

The International Conference on Energy Efficiency in Cities 2016

Panel 2A: Planning and Integration of Energy Considerations

Stephen Cook
17 February 2016

Seattle Public Library



Mexico City Airport

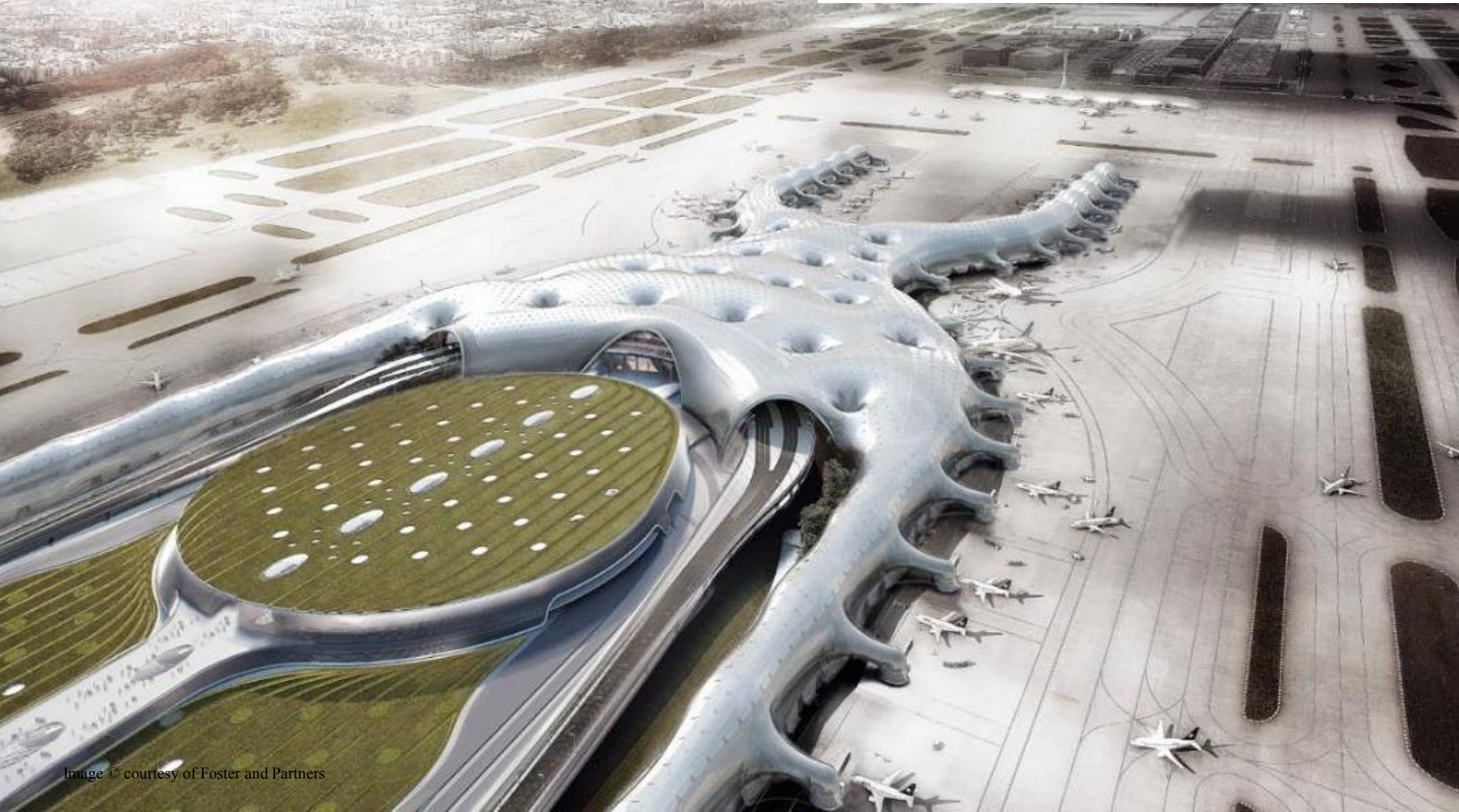


Image © courtesy of Foster and Partners

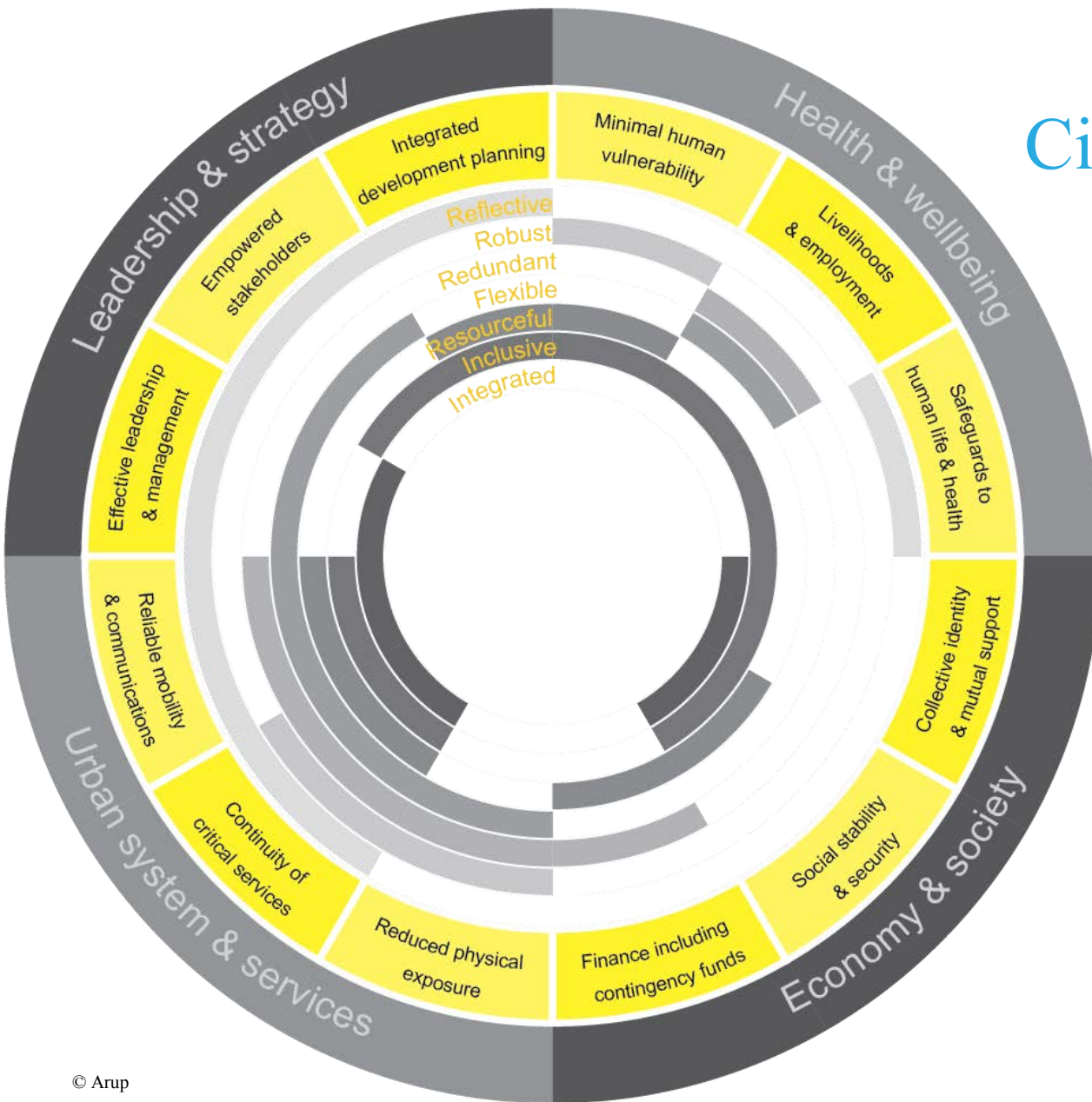
Los Angeles Airport Central Utilities Plant



© Arup

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City Resilience Index



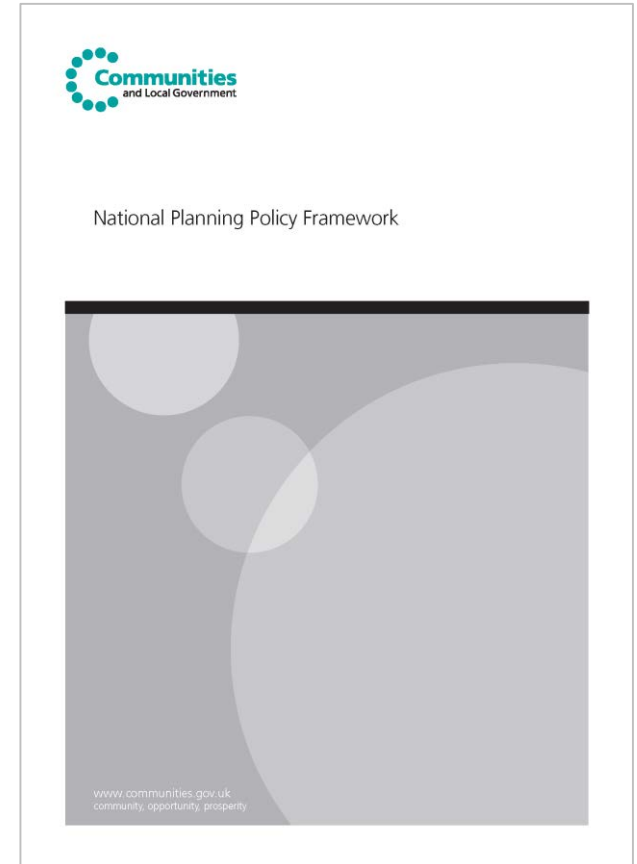
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Integration of energy in planning

National scale: UK Government guidance to city governments

Local planning authorities should:

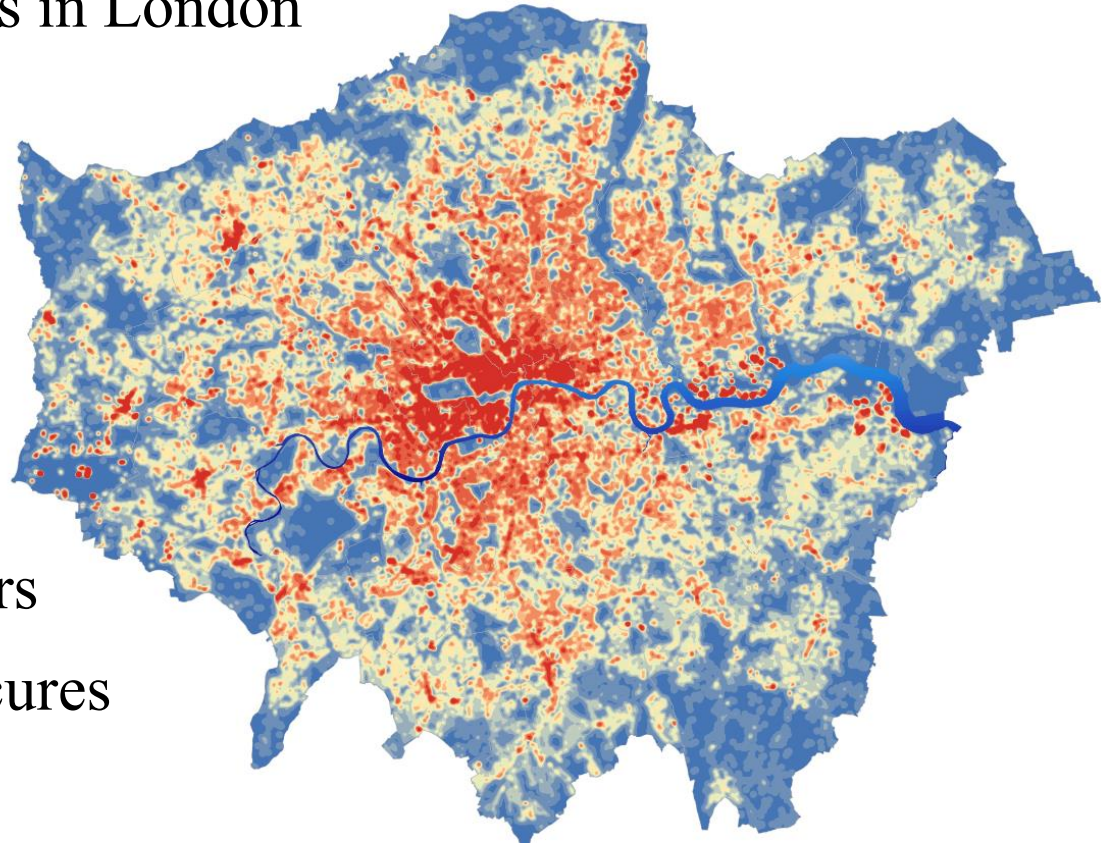
- **Plan for new development** in locations and ways which reduce greenhouse gas emissions
- **Actively support energy efficiency** improvements to existing buildings
- Be consistent with the **Government's zero carbon buildings policy** and adopt nationally described standards
- Identify **suitable areas for renewable and low carbon energy** sources, and supporting infrastructure



UK Government, National Planning Policy Framework, 2012

Regional Scale: London's Decentralised Energy Programme

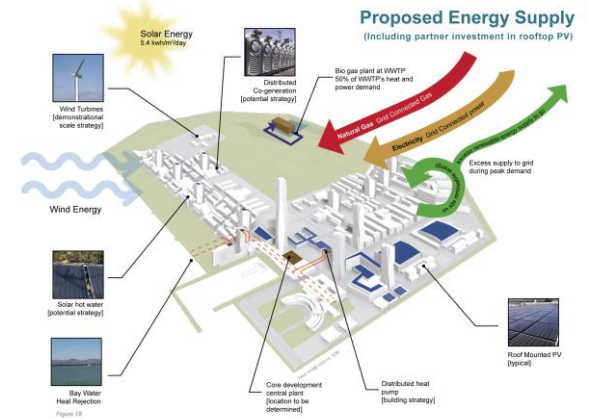
- Mayoral strategy committing to develop energy resources in London
- Local planning policies set targets for new developments
- Mayor funds technical studies
- Training and support provided to local planners
- Delivery programme secures investment in projects
- 10 year process



Greater London Authority, London Heat Map

Project scale: Treasure Island Masterplan, San Francisco

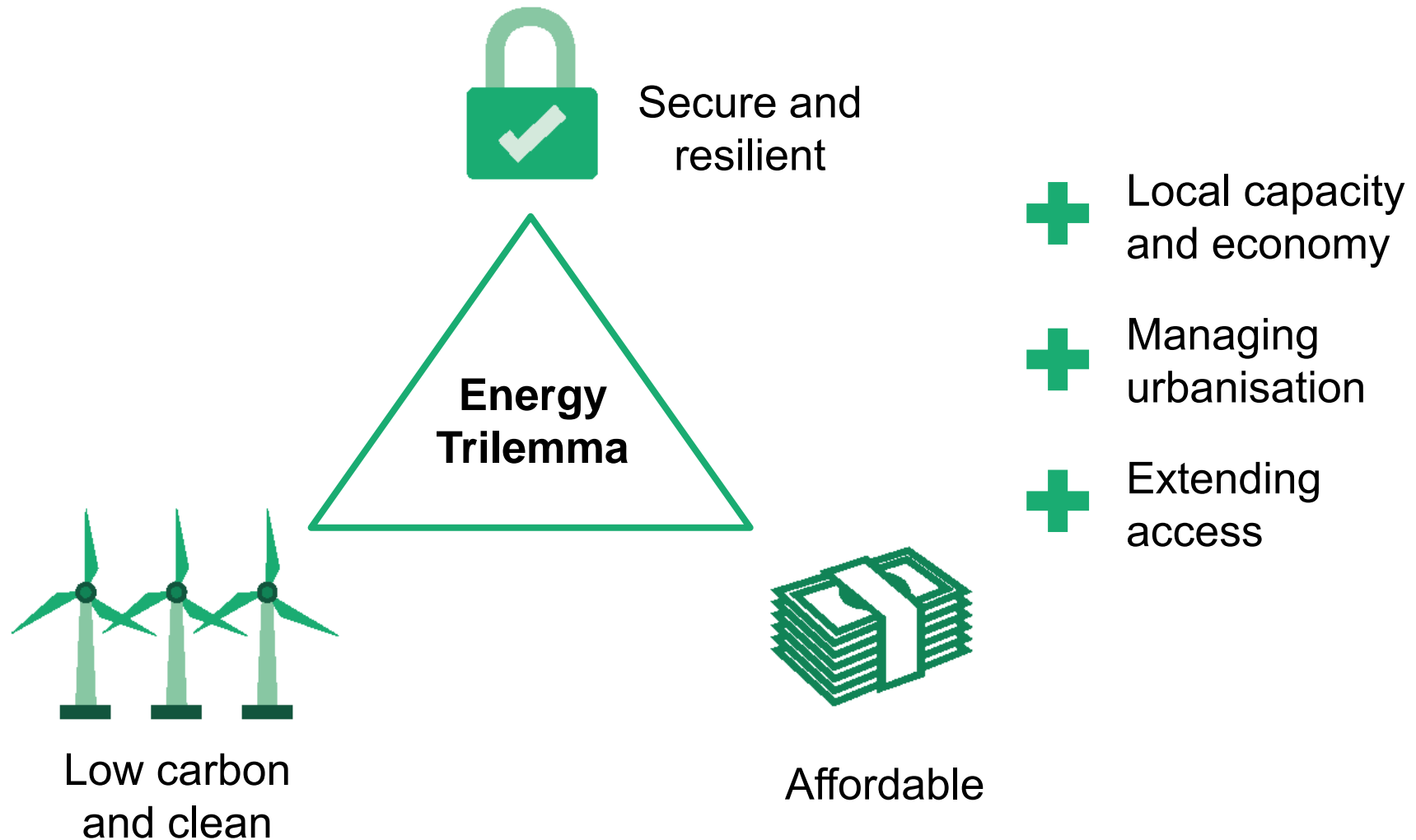
- Integrated strategy – layout, design, energy, transport, water, open space
- 50% from renewables
- KPIs to ensure delivery of commitments



Images © Courtesy of Skidmore Owings Merrill LLP

Drivers of action on energy

Multiple drivers, balanced in a political context



Heat network in London



© Arup

Heat network extension options

Option A: Technical-commercial optimisation


• Residents connected to network	1,300
• Return on investment	6%
• Annual CO ₂ emissions savings	850 tonnes


Option B: Social-political optimisation

• Residents connected to network	1,400
• Return on investment	5%
• Annual CO ₂ emissions savings	700 tonnes

Difference

8% 

17% 

18% 

Enablers

Leadership

Knowledge and evidence

Technology

Governance and roles

Leadership



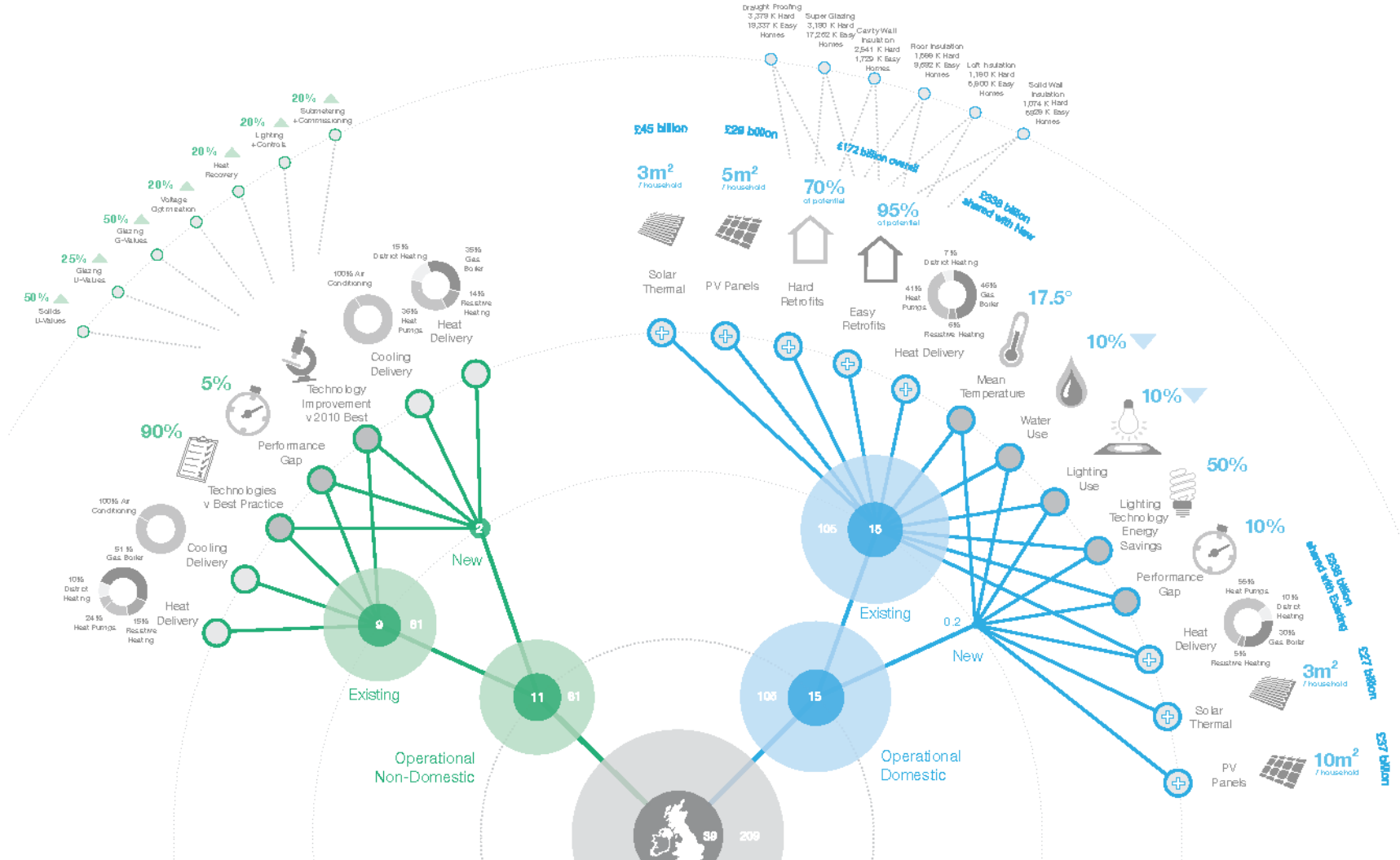
New Orleans Mayor Mitchell J. Landriau

“Leadership is a key ingredient in encouraging individuals and communities to take action during challenging times.”

Arup’s City Resilience Framework, 2014

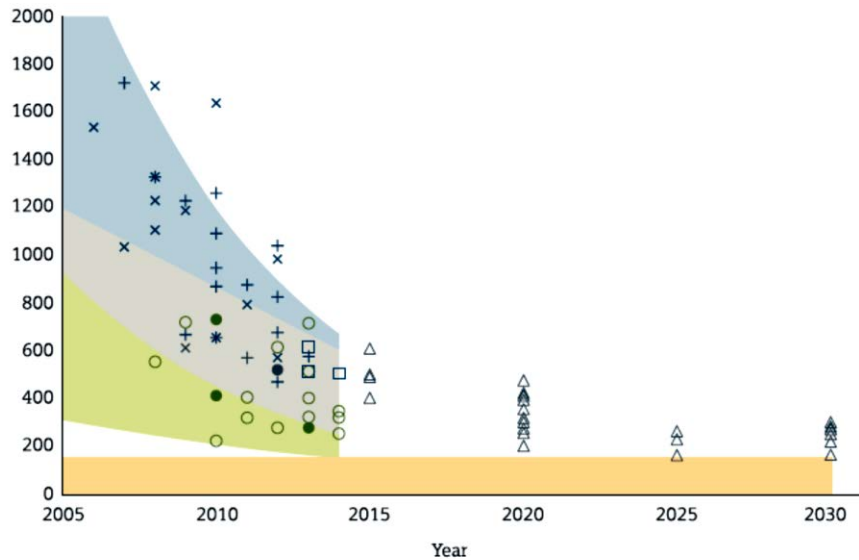
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Evidence-based planning

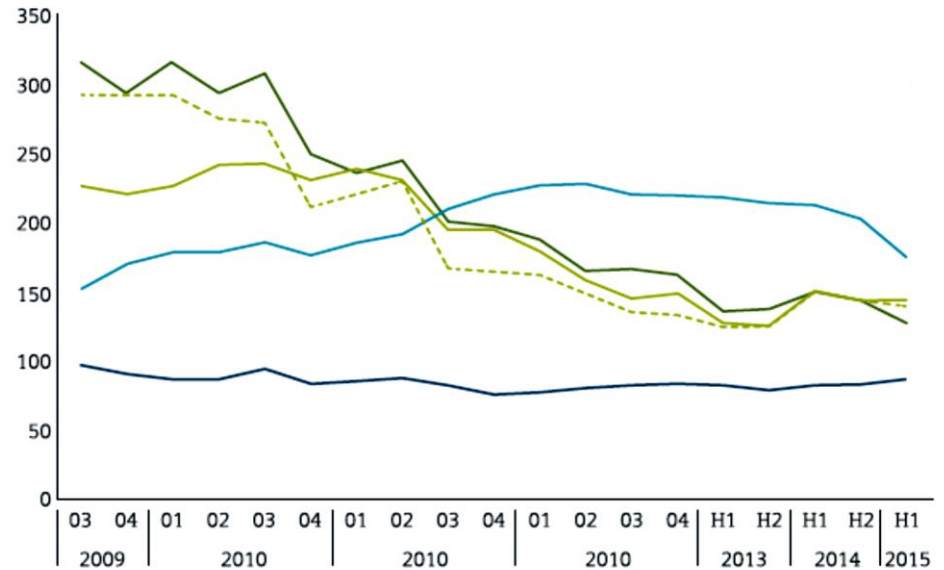


Arup's Zero carbon route map for the built environment, for the Green Construction Board

Technology costs are falling



Cost of Li-ion batteries for electric vehicles



Wind and solar levelised cost per kWh

Images from Arup and Siemens' forthcoming report on Distributed Energy Systems.

Sources: (L) Björn Nykvist and Måns Nilsson, 2015. (R) FS-UNEP Collaborating Centre for Climate Change & Sustainable Energy Finance, 2015

Monitoring, communications and control

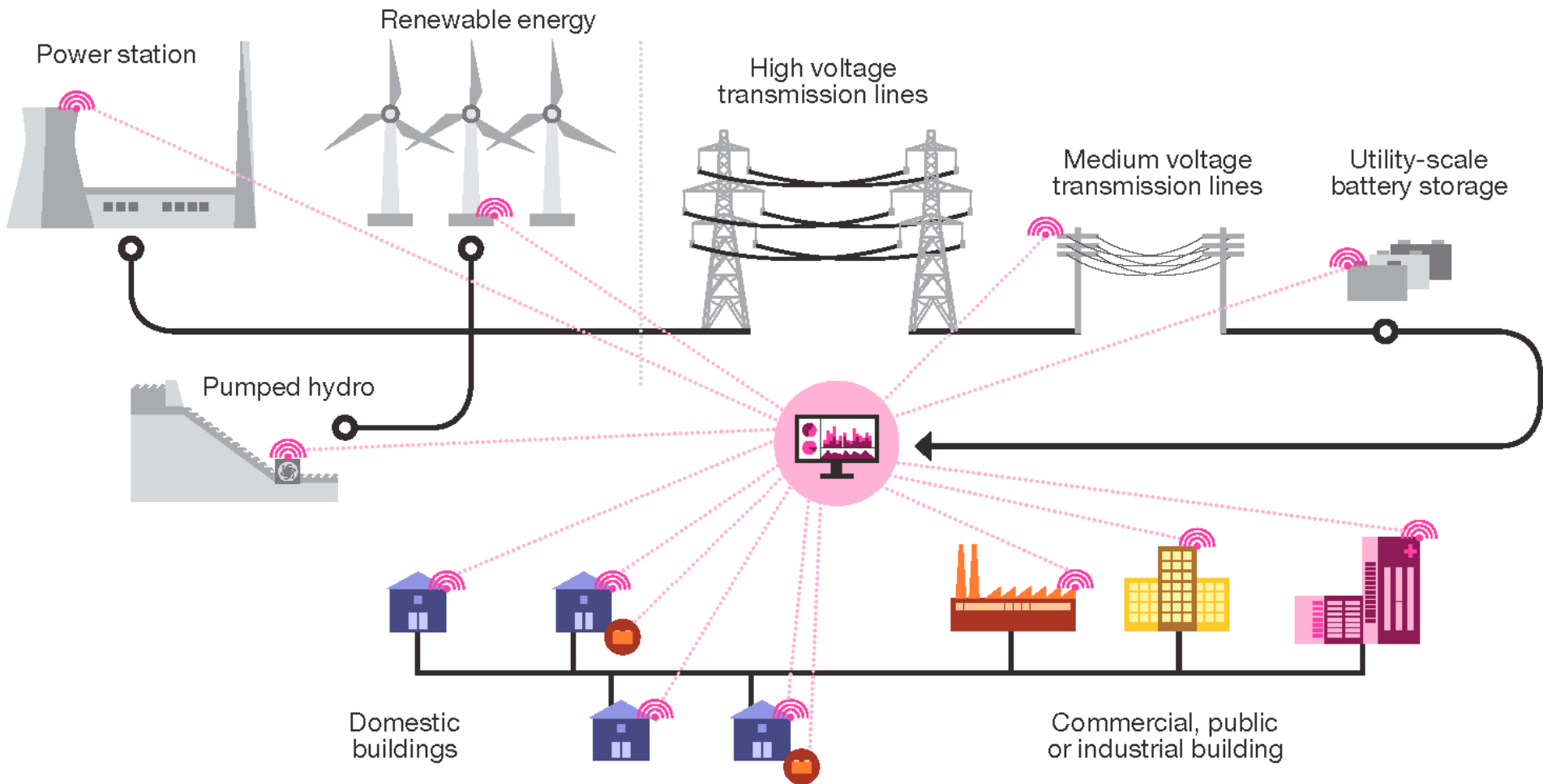
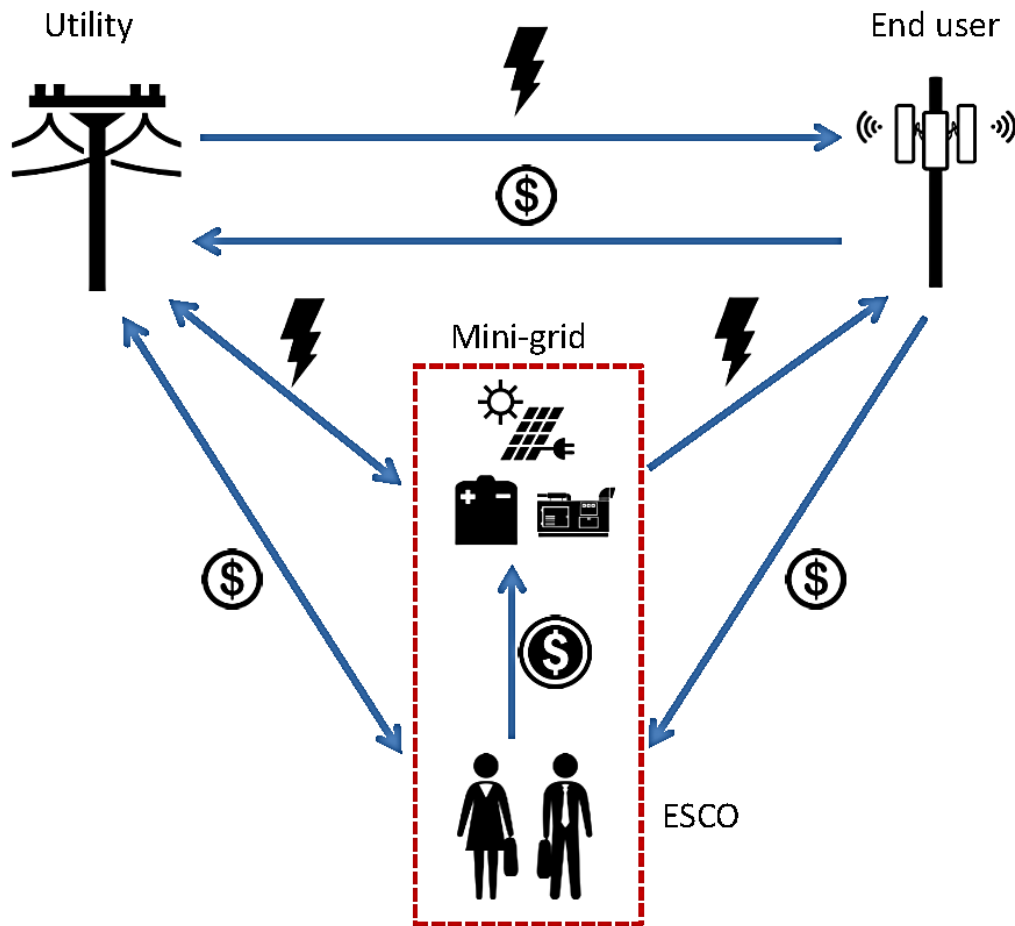


Image from Arup's Five Minute Guide: Energy in Cities

New governance models for new energy solutions



- Who will own?
- Who will fund?
- Who will regulate?
- Who will operate?
- How will risks be allocated?

Image from Vivid Economics and Arup, "Opportunities to enhance electricity network efficiency," report for UK Department for International Development, 2015

Recap: Energy planning in cities

Integration

- National
- City
- Project

Drivers

- Secure and resilient
- Clean and low carbon
- Affordable
- Grow local capacity and economy
- Manage urbanisation
- Extend access

Enablers

- Leadership
- Knowledge and evidence
- Technology
- Governance and roles

Thank you

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