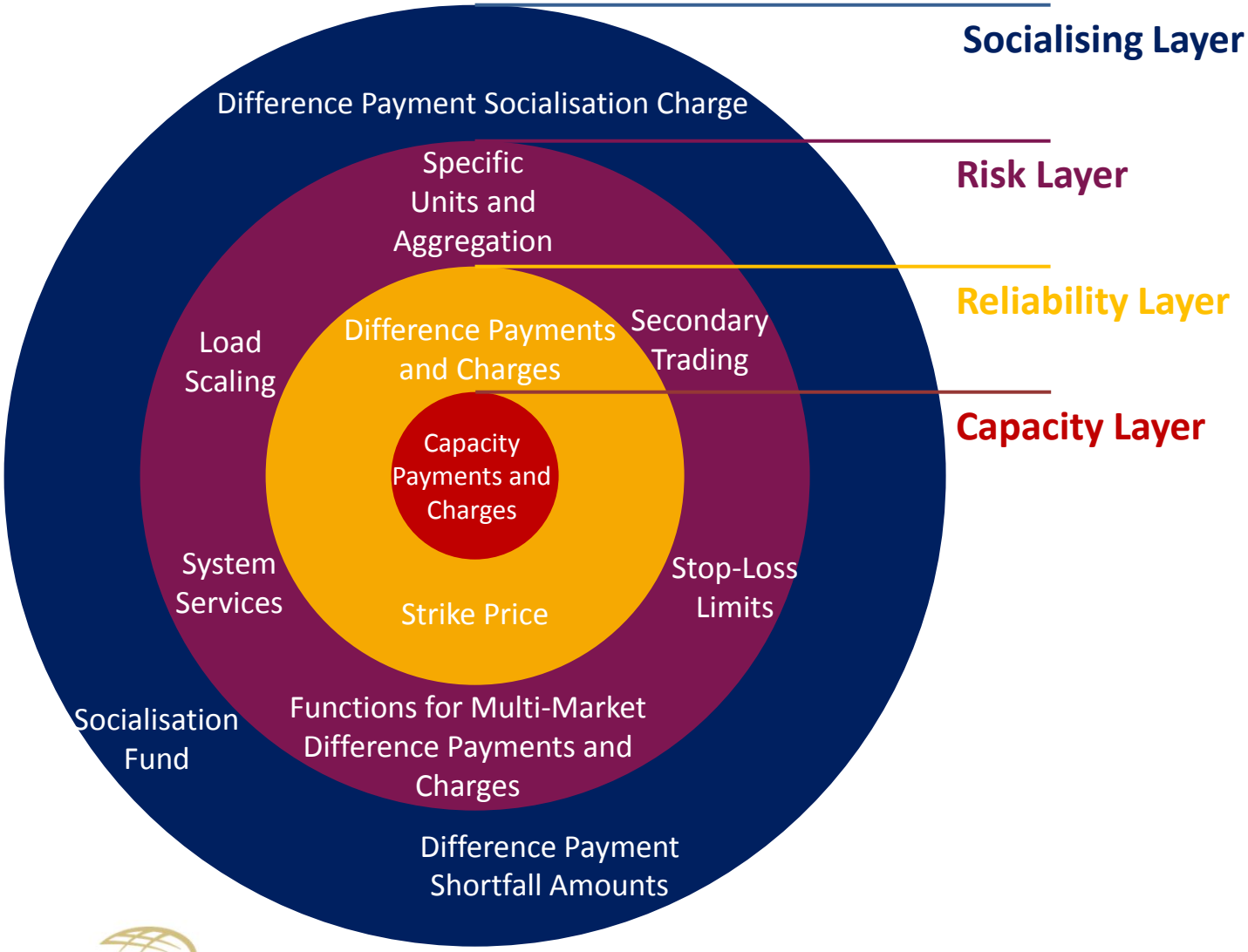
Training Topic 8 – Conceptual Settlement Overview

- A separate session will cover settlement, this section is just to demonstrate how everything we have covered links into settlement.

Links to Settlement



Settlement Terms



Topic 9: Course Summary

Review of Learning Objectives

As a result of this training module, you should now:

Have an understanding of key features and obligations of the Capacity Market Code and its relation to broader market arrangements ✓

Understand the Qualification Process, including options for addressing any disagreements with Preliminary Qualification Results ✓

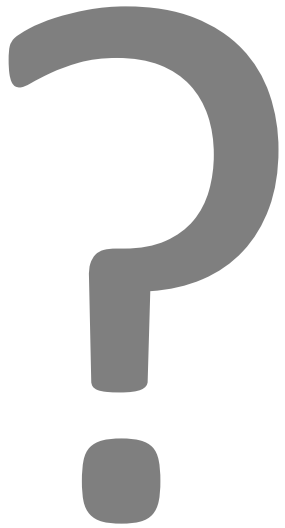
Be in a position to understand Qualification Results and how they influence participating in a Capacity Auction and Secondary Trade ✓

Understand how to offer into a Capacity Auction ✓

Understand the Interim Secondary Trade Arrangements to apply from the start of the market and how longer term Secondary Trade will work ✓

Understand the risks and trade offs in how you participate ✓

Questions



Thank you!

Thank you for your time and engagement during this session.

Please take the time to share your feedback with us by completing the short feedback survey before you leave.