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Islay's Future Energy System: Key Challenges and Opportunities

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Energy System Challenges



- Power
  - Links to mainland network vulnerable to disruption (OHL, subsea)
  - Local network on island unable to support larger amounts of renewable generation



- Heat
  - Significant reliance on imported fossil fuel (fuel oil, heating oil)
  - Ability to bring fuel on to the island affected by sailing conditions



- Transport
  - Fossil fuel dominant
  - Petrol and diesel imports need ferry berths for tankers/lorries
  - Low emission vehicles need electric network capacity (EV)

Why does this matter for power?

- No ability to expand local community renewable energy generation
- Diesel fuelled generators continue to be needed to balance power system during shortfalls/outages
- Any increase in power demand relies on investment in network (on island or mainland) so is costly to achieve



Community turbine image courtesy of the Islay Energy Trust

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Why does this matter for heat?

- Electric options (heat pumps, direct electric) to replace fossil fuels constrained by power network
- No single alternative source of supply on-island can meet existing and future demand
- Other alternative fuels don't avoid need to import them to the island
- Carbon reduction commitments require substantial change (e.g. local authority, ferry operator, industrial users)



Why does this matter for transport?

- Remain reliant on importing fuels to the island
- This means vehicle capacity on ferries is constrained
- Movement of fuel deliveries on the island adds to traffic (and road maintenance)
- Alternative fuels for ferry or air transport difficult to generate on island (power system constraint)









What is a future energy system trying to achieve?

- **Sustainable energy supply** maximising use of natural renewable resources
  - Extend local use of resources; reduce scale of imported energy

- **Reduce energy costs** particularly in respect of heat and transport
  - Minimise 'built in' costs of fossil fuels (and future rising costs)

- Increased **security of supply**
  - Increase ability to meet energy needs locally; reduce impact of disruption

- Robustness of energy supply to **cater for increased demand**
  - Ease capacity to meet energy needs of whole island and its visitors

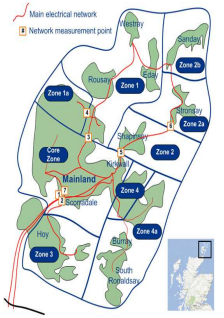
What could this mean for power?

- Integration of power made available from offshore sources (e.g. tidal, wind)
- Smart system management to better manage power flows
- More renewable generation onshore
- Use of battery storage rather than diesel generators to manage power flows
- Opportunity for hydrogen production (electrolysers)









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What could this mean for heat?

- Increased use of local resources to reduce imported fuel needs
- Increase in availability of power increases options for low carbon heat (e.g. heat pumps)
- Potential use of hydrogen as heating fuel or energy store
- Increase in diversity of energy sources





What could this mean for transport?

- Reduced tanker/lorry movements of fossil fuel
- Increased capacity for electric vehicles
- Potential for electric vans / taxis
- Low carbon buses / lorries / agricultural vehicles (electric, hybrid or hydrogen)
- Supporting infrastructure for low carbon aircraft and ferries (electrical charging or hydrogen fuelling)









A ‘whole system’ approach

- No single alternative will deliver benefits across the community
- Increasingly the need for power, heat and transport are linked
- A ‘whole system’ approach therefore offers the most efficient way of meeting future energy needs

