



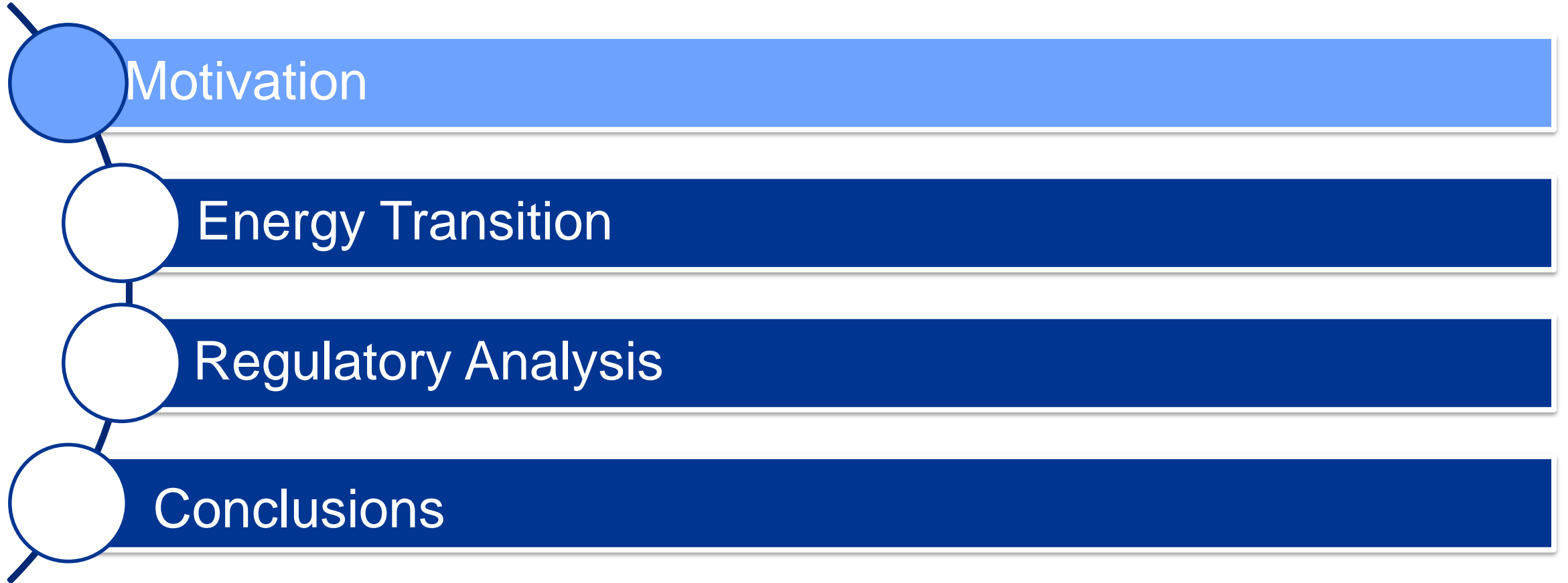
WHEN TRUST MATTERS

Regulatory Instruments in the Context of Energy Transition Economic Properties and Practical Use

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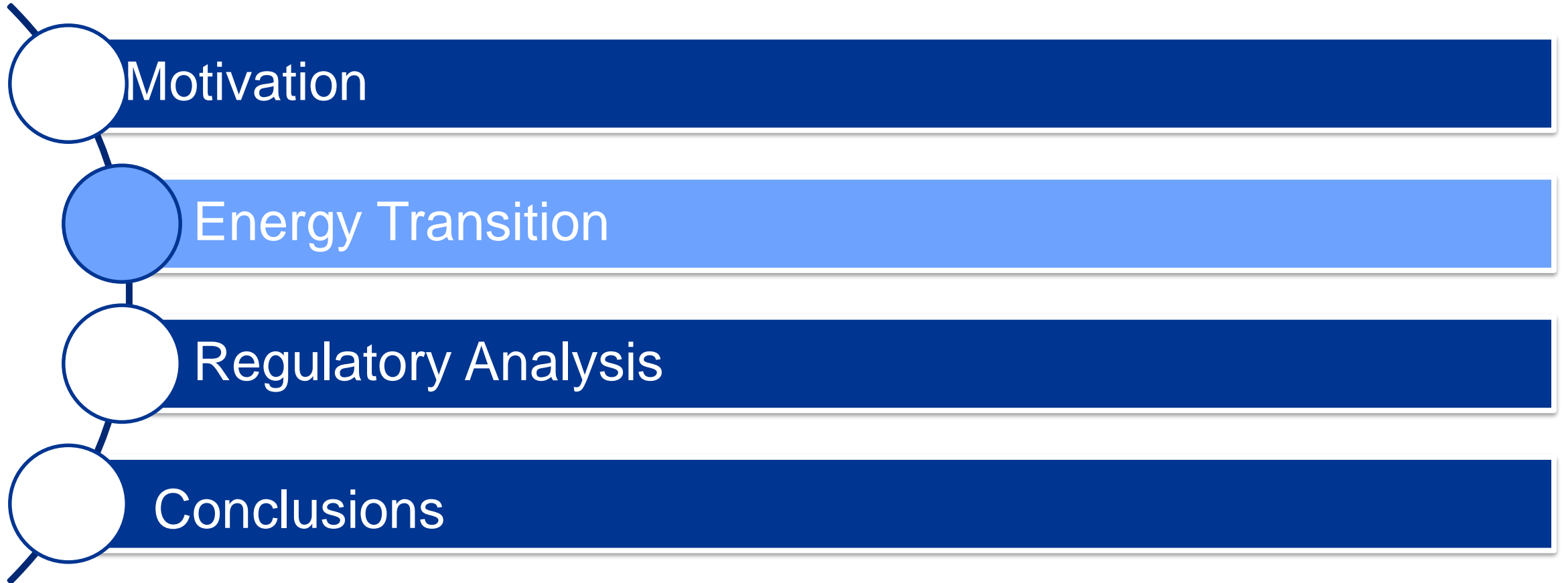
Content



Motivation

- The EU countries are faced with the challenge of the energy transition and carbon neutrality.
- This challenge requires substantial efforts from electricity network operators to accommodate new tasks and responsibilities.
- This has prompted energy regulators to review the way they organise the network regulation.
- The presentation is based on project work for European regulators. Its purpose is to bring insights into the relevance and properties of regulatory instruments used in electricity network regulation.

Content



Energy Transition Characteristics

- Permanent growth of renewable intermittent generation and new types of load (electric vehicles, heat pumps, electrolysis facilities)
- Rapid development of new technologies (storage, demand response, smart applications)
- Bi-directional electricity flows in electricity distribution / flexibility services
- Increasing interconnection on transmission level / market integration



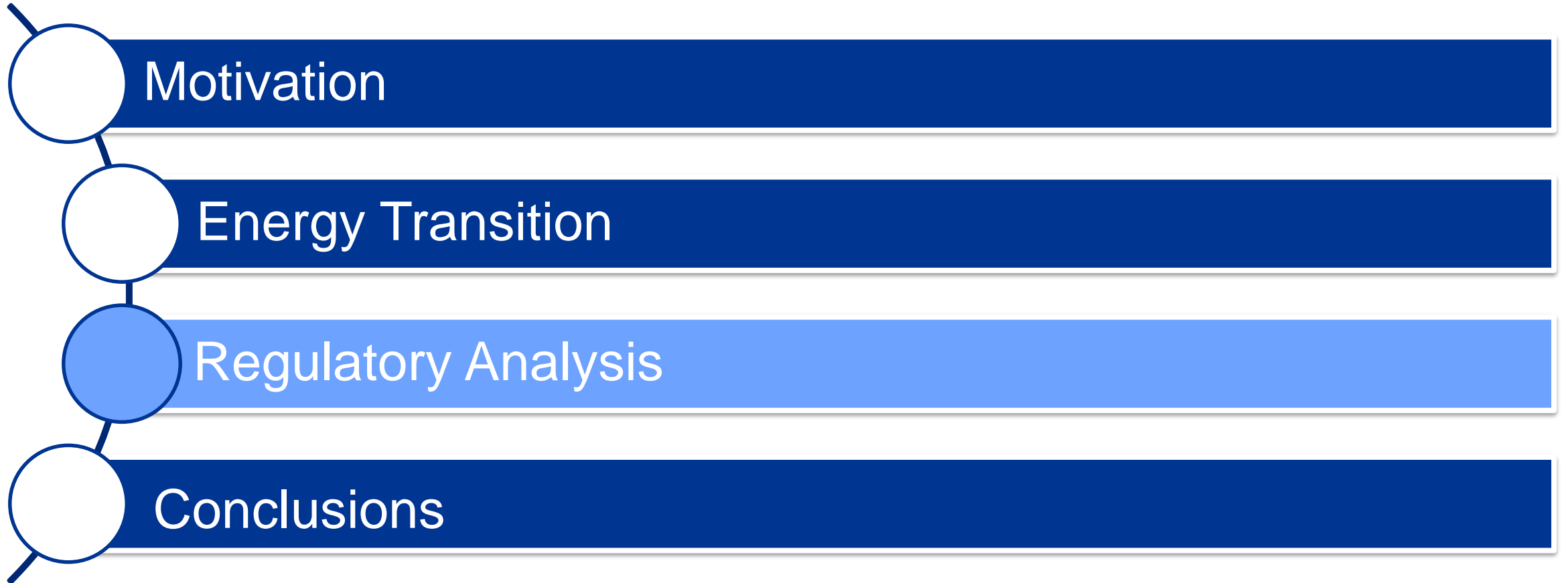
Energy Transition Characteristics

- Large-scale investments in network reinforcement and expansions to integrate generation and load
- New market participants: prosumers, aggregators, storage provides etc
- Increasing complexity of the network tasks and management
- Smart technologies / monitoring and communication



The changing role and tasks of electricity network operators should be reflected in the regulatory arrangements.

Content



Overview of the Regulatory Analysis

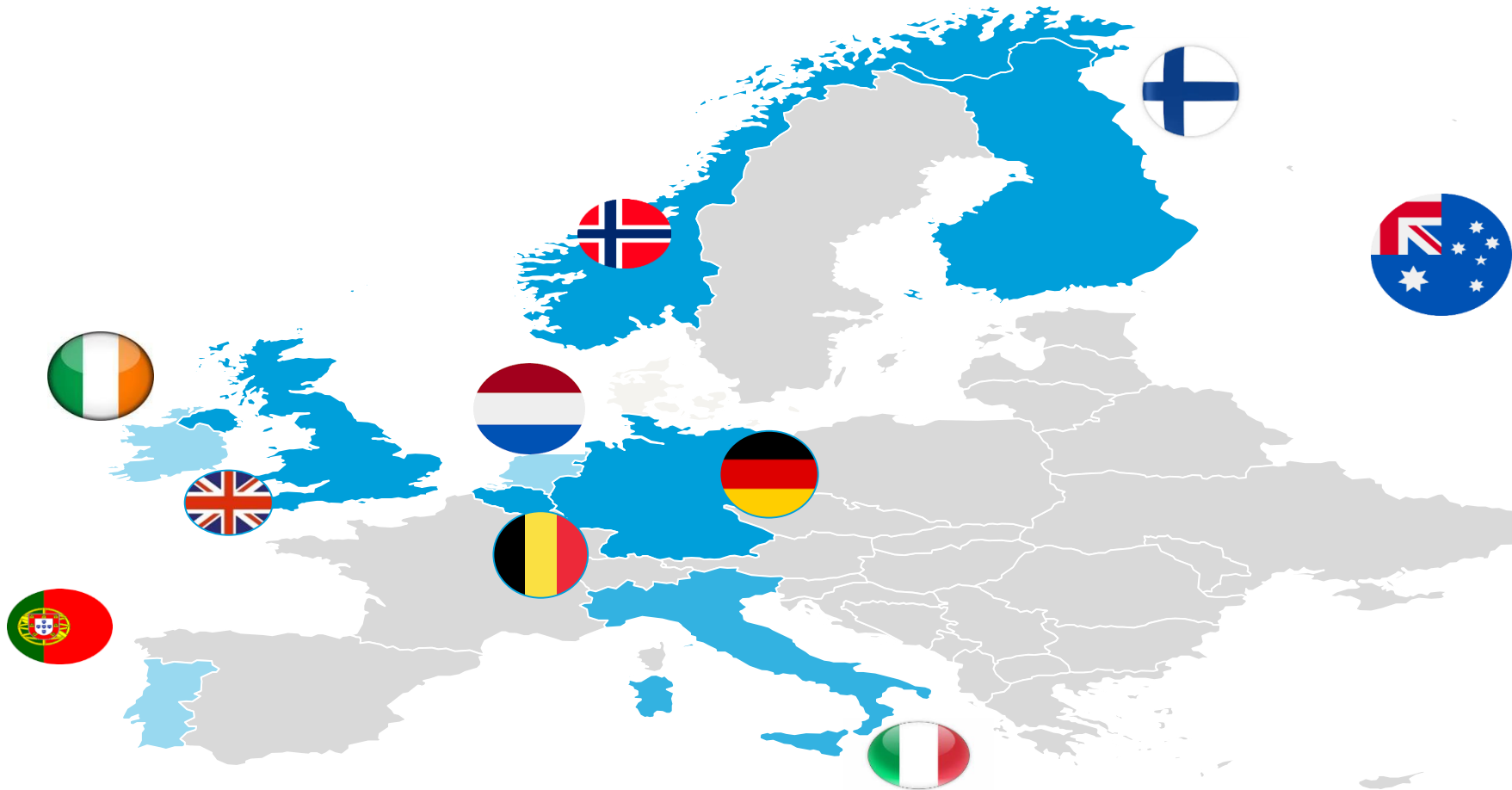
Objectives / Properties

- Identification of regulatory instruments
- Objectives and economic properties
- Practical experience with regulatory instruments
- Effectiveness and lessons learned

Approach

- Normative theory and concepts in regulatory economics
- Review of existing regulatory frameworks in selected jurisdictions
- Review of existing regulatory statistics, activity reports and sector studies
- Review of academic literature / publications on applied regulatory aspects

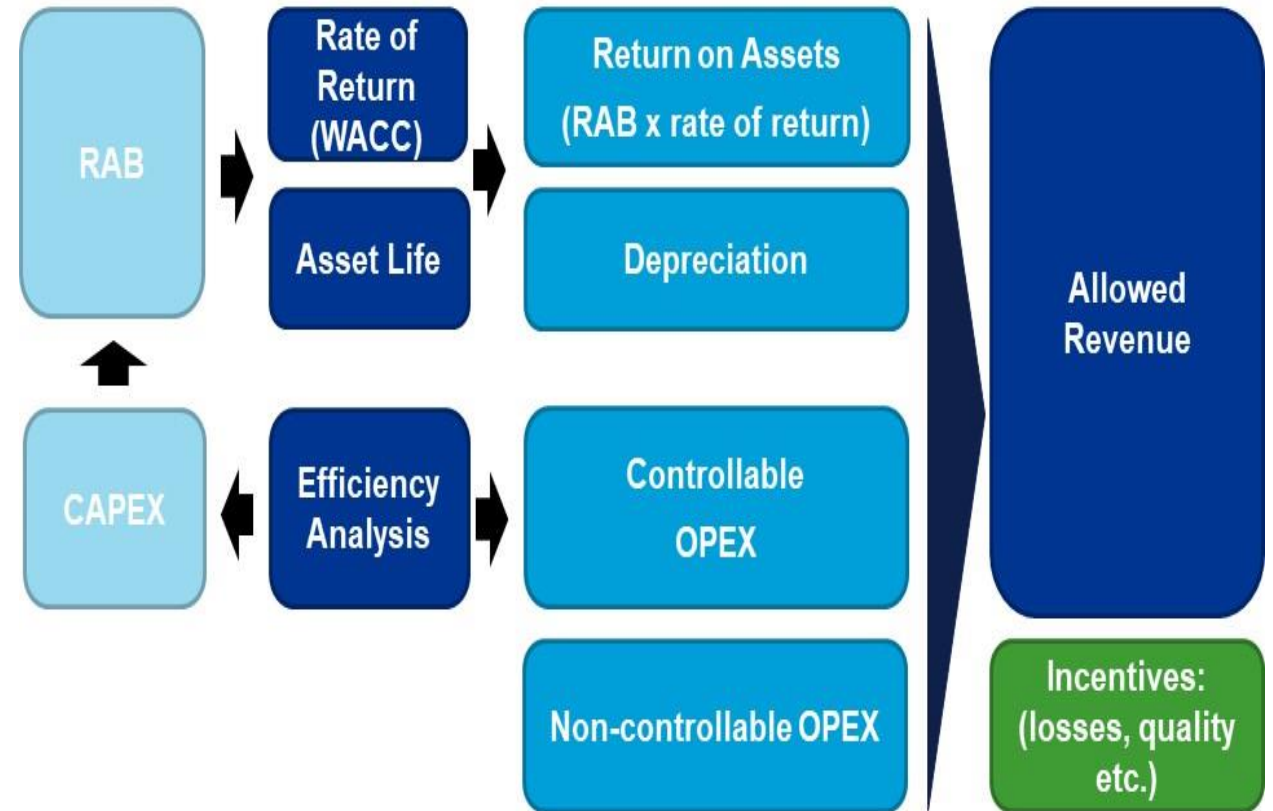
Regulatory Jurisdictions



- Application of elaborated forms of incentive regulation and regulatory reviews
- Substantial regulatory experience and traditions
- Use of explicit arrangements related to energy transition aspects

Revenue Setting Routines

- Incentive regulation based on revenues caps, the regulatory revenue setting follow some general principles.
- The allowed revenues cover the efficient operating costs (OPEX) and capital costs (i.e., depreciation and return on assets).
- OPEX is categorized into controllable and non-controllable OPEX.
- Controllable costs are exposed to efficiency analysis and network operators receive an ex-ante allowance representing the regulatory estimate of the efficient cost level.
- Depending on the regulatory regimes this can be incentives for losses, quality of supply for example.



Regulatory Instruments / Classification

Group	Properties /Objectives
Investment incentives	<ul style="list-style-type: none"> Aim to assess and recognise the capital cost of planned / executed efficient investments In such a way that they create certainty and encourage network operators to plan and deliver the necessary investments.
Efficiency incentives	<ul style="list-style-type: none"> Aim to provide incentives to improve efficiency (reduce costs) through efficiency improvement requirements incorporated in the allowed revenues. Apply retention / sharing mechanisms by splitting the gains and losses of over- or under-achieving regulatory targets between companies and customers according to pre-defined rules.
Innovation incentives	<ul style="list-style-type: none"> Innovation projects are inherently risky and regulatory scrutiny may discourage companies to invest, if they retain the exposure to the downside risks of investment but do not share in the upside benefits. Typical regulatory instruments that aim to encourage innovation include the use of explicit allowance for innovation in the allowed revenue and special funds for innovation.
Coordination incentives	<ul style="list-style-type: none"> The purpose of this incentive is to encourage the companies to act jointly and align their activities in terms of planning, operation and innovation. They also aim to encourage the companies to improve their engagement activities. i.e. how the companies understand and address the needs of stakeholders and how their input is used to improve services.
Uncertainty mechanisms / New tasks	<ul style="list-style-type: none"> There are various sources of uncertainty including inter alia future electricity demand, network capacity needs, new connections of renewable generation, penetration of new technologies, implementation of new requirements etc There are different regulatory mechanisms that NRAs use to manage uncertainties such as revenue adjustment schemes, interim reviews, trigger mechanism, cost-pass through provisions.

Regulatory Instruments / Overview

Investments Incentives

- Capex Reviews
- WACC-Mark Up
- Sharing Mechanisms
- Carry-Over Schemes
- Quality Performance
- Business Plans

Efficiency Incentives

- Efficiency Analysis
- Regulatory Period
- Network Loss Incentives
- Menu Regulation
- End-of-Life Incentives

Innovation Incentives

- Innovation Allowance
- Innovation Funding
- WACC-Mark Up

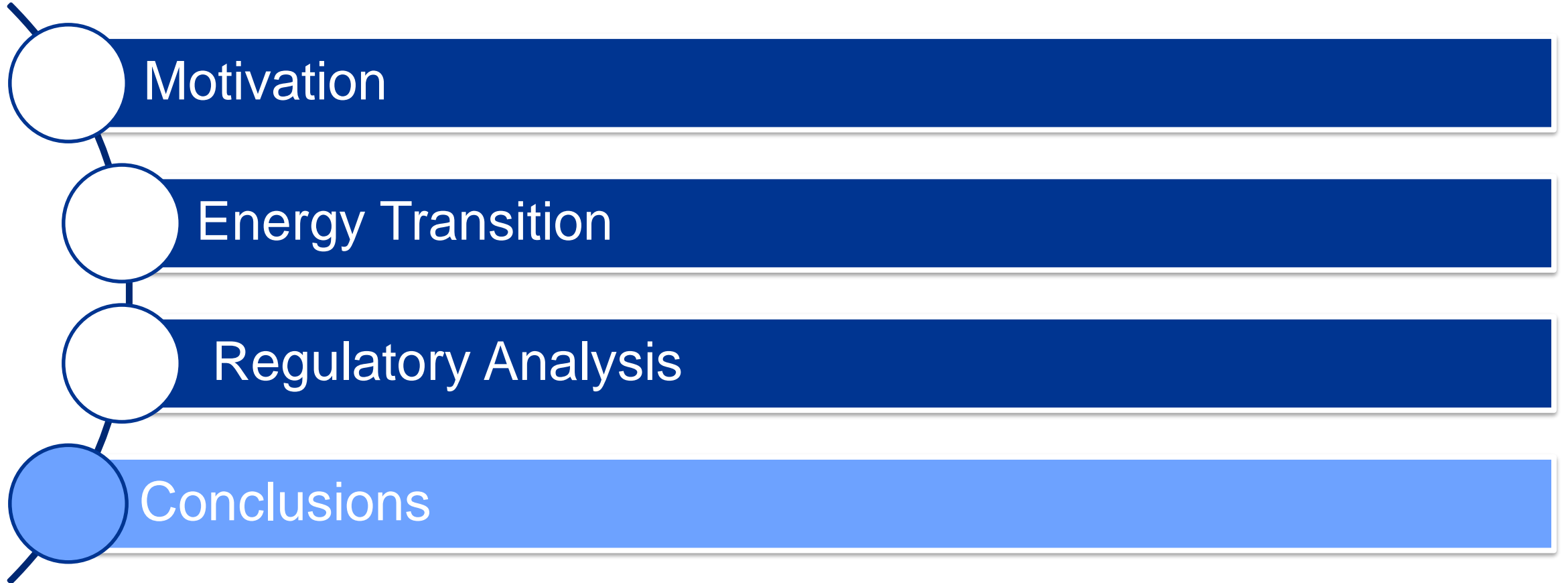
Coordination Incentives

- Stakeholder Engagement
- Data Provision
- Joint Incentives

Uncertainty Mechanisms

- Revenue Adjustment Schemes
- Interim Reviews
- Trigger Mechanisms
- Indexation / Quantity Factors

Outlook



Conclusions

- The NRAs apply a large variety of regulatory instruments with different technical complexity.
- In addition to the classical cost reduction incentives, regulatory frameworks use a series of supplementary incentive schemes related to network loss reduction, quality of supply, achieving environmental objectives and improving coordination.
- There is an increasing focus on the use of forward-looking regulatory arrangements to secure (ex-ante) the integration of the forecasted reasonable costs for the upcoming regulatory period.
- With the rise of decarbonisation as a key policy goal, NRAs have recognised the need to apply explicit schemes to facilitate and encourage innovation in electricity networks.
- Various instruments have been used to account for uncertainties including revenue adjustment schemes, interim reviews, trigger mechanisms and indexation/quantity adjustment factors.

Thank you

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