

Multi-scale modelling of integrated energy supply systems in Great Britain

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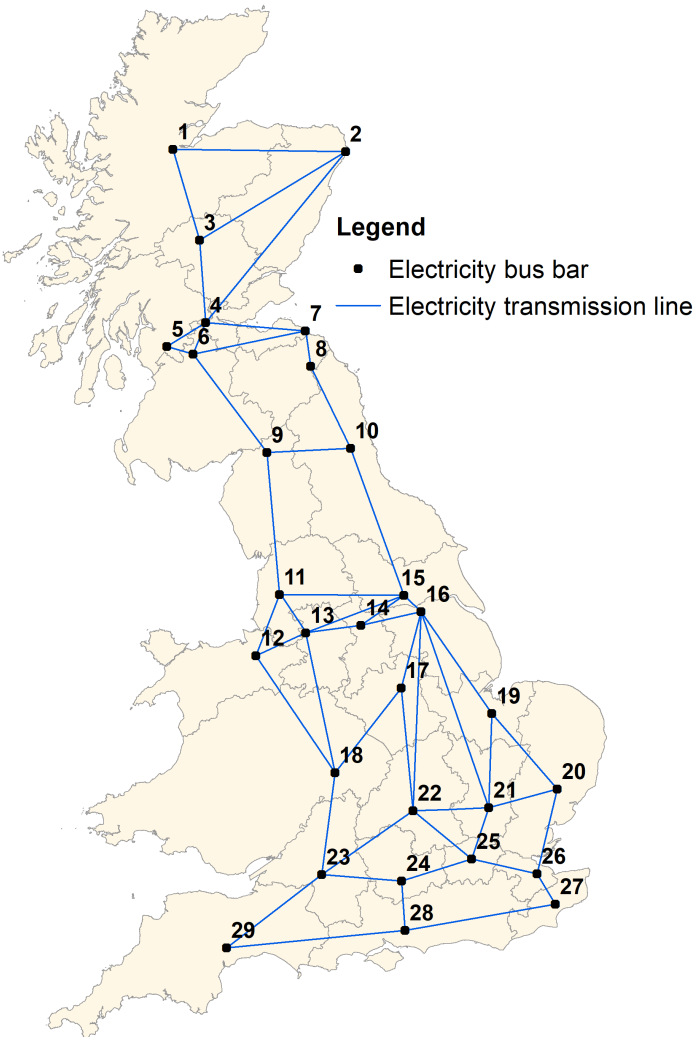
Model Summary

- Energy supply systems are undergoing enormous change to deliver against all aspects of the "trilemma" - cost, security of supply and decarbonisation.
- The modelling approach adopted offers analytics across the entire energy supply chain - supply, generation, transmission, distribution and end use.
- The model is able to perform 'what if' analyses of future energy supply system scenarios across multiple energy vectors.
- The model is capable of exploring cost effective ways to meet energy demands subject to detailed technical constraints of the system.

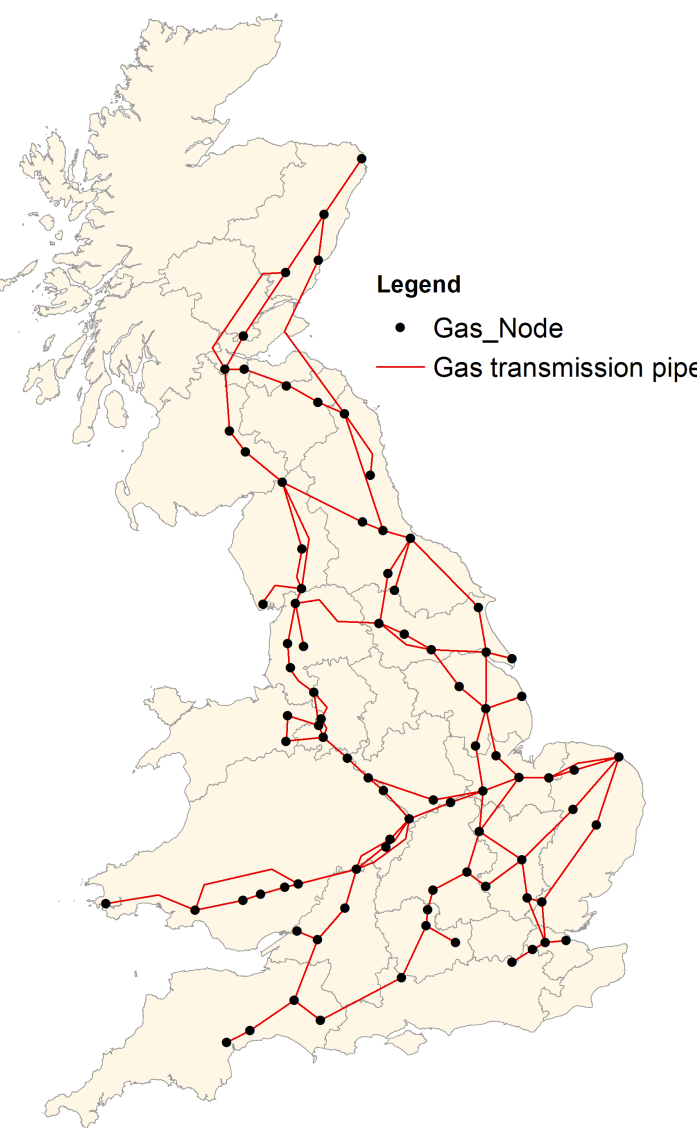
Model inputs

- Energy Demands
- Technology data: Capacity & efficiency
- Cost data: Fuel prices, generation and emission costs
- Weather data: wind speed & solar irradiation
- Scenarios and policies
- Infrastructure dependencies with other sectors

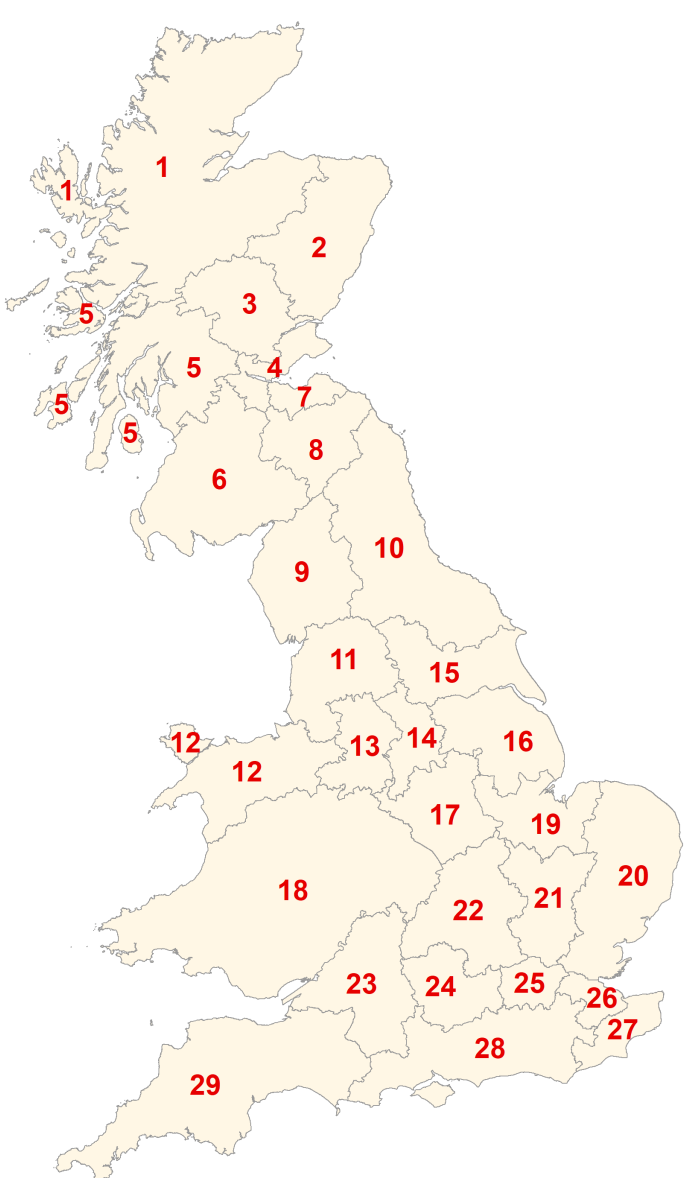
Representative networks and boundary data



Electricity transmission network

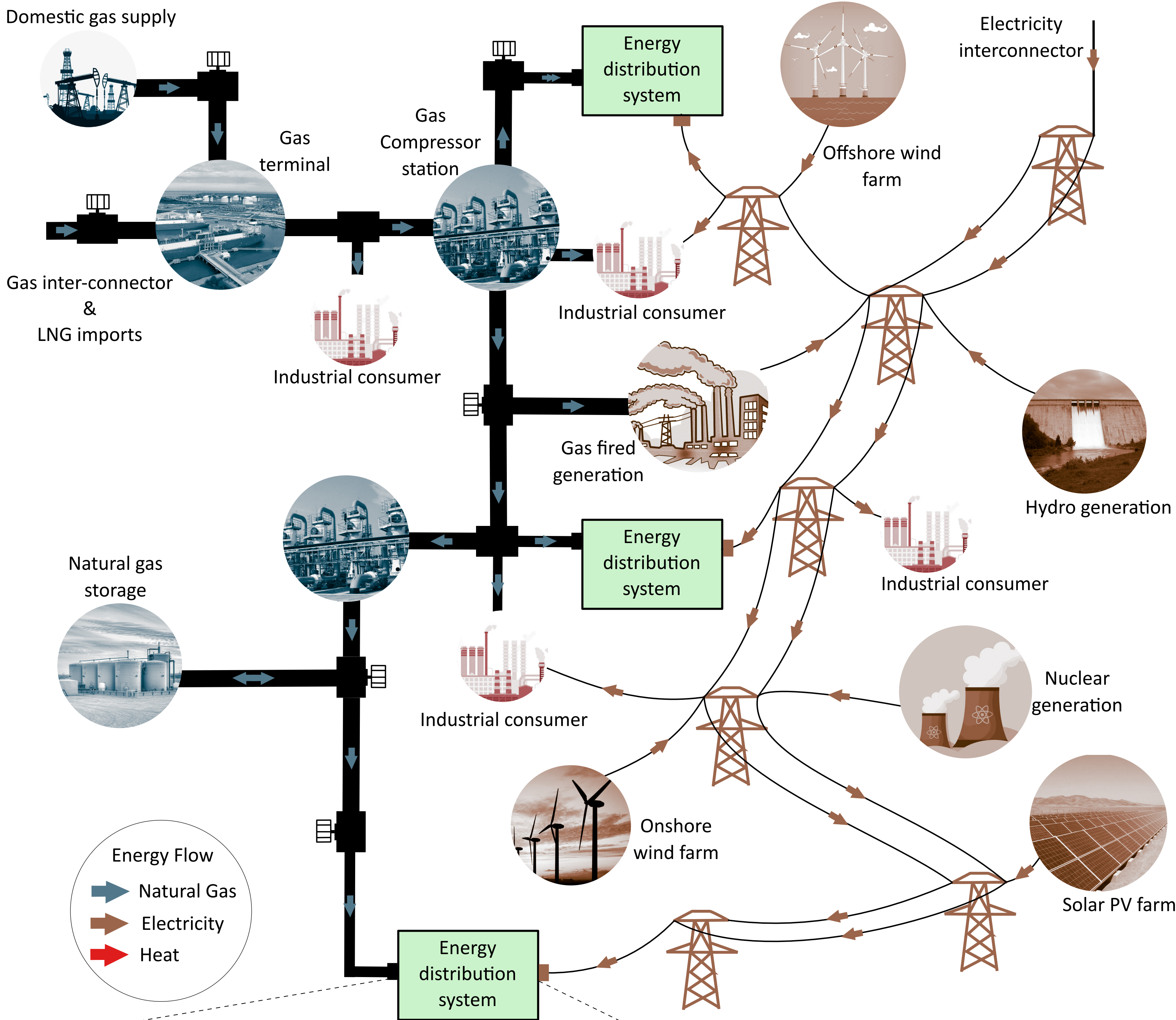


Natural gas transmission network

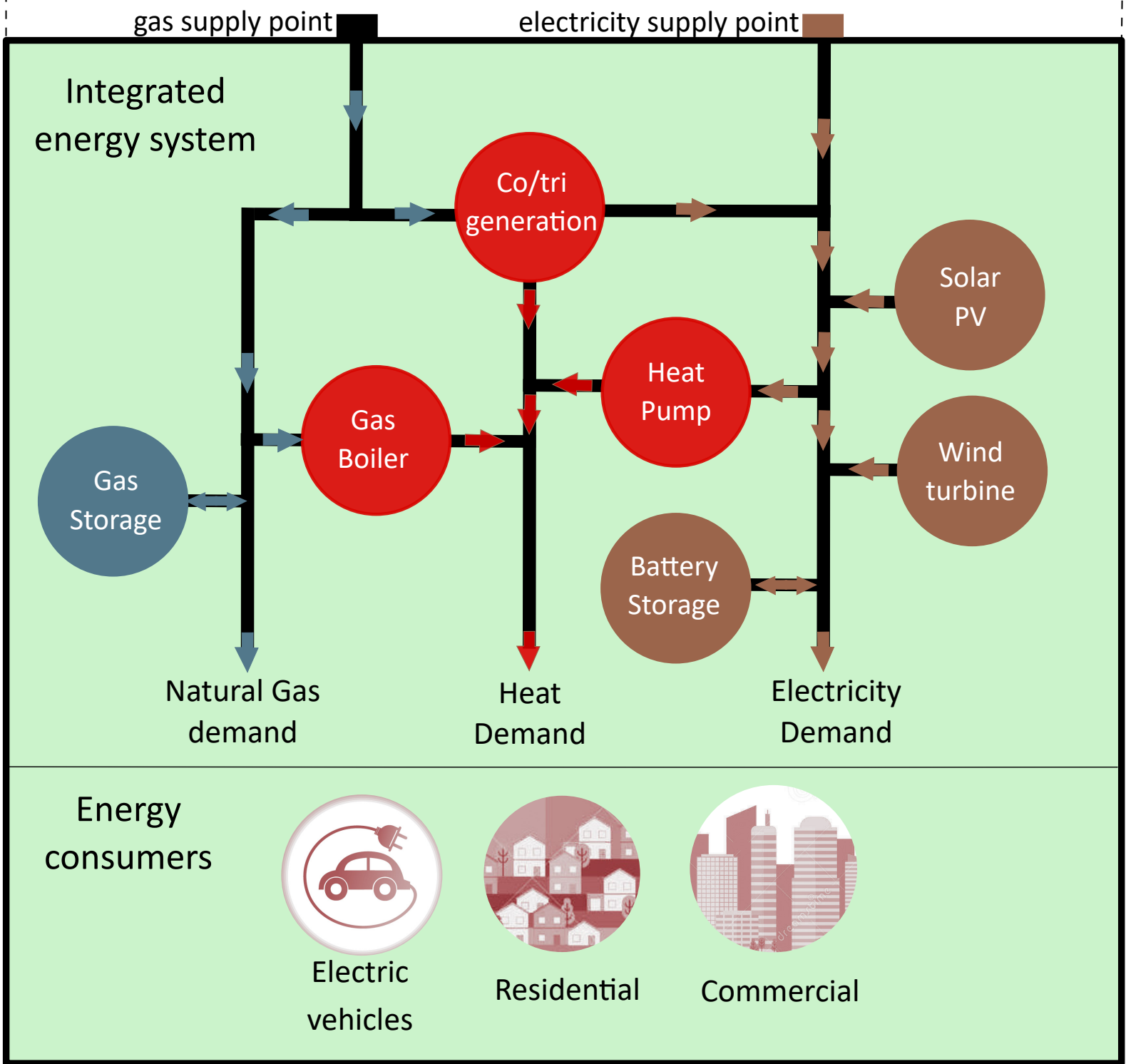


Geographical boundaries of energy distribution systems

Energy supply model



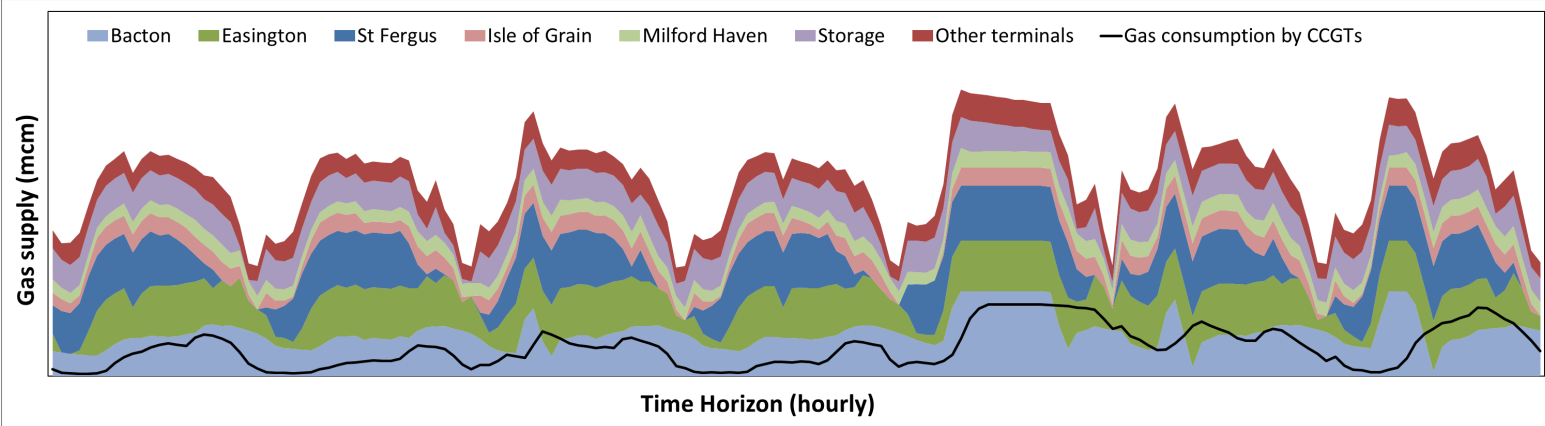
Energy hub representation of energy distribution systems



Model Outputs

- The outputs illustrate the energy supply mix at transmission and distribution.
- Additional output matrices are used to provide insights on emissions, cost of system operation and infrastructure planning decisions.

Gas supply from terminals



Electricity supply mix

