



Centre for Energy and
Environmental Markets

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A Framework for Designing and Categorising Capacity Markets

Insights from an Application to Europe

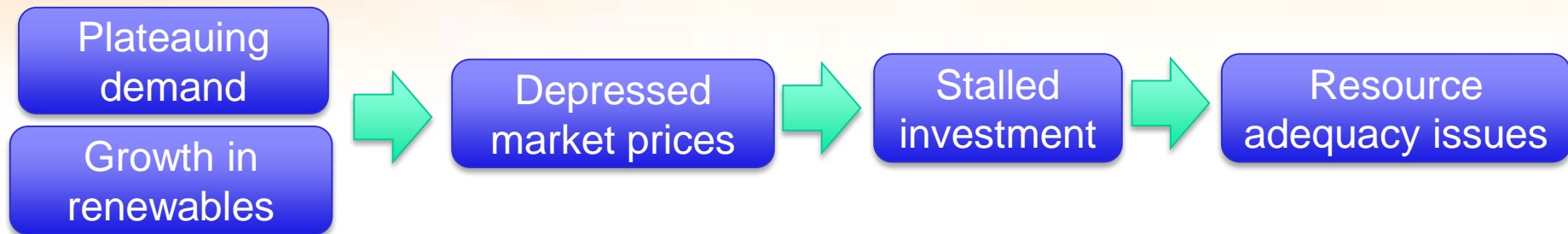
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Monday 25th May, 2015

IAEE, Antalya, Turkey

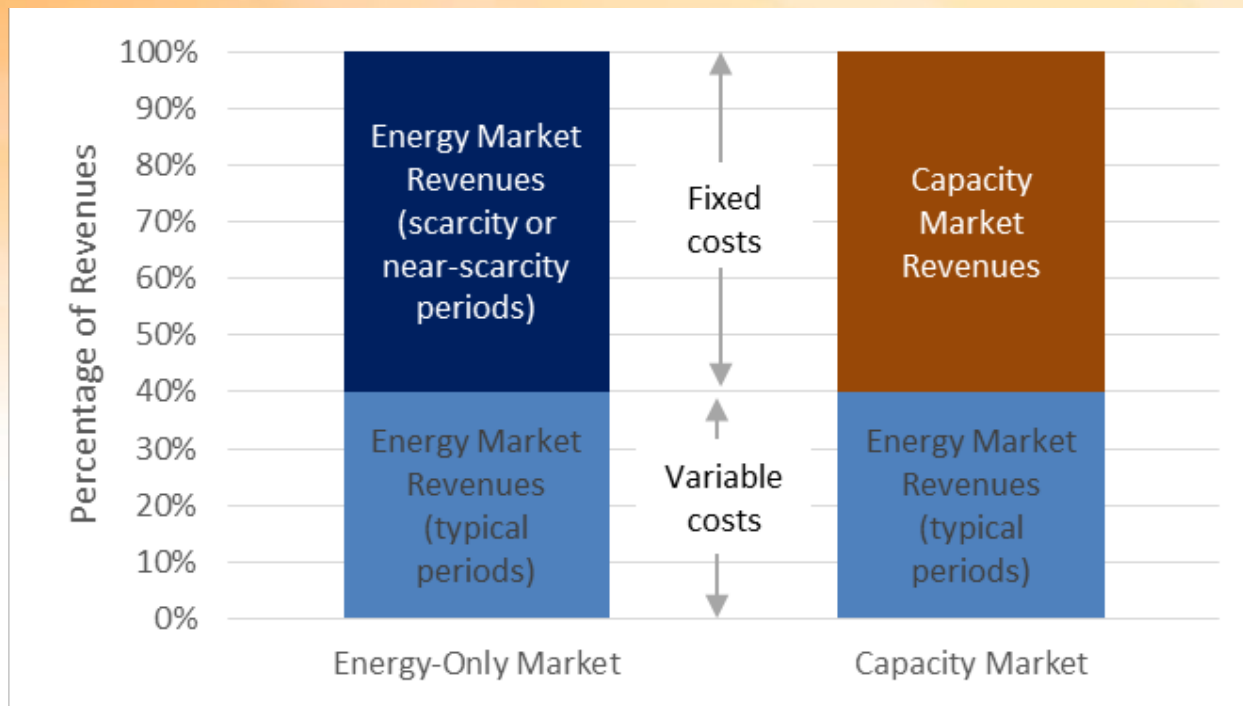
Introduction

- Resource Adequacy:
 - Mechanisms to manage capacity of installed generation, and adequacy to meet demand
- Becoming more challenging



Many jurisdictions moving towards explicit capacity remuneration mechanisms

Capacity markets vs Energy-only Markets

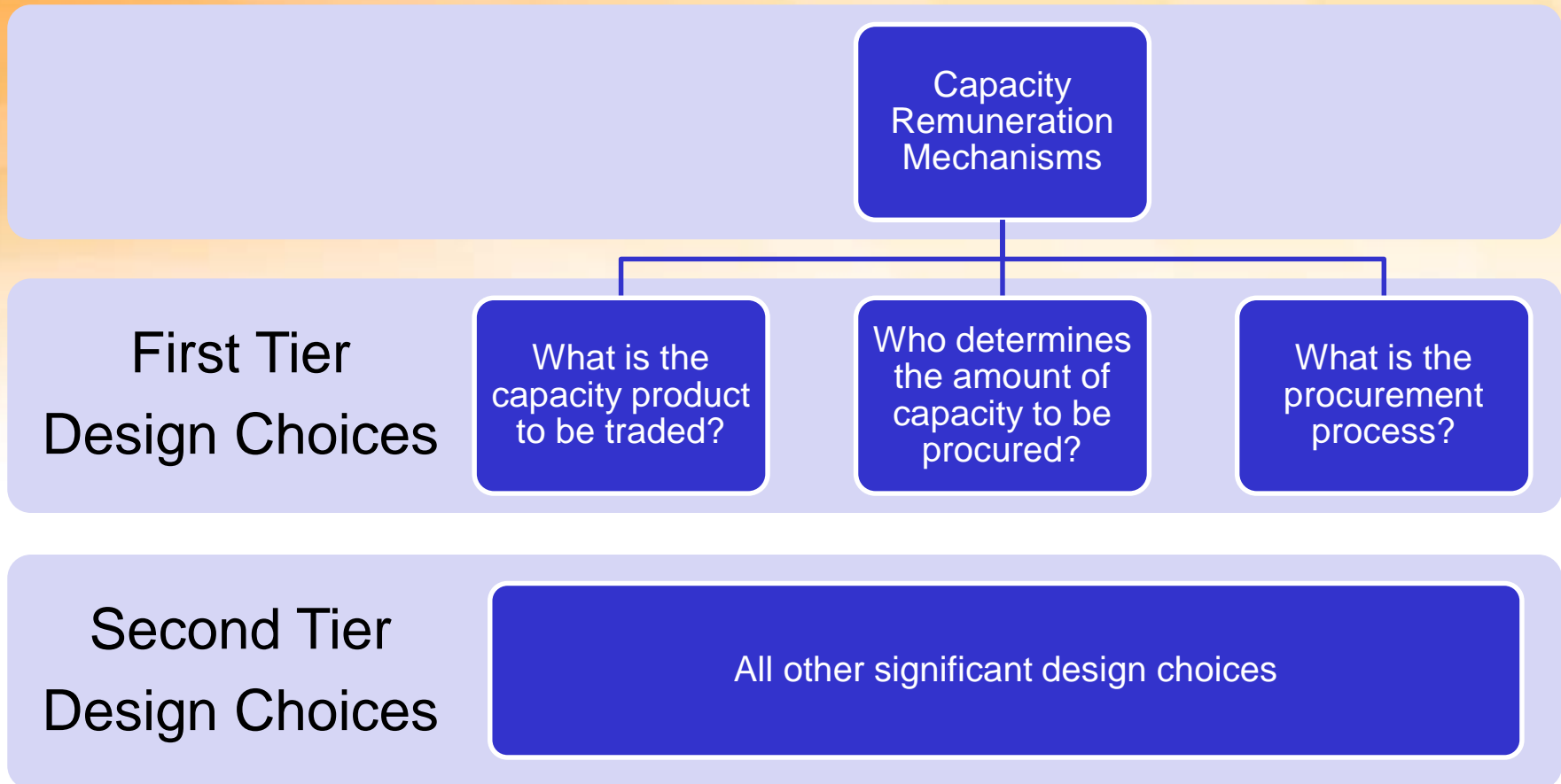


Capacity markets may be necessary where it is politically (or otherwise) not possible to allow sufficiently high scarcity prices

Many different kinds of capacity mechanisms

- A plethora of different capacity mechanism designs have been explored and implemented
- Can be challenging to compare between jurisdictions
 - Terminology differences
 - Lack of common framework
- Developed a 2-tier framework for categorising capacity mechanism designs
 - Useful framework for comparing and considering designs





2 Tier Design Framework for capacity market design



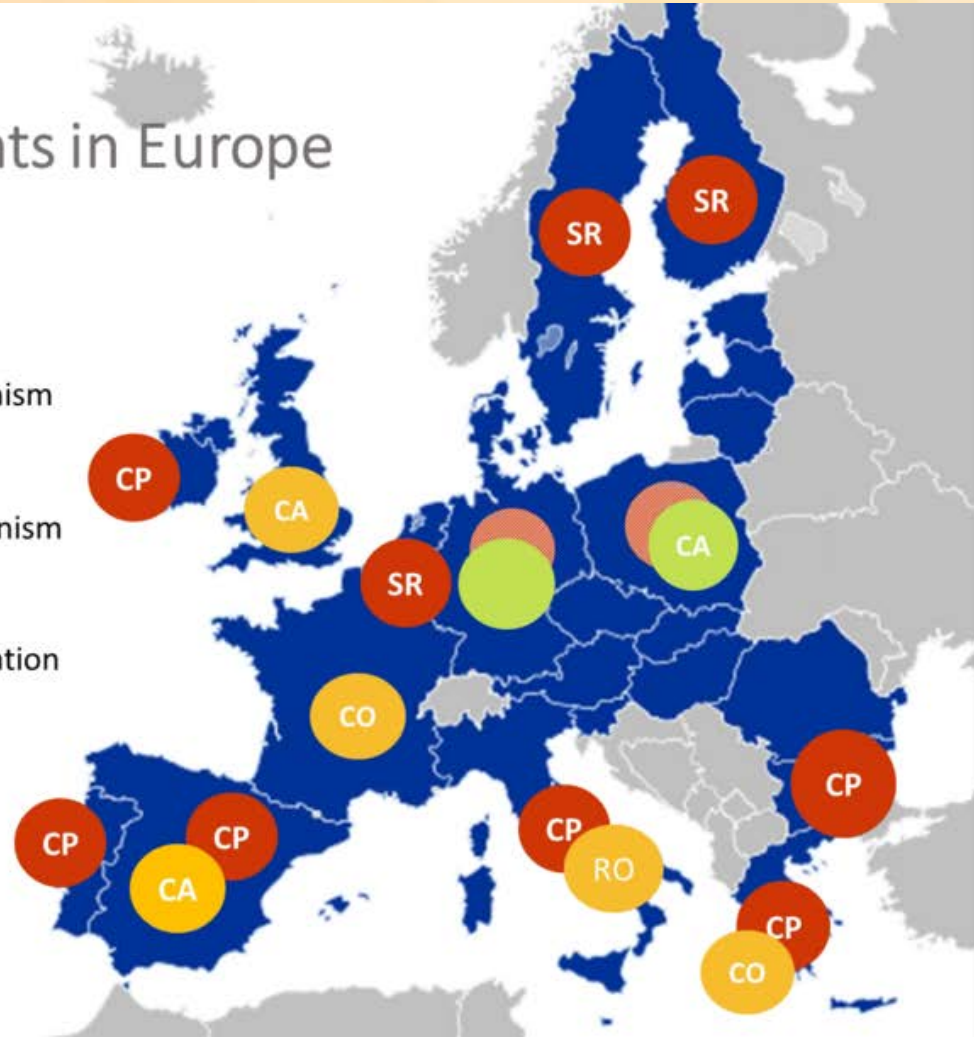
Common Terminology

	Product Description	Who determines how much is procured?	Procurement process
Centralised capacity market	Physical Capacity	Central Authority	Central Procurement
Capacity Obligation (France)	Physical Capacity	Central Authority	Bilateral
Decentralised capacity market	Physical Capacity	LSEs	Bilateral
Capacity Subscription	Physical Capacity	Customers	Bilateral
Reliability Options (Italy)	Financial Instrument	Central Authority (usually)	Central Procurement (usually)

Current developments in Europe

-  existing capacity mechanisms
-  some elements of a capacity mechanism in place (types of strategic reserves)
-  implementation of a capacity mechanism or its revision in progress
-  capacity mechanism under consideration

CP – capacity payments
CO – capacity obligations
CA – capacity auctions
SR – strategic reserve
RO – reliability options



Source: EUI webinar “Capacity mechanisms: legal issues” by Malgorzata Sadowska
(<http://fsr.eui.eu/Publications/WEBINAR/2014/141217-WR-Sadowska.aspx>)

The French capacity mechanism: Type, Status, Aim

Type:

- Capacity Obligation
- Physical Capacity is set by central authority and traded bilateral

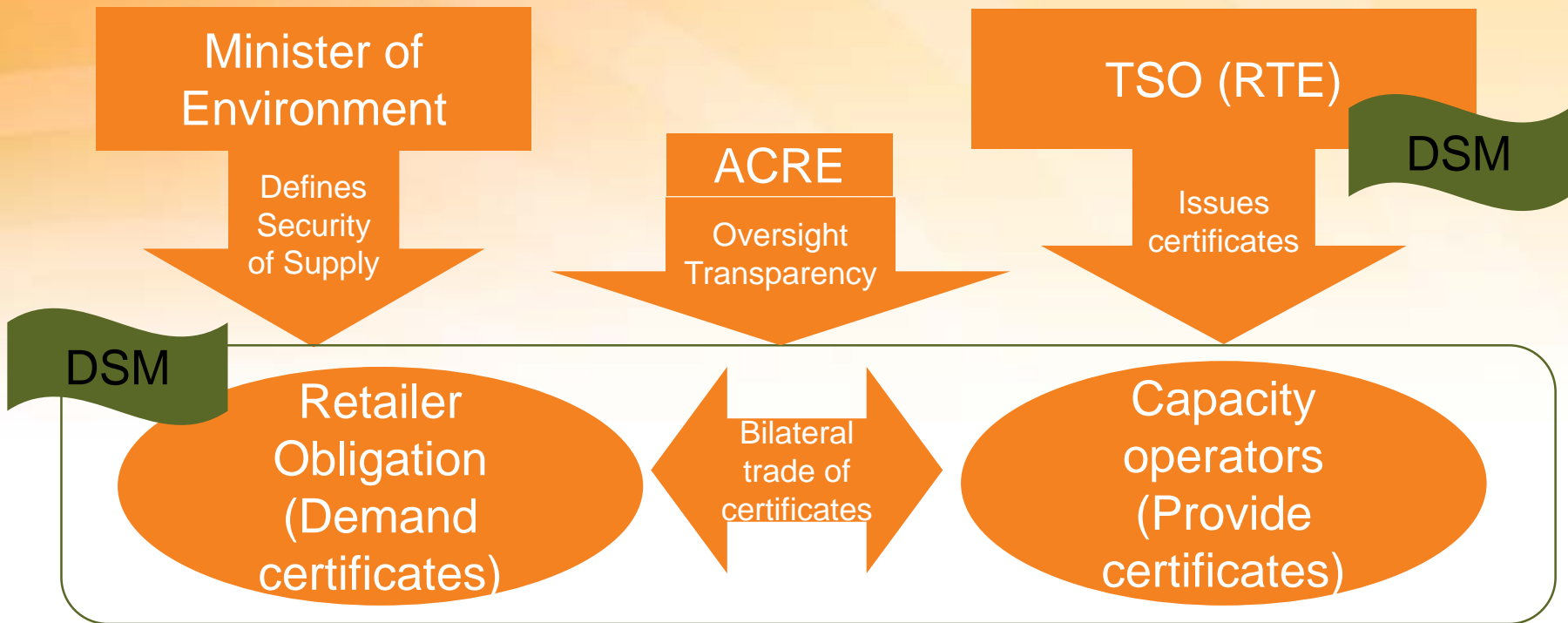
Status:

- Decree in 2012 contained the main principles
- ACER report April 2014 explained market rules
- Decree signed January 2015
- First delivery year: January 2017 to end of December 2017

Aim: Security of Supply

- Tackle the peak load issue (especially in Winter)
- Boost Demand Side Management (DSM)

The French capacity mechanism: Design



Price of certificates reveals value of Security of Supply
Price is zero if there is no risk on Security of Supply

The Italian capacity mechanism: Type, Status, Aim

Type:

- Reliability Option
- Adequacy target is set by TSO (Terna) and reliability option contract is the product which is bought through a central auction in each region

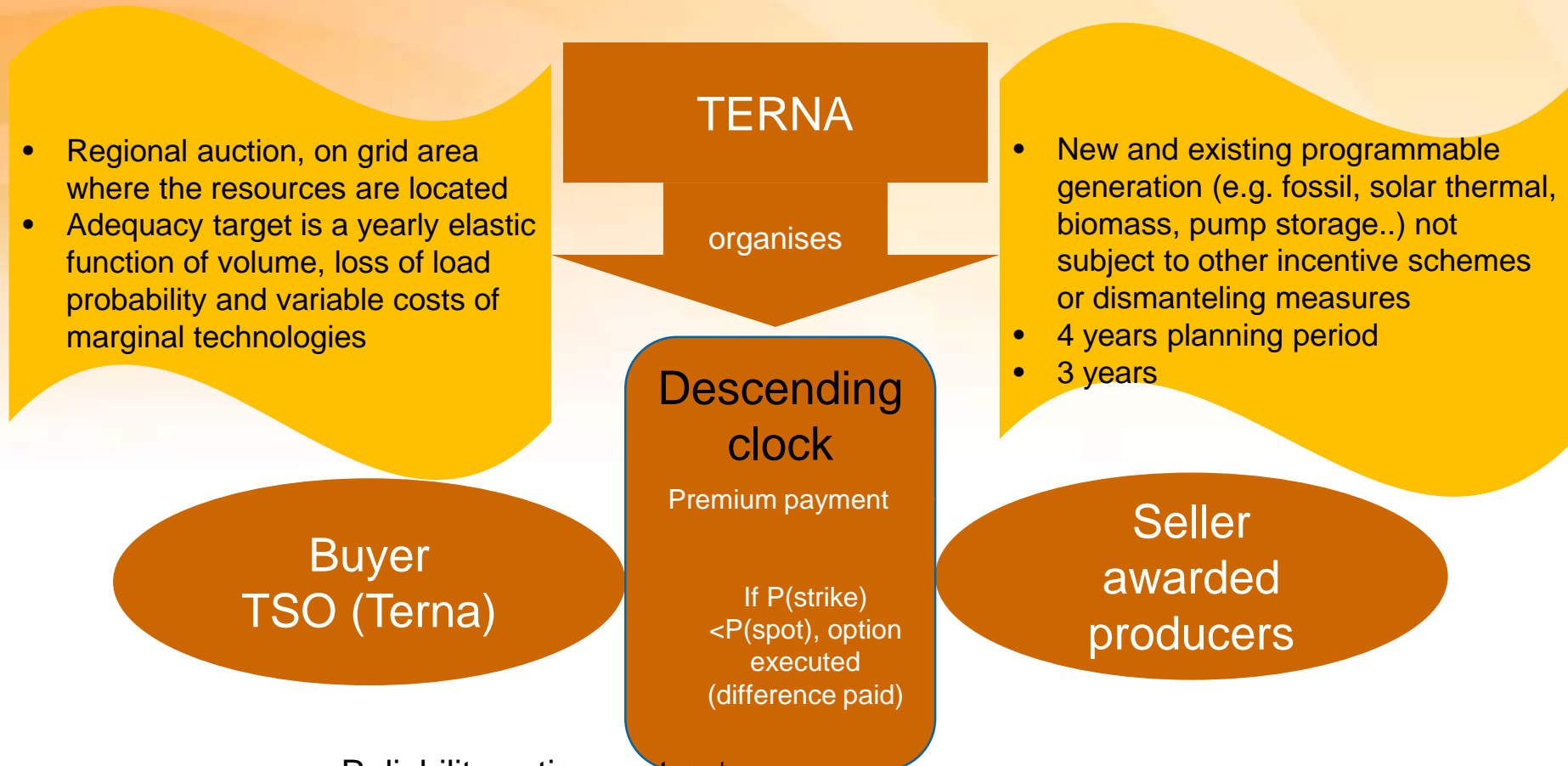
Status:

- Law has been approved by Ministry of Economic Development in 2014
- First auctions in 2015
- First delivery period: 2019 or 2020

Aim: System Adequacy

- No capacity problem , aim to ensure that not too much of the overcapacity (mainly gas) is retired
- Long-term price signals to support coordinated development

The Italian capacity mechanism: Design

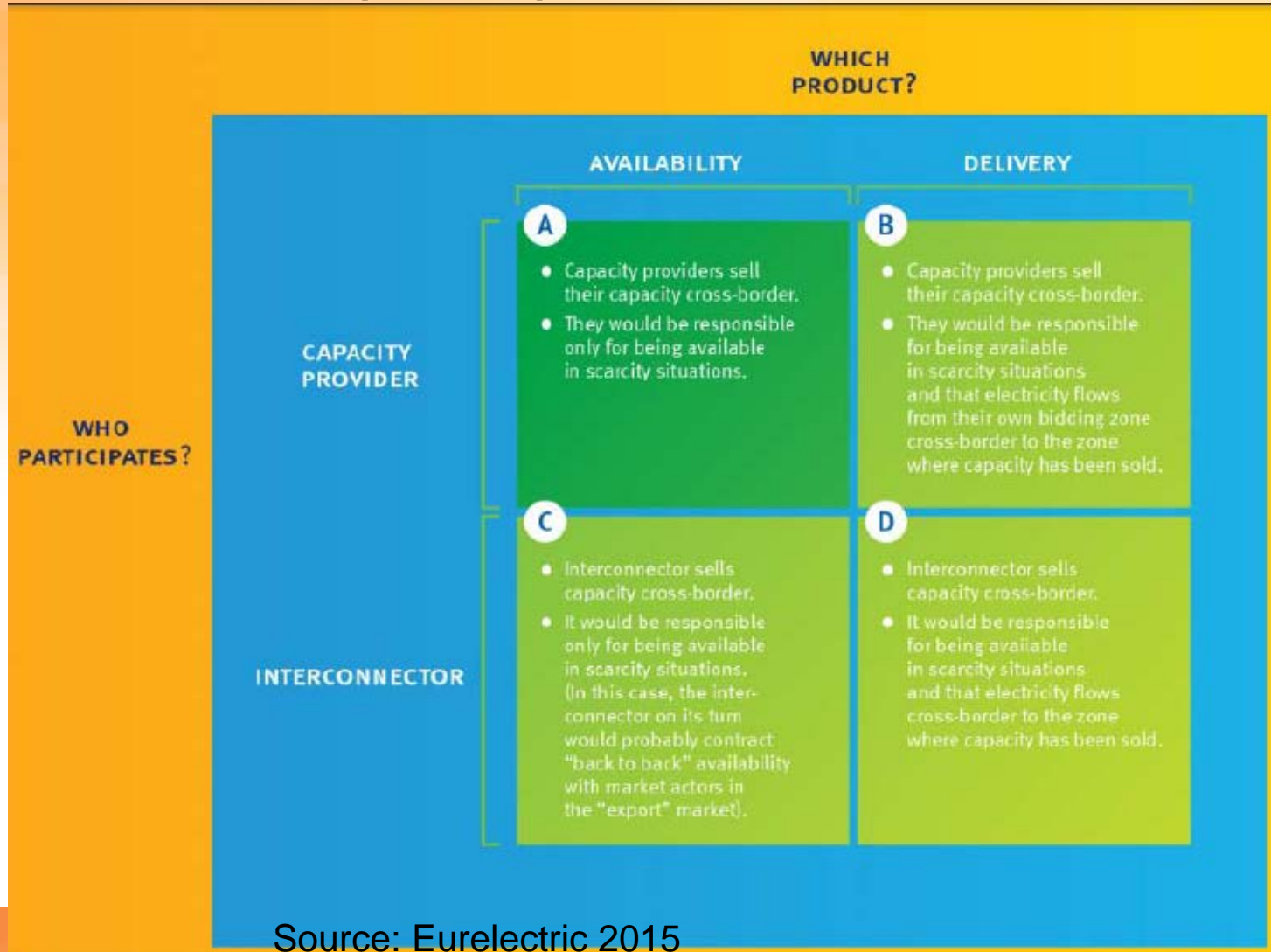


- Regional auction, on grid area where the resources are located
- Adequacy target is a yearly elastic function of volume, loss of load probability and variable costs of marginal technologies

- New and existing programmable generation (e.g. fossil, solar thermal, biomass, pump storage..) not subject to other incentive schemes or dismantling measures
- 4 years planning period
- 3 years

- Reliability option contract
- Strike price is set at variable costs of an efficient peak plant
- →Penalty if no delivery in peak periods

Cross-border participation





Summary

- Plethora of different capacity mechanism designs have been explored and implemented
- Usually the design choice is purpose driven
- Cross-border participation in EU mandated by EU Commission to ensure functioning of IEM
- Different capacity market designs may make linking difficult and lead to distortions in the IEM
- Depending on design different impacts on electricity price: short term and long term impacts to be distinguished



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