

# **Grid Integration of Electricity from Renewable Energy Technology**

Experts Meeting

International Energy Agency, Paris, 29 May

## **Bridging technological feasibility and policy practicality**

Goran Strbac and Charlotte Ramsay

**DTI Centre for Distributed Generation and  
Sustainable Electrical Energy**

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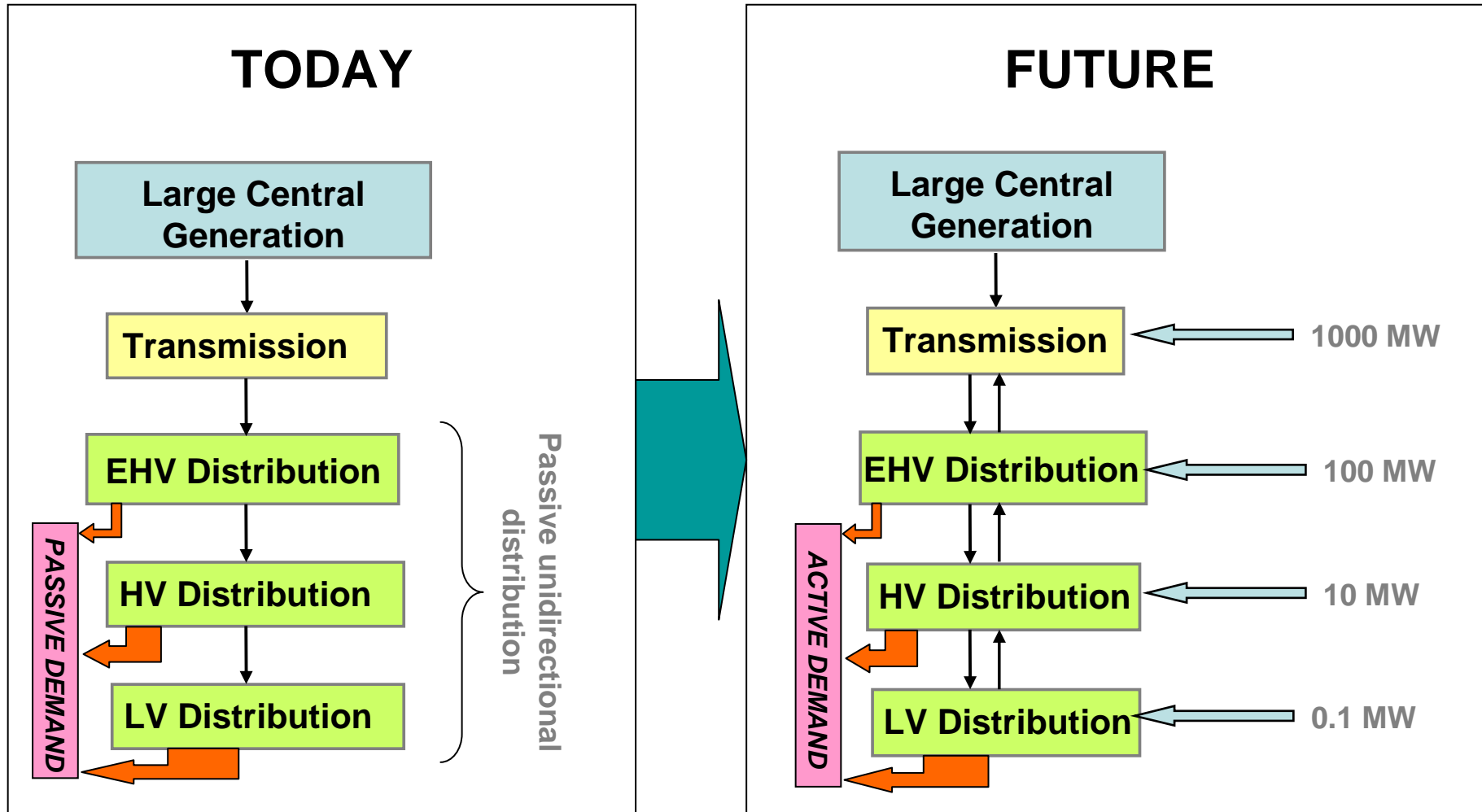
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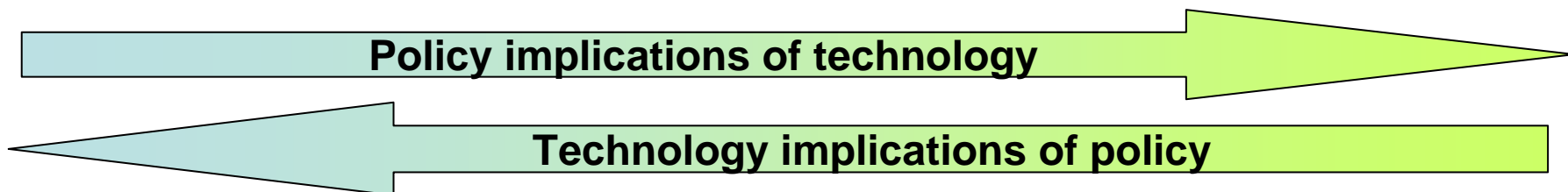


# Electricity system in transition

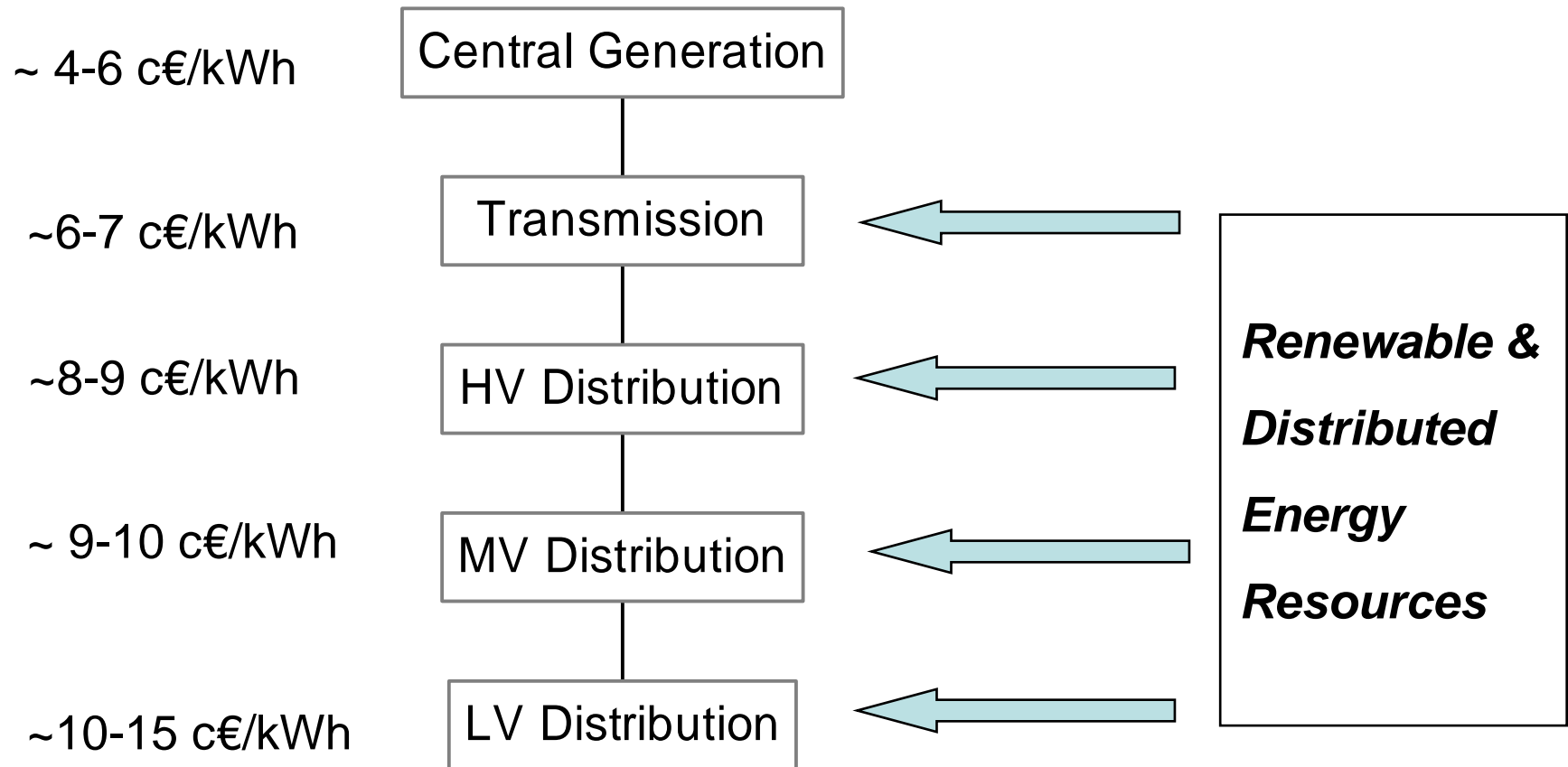


# Whole systems approach to operation and development of future electricity system

System technical performance	System economic performance	Commercial & Regulatory Framework	Policy Framework
<i>Grid codes</i>	<i>Efficiency</i>	<i>Access</i>	<i>Policy</i>
<i>Stability</i>	<i>Network design</i>	<i>Pricing</i>	<i>Incentives</i>
<i>Reliability</i>	<i>Investment</i>	<i>Investment</i>	
<i>Integrity</i>	<i>Costs and benefits</i>		
<i>New technology</i>	<i>of new technologies</i>		

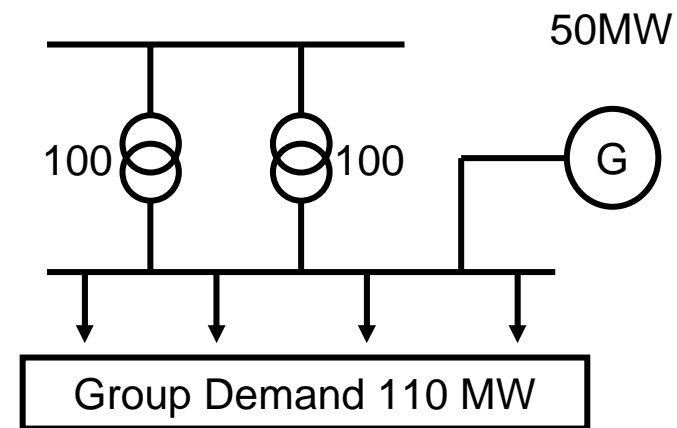
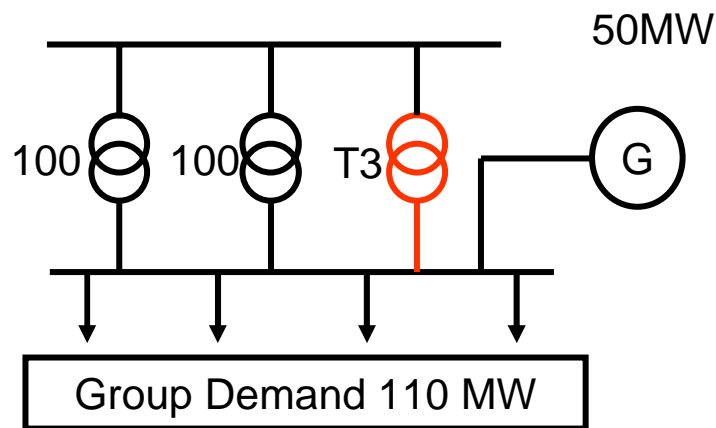


# UK focus: commercial integration



# Solving Network Problems with DG

- Past: generator contribution ignored
- Present: generator contribution recognised

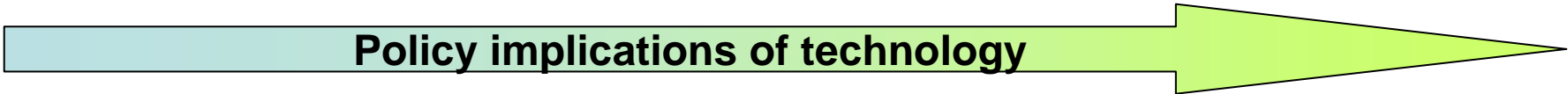


Policy implications of technology

# Investment, access and pricing of transmission in systems with significant penetration of wind

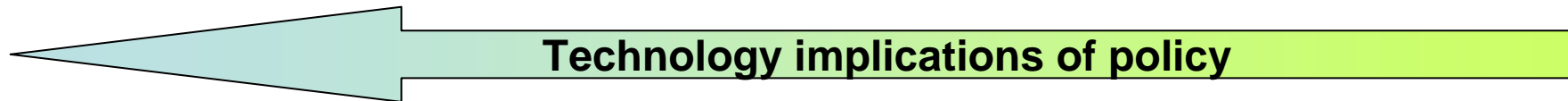
- 16 GW of wind applications in Scotland (demand in England)
  - Transmission capacity between Scotland and England of 2.5 GW, Installed generation capacity in Scotland of 8.5 GW, supplies peak load of 6.5 GW peak.
- Wind energy drives less investment than conventional generation
- Wind and conventional generation to share capacity
- Access and pricing arrangements to be developed

**Policy implications of technology**



# Innovation in regulation

- Innovation funding initiative
  - Technology innovation to transform network operation philosophy
- Registered Power Zones
  - Demonstration of innovation in system integration of DG
- DG connection incentive scheme
  - Revenue incentive for (innovative) DG connection



# Observations

- To bridge technological feasibility & policy practicality:
  - Identify & characterise relevant technologies and innovations
  - Quantification of impacts and value of technology and new solutions
  - Identification of drivers for impact/value
- Commercial and regulatory frameworks to meet overarching policy goals (efficient operation, economic development & environmental sustainability):
  - Develop current arrangements to create cost reflective frameworks for new technology and to support a changing philosophy of operation (technology → policy)
  - Stimulate and promote innovation and encourage penetration of new technology (policy → technology)

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