



The Challenges of Scotland's Rural Economy

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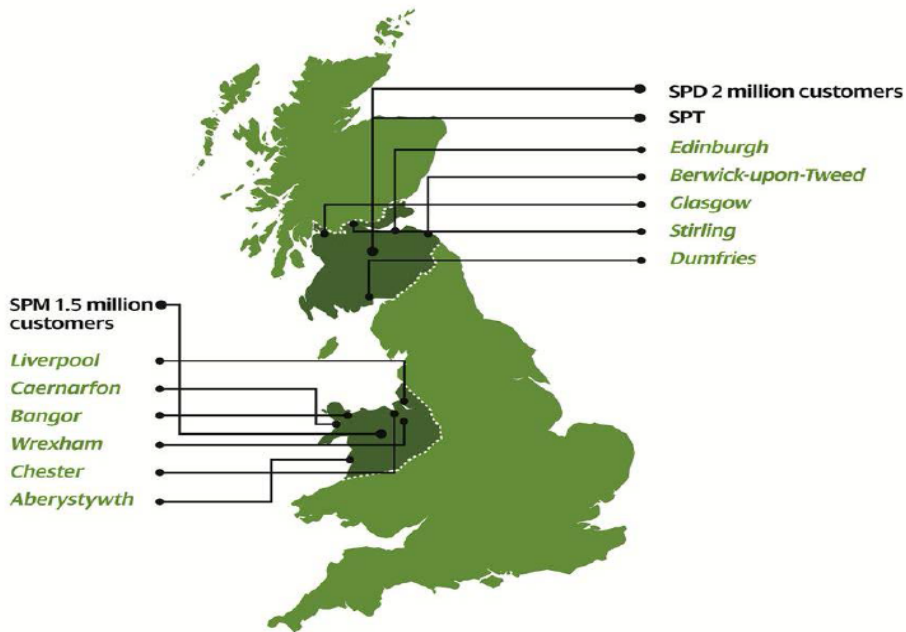


SP Energy Networks (SPEN)

Distribution

(Scotland, England & Wales)

- 3.5million connected customers
- 16% of annual electricity bill
- 30% UK's distributed renewable generation but only 14% customers



The only network operator to cover Scotland, England and Wales

Transmission

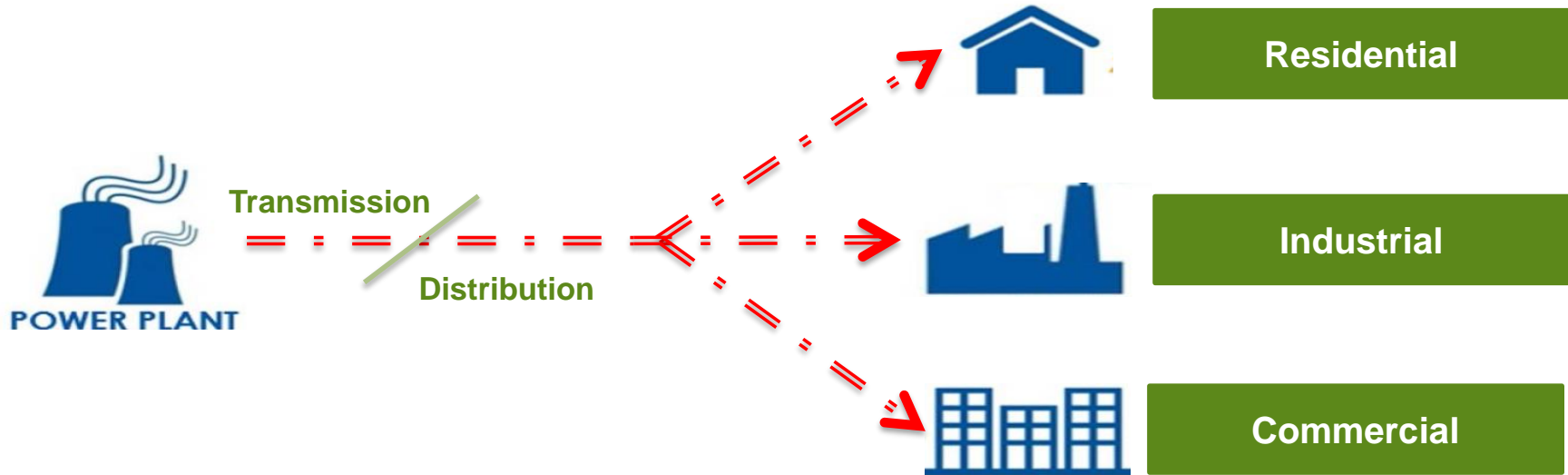
(Scotland only)

- 4% of annual electricity bill
- 56% of Scotland's transmission connected renewable generation
- Gateway South for all of Scotland's renewable generation

Low Carbon Transition - A Changing Customer Experience

Traditional

- One-Way Passive Power System



Low Carbon Transition - A Changing Customer Experience

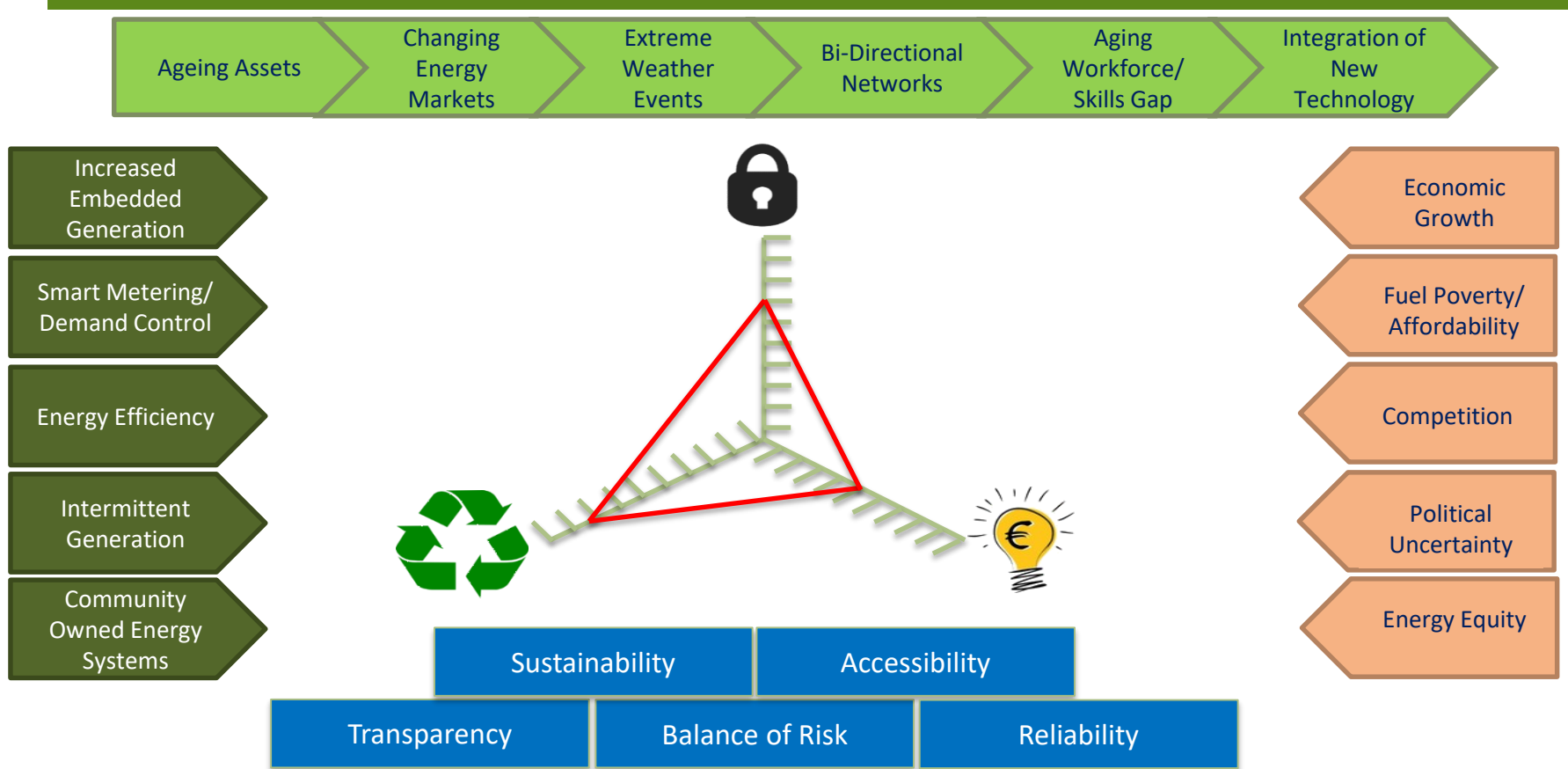
Current Energy System

- Active, Dynamic Network & Real-time Control

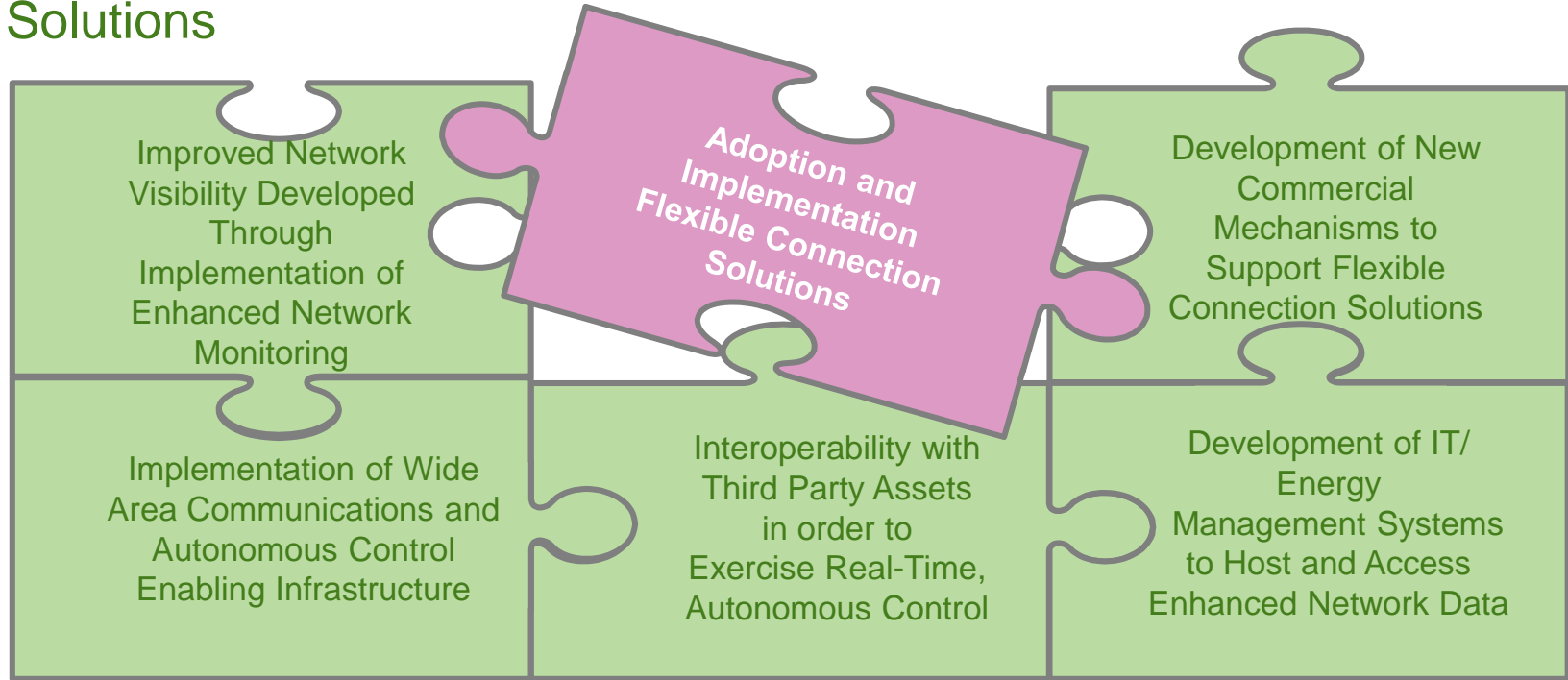


- Wide range of technical, commercial, environmental and regulatory changes that are transforming the traditional utility model for energy provision

Network Operation – The Current Challenge



- A whole system approach is required to implement Flexible Connection Solutions



Conclusions

- Integration of low carbon technologies require network operators to deploy new innovative solutions to balance supply and demand
- Network operators must consider new tools to balance variable energy technologies that include; Storage, Demand Side Response, Active Network Management, Virtual Private Wire
- Demand side response will both empower customers and provide greater economic opportunity by ensuring continued growth of renewable penetration
- Majority of energy generation will occur at distribution voltage levels, therefore there needs to be greater visibility and control of those assets
- There must be a transition to fully-functional Distribution System Operators which balance and control local grids
- Those seeking to connect new Low Carbon Technologies need to engage early with local network operator – Alternative Connection Solutions will be available

Thank You