Economic Regulation Authority

WESTERN AUSTRALIA

Promoting fair prices, quality services and choice.

Short Run Marginal Cost

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Short Run Marginal Cost

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SRMC Forum
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Overview

- Purpose of SRMC Papers & Workshop
- Role of ERA & IMO
- Compliance requirements of the Rules
- Basic Economics
- Relevant costs
- Optimal Portfolio SRMC

Role of ERA and IMO

- Monitoring
- Investigate
- Publish results within 20 days
- Refer to Energy Review Board

(Sections 2.16.9 and 6.6.3 Rules)

Role of ERA and IMO

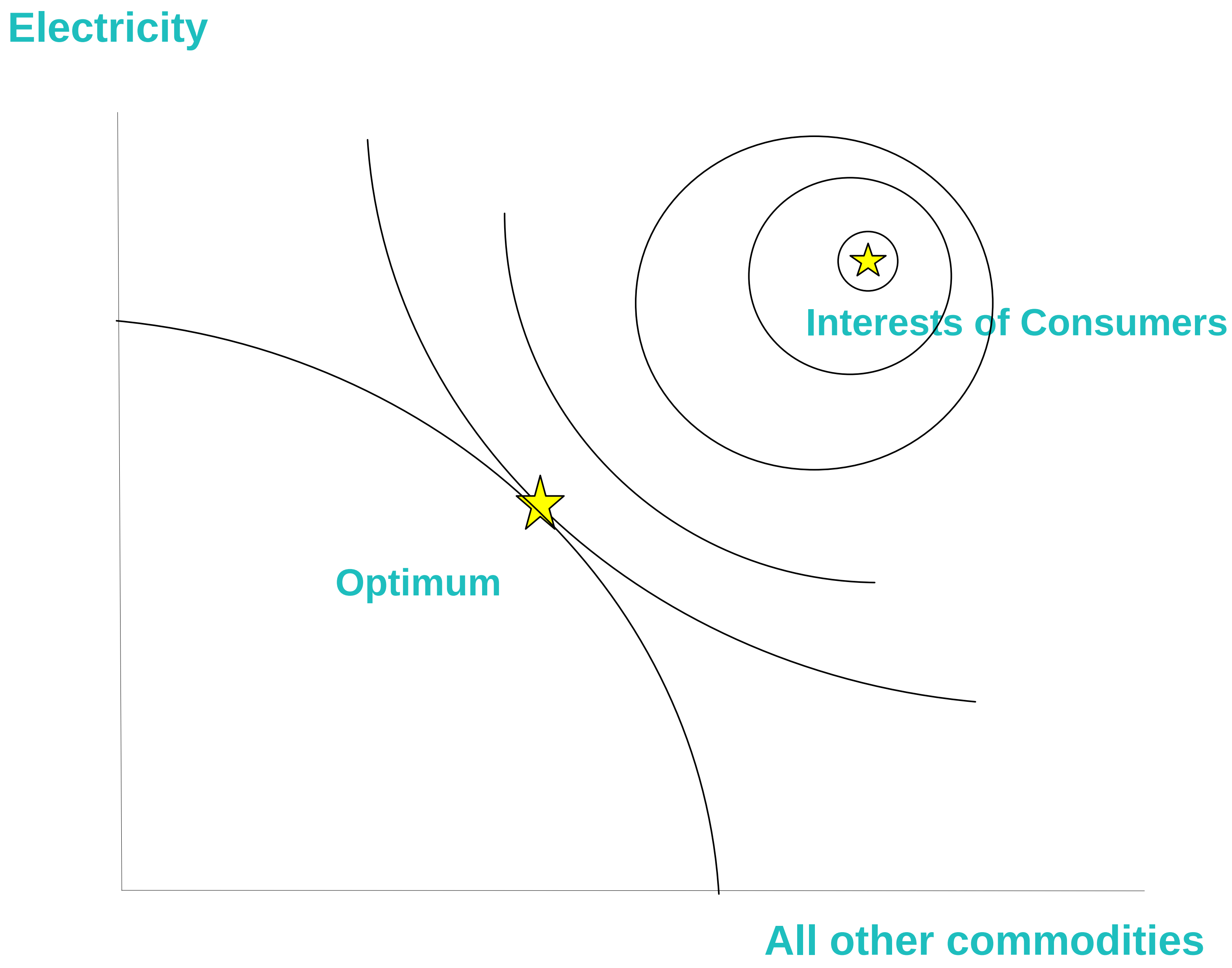
In summary, the Authority, with the assistance of the IMO, is responsible for monitoring the effectiveness of the market in meeting the Wholesale Market Objectives and must investigate any market behaviour if it considers that the behaviour has resulted in the market not functioning effectively. If a firm with market power submits a portfolio supply curve that does not reflect that firm's reasonable expectation of SRMC for any given trading interval and the Authority determines that to be the case, the matter must be referred by the IMO to the Energy Review Board requesting that a civil penalty be imposed on the relevant market participant.

Compliance requirements of the Rules

- Reasonable expectations of SRMC
  - Market power
  - Relevant electricity
  - Market not functioning effectively
  - Meeting the Wholesale Electricity Market objectives
- Inappropriate or anomalous market behaviour
- Exploitation of shortcomings in WEM Rules
- Reasonable expectations wrt availability declarations
- Reasonable expectations wrt fuel declarations
- Etc.

Economic Efficiency

- Technical
- Allocative
- Dynamic (long run)
  - Inefficient markets waste resources


Electricity
Interests of Consumers
Optimum
All other commodities

What is Short run Marginal Cost?

The change in short run total cost (C’) for an extremely small change in output (Q).

$$C'(Q) = \frac{dC}{dQ}, \qquad Q \geq 0,$$

Distinction between Short Run and Long Run Marginal Costs

- Only superficially about the notion of time
- The long run is how long it takes for the technologically feasible mix of inputs to be changed

Costs Ain’t Costs

– SRMC not “fair value”

– SRMC is not necessarily what you pay but
– it’s what it really costs the organisation

Take fuel:
– If 100% take or pay & use it or loose it
  $\Rightarrow$ SRMC $\approx$ 0
– If pay as you use, no loss of inventory & no secondary market
  $\Rightarrow$ SRMC $\approx$ what you pay for it
– If pay as you use, no loss of inventory & secondary market
  $\Rightarrow$ SRMC $\approx$ opportunity cost

What Costs?

- Variable costs
- Avoidable costs
- Direct / indirect costs
- Fixed costs
- Joint costs
- Sunk costs
- Overhead costs
- Opportunity costs

Types of costs

	Variable	*Not Variable*
Avoidable	Variable Costs	Avoidable Fixed Costs Shutdown Costs
Not Avoidable		Sunk Costs

What is a sunk cost?

– A sunk cost is a fixed cost that cannot be avoided in the short run
– In the long run there are no sunk costs

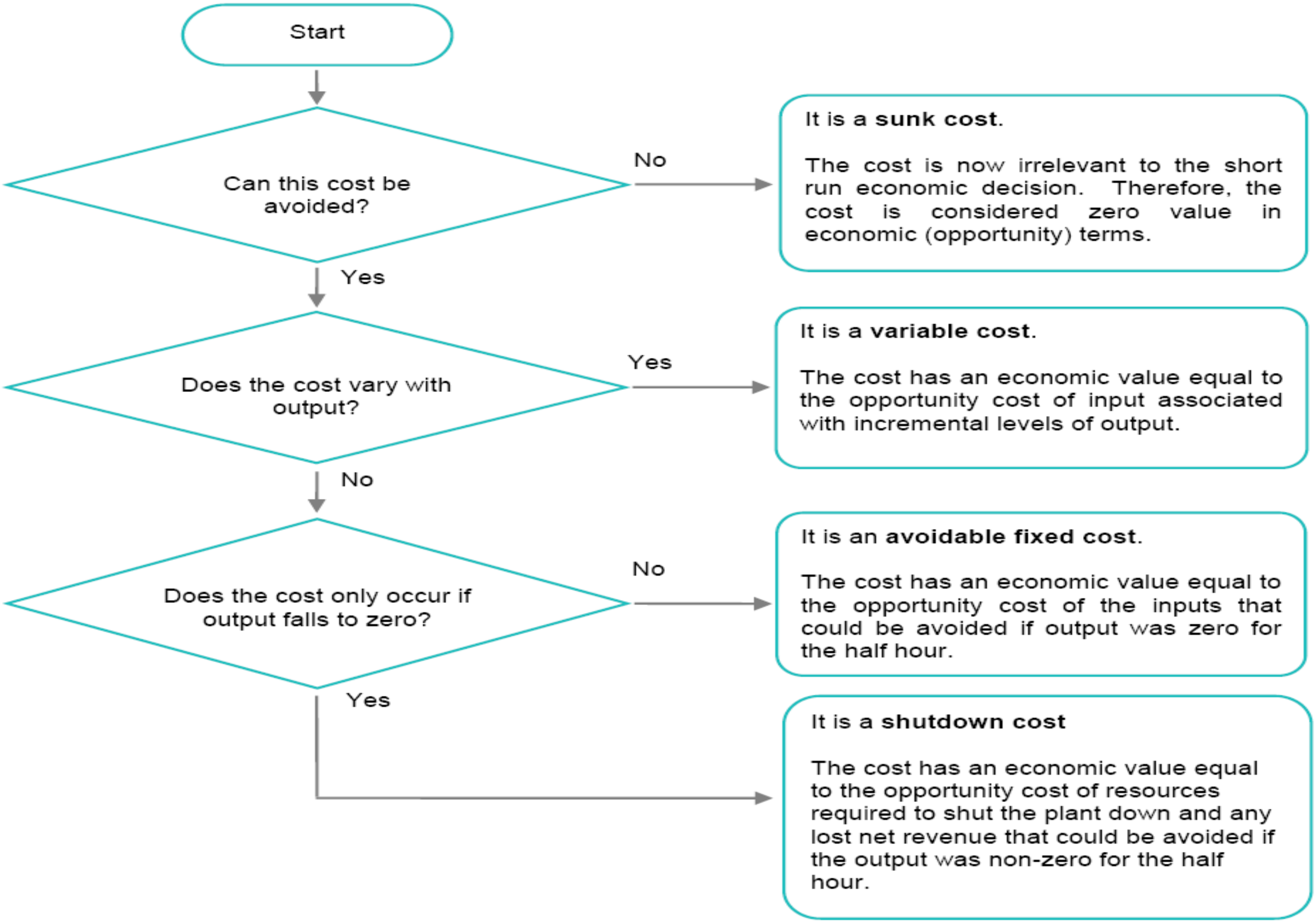
What is an Opportunity Cost?

- Potential benefits foregone to create greater benefits

Avoidable Fixed Cost vs Shutdown Cost?

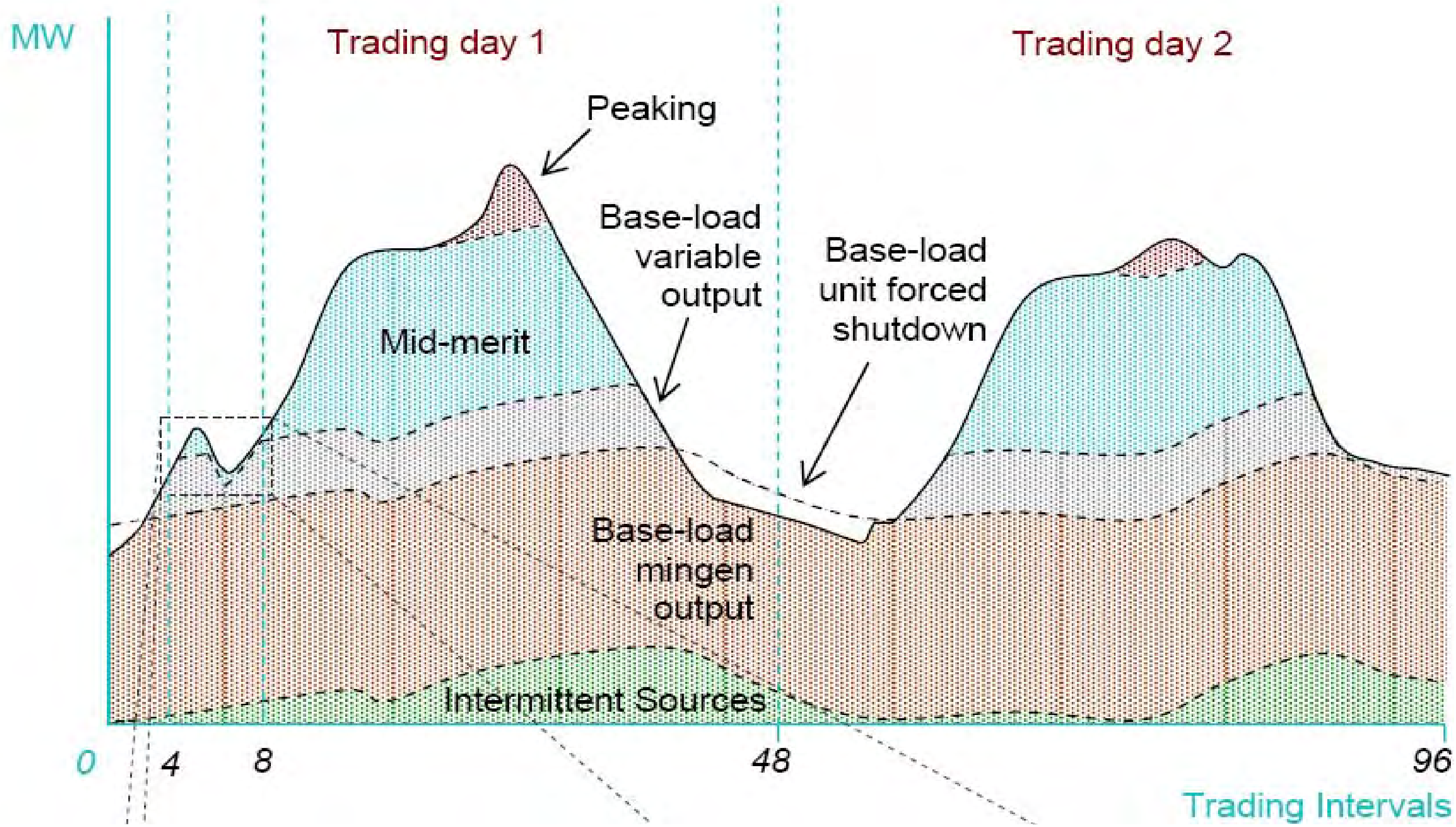
- Avoidable fixed cost is zero when output is zero (eg start-up cost)
- Shutdown cost is opposite to avoidable fixed cost (eg non-zero if plant is shut down)

Identification of costs



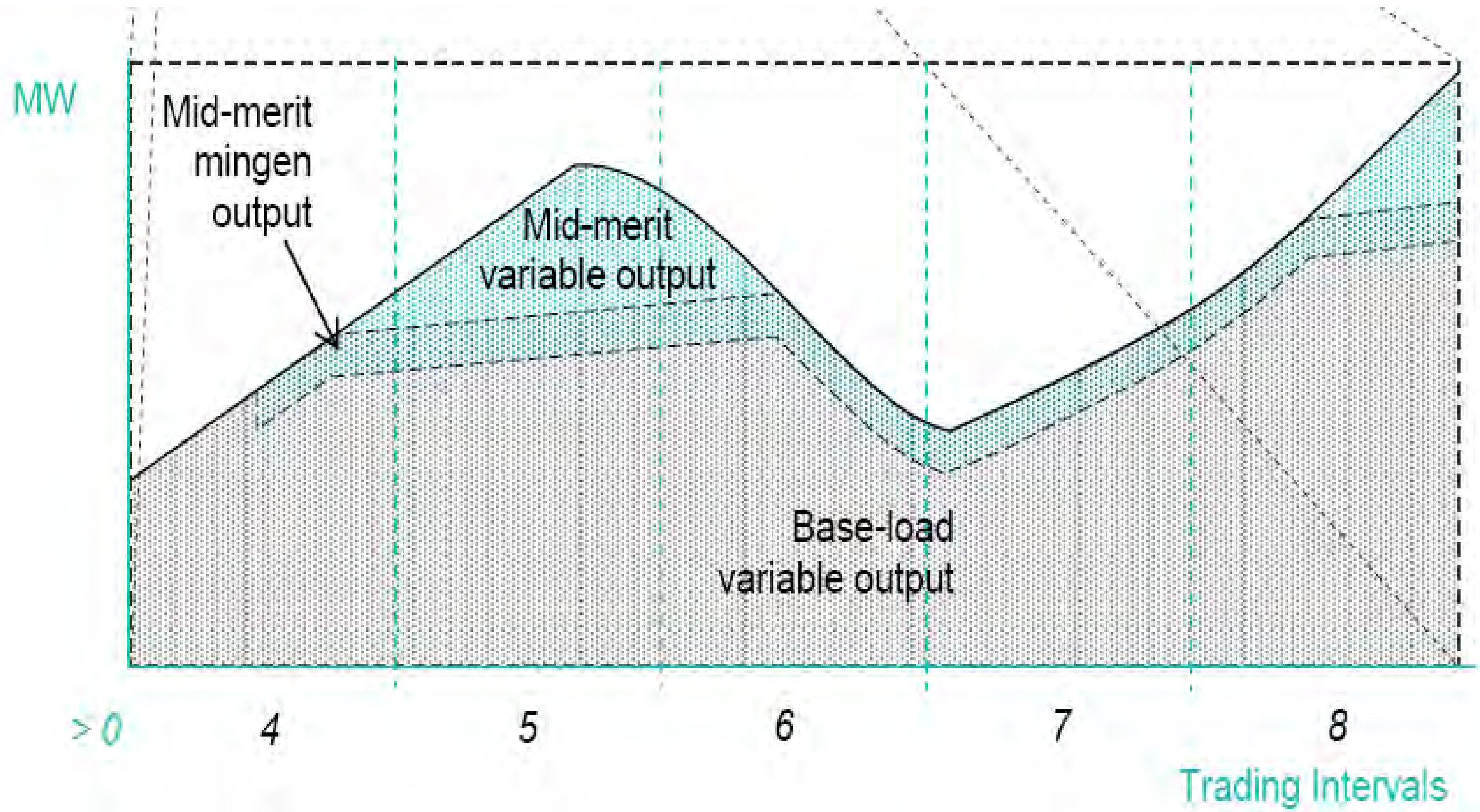
Generation technologies

– Electricity output over 2 trading days



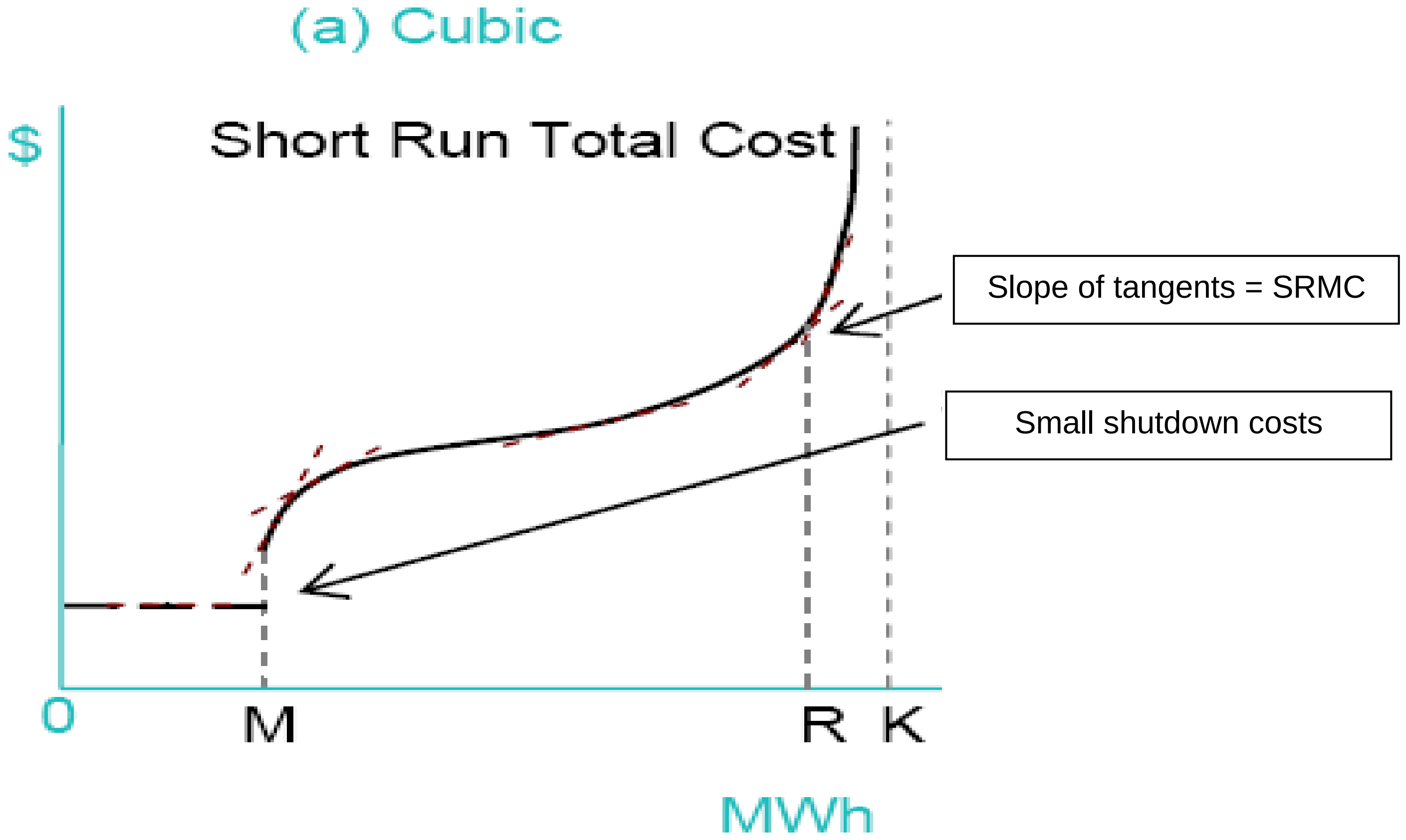
Generation technologies

– Electricity output over 5 trading intervals



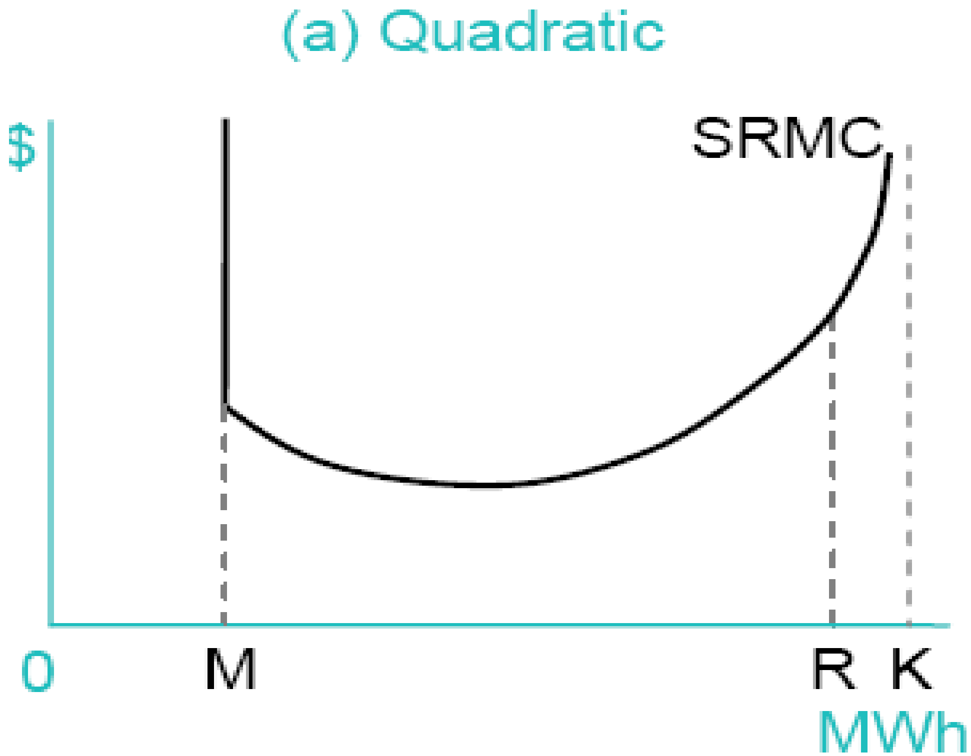
Short Run Total Cost Curve

– Plant with Sunk Start-Up Costs and Small Shutdown Costs

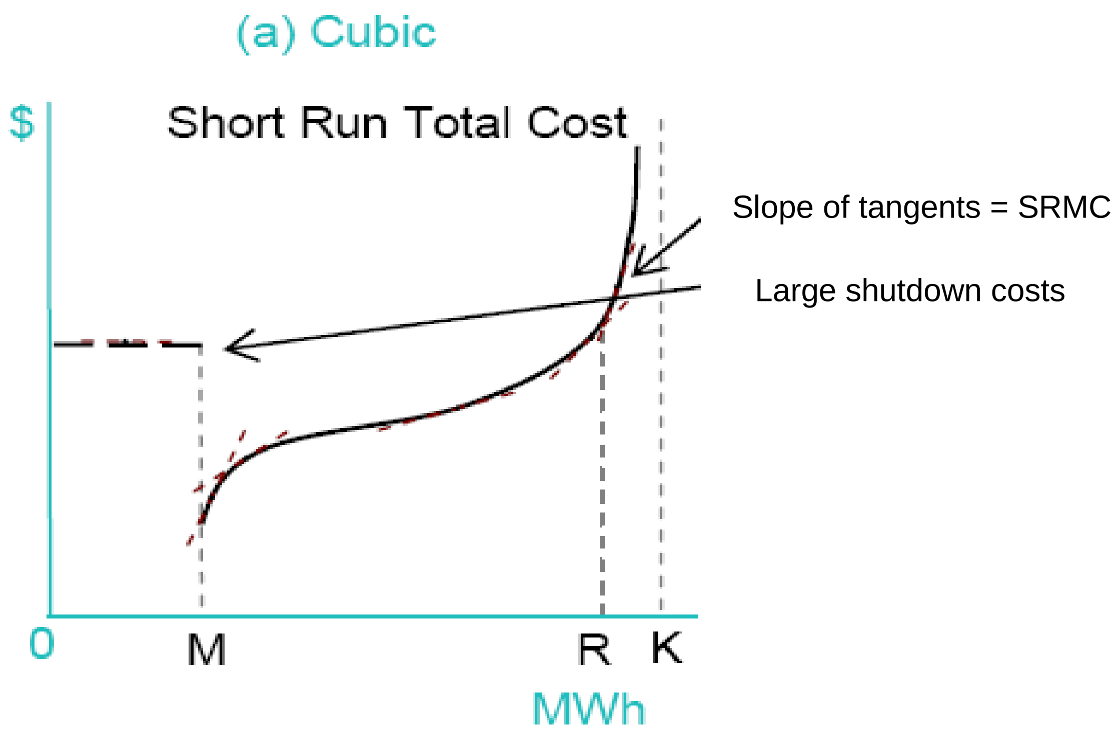


Short Run Marginal Cost Curve

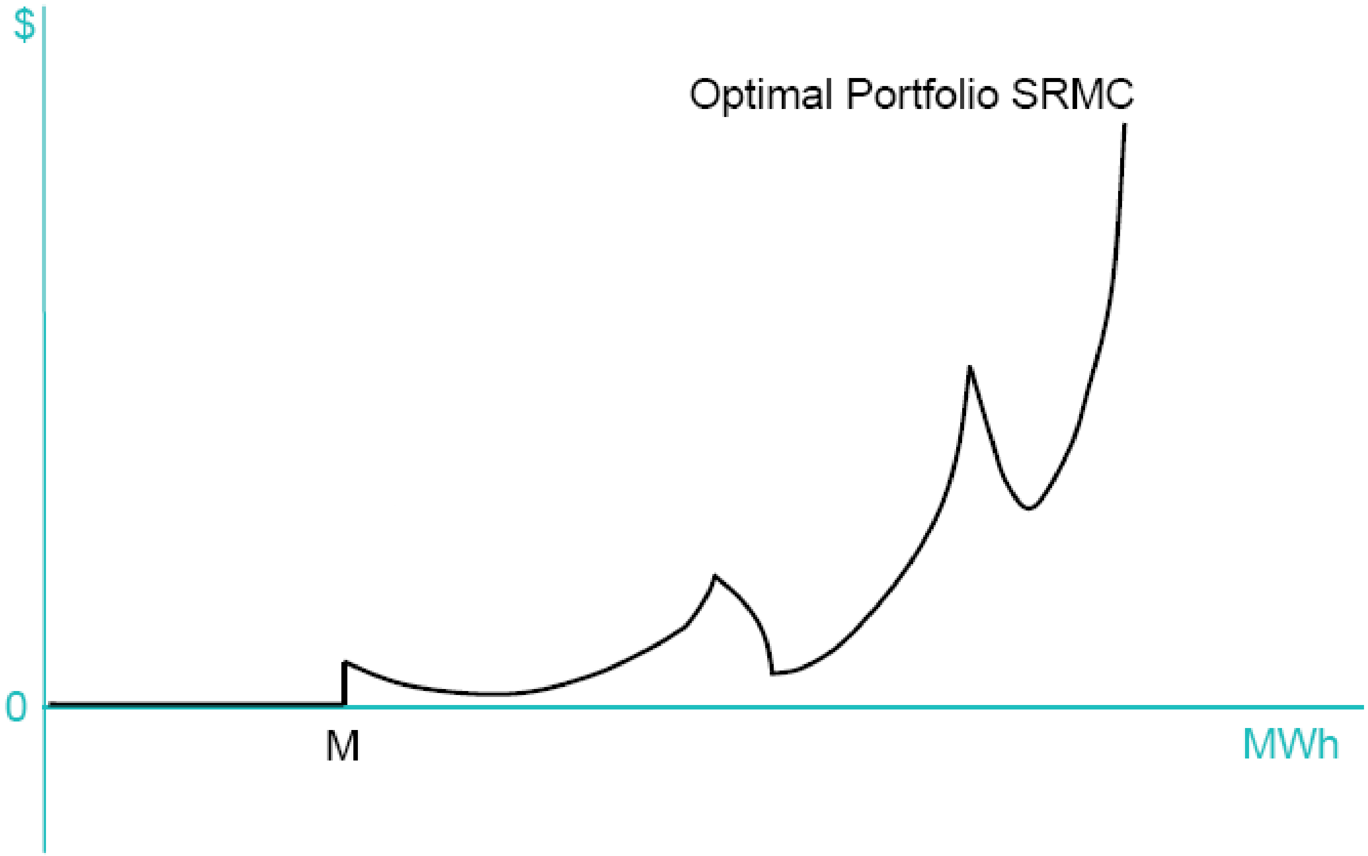
– Plant with Sunk Start-Up Costs and Small Shutdown Costs



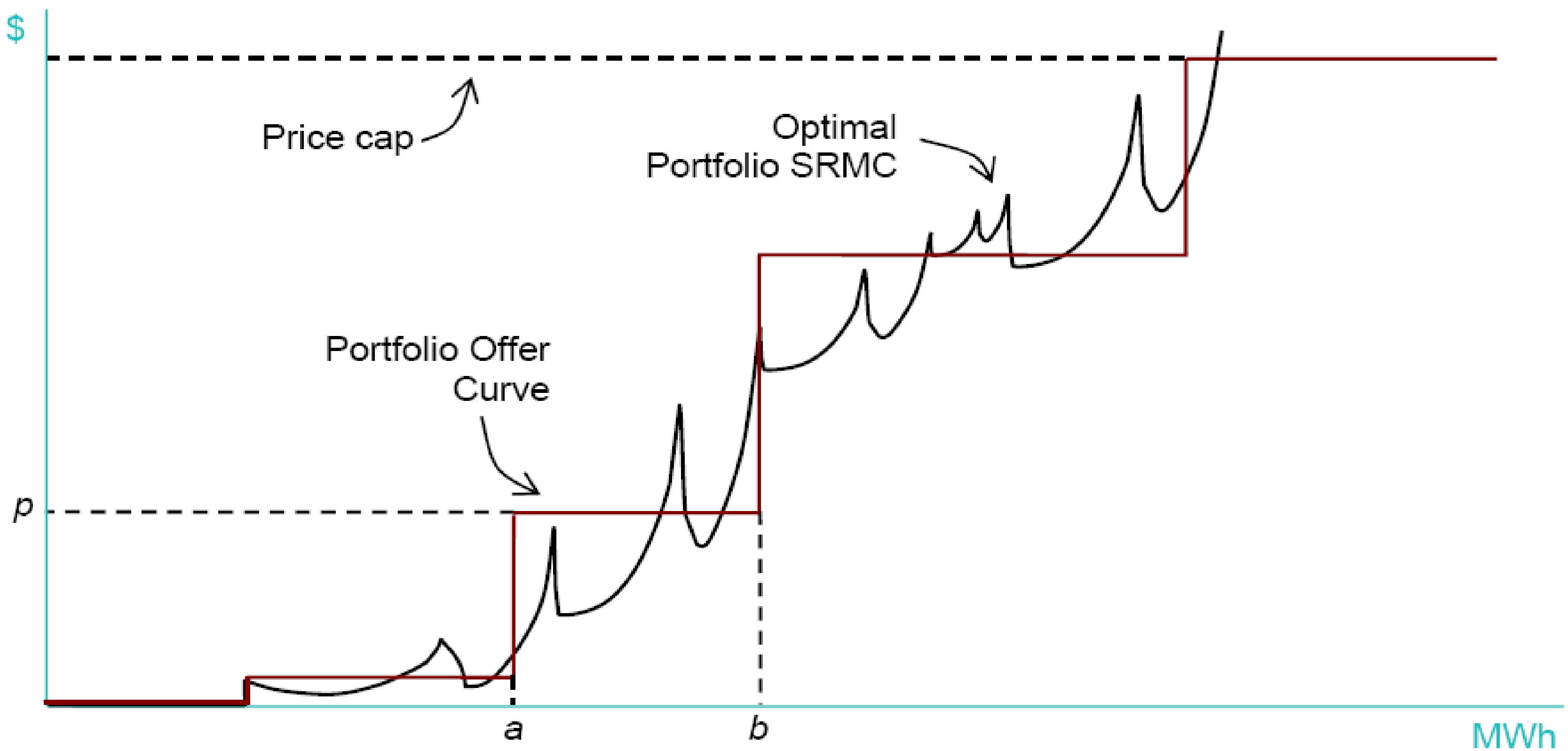
Short Run Total Cost Curve
– Plant with Sunk Start-Up Costs and Large Shutdown Costs



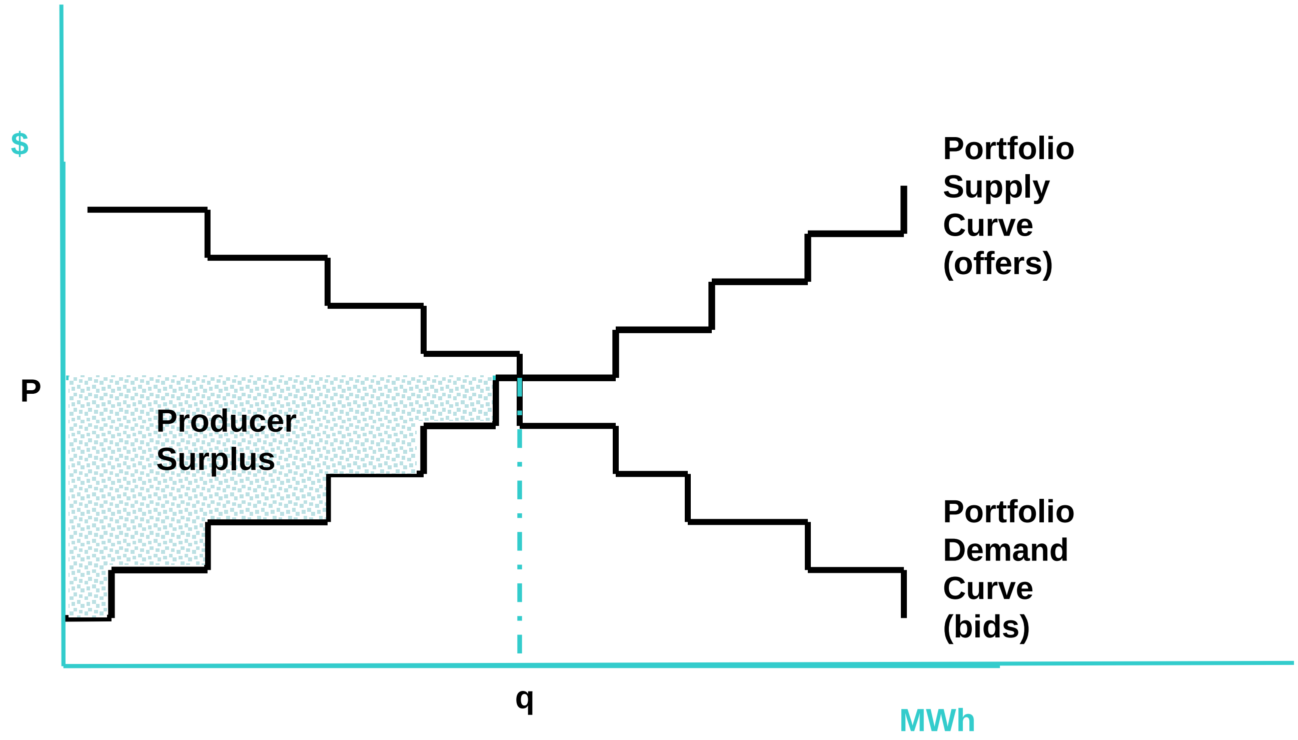
Optimal Portfolio Short Run Marginal Cost Curve



Quantity Band Average Marginal Cost Approach



Supply and Demand Portfolio



Concluding Remarks

- Questions
- Comments

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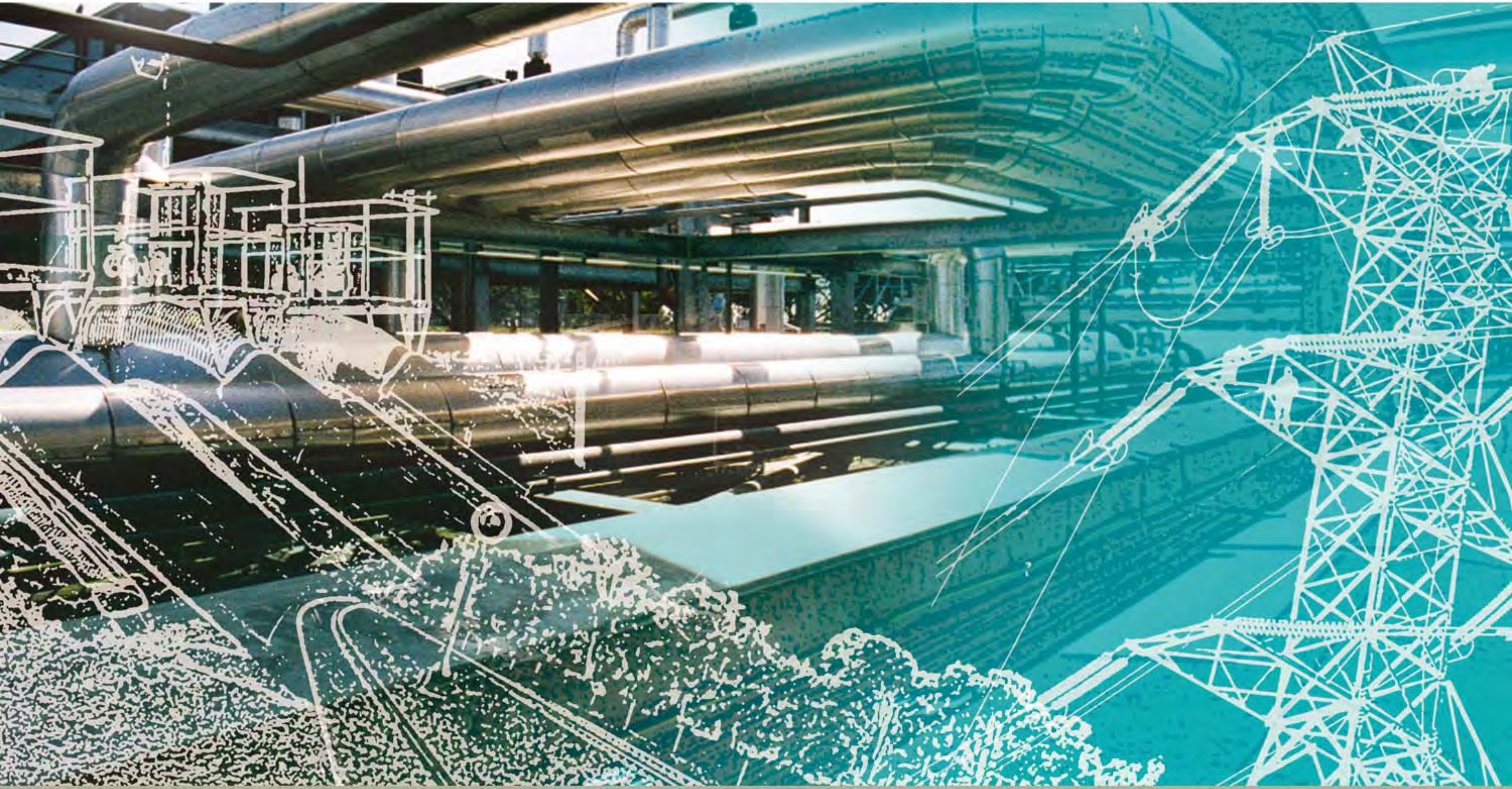

Economic Regulation in Energy

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