



Fife – A Place for Energy

Exploring Fife's innovative approach to the energy transition through our Big Energy Move

Agenda

- **09:30** - Opening remarks: Cllr Jan Wincott
- **09:40** - Keynote: Fergus Tickell
- **10:10** - Session 1: Planning and the energy transition
- **11:30** - Break
- **11:45** - Session 2: Breakout rooms
 1. Developing the future workforce - exploring skills and supply chain needs
 2. Renewable heat from minewater
- **13:00** - Lunch
- **13:50** - Session 3: Energy for Industry: supporting the transition
- **14:50** - Break
- **15:05** - Session 4: Innovation & Fife's future
- **16:05** - Closing remarks: Pam Ewen

Opening Remarks

Cllr Jan Wincott

*Spokesperson - Environment and Climate
Change*

Fife Council

Keynote

Fergus Tickell

*Regional Energy Strategic Planning Manager
for Scotland*

National Energy System Operator (NESO)



NESO, Strategic Energy Planning & RESP

Fife - A Place for Energy

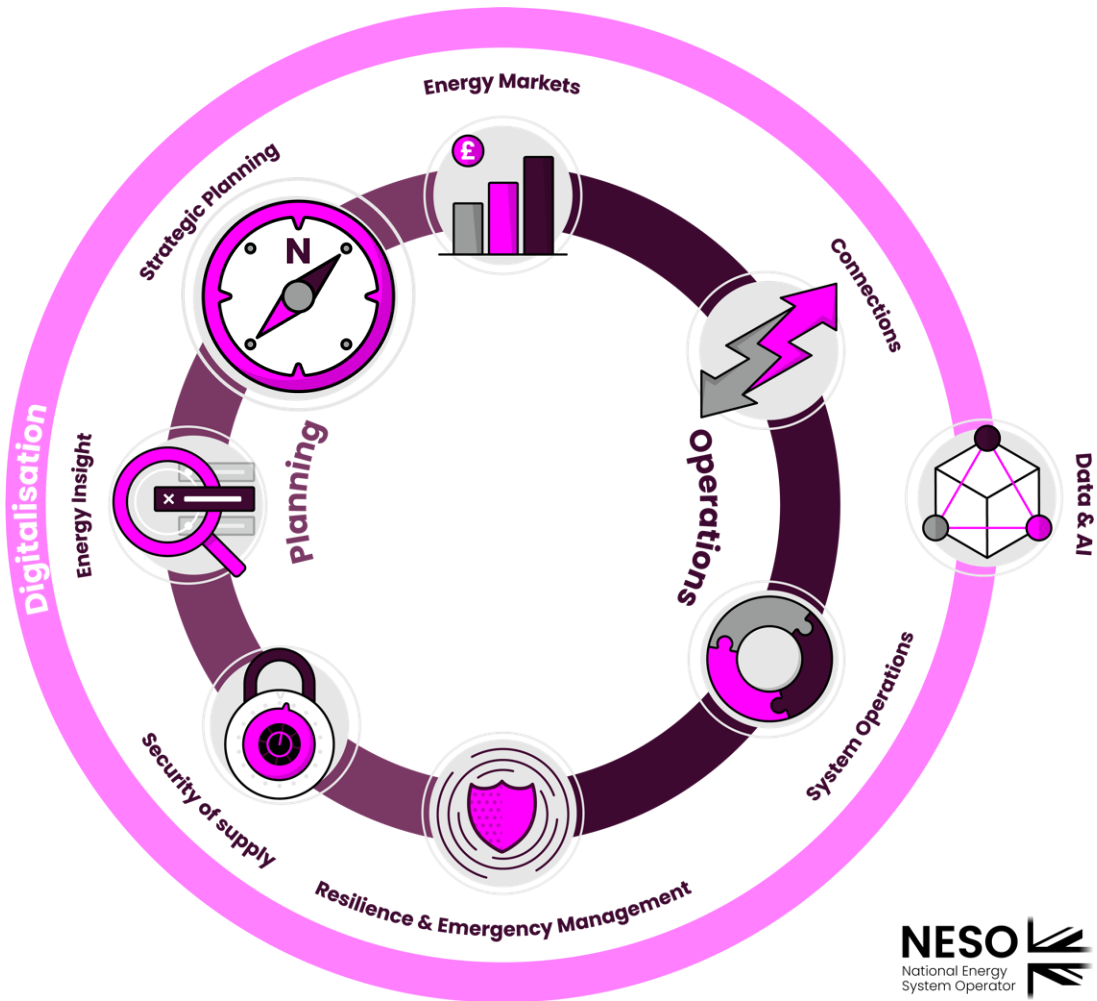
12th June 2025

Fergus Tickell – RESP Manager Scotland

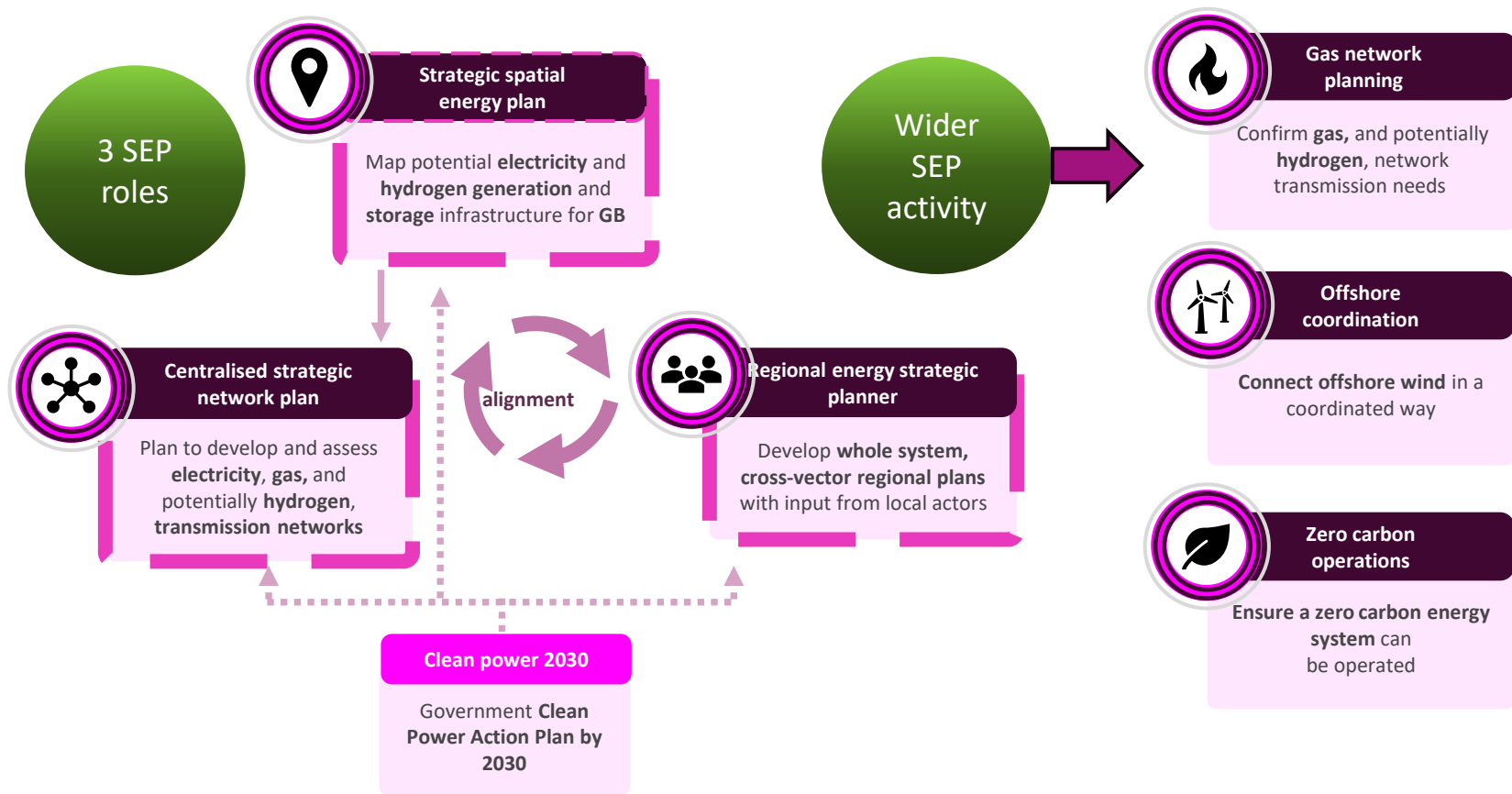
What we do

Strategic Planning

We take a long-term approach to planning, that identifies whole energy system needs and ensures that the system can be designed and built accordingly.



Strategic energy planning (SEP)



RESPs – why do we need them?

The
Why...

1

Local voices & needs - ensure that local voices & needs are at the heart of the way we plan the energy system

2

To drive investment - ensure local areas get the energy infrastructure they need to realise local goals

3

Ensure efficient network investment - that keeps bills low by looking at the whole energy system



RESP regions & boundaries

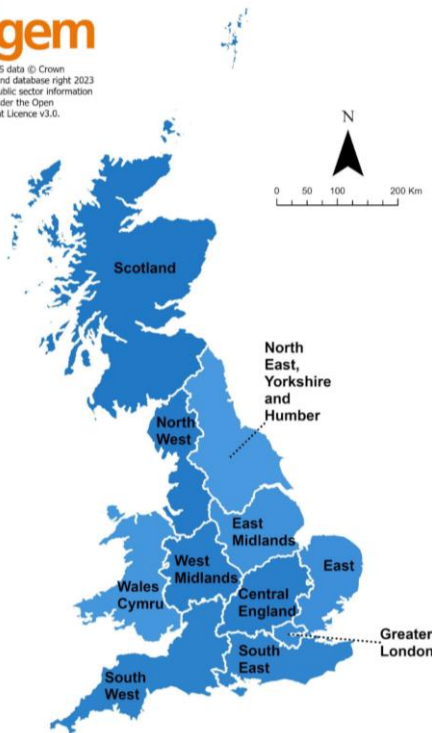
The
Where...

North regions/nations

- Scotland
- North East, Yorkshire and the Humber
- North West
- East Midlands
- West Midlands

ofgem

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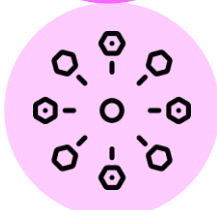
South regions/nations

- Wales
- Central England
- East
- Greater London
- South East
- South West

How we will work: Six guiding principles



Place based



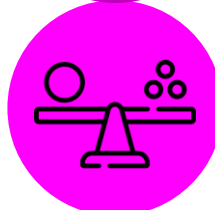
Whole-system



Vision led



Proactive



Fair



Transparent &
collaborative

Five components of a RESP

The
What...

1

Regional Context

Comprehensive view of regional conditions & priorities

2

Consistent Planning Assumptions

Assumptions to drive consistent derivation of network impacts

3

Strategic Investment Need

Identify needs which are of high economic/ system value and key to regional priorities

4

Pathways

Spatial models of future supply and demand

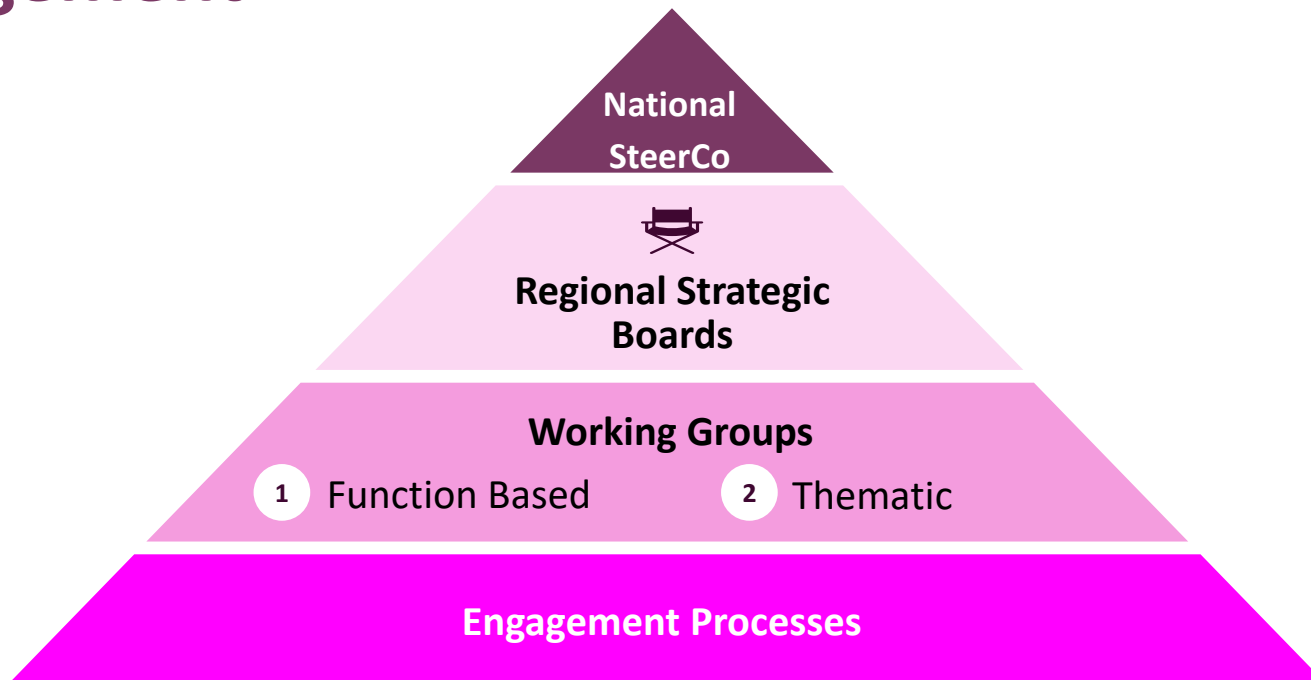
5

Spatial Context

Geospatial view of pathways against network conditions

Who's involved: Governance & engagement

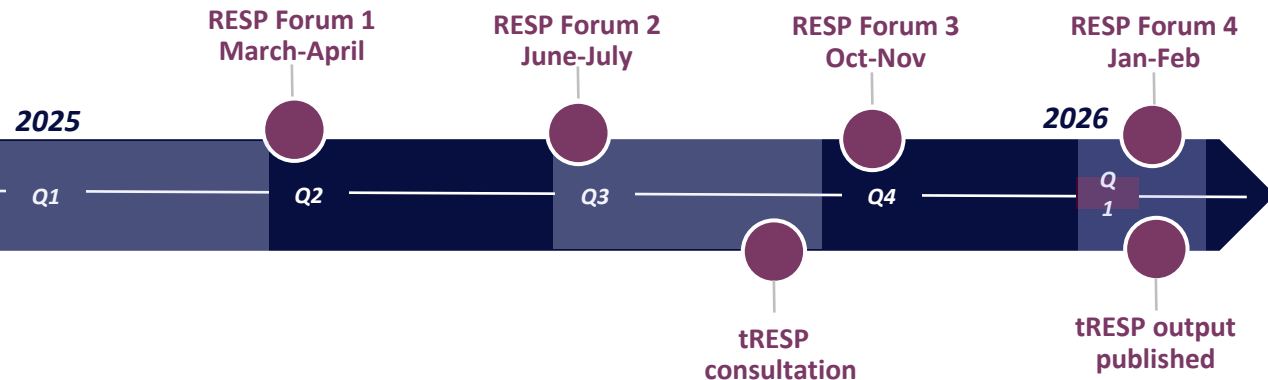
The
Who...



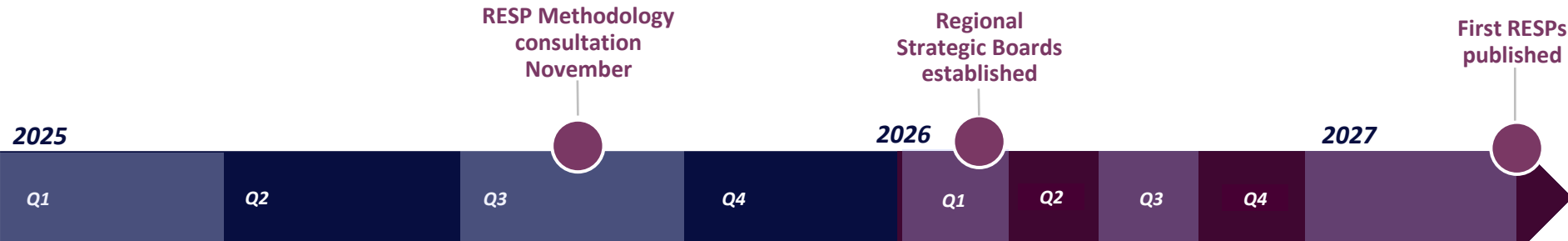
How to get involved

The
When...

Transitional RESP



Enduring RESP



Further information on RESP



Look out for future Forum dates
neso.energy/news-and-events/calendar



Newsletter sign up
neso.energy/news-and-events



RESP web pages
neso.energy/what-we-do/strategic-planning/regional-energy-strategic-planning-resp



Contact the RESP team
box.resp@neso.energy

Thank you

NESO

<https://www.neso.energy/what-we-do>

Strategic Energy Planning

<https://www.neso.energy/what-we-do/strategic-planning>

Contact

fergus.tickell@neso.energy

Audience Q&A

Session 1: Planning & the energy transition

Fife's long-term vision for energy, both in terms of the planning process, developers, and utilities

- **Craig Walker** - Lead Officer, Policy & Place, Planning Services, Fife Council
- **Tricia Hill** - Development and Sustainability Director, Kingdom Housing Association
- **Nick Clark** - Chief Executive, Ore Valley Housing Association
- **Rachel Shorney** - Strategic Optimisation Manager, SP Energy Networks

Facilitated by **Kevin Treadwell**, Service Manager - Strategic Development and Infrastructure



Session 1: Planning & the energy transition

Craig Walker

Lead Officer

Policy & Place, Planning Services

Fife Council





Fife's Place Plan
Developing thriving places for the future



Fife's Place Plan

Local Development Plan 2

Craig Walker, Lead Officer (Policy & Place), Planning Services

#OurFife
Successful · Confident · Fairer



Fife's Place Plan
Developing thriving places for the future



How will Fife's Place Plan consider the energy and heat transition and support energy developments?



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Developing thriving places for the future



FIFE plan

PEOPLE | ECONOMY | PLACE



Fife Local Development Plan
Adopted Plan
September 2017

FIFEplan

PEOPLE | ECONOMY | PLACE



Low Carbon Fife
Supplementary Guidance
January 2019



Low Carbon Sustainability Checklist for Planning Applications

Issue Overview and Aim	Validation Requirement	Exemption	Information Submitted with Applications
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Energy and Climate Change

Demonstrate that the application meets the CO₂ emissions reduction targets currently in place and that the required proportion of that reduction is met by low and zero carbon generation technologies.

Improve the energy efficiency of both domestic and non-domestic buildings to minimise total whole-life energy consumption.

For Local Developments - Provide information of the energy efficiency measures taken and energy generating technologies associated with this application

For Major Developments - An energy statement on intention is required. See [Low Carbon Fife Supplementary Guidance](#) page 59 for more information

Householder Application Proposals which are not heated or cooled (other than heating or frost protection).

Conversion of buildings with [Building standards 6.1 exemptions](#)

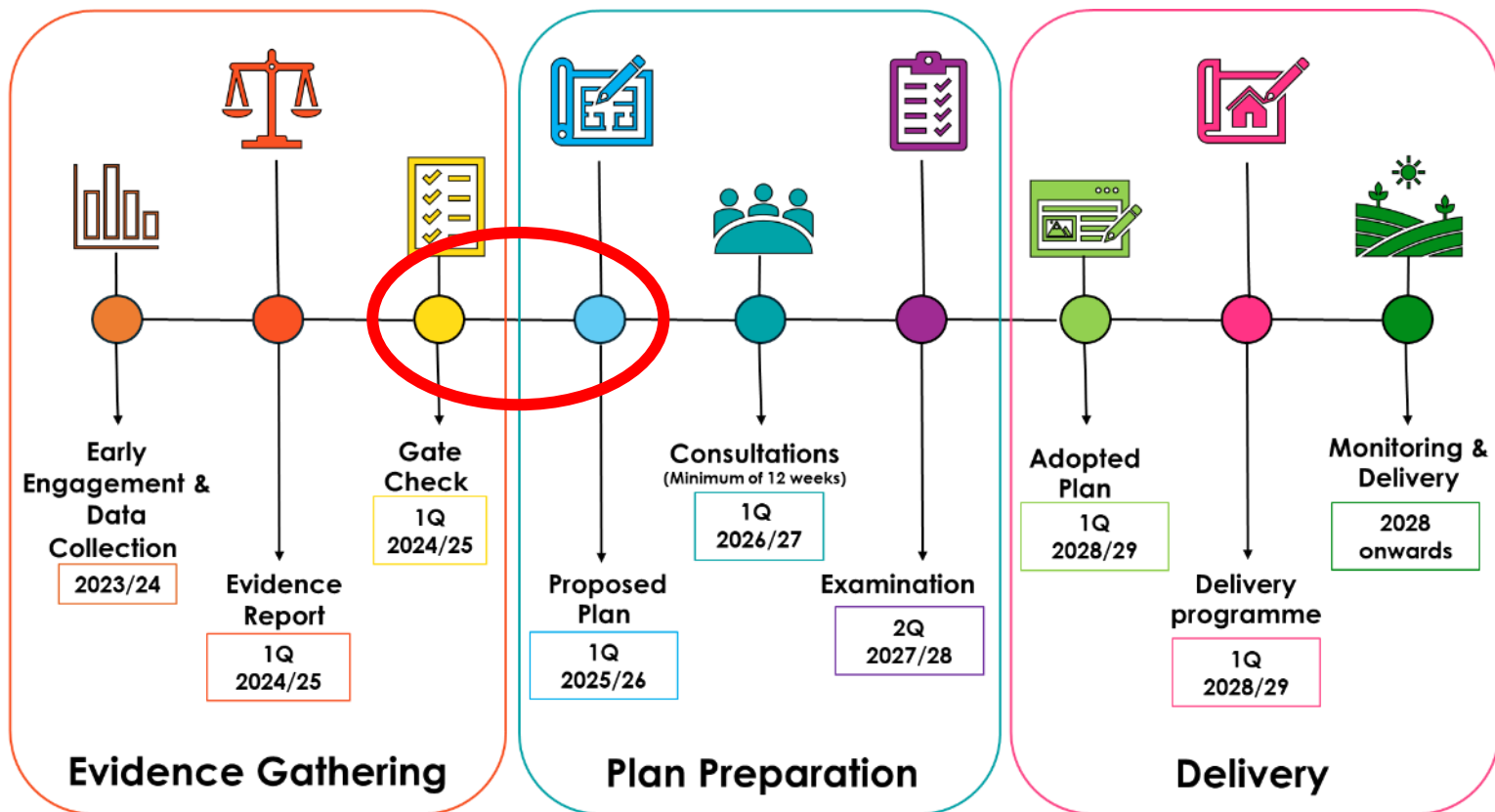
Temporary buildings with an intended life of less than 2 years

Details: ☐



Fife's Place Plan

Developing thriving places for the future





FIFEplan → Fife's Place Plan: Changing Landscape



Fife Council declared a Climate Emergency (Sept 2019)



Nature Crisis



National Planning Framework 4 (Feb 2023)



Fife Council declared a Housing Emergency (March 2024)



Scottish Parliament declared a Housing Emergency (May 2024)



NPF4



36 Part 2 – National Planning Policy

Sustainable Places

1. Tackling the climate and nature crises
2. Climate mitigation and adaptation
3. Biodiversity
4. Natural places
5. Soils
6. Forestry, woodland and trees
7. Historic assets and places
8. Green belts
9. Brownfield, vacant and derelict land and empty buildings
10. Rural development
11. Energy
12. Zero waste
13. Sustainable transport

Liveable Places

14. Design, quality and place
15. Local Living and 20 minute neighbourhoods
16. Quality homes
17. Rural homes
18. Infrastructure first
19. Heat and cooling
20. Blue and green infrastructure
21. Play, recreation and sport
22. Flood risk and water management
23. Health and safety
24. Digital infrastructure

Productive Places

25. Community wealth building
26. Business and industry
27. City, town, local and commercial centres
28. Retail
29. Rural development
30. Tourism
31. Culture and creativity
32. Aquaculture
33. Minerals



NPF4 Policies 11 & 19

Policy 11 Energy

Policy Principles

Policy Intent:

To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS).

Policy Outcomes:

- Expansion of renewable, low-carbon and zero emissions technologies.

Local Development Plans:

LDPs should seek to realise their area's full potential for electricity and heat from renewable, low carbon and zero emission sources by identifying a range of opportunities for energy development.

Policy 19

Heat and cooling

Policy Principles

Policy Intent:

To encourage, promote and facilitate development that supports decarbonised solutions to heat and cooling demand and ensure adaptation to more extreme temperatures.

Policy Outcomes:

- Development is connected to expanded heat networks which use and store heat from low or zero emission sources.
- Buildings and places are adapted to more extreme temperatures.

Local Development Plans:

LDPs should take into account the area's Local Heat & Energy Efficiency Strategy (LHEES). The spatial strategy should take into account areas of heat network potential and any designated Heat Network Zones (HNZ).



- ▶ Heat network zones will be used to assess decarbonised heat options for proposals;
- ▶ Fife Council supports the Heat in Buildings Strategy vision *“that by 2045 our homes and buildings are cleaner, greener, and easy to heat, and no longer contributing to climate change, as part of the wider just transition to net zero”*.



LDP implications of climate emergency evidence:

- ▶ Incorporate spatial planning actions from Fife's Sustainable Energy and Climate Action Plan and incorporate climate and carbon assessments as part of the site assessment methodology;
- ▶ The spatial strategy will also have regard to climate change and risk in identifying where development should, or should not, take place;
- ▶ Incorporate the spatial principles of local living and compact urban growth;



LDP implications of climate emergency evidence:

- ▶ Encourage low and zero carbon design and energy efficiency in new development and consider the potential for nature-based solutions in mitigating and adapting to climate change; and
- ▶ The site assessment and place making principles will promote the role that well maintained and retrofitted traditional buildings can play in reducing carbon emissions and helping to deliver net zero targets.



LDP implications of energy, heating and cooling infrastructure evidence:

- ▶ Development programming required to avoid electricity supply issues or grid capacity issues;
- ▶ Collaborate with infrastructure providers when identifying sites for allocation and phasing of development where applicable;
- ▶ Potential connections from offshore generators direct to Fife may need to be considered to support the energy supply and transition;
- ▶ Consider the role the LDP may have in supporting the decarbonisation of gas infrastructure.



LDP implications of energy, heating and cooling infrastructure evidence:

Consider:

- ▶ The impact of renewables development on prime agricultural land and employment sites as part of LDP site selection, and policy formulation;
- ▶ How to realise the full potential of opportunities for renewable, low carbon, and zero emission energy in Fife;
- ▶ Current and proposed hydrogen projects in Fife in relation to land-use planning, with consideration to distribution and storage.



LDP implications of energy, heating and cooling infrastructure evidence:

- ▶ Apply energy considerations as part of the LDP strategy and in the site assessment methodology - take account of the proximity of (and potential for) heat network zone designation in allocating proposed development sites.



Fife's Place Plan
Developing thriving places for the future



www.fife.gov.uk/fpp



Fife's Place Plan
Developing thriving places for the future

Fife's Local Place Plan (Local Development Plan)

We are preparing a new Local Development Plan. This will be known as Fife's Place Plan. Once adopted, Fife's Place Plan will replace the existing Local Development Plan (**FIFEplan**). It will also replace the Supplementary Guidance on Affordable Housing, Low Carbon Fife, Making Fife's Places, and Minerals.

Along with the Scottish Government's **National Planning Framework 4** (NPF4), it will form the statutory development plan for Fife. It will set out the planning policies and proposals for the use and development of land across Fife for the next 10 to 20 years.

NPF4 is the national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments, and national planning policy.



Place Matters

Place Matters - Call for sites and ideas is now closed

Our call for sites and ideas event, which ran for 14 weeks from 18 November 2024 to noon on the 24 February 2025, is now closed. If you made a submission through our consultation portal, thank you!

The Policy and Place Team will now process the submissions received. All sites and ideas submitted will have to be processed and analysed using our site assessment criteria, as well as referencing national and local planning policies, and an emerging spatial strategy. We need to ensure they are required and suitable for development. This is a lengthy internal process, which will result in some sites and ideas being included in the Proposed Local Development Plan.





Fife's Place Plan
Developing thriving places for the future

Fife Planning Update

www.fife.gov.uk/fpp

Fife Planning UPDATE



Fife's Place Plan: Place Matters (Call for sites and ideas)

This update contains advance notice and information about our upcoming **Place Matters - Call for sites and ideas** consultation. We hope this will help you to prepare your submissions to inform our new Local Development Plan when the consultation begins next month.

Our new Local Development Plan will be known as **Fife's Place Plan**. Once adopted, Fife's Place Plan will replace the existing Local Development Plan ([FIFEplan](#)).

We will commence the 'Place Matters - Call for sites and ideas' stage of the Plan on 18 November 2024. This will provide an opportunity for stakeholders, including communities, landowners, and developers to put forward ideas or sites they would like to be considered for inclusion in the next Local Development Plan.

The call for sites and ideas event will run for 14 weeks from **18 November 2024** to **24 February 2025**.

For your site or idea to be considered for inclusion in Fife's Place Plan you will be required to complete our online form (once it goes live), providing as much information as possible. All sites submitted to the Place Matters process will have to be tested against our site assessment criteria.

Information on how and where to submit proposals for Place Matters will be published on our website (at www.fife.gov.uk/fpp) from 18 November 2024. A **consultation portal will be created which all submissions must go through**. Submissions made through other channels such as through Fife Council email addresses will not be accepted.

Session 1: Planning & the energy transition

Tricia Hill

*Development and Sustainability Director
Kingdom Housing Association*



Heat Networks - an RSL experience

Tricia Hill, Development & Sustainability Director
12 June 2025


KINGDOM
Housing Association

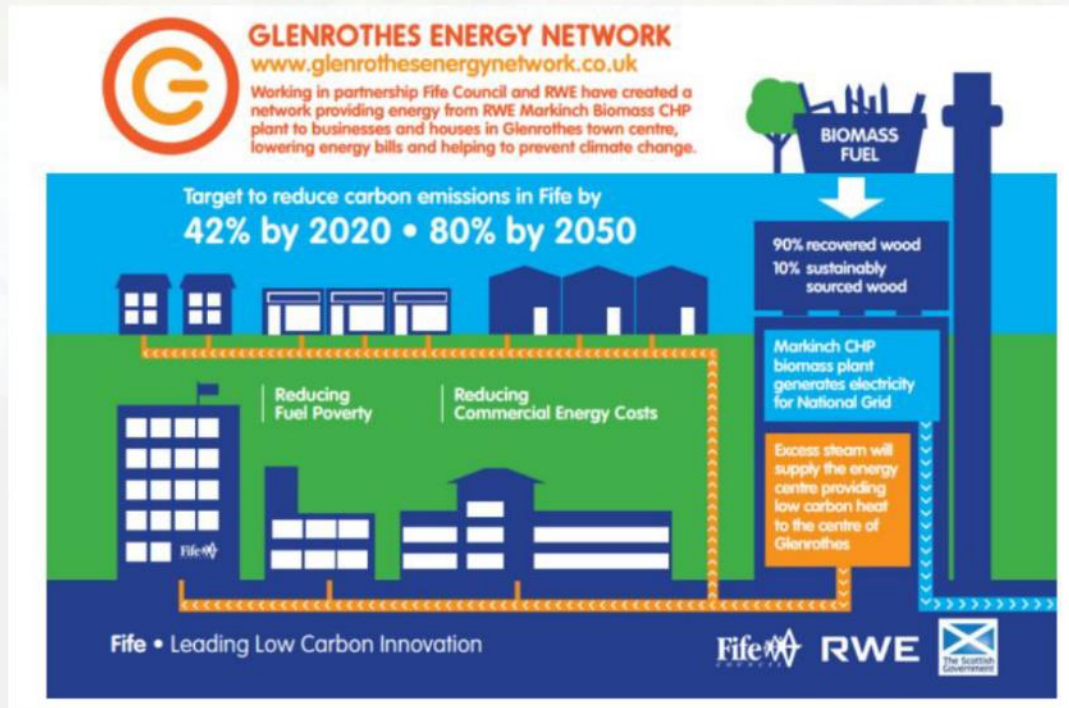

KINGDOM
Initiatives


KINGDOM
Support & Care

GRANGE
 St Andrews 


Part of **KINGDOM**
Group

Glenrothes Biomass Plant

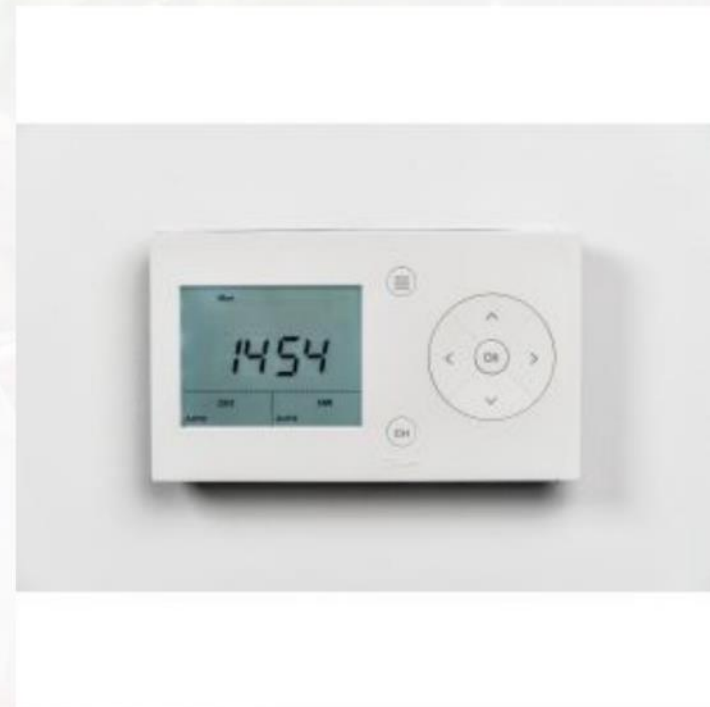




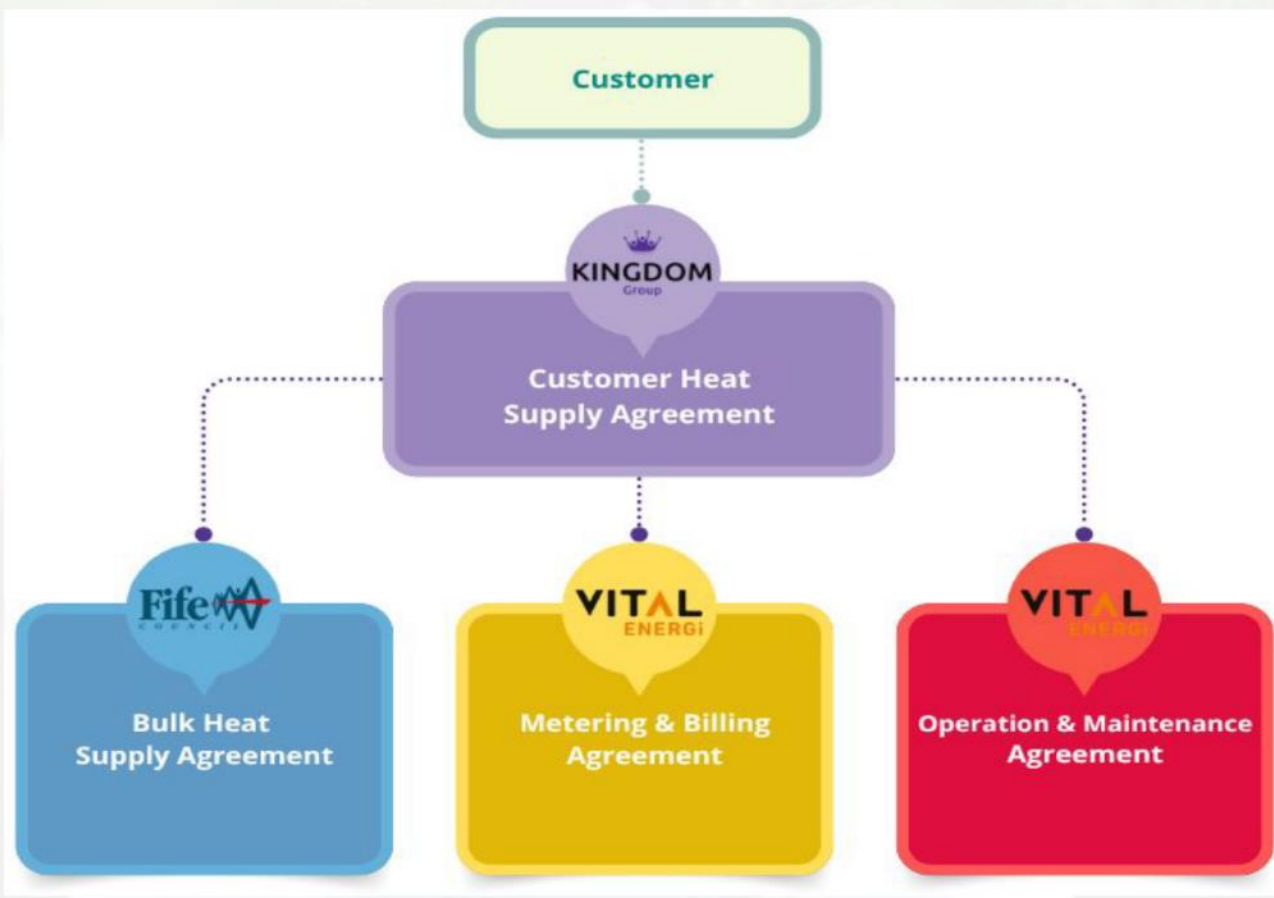
85 homes for social rent completed by
Campion homes in April 2023



Inside the home



The Relationships / Contract Management



Tariff Setting and Average Customer Costs:

From April 2023:

Heat Network	Standing charge	Unit rate
Queensgate	26p/day	7.14p/kWh

Heat network	Average user cost <u>per annum</u> (4,000 kWh/annum)	Average user cost <u>per week</u> (4,000 kWh/annum)
Queensgate	£380.26	£7.31

Lessons Learned/ learning continues

- No dedicated resource within KHA
- First tariff review since April 2023
- Consumer protection from 1 April 2025
- OfGem regulation / compliance reporting from Jan 2027

Customer Feedback

- It is very easy to use in terms of heating and topping up
- Cost is reasonable - houses are also very warm without heating
- Water is always hot
- Emergency credit can be difficult to arrange although only required on a handful of occasions to date

Questions ??

Session 1: Planning & the energy transition

Nick Clark

Chief Executive

Ore Valley Housing Association





Delivering Net Zero

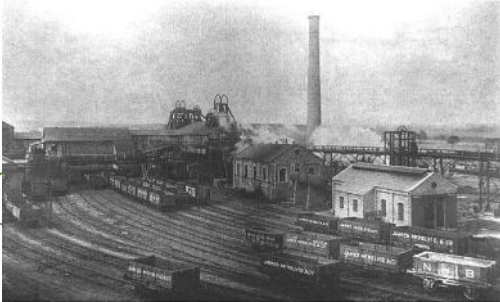


Nick Clark
Chief Executive
Ore Valley Housing Association

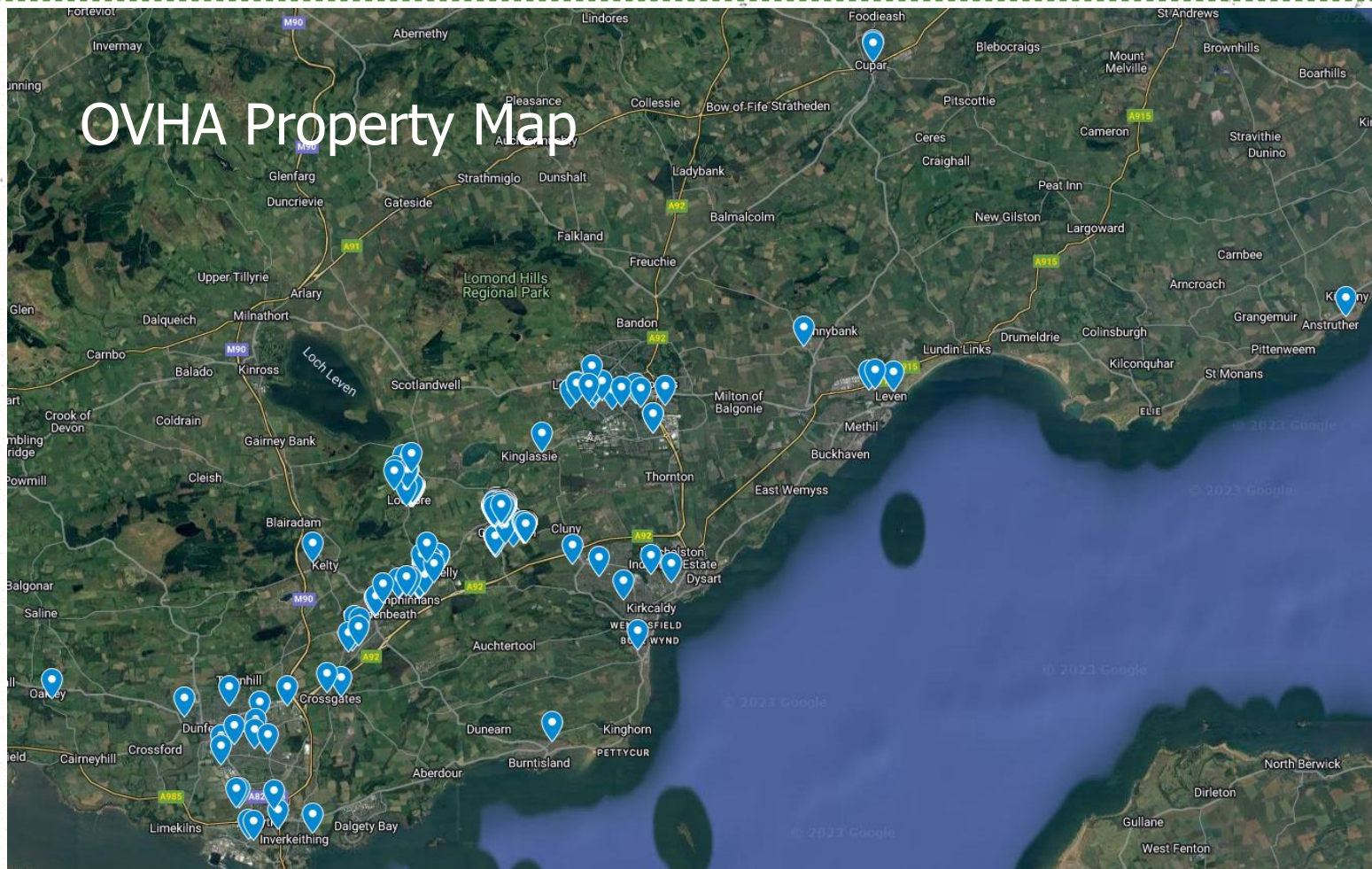
Ore Valley Housing Association

- Formed in April 1991
- Originally Auchterderran Housing Association
- Community-led organisation.
- Stock transfer, new build, acquisition and 'mortgage to rent'.
- 802 houses for social and mid-market rent.
- 'ABCD' villages in Cardenden.
- Lochgelly, Benarty, Glenrothes and Levenmouth.
- Primarily former mining towns.
- Previously enjoyed high levels of employment.

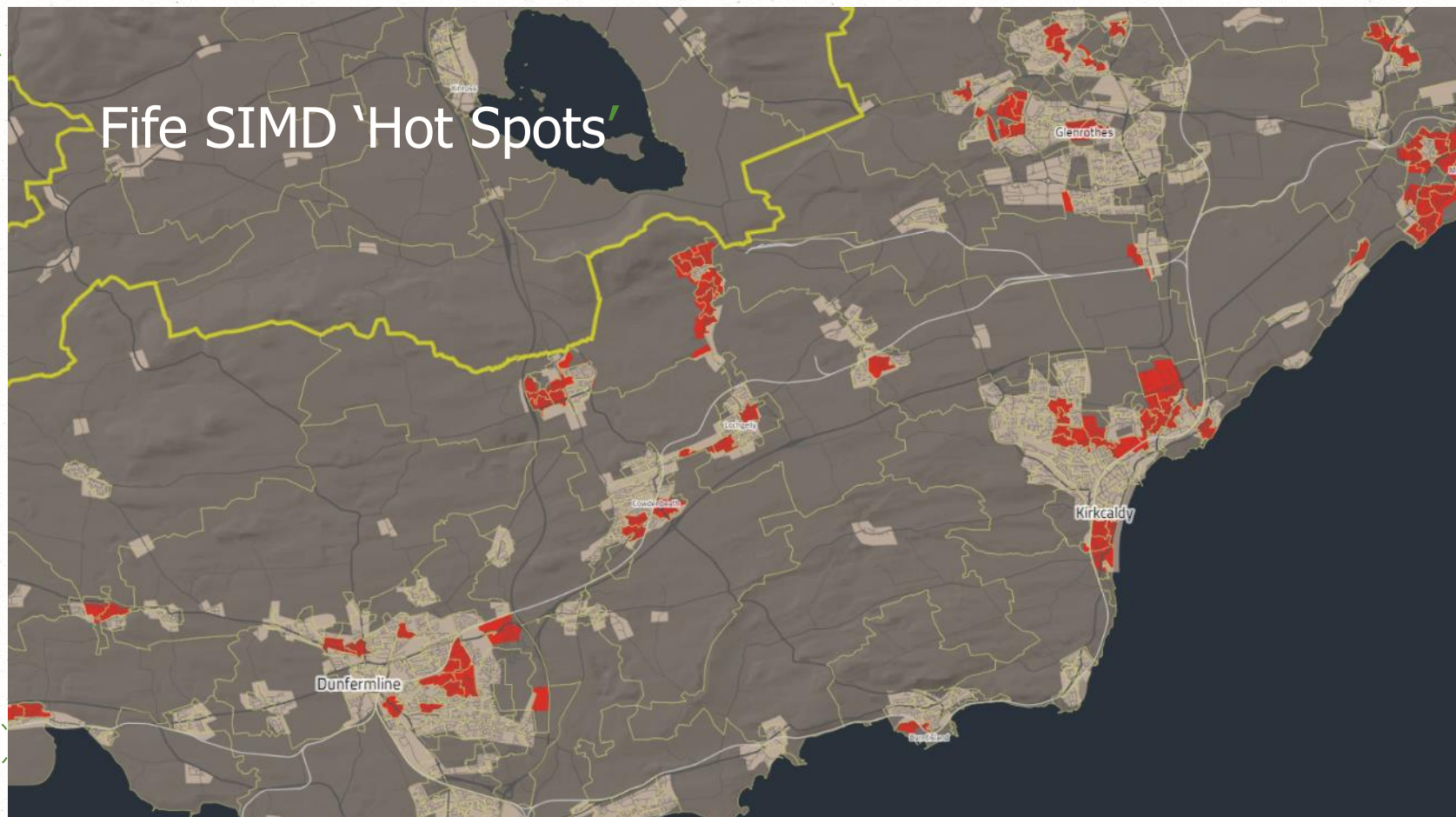
Fife's Mining Heartland



OVHA Property Map



Fife SIMD 'Hot Spots'



The Current Challenge

- High levels of poverty, fuel poverty and unemployment.
- Poor Scottish Index of Multiple Deprivation levels.
- Below average educational attainment.
- Below average income levels.
- Poor transportation links.
- Expensive local public transport options.
- Little inward investment since coal mining industry decline.
- Impact from continued loss of local services.
- Ongoing 'Cost of Living' crisis.
- Fife Council and Scottish Government declarations of housing emergencies.
- Challenge of achieving 'net zero' and related national targets



Previous and Current Projects

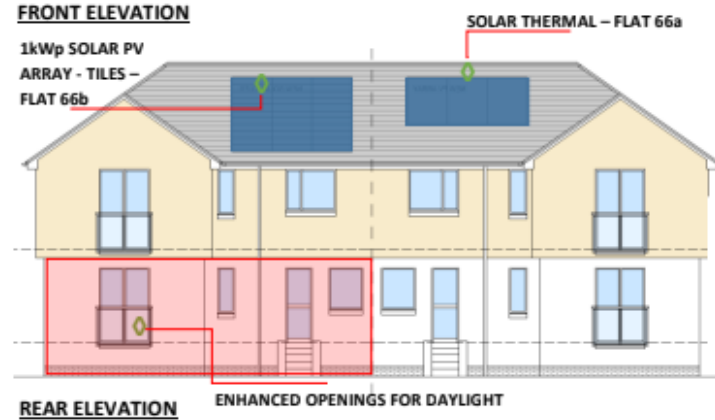
Existing Stock Improvements

- Programme of improvements over many years.
- Focus on fabric efficiency works.
- Cavity Wall insulation, External Wall insulation and draughtproofing.
- Replacement roofs, doors, windows and solar p.v.
- Boiler replacement works ongoing.
- Challenge of balancing kitchen and bathroom replacements with fabric improvements.
- Affordability is growing in importance for tenants.
- Money is always a factor for all parties!



Stock Improvement Testing

- Rosewell Drive in Lochore.
- A four-in-a-block property.
- Utilised a combination of test technologies.
- This included solar p.v., solar thermal, triple glazing, underfloor heating, underfloor insulation, heat recovery and external insulation.
- Air quality solutions also tested.
- Test bed for finding the most effective combination of solutions.
- Developed in partnership with Napier University in 2015



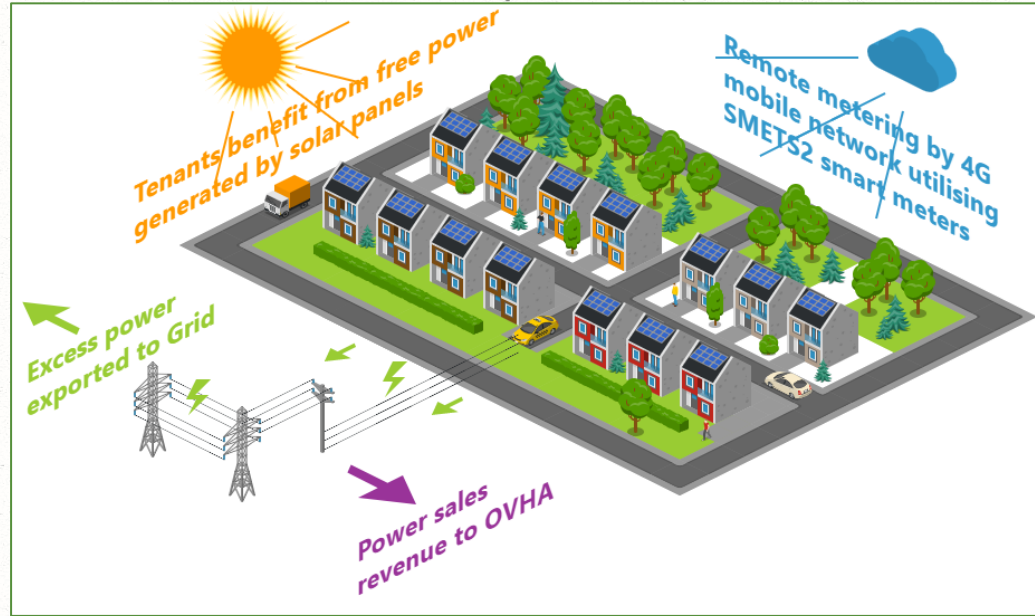
New Housing – Bowhill Institute

- Historic Miners Institute in Cardenden
- Culturally significant building in heart of the community.
- Unused for 25+ years.
- Symbol of neglect and an eyesore.
- Project focused on façade retention.
- Very challenging development.
- Expanded to integrate space for 10 homes for social rent.
- Energy efficient design including Solar PV, high insulation levels etc.
- Won 2024 Green Apple Environment Award for Regeneration.
- Shortlisted for further awards.



'Virtual Power Plant' project

- 59 distributed Solar PV assets so far.
- Tenants use generated power.
- Excess is combined and exported to grid for £.
- Expandable with more renewable sites.
- Developed with Octopus.

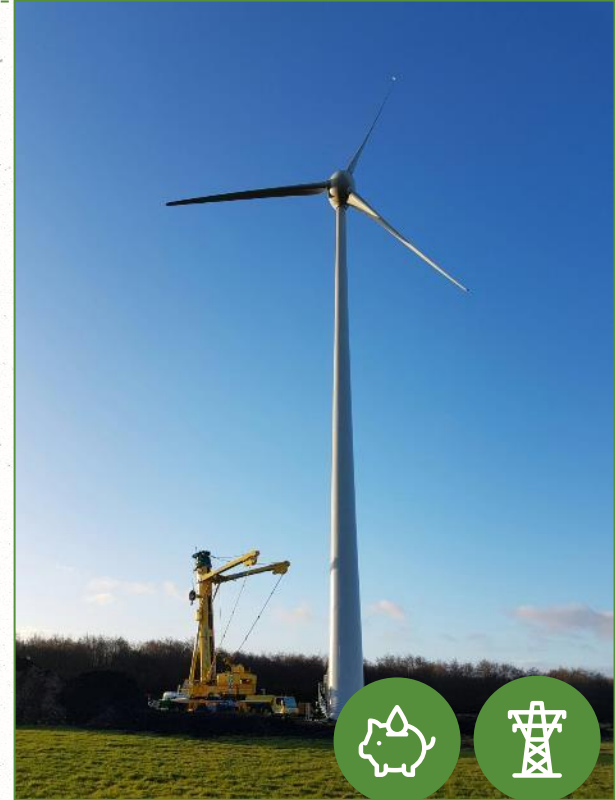


octopusenergy



Wind Turbine & Community Investment Fund

- 500kW commercial 99.5m wind turbine.
- 1800MW of power produced per year.
- Equivalent to demand of 470 homes.
- All power sold to grid via PPA.
- c.£350,000 revenue p.a. / c.400tC/p.a.
- Funded by OVHA, EU and ScotGov.
- Owned by Ore Valley Energy and CHAP.
- Profits split between OVHA and Community
- Community Wind Investment Fund distributes grant funding in support of local projects.
- Won 'Best Community Project' at Scottish Green Energy Awards 2018.
- Shortlisted for St. Andrews Prize for the Environment 2023.



Ore Valley Business Centre

- Opened in 2011.
- Business and meeting space.
- Home to 21 business spaces.
- Designed to be low carbon.
- TermoDeck thermal energy storage & heat recovery system.
- 24 hour facility.
- Owned by subsidiary Ore Valley Community Initiatives.
- Former derelict bingo hall.
- Supports business growth, job creation and economic activity in local community.
- Other projects on-site.



TermoDeck



Electric Car Charging Network

- 11 x Charging points in Lochgelly and Cardenden.
- More coming soon.



LOCHGELLY AND CARDENDEN

Get up and go with green energy



Business development manager Nick Clark, board chairwoman Susan McDonald and CEO Andrew Saunders.

Ore Valley Group has installed four electric vehicle charging points in Cardenden and Lochgelly, in a first for the towns.

It fills a significant gap between Cowdenbeath and Glenrothes where no public charging facilities were previously available.

The charging points, funded with Scottish Government support, are free for public use for the first 12 months to encourage uptake.



OVHA Electric Car Club project

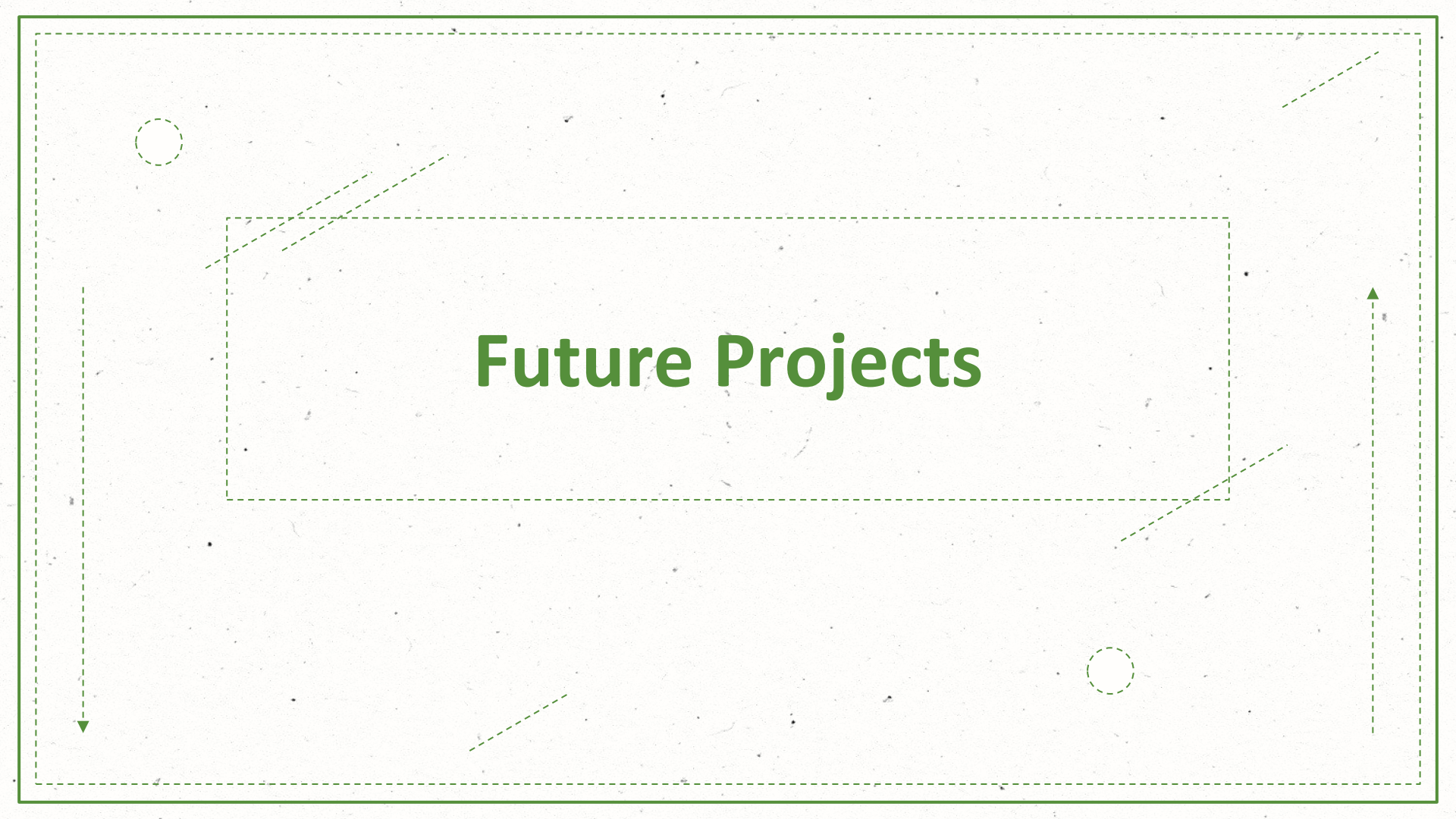
- 10 cars at 5 locations across Fife,
- All electric vehicles,
- App controlled, free to join,
- In partnership with Enterprise,
- Heavily used during Covid,
- Now self-sustaining,



Ore Vall-E-Bikes

- 4 folding electric bikes.
- Free use for registered users.
- 2 located in Cardenden.
- 2 located in Lochgelly.
- Helmets and other protective gear provided.
- Alternative to car, bus and train travel for local journeys.
- Many users have gone on to buy their own e-bikes.
- Project linked with Fife-wide Climate Action Fife project.



The background is a light gray textured surface. A large dashed green rectangle frames the entire page. Inside this frame, there are several geometric elements: a dashed green circle in the top-left corner, a dashed green circle in the bottom-right corner, a dashed green rectangle in the center, and several dashed green lines of varying lengths and orientations, including a vertical line with a downward arrow on the left and a vertical line with an upward arrow on the right.

Future Projects

Future Heating Solutions

- 44 Whitehall Drive in Cardenden.
- Property matches our most common archetype.
- Very old storage heating system.
- Replacing with modern high-heat retention storage heaters.
- Solar photovoltaics, underfloor insulation and new smart controls.
- Ventilation solutions also being installed.
- IoT sensors also being installed to monitor comfort, energy use and air quality.
- Testing of new zero emission heating system.



District Heating Cardenden

- District heating project to provide heat and hot water to 1200+ social homes and 10 public buildings
- Spare heat from local energy from waste plant
- Key local partners involved inc. Council and RSLs.
- Builds on previous CHP effort
- Aligns with ScotGov & LHEES strategic aims
- Help address cost-of-living and EESSH/SHNZS
- Aspiration of 'Scandinavian model' of community-ownership.



 DISTRICT HEATING
CARDENDEN



“Delivering Net Zero”

- Have to take the community with you.
- Detailed engagement with all stakeholders is critical.
- Be ready and able to pursue grant funding opportunities.
- Partnership makes everything better.
- Clarity on policy needed at local and national level.
- Energy efficiency standards, Scottish PassivHaus Standard etc.
- Funding picture is still unclear, especially in RSL sector.
- Net zero will be the key focus in future.
- Thank you for your time...

Session 1: Planning & the energy transition

Rachel Shorney

*Strategic Optimisation Manager
SP Energy Networks*



Planning and the energy transition

Rachel Shorney – Strategic Optimisation Manager

June 2025

Who are SP Energy Networks



We own and operate two regulated distribution networks:

- SP Distribution plc (SPD)
- SP Manweb plc (SPM)

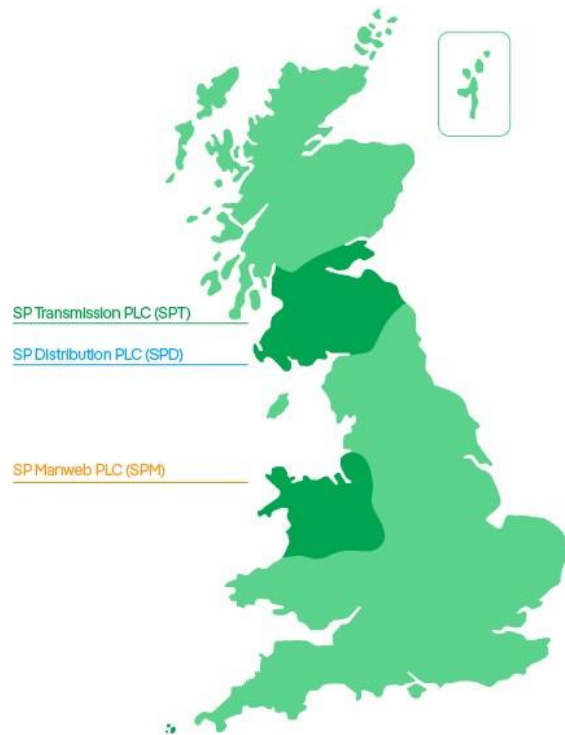
We also own and operate one transmission network in Central and Southern Scotland:

- SP Transmission plc (SPT).

We are the only DNO group to operate across all three nations of GB – Scotland, England and Wales.

Our business is crucial to the delivery of the UK's Net Zero targets and the transition to a more sustainable future.

We are committed to making this happen at pace, and placing our customers and stakeholders at the heart of this journey.



The Net Zero Challenge

Achieving Net Zero will require a big shift in how we get our energy and the way we consume it. The electricity system plays a fundamental role in facilitating this transition



Double
peak
demand
by 2050.



Five times
distributed
renewable
generation
by 2050.



>800GW
now in GB
connections
queue.

>500%
increase in
connection
activity.



>60 GW
contracted
connections.



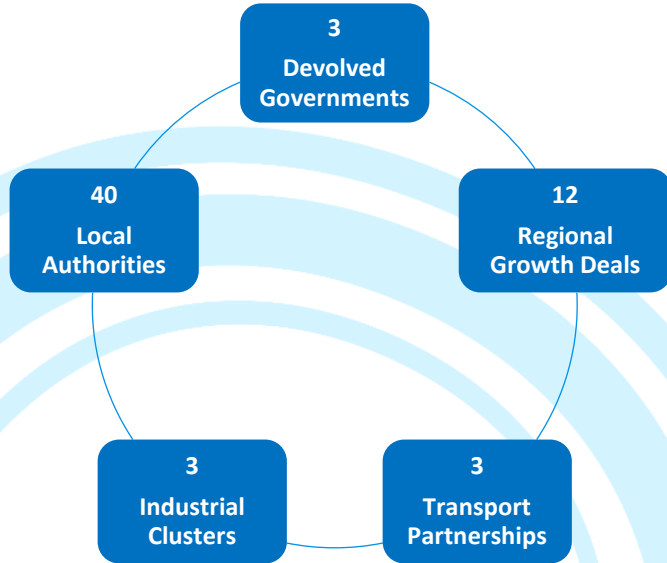
8m electric
vehicles and
heat pumps
by 2050.



Network planning data is shared on SPEN's Open Data Portal

Our Strategic Optimisation team

Our Strategic Optimisation team supports Local Authorities, Regional Government bodies and other industry organisations develop their energy plans and decarbonisation programmes



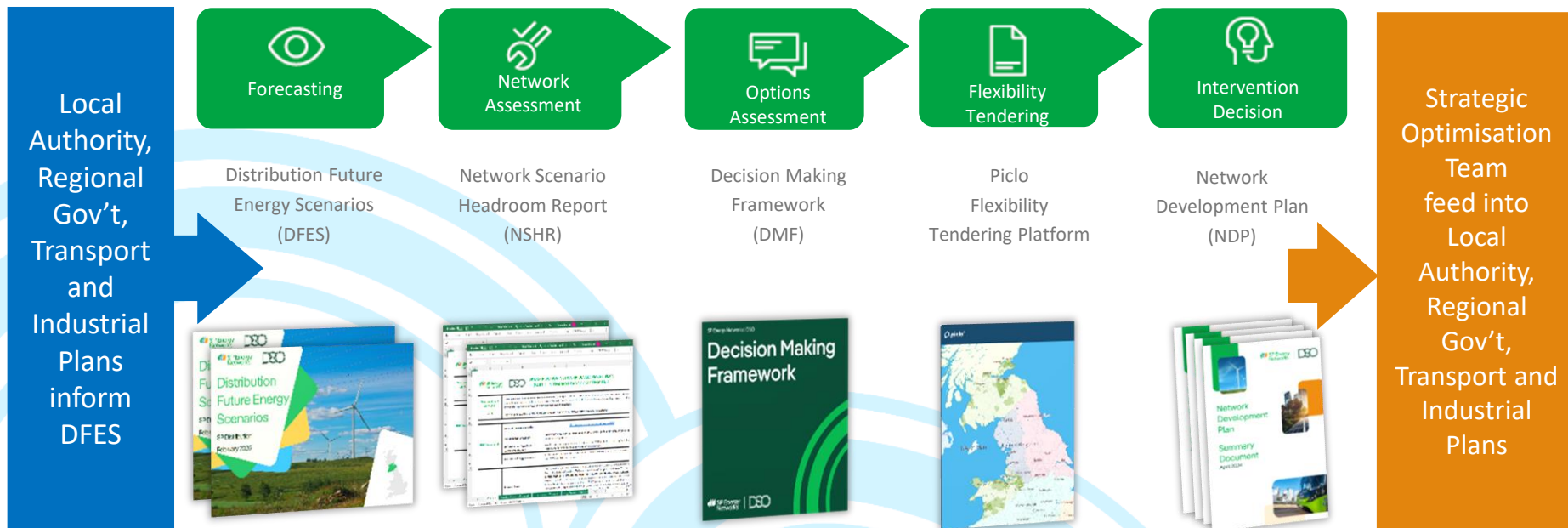
We can help Local Authorities, Regional Government bodies, Transport Groups and Industrial Clusters by:

- Providing guidance, support, and optioneering to develop co-ordinated energy plans.
- Supporting the development of strategies, scenarios, and decarbonisation programmes.
- Analysing network project viability by determining future decarbonisation scenarios.
- Identifying commercial and strategic partnerships.
- Recognising Whole System opportunities, feeding into appropriate plans and developing the **SPEN Register of Strategic Projects**.

Contact us at: StrategicOptimisation@spenergynetworks.co.uk

Network Planning for RII0 - ED3

Providing the network capacity our customers need safely, efficiently, and on time



Strategic Planning with Fife Council – by 2030



Electrical Peak Demand (MW)
by geography



Residential battery EV uptake by primary
substation area – No. of vehicles



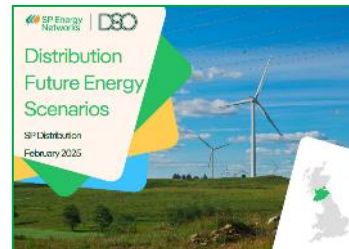
Installed generation and storage capacity
(MW) by GSP area



Heat pump numbers by primary substation
area – No. of heat pumps



SPEN Register of Strategic Projects
incorporates stakeholder plans
into our strategic planning process



Working with NESO, RESP and tRESP for RIIO-ED3



SPEN Strategic Planning Teams preparing for RIIO-ED3

Currently preparing RFI for tRESP

Public

Introduction to NESO & Regional Energy Strategic Planning

Regional Energy Strategic Planning Team
National Energy System Operator
20th March 2025

NESO

Draft RESP Outputs

Ofgem have outlined 3 building blocks that NESO's RESP must deliver. The NESO RESP Team is responsible for these outputs and will be producing them in collaboration with stakeholders. We have identified 8 key outputs that will enable the delivery of credible whole energy regional plans. These outputs will be refined and validated when developing the RESP Methodology.

- 1 The Regional Energy Vision**
Develop and establish Regional Energy Vision, reflecting local needs, to collectively support national objectives.
- 2 Regional Pathways**
Create Regional Pathways – built from the bottom-up and which are coherent with national needs. NESO will also develop consistent planning assumptions.
- 3 Spatial System Need**
Following from the pathways and considering network constraints, identify strategic investment needs to meet spatial cross-vector system needs.
- 4 Support for price controls**
Network plan technical coordination
Assure that network coordinated investment plans are integrated across vectors, built on consistent assumptions and deliver regional needs of people, within national constraints.
- 5 Regional Geospatial Energy Plan**
Develop publicly available geospatial regional plans that provide transparency and visibility to all stakeholders. The plans will track and monitor the delivery of the RESP, including Strategic Investments.
- 6 Societal Impact Assessment**
Review the societal impact of a local level of the energy transition (including skills, transport, industry, development etc.)

Ofgem consultation building blocks: a) Modelling supply and demand, b) Identifying system need, c) Technical coordination.

NESO

Public

Regional Energy Strategic Plans (RESP)

Why?
To achieve local and national net zero targets we need:

- 1. To accelerate electricity network investment** – enable heat & transport decarbonisation
- 2. Consistency** – same approach for all network companies
- 3. Whole system** – joined-up plan for all aspects of energy system

Where? (proposed)
Map of the UK showing the proposed regions for the RESP: North East, Yorkshire and the Humber, East of England, London, South East, South West, Midlands, North West, and Wales.

Who? (proposed)

- Ofgem** – defining role
- NESO** – delivering role
- Strategic Boards & Working Groups**
- Local authorities:** England: CAs, CCs, unitaries; Scotland & Wales: unitaries
- Networks:** DNOs & GDNs
- Other local actors:** relevant to energy system & spatial planning

NESO

Public

What is Enduring Methodology?

What is the Methodology?
The methodology will set out our approach for delivering the first Regional Energy Strategic Plans, which will be produced in late 2027.

What will be its key functions?
The methodology will set out how RESP will support coordination between key stakeholders, including networks and government.

Enduring Methodology
Timeline: Methodology Published, Consultation Opened (Late 2025) → Enduring Methodology (Late 2025) → Transitional RESP (Early 2026) → tRESP Published (Early 2026) → RESP Published (Late 2027).

We will support the implementation of the energy transition, working with local actors and providing practical guidance.

We will provide regionally tailored Pathways plans based on both top-down and bottom-up forecasting, to support investment planning.

NESO



Audience Q&A



Refreshment Break

11:30 – 11:45



Session 2: Breakout Rooms

Breakout 1: Developing the future workforce

*Skills & supply chain for the construction & energy sectors.
How to solve jobs & skills gap for retrofit and heating in Fife/wider region.*

Wallace Suite

Breakout 2: Renewable heat from minewater

Discussing ways to maximise minewater heat in Fife and the associated challenges & opportunities.

Main Room



Lunch

13:00 – 13:50



Session 3: Energy for Industry: supporting the transition

How industry and businesses are being innovative to support Fife's energy transition

- **Clare Reid** - Director of Policy & Public Affairs, Prosper
- **Sean McManus** - Project Manager - Operations, Brockwell Energy
- **Jessica Stewart** - Sustainability Manager, InchDairnie Whisky Ltd

Facilitated by **Pamela Stevenson**, Service Manager - Economic Development



Session 3: Energy for Industry: supporting the transition

Clare Reid

Director of Policy & Public Affairs

Prosper





prosper

Energy for Industry: supporting the transition

Clare Reid, Director of Policy and
Public Affairs, Prosper





Energy issues today



Zonal pricing –
uncertainty



Highest
electricity costs
in Europe



UK government
position on
licensing



Energy Profits
Levy/Investability



Net Zero Backlash



Project Acorn –
CCUS site



Project Willow
and future of
Grangemouth



Grid connections –
consenting and
planning



Conditions for a just transition?

- Managed transition between oil and gas production and growth in renewables
- At a pace that retains the supply chain needed for renewables
- And enables the transition of the workforce to renewables roles or retraining



Source: Energy Voice



How do we achieve energy transition?

1. UK government to prioritise domestic oil and gas production over imports
2. Replace the Energy Profits Levy by Spring 2026
3. Regulatory regime for North Sea licences needs to support lower emission intensity production
4. Scottish Government's Energy Strategy should prioritise domestic oil and gas
5. Fund long-term Just Transition programme in North East





Building blocks of a once-in-a-generation opportunity for clean power

Renewable Energy

CCUS and Hydrogen

Grid

Market Reform

Ports and Supply Chain

Planning and Consenting

People



Building blocks of a once-in-a-generation opportunity for clean power

Renewable Energy

CCUS and Hydrogen

Grid

Market Reform

Ports and Supply Chain

Planning and Consenting

People





If you'd like to join our conversation on this Prosper Blueprint 2025

- Prosper's vision for the Scottish economy – an economy that provides opportunity for everyone, takes advantage of the once-in-a-generation opportunity from the energy transition and a country that gets things done more sustainably and efficiently
- 12 actions across 3 overarching recommendations looking at Growth and Opportunity; Energy Transition; Reform & Delivery
- **Launch event:** Wed 25 June, 8.30am for a 9am start at the Scottish Storytelling Centre on the Royal Mile in Edinburgh.





prosper

Thank you

Session 3: Energy for Industry: supporting the transition

Sean McManus

*Project Manager - Operations,
Brockwell Energy*





Westfield Energy Recovery Facility

Delivering Resilient, Responsible Energy
Infrastructure
June 2025



1 **Introduction & Purpose**
Why we're here and what we'll cover

2 **The Challenge – Why We Need EfW**
Context of waste, carbon reduction, and energy needs

3 **Vision & Goals**
How Westfield aligns with a low-carbon future

4 **From Idea to Consent**
Planning, consenting, and environmental assessments

5 **Procurement & Partnership**
Strategic supplier selection and risk management

6 **Site Enabling & Early Works**
Preparing the site and protecting local ecology

7 **Civil & Structural Works**
Infrastructure development and sustainable construction

8 **Mechanical & Electrical Installation**
Delivery of key systems and performance-focused design

9 **Commissioning & First Fire**
Milestone achievements and lessons learned

10 **Delivering Capability & Confidence**
Team building, training, and a 'one team' culture

11 **Handing Over a Resilient Asset**
Assuring environmental and operational readiness

12 **Environmental Impact & Performance**
Emissions control, carbon savings, and future potential

13 **What Makes It Innovative & Responsible?**
Key innovations, design resilience, and replicability

14 **Looking Ahead**
Long-term contribution and future opportunities

15 **Summary & Key Takeaways**
Reinforcing the message of innovation, resilience, and responsibility

16 **Q&A**
Open floor for questions



1. Introduction & Purpose

Why we're here and what we'll cover



Introduction

Why we're here and what we'll cover

Aims of the presentation

- The purpose of this presentation is to explore how we can deliver energy infrastructure that is innovative, environmentally responsible, and resilient.
- We'll use the Westfield Energy from Waste (EfW) project as a case study — a real-world example of delivering complex infrastructure that contributes to Scotland's low-carbon goals.
- This journey highlights how integrated planning, technical delivery, and a high-performance culture can deliver impactful outcomes.
- The story will follow the full lifecycle of the project — from concept and consent through to commissioning and operational readiness.
- Along the way, we'll reflect on the lessons learned, innovations introduced, and the role EfW plays in supporting a circular, low-carbon economy.



2. The Challenge – Why We Need EfW

*Context of waste, carbon reduction,
and energy needs*



The Challenge – Why We Need EfW

Part of the solution for Net Zero and a Circular Economy

-  **Landfill Ban Pressure:** Scotland is implementing a ban on biodegradable municipal waste going to landfill (delayed to 2025), creating a need for **residual waste treatment capacity**.
-  **Bridging the Energy Gap:** Energy from Waste (EfW) contributes to **baseload electricity**—helping balance intermittent renewables like wind and solar.
-  **Carbon Impact:** EfW recovers energy from non-recyclable waste, diverting it from landfill where it would emit **methane**, a greenhouse gas **25x more potent** than CO₂.
-  **Contribution to Net Zero:** The Scottish Government aims for **Net Zero by 2045** — EfW, when paired with **carbon capture** and **heat recovery**, can be **net carbon negative**.
-  **Residual Waste Reality:** Even with best recycling efforts, around **20–25%** of household and commercial waste remains non-recyclable — EfW provides an essential outlet.
-  **Fife Context:** Westfield EfW is built on a **former open cast coal site**, turning an area of legacy environmental degradation into a hub for **clean energy production**.
-  **Circular Economy Alignment:** EfW plays a role in the **Scottish Circular Economy Route Map** (2022) by recovering value from waste and supporting zero waste targets.
-  **Heat Opportunity:** Fife has been identified in studies (e.g. LHEES) as a region with potential for **district heating network** — EfW plants can be valuable local heat sources.

3. Vision & Goals

How Westfield aligns with a low-carbon future



Vision & Goals

Why we do what we do

- The vision for Westfield EfW is to create a modern, efficient energy recovery facility that transforms residual waste into low-carbon electricity.
- The project supports Scotland's ambition to achieve Net Zero emissions by 2045 by diverting non-recyclable waste from landfill and displacing fossil-based energy.
- Located on a former open cast coal site, the project is a model for land repurposing and just transition — turning a legacy industrial site into a clean energy hub.
- The plant is designed to handle up to 240,000 tonnes of residual waste per year, with strict emissions controls and high energy recovery efficiency.
- It contributes to local and regional energy security, delivering baseload electricity to the grid with potential for future heat network integration.
- Key goals include environmental compliance, operational reliability, safety, and delivering long-term value to the community and stakeholders.
- Embeds circular economy principles by extracting energy from materials that would otherwise have no productive use.

4. From Idea to Consent

*Planning, consenting, and
environmental assessments*

From Idea to Consent

The Planning stage is where many a project fails “out the gates”.

- Secured Planning Permission from Fife Council after comprehensive site assessments and design reviews.
- Obtained a PPC (Pollution Prevention & Control) Permit from SEPA to ensure best-available-tech emission standards and ongoing environmental compliance.
- Conducted extensive Community Engagement: public exhibitions, workshops, and stakeholder briefings to address local concerns and build support.
- Applied for and received a Water Abstraction Licence from SEPA to regulate process water usage and protect local watercourses.
- Negotiated Utilities Agreements for new water and electrical connections with Scottish Water and the Distribution Network Operator to guarantee reliable supply for operations.
- Implemented an iterative consent strategy, aligning technical design updates with regulator feedback to streamline approvals.

5. Procurement & Partnership

*Strategic supplier selection and risk
management*

Taking time to select the right partnerships

- Chose **Kanadevia Inova** (formerly HZI) as EPC and O&M partner — a **market leader in EfW** with a strong UK track record and over 600 references globally.
- Developed a “**best in class**” **facility** by leveraging Kanadevia’s technical expertise and proven combustion and flue gas treatment technologies.
- Negotiated a **full Turnkey EPC contract** with a comprehensive **wrap-around guarantee** — placing performance and delivery risk squarely with the contractor.
- Structure gave funders confidence and supported **bank-financed delivery**, ensuring the project was investment-grade and fully underwritten.
- Executed a **25-year O&M contract** with Kanadevia, aligning long-term operations with design intent and incentivising whole-life performance.
- Procurement strategy prioritised **technical excellence**, **risk transfer**, and **bankability**, while ensuring long-term value and resilience.

6. Site Enabling & Early Works

*Preparing the site and protecting
local ecology*

Site Enabling Works

Cut & Fill + Dynamic Compaction. Land remediation on old mining ground. Utility works (power, water telecoms).



7. Civil & Structural Works

*Infrastructure development and
sustainable construction*

Civil & Structural Works

Main Civils contractor, PJ Careys, performed excellently. This gave the project an early win & tail wind.

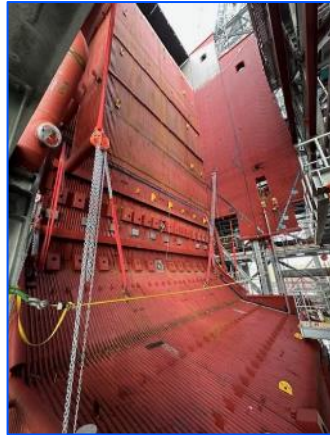
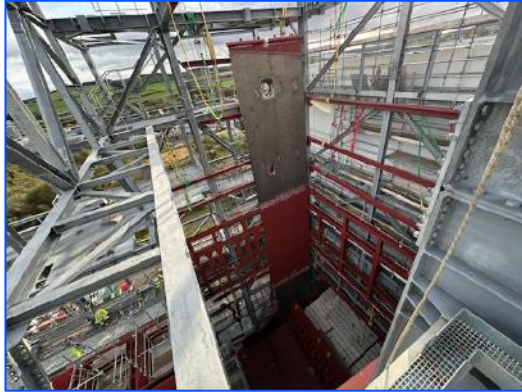


8. Mechanical & Electrical Installation

*Delivery of key systems and
performance-focused design*

M&E Works

Huge job from an M&E perspective. ~15 main sub-contractors working under the Principal Contractor, on a variety of packages. Interface management and safety supervision is key.



9. Commissioning & First Fire

Milestone achievements and lessons learned



Commissioning Era

Phased & strictly controlled handover into commissioning as heat, chemicals and electricity are introduced to the plant. The build is brought alive during this phase and it takes a massive engineering effort.



10. Delivering Capability & Confidence

Team building, training, and a 'one team' culture



Delivering Capability and Confidence

Staff recruitment and training programme. Knowledge transfer from Swiss engineering centre and UK commissioning team to the newly recruited plant operations team. Experienced plant manager hired from EfW industry.

- Comprehensive training programme delivered by Kanadevia Inova's expert commissioning team, covering operations, safety, and maintenance.
- Structured handover from construction to operations, with phased involvement of future operators during cold and hot commissioning.
- Recruitment of a dedicated team of 30 operations and maintenance staff, drawn from related sectors such as power generation, petrochemicals, and heavy industry.
- Focused on building in-house capability through cross-training and knowledge transfer, reducing reliance on external support.
- Majority of staff had no prior experience in Energy from Waste, but brought strong transferrable skills and safety culture.
- Outcome: confident, competent team in place at handover, ensuring smooth transition to steady-state operations.



11. Handing Over a Resilient Asset

*Assuring environmental and
operational readiness*



Handover to Operations

Structured handover process. Construction team focuses on 'snagging' whilst the training and commissioning programme takes place.

- Comprehensive training programme delivered by Kanadevia Inova's expert commissioning team, covering operations, safety, and maintenance.
- Structured handover from construction to operations, with phased involvement of future operators during cold and hot commissioning.
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- Outcome: confident, competent team in place at handover, ensuring smooth transition to steady-state operations.



12. Environmental Impact & Performance

*Emissions control, carbon savings,
and future potential*

Environmental Impact & Performance

A lasting legacy with minimal environmental impact

- The plant exports **25 MW of renewable electricity** to the local grid — enough to power over **45,000 Scottish homes**.
- Processes up to **240,000 tonnes of residual municipal solid waste (MSW) per year**, sourced from **Fife and surrounding local authorities**.
- Diverts waste from landfill, supporting Scotland's **zero waste targets** and improving local circular economy outcomes.
- **Bottom ash** is recovered and processed into aggregate material for **road construction**, reducing demand for virgin quarried stone.
- **Fly ash** is safely treated and disposed of at a specialist **land raise facility in North East England**, in full regulatory compliance.
- Equipped with advanced **emissions control systems**, ensuring compliance with the **Industrial Emissions Directive (IED)** and SEPA permit limits.
- Contributes to both **climate goals** and **infrastructure resilience**, reducing reliance on fossil fuels and improving waste management security.

13. What Makes It Innovative & Responsible?

*Key innovations, design resilience,
and replicability*



What makes this project innovative and responsible?

-  Proven **moving grate combustion system** by Kanadevia — a reliable, scalable design used in **dozens of UK EfW plants**.
-  Advanced **state-of-the-art control system**, enabling precision operation, remote diagnostics, and continuous optimisation.
-  Built to last — robust design, **high-spec materials**, and premium OEMs like Siemens, Babcock, and Andritz.
-  **Zero Liquid Discharge** policy – rainwater harvesting and full on-site treatment ensure no effluent leaves the site.
-  Long-term **lifecycle service agreements** in place with the EPC/O&M contractor — ensuring performance over decades.
-  Highly **replicable model** for other UK regions: bankable, consentable, and community-aligned infrastructure.
-  Responsibly designed to support a **circular economy**, reduce landfill, and contribute to **Net Zero goals**.

14. Looking Ahead

Long-term contribution and future opportunities

Where next for Westfield?

-  Exploring a **district heating network** to supply **low-carbon heat to Cardenden village**, enhancing local community benefit.
-  Plans to **enhance metals recovery** from bottom ash, maximising circular economy outcomes and resource efficiency.
-  Investigating opportunities for **carbon capture**, aligning with long-term decarbonisation strategies and Net Zero targets.
-  Embedded within the **wider Hargreaves Westfield masterplan** — a growing hub for green industrial development.
-  Capable of offering **private wire electricity** and **steam export** to future **co-located manufacturers** or clean tech industries.
-  Flexible, futureproof infrastructure designed to **adapt and integrate with evolving low-carbon technologies**.

15. Summary & Key Takeaways

*Innovation, resilience, and
responsibility*



Summary and Key Takeaways

Westfield ERF is an example of a modern energy project being well planned & executed with a positive impact locally & nationwide

- **Westfield EfW** is a flagship project contributing to Scotland's low-carbon, circular economy.
- Delivered **on time and safely**, with strong collaboration between client, contractor (Kanadevia), and stakeholders.
- Demonstrates the power of **innovative yet proven technologies**, including moving grate combustion and zero liquid discharge systems.
- A robust **turnkey EPC and 25-year O&M structure** ensures long-term performance and lifecycle resilience.
- Created **local capability and confidence** through targeted recruitment, training, and operational readiness.
- Designed with **scalability and replicability** in mind – a model for future sustainable infrastructure.
- Positioned to play a wider role in **heat networks, carbon capture, and industrial de-carbonisation** in Fife and beyond



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www.brockwellenergy.com



Session 3: Energy for Industry: supporting the transition

Jessica Stewart

Sustainability Manager

InchDairnie Whisky Ltd



!

INCHDAIRNIE
DISTILLERY

FIFE: A PLACE
FOR ENERGY

Jessica Stewart
JUNE 2025



WHO WE ARE

TASTE REVOLUTION

- Fife Grown, Fife Distilled, Fife Matured
- Started distilling in 2015
- A modern distillery, with equipment uncommon in the industry
- Not open to the public
- <https://www.youtube.com/watch?v=8fDKIALAaFA>



!
INCHDAIRNIE
DISTILLERY

1. LAND & WATER →

2. **ENERGY & EMISSIONS** →

3. PACKAGING →

4. PEOPLE & PARTNERSHIPS →

ENERGY & EMISSIONS



Whisky is an energy intensive business. Therefore, through our Energy and Emissions theme we will continue to minimise energy use, maximise energy efficiency and embrace cleaner energy in order to lower our emissions and environmental impact.

Not only will we do this in our own operations, but we will support these same ambitions in our supply chain.

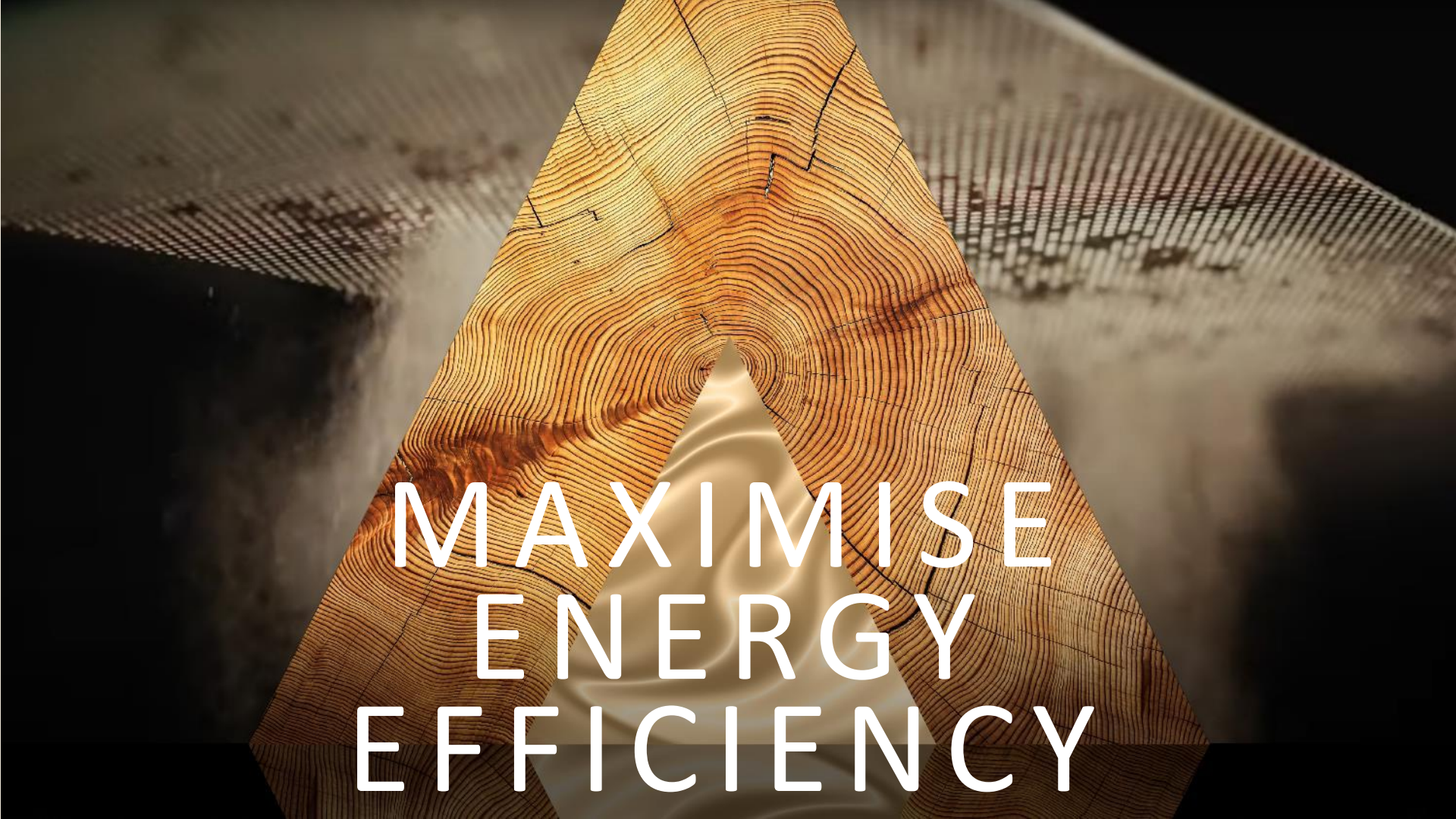
[Scope 1 & 2 2030](#)

OBJECTIVES

1. Minimise energy use
2. Maximise energy efficiency
3. Embrace cleaner energy



MINIMISE
ENERGY USE



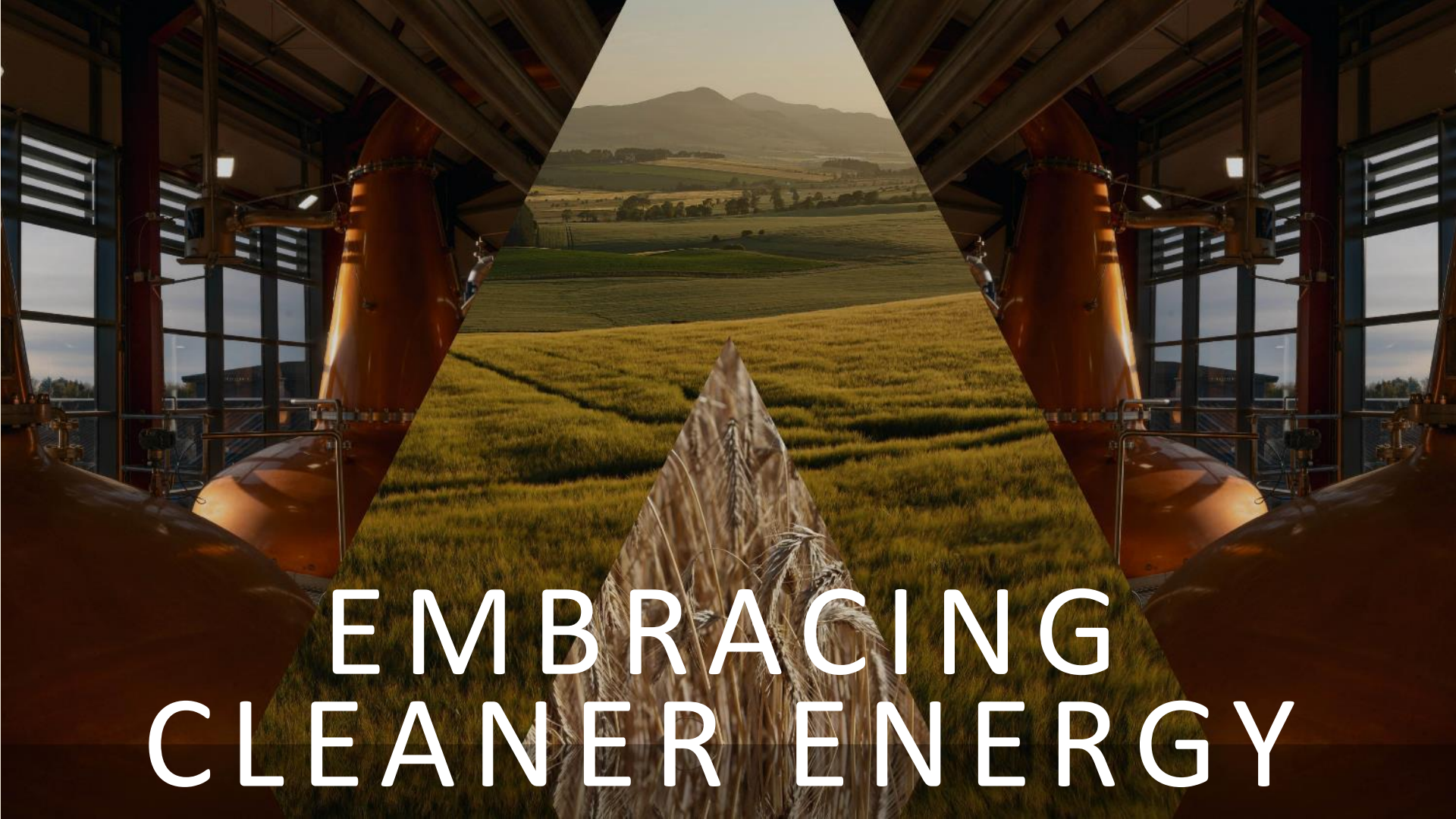
MAXIMISE
ENERGY
EFFICIENCY

*At InchDairnie we use **30% less energy** than
industry malt distilling average*



Energy





EMBRACING
CLEANER ENERGY

Decarbonising the InchDairnie Distillery

Feasibility Report

March 2021



BEIS GREEN DISTILLERIES COMPETITION: PHASE 1

(TRN 2564/08/2020)

!
INCHDAIRNIE
DISTILLERY

ARUP

Hydrogen switch ‘a big step’ for InchDairnie

InchDairnie plans to run a boiler on 100% hydrogen for use in their distilling process.

Managing director Ian Palmer estimates the switch will cut his business’ carbon footprint by more than a third.

He said: “We’re a new distillery and sensible and rational use of resources is key. Switching to green hydrogen is a big step. It will make a huge difference to our carbon footprint.

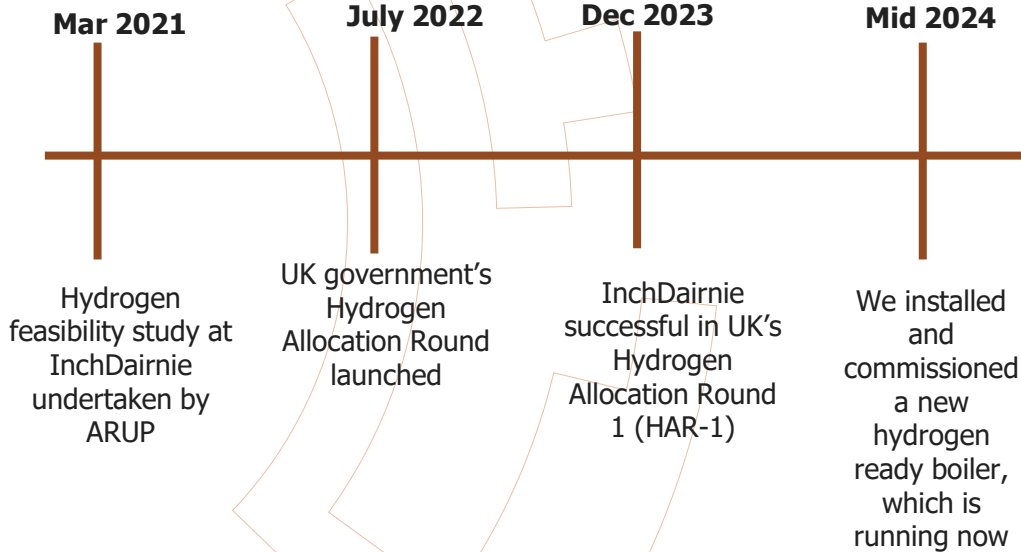
“We’ve done a carbon footprint calculation and by switching to green hydrogen we wipe out 35% of our carbon footprint. That is a big step for us.”



The Hydrogen Allocation Rounds (HARs) are a government funding mechanism to support low carbon hydrogen production across the UK.

Ian Palmer gives a tour of the facility to Claire Coutinho, minister for energy security and net zero. Image: Steve Brown/DC Thomson.

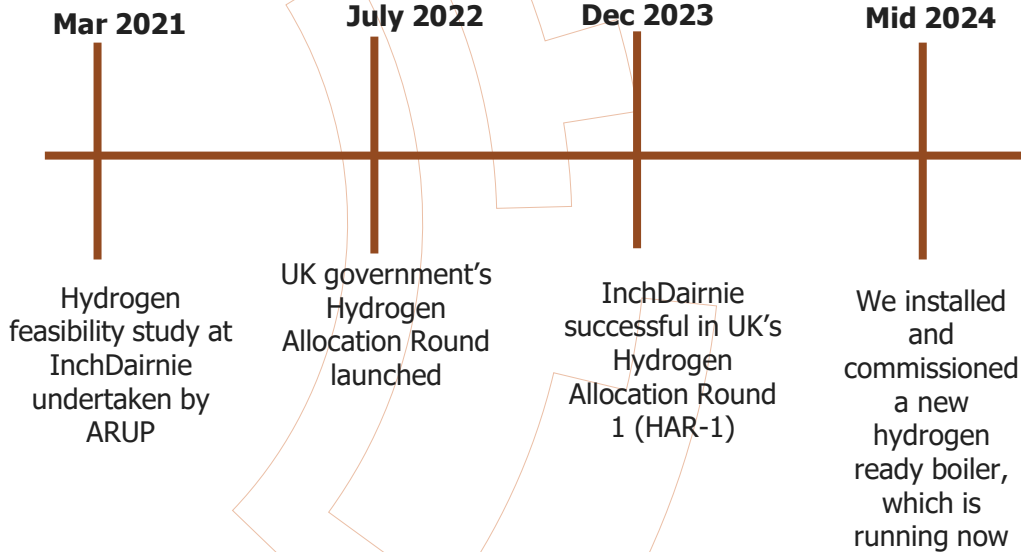
Inchdairnie timeline



- The 15-year contract is currently prohibitive due to inflexibility in volumes
- The cost of delivery and infrastructure is high, and therefore, even though hydrogen price is matched to gas, the cost to the off-taker would still be considerably higher than gas
- There are still details to be ironed out by DESNZ, so we are still unable to make a totally informed decision



Inchdairnie timeline



- We currently do not have trucks on the road for fuel deliveries, as we are on mains gas.
- This would change when we get hydrogen, as supply isn't close enough to be piped.
- We do not want to add road emissions from fossil fuels
- We can provide the hydrogen to the delivery trucks, as we would have the ability to reduce the pressure enough to allow for use in trucks.



!

INCHDAIRNIE
DISTILLERY

THANK YOU



Audience Q&A



Refreshment Break

14:50 – 15:05



Session 4: Innovation & Fife's future

An exploration of some of the innovative and exciting projects being delivered in Fife

- **Hamish Martin:** Strategy Officer (LHEES), Fife Council
- **Bobbie Milligan:** Principal Engineer, Ramboll
- **Karen Primrose:** Director, The Eden Campus, University of St Andrews

Facilitated by **Ross Spalding**, Service Manager – Climate Change & Zero Waste



Session 4: Innovation & Fife's future

Hamish Martin

Strategy Officer (LHEES)

Fife Council

Bobbie Milligan

Principal Engineer

Ramboll



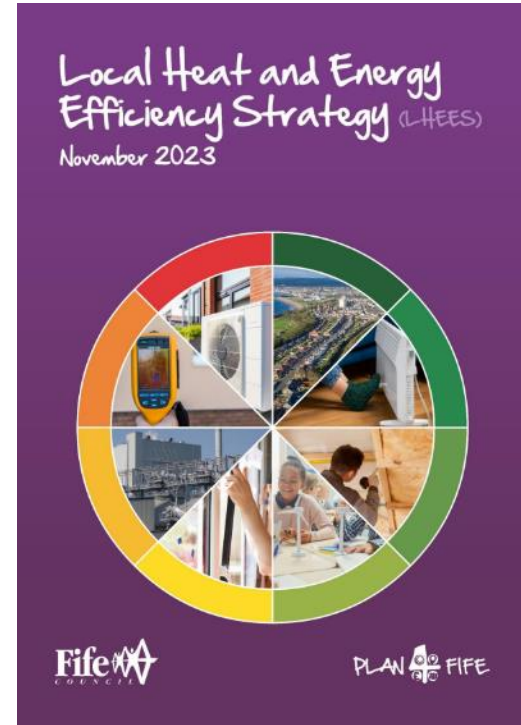
Dunfermline & Rosyth Energy Plan

Hamish Martin – Strategy Officer (LHEES), Fife Council
Bobbie Milligan - Principal Engineer, Ramboll

LHEES Vision & Priorities

Provide a focus for Fife to improve the energy efficiency and decarbonise heat sources of buildings in a climate friendly, ready, and just manner to meet targets.

1. Being **Climate** Friendly & Ready
2. Tackling **Fuel Poverty**, Health, and the Just Transition
3. Supporting an **Inclusive Economy**, Jobs, and Skills
4. Maximising **Knowledge** and Awareness
5. Ensuring **Certainty** of Success
6. Transitioning the **Energy** System
7. Improving the Energy **Efficiency** of Buildings
8. **Decarbonising** Heat Sources

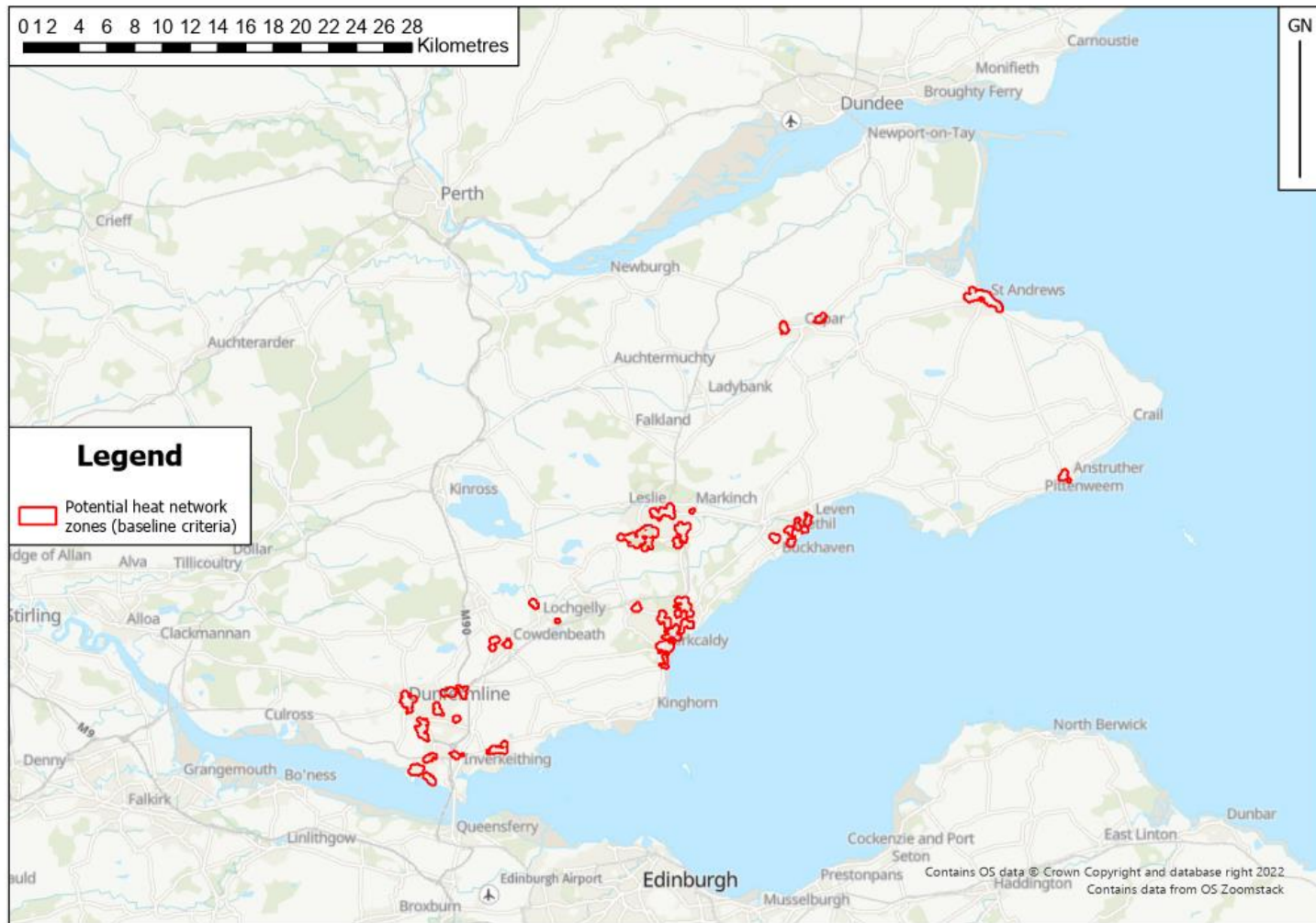


New Zones

Amended potential
heat network
zones

Subject to change
following review

[Fife Local Heat &
Energy Efficiency
Strategy \(LHEES\)
Web Map](#)



Amended potential heat network zones

Subject to change
following review

[Fife Local Heat & Energy Efficiency Strategy \(LHEES\) Web Map](#)



Wider energy system

- Changing use of existing energy infrastructure & interaction with wider energy system must be considered when planning heat decarbonisation.
- Consider wider energy opportunities to enable large scale, deliverable heat networks in Fife.
- Pilot Dunfermline & Rosyth energy plan as prospectus & shared vision for community.

Explore large-scale heat network vision

Impact of energy generation/ storage opportunities and constraint risks

Heat network = anchor project

Dunfermline & Rosyth

City status

Heat network &
zones

Social housing/
fuel poverty

Homes unsuitable
for heat pumps

Forth Green
Freeport

Heat sources
(ambient)

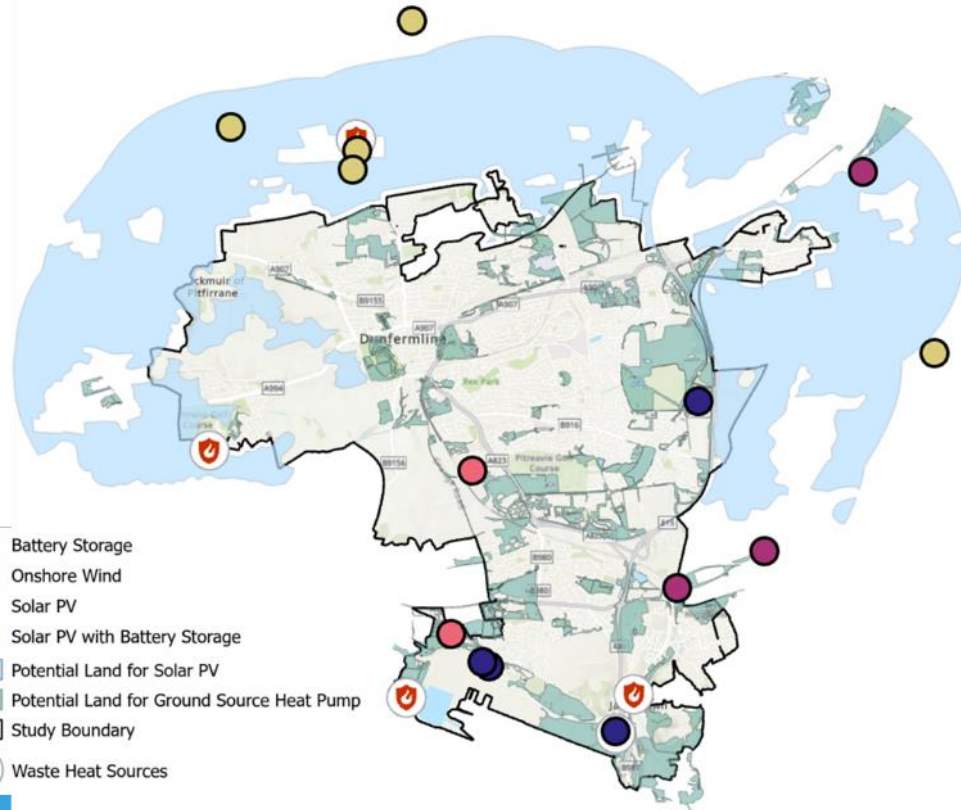
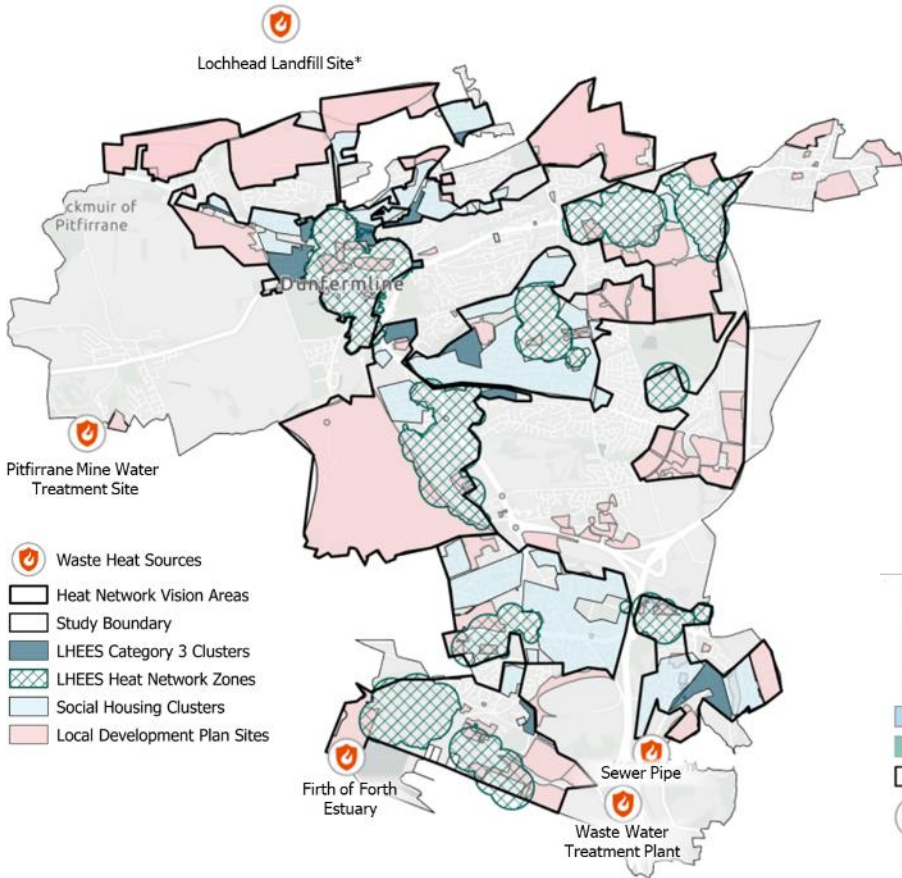
Proposed grid
upgrades

Inverkeithing High
School

Strategic
development
areas

Multiple large
energy loads

Dunfermline & Rosyth Energy Prospectus



Dunfermline & Rosyth Energy Prospectus



Up to
40%

of electricity demand
could be met by local
renewables

At least
90%

increase in *annual*
electricity demand to meet
future power, heat and
transport demands

↓ **11%**

less *annual* electricity
demand needed for heating
compared to air source heat
pump counterfactual

190
MWh

of battery storage needed
to support optimised
energy system

Increase in annual
demand from new
developments

↑ Heat
20%

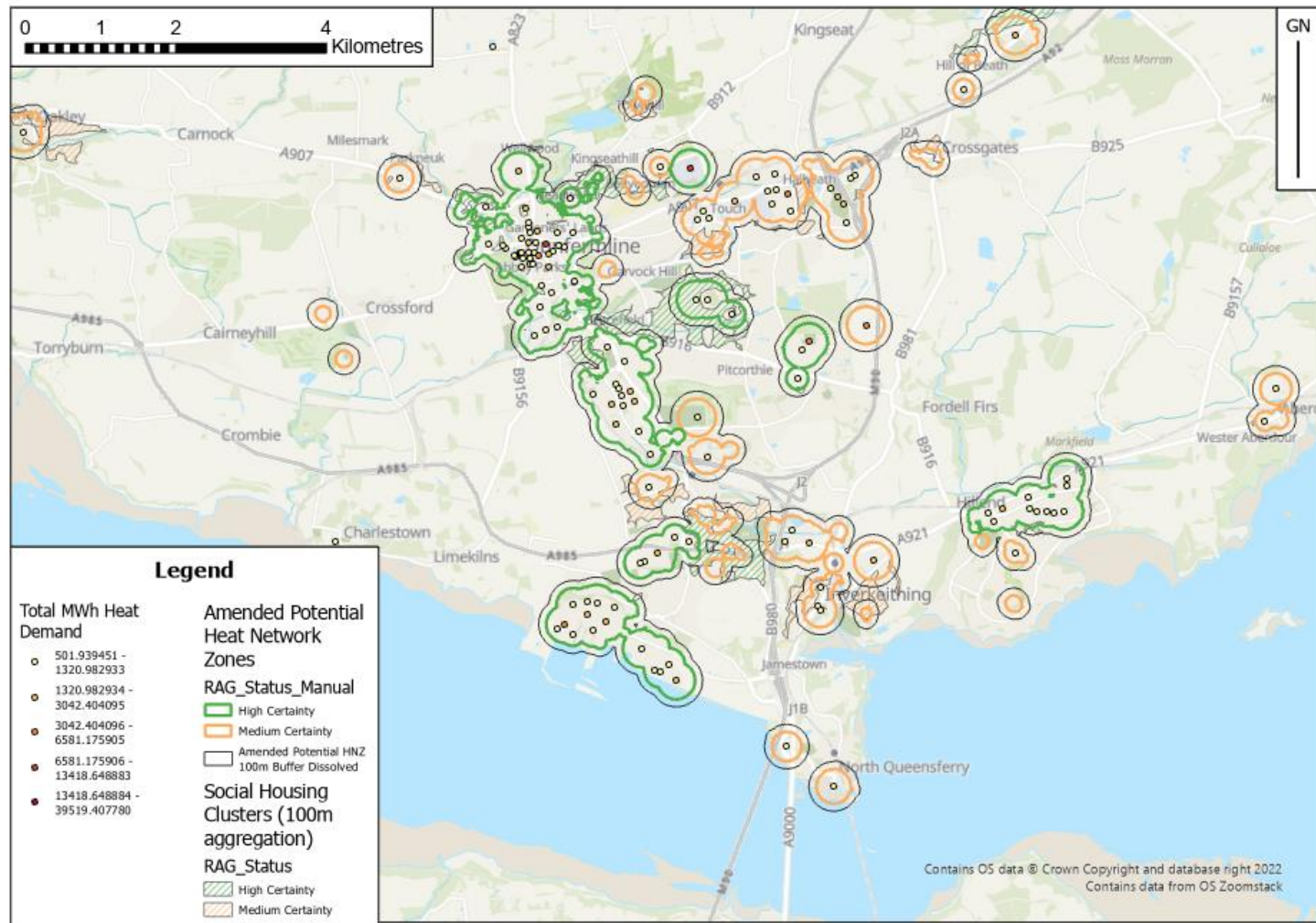
↑ Power
23%

Treatment Plant

Dunfermline Rosyth

Amended potential
heat network
zones

Subject to change
following review



Place-based energy plans – next steps

- Heat Network Support Unit funding
- Bring in Ramboll to develop full Dunfermline & Rosyth Energy Plan.

Data gathering

Energy mapping and
modelling

Investigate/characterise
heat network zones

Investigate/characterise
heat sources

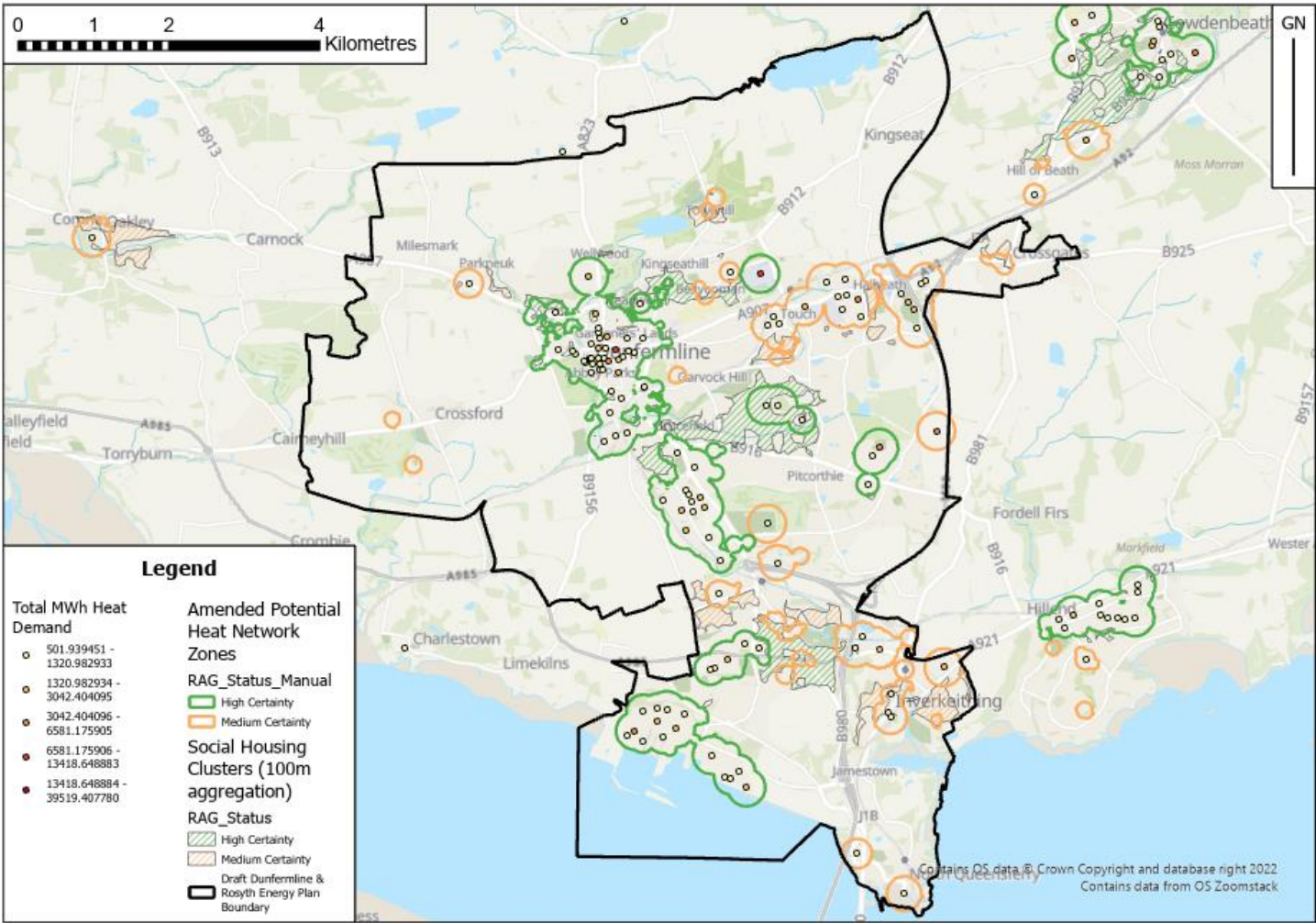
Multi criteria analysis and
sequencing

Est. investment needs,
outcomes, target
contributions

Energy Masterplan & Heat
Network Vision

Methodology production

Project Area



Topics

1. Who are Ramboll
2. The Energy Problem
3. District Energy?
4. What are the technologies
5. Opportunities in Dunfermline & Rosyth
6. Exploring Cost Effectiveness
7. Modelling Routes – connecting the dots

District Energy UK

”

Ramboll designs fully integrated electric, thermal and cooling systems for cities and campuses of all sizes.

We have provided consultancy services to more than 250 district heating systems worldwide and supported some of our clients for more than 30 years.

Our services cover all scales, from small village schemes to city-wide transmission networks, like the one in Copenhagen supplying heat to more than 1 million people.

”



The Energy Issue



The decarbonisation of heat has focused on the use of electricity as the primary solution



Grid scale electricity is steadily declining in carbon content and is an “easy” choice for master planning



The scale of local consumer generation through PV/wind is not great enough to cover the increased energy demand.



In new and renovated properties seasonal heating is becoming a smaller proportion of the energy demand with hot water becoming the peak property energy use.



HV, EHV and even LV level energy is quickly becoming constrained – if not already constrained



The Transmission grid is undergoing an overhaul *and* reinforcement at a scale greater than ever

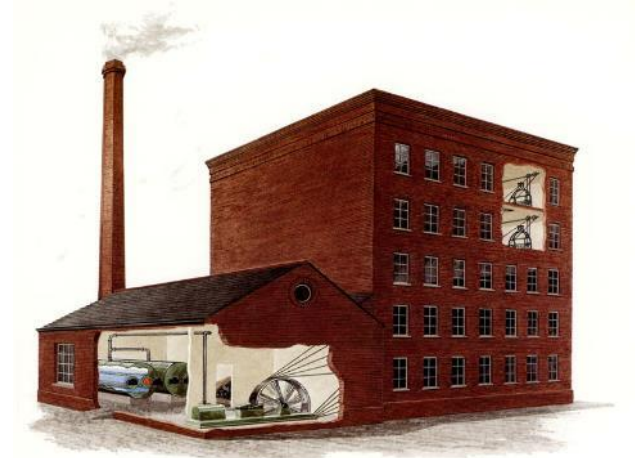


Despite Government support the cost of connection is increasing steadily to fund this transition

District Energy?

The History

- District energy is both a look to the past and innovation for the future
- During early electrification small decentralised generation provided electricity to communities and districts
- During the industrial revolution manufacturing sites benefitted from centralised steam generation for multiple factories and lathes/looms etc etc



District Energy?



The Future

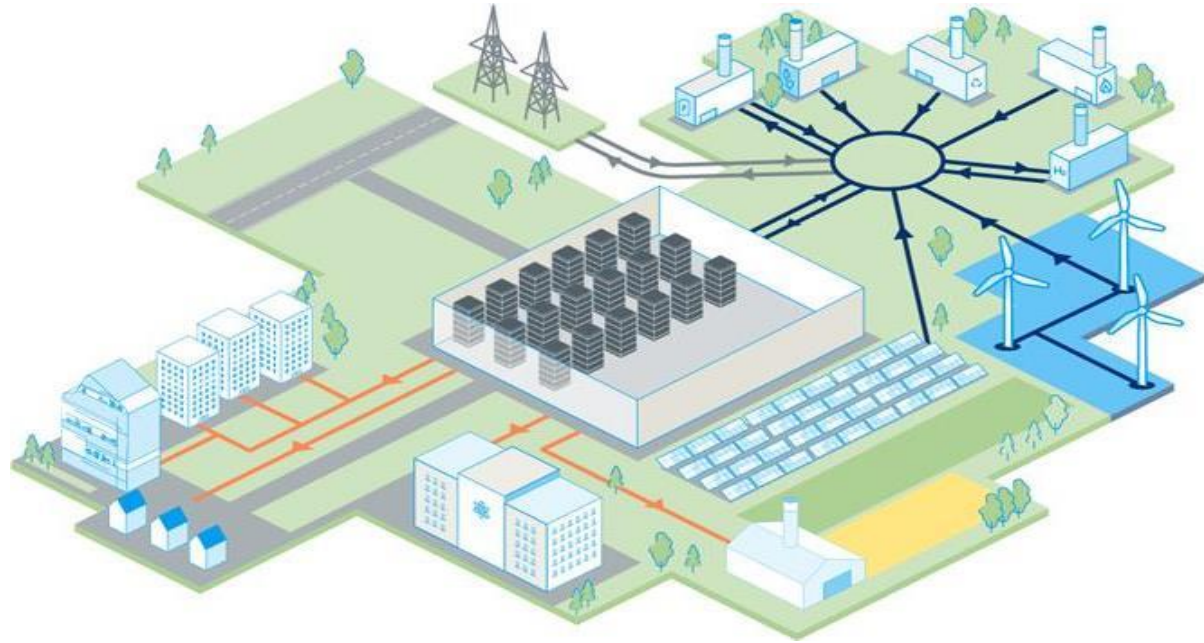
- The Route to Decarbonisation of heat is fastest through electrification.
- This puts exceptional load on the power and transmission network if put at the domestic scale we know today
- As we decarbonise the lessons of early heat and power can be taken to reducing demand and decarbonising our systems
- Centralised heat generation can reduce the electrical load for heat through economies of scale
- Power can be offset by private wire and local renewable energy generation

What is District Energy – The Scale



The Technologies

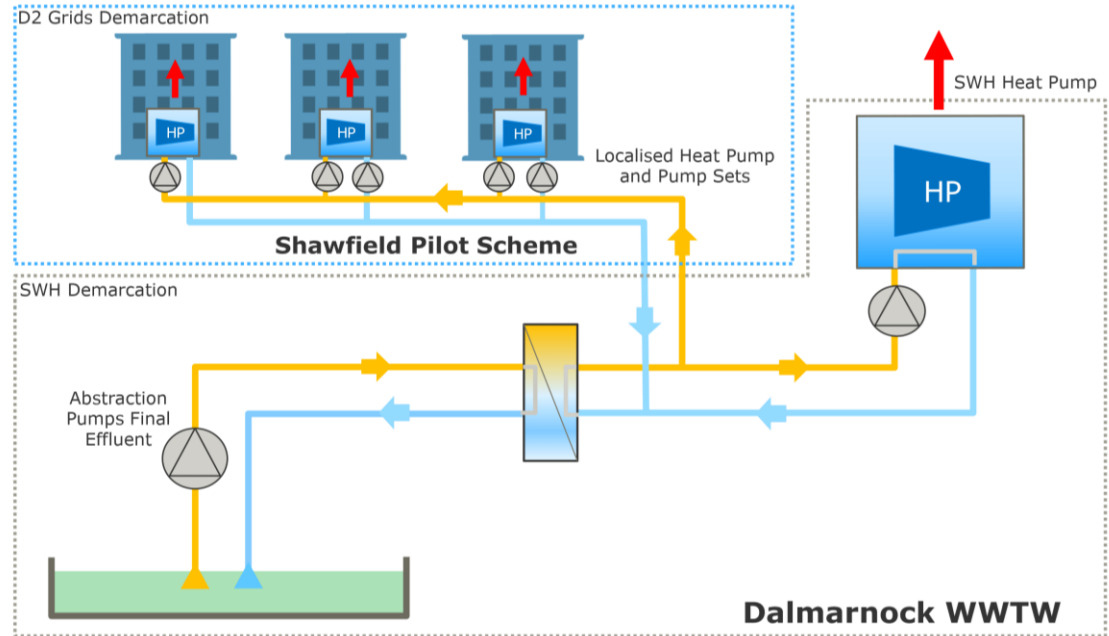
- Heat Pumps (air, water, process, mines)
- Electric Boilers
- Energy from waste (incinerators)
- CHP's (biogas)
- Hydrogen Boilers
- Solar PV
- Solar Thermal
- Seasonal Storage
- Wind
- Heat recovery (industry, data centres)



Innovative Technologies

- Sewer, mine & geothermal Heat recovery
- Improves heat pump coefficient of performance (energy in to energy out up to a COP of 5!)

OVERVIEW OF D2 GRIDS CONCEPT



Innovative Technologies

- Large Thermal and intraseasonal Storage (city scale)
- 200,000m³
- 70,000m² of solar heat array
- 10MW Electric boilers, heat pumps, gas boilers



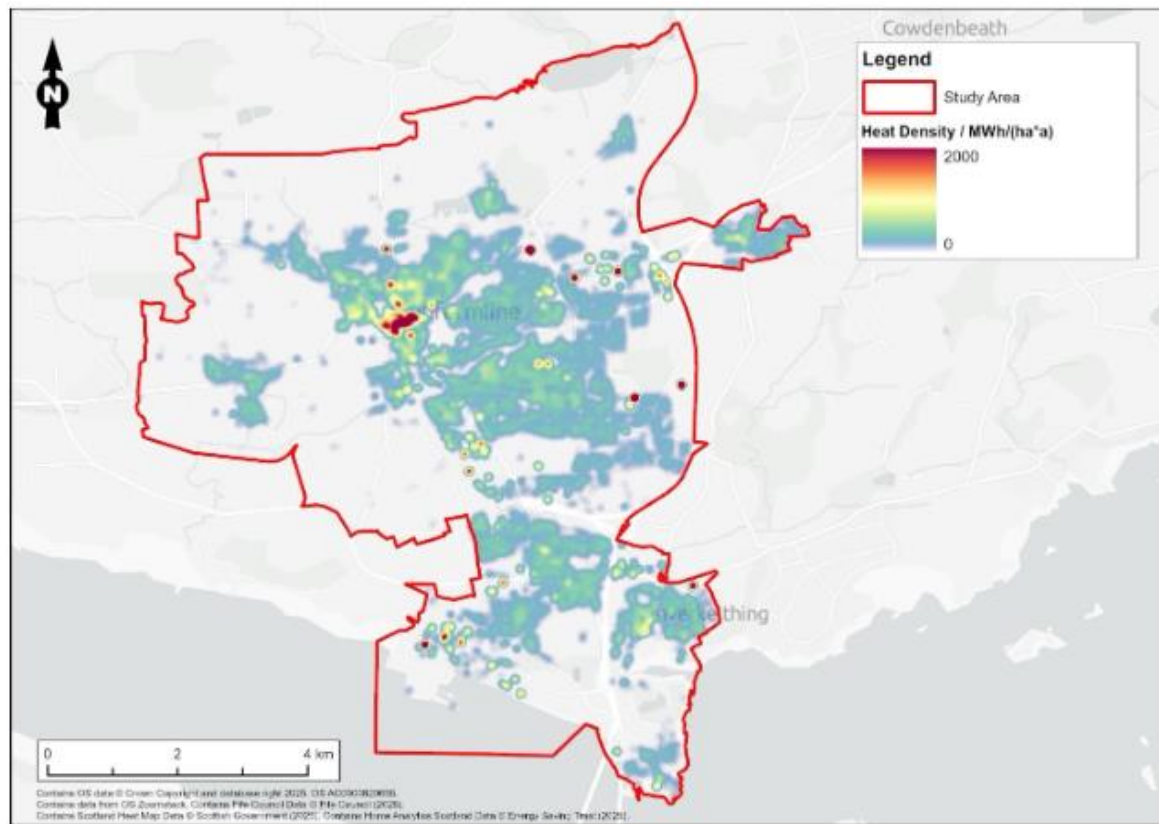
Innovative Technologies

- Large Thermal and intraseasonal Storage (Development Scale)
- 43,000m³
- Seasonal 1,500MWhr Flexibility
- 1,000 TCO_{2e} reduction

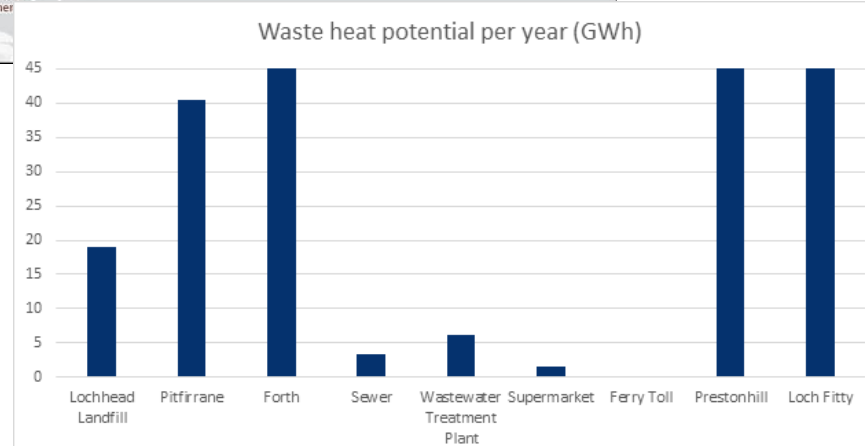


Exploring cost effective routes to decarbonisation

- Dunfermline and Rosyth Heat density Map



- Opportunity Mapping
- Lochhead Landfill – CHP headroom
- Pitfirrane – 30-150m mine
- River Forth
- Dunfermline Wastewater treatment plant - 165,000 tons/yr



Exploring cost effective routes to decarbonisation

- A number of locations were identified where a heat networked solution could be **potentially** more cost effective than the counterfactual

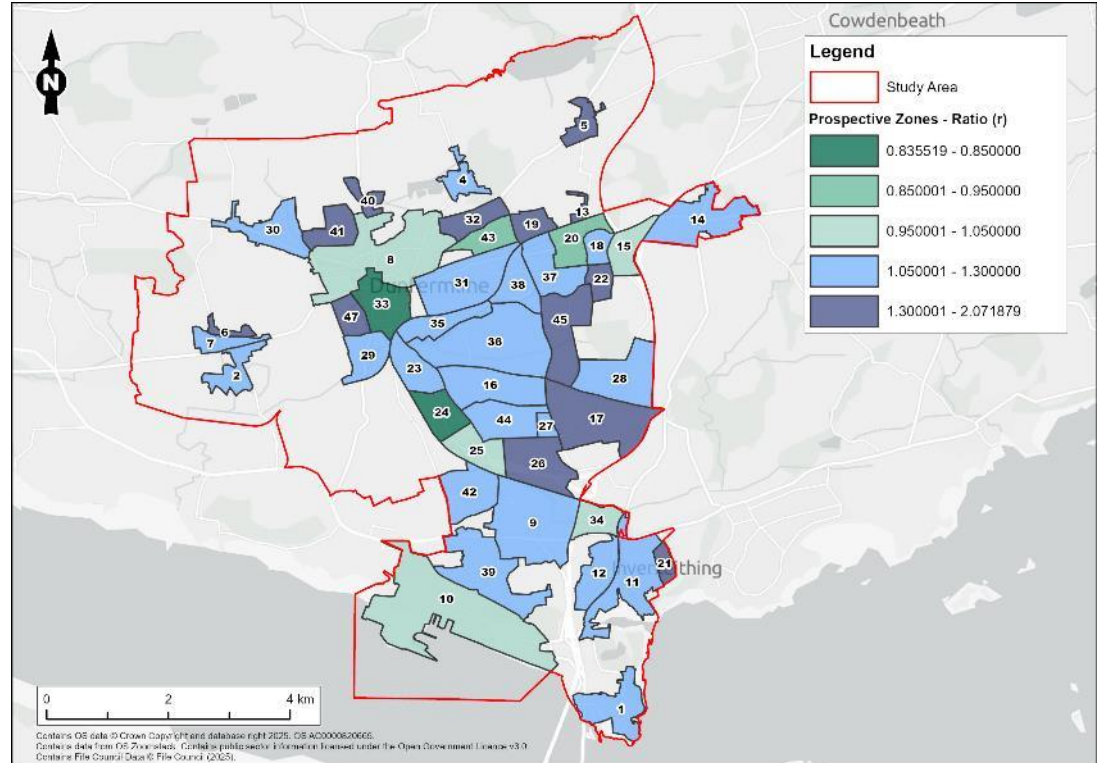
BUT;

- Some marginal areas adjacent which could be cross-subsidised to support the case for a heat networked solution
- As requested by Fife Council, Ramboll has investigated how these zones can be **combined** to create a larger zone.

$$\text{Heating cost ratio (r)} = \frac{\text{Heating_cost}_{\text{District_heating}}}{\text{Heating_cost}_{\text{Individual_heating}}}$$

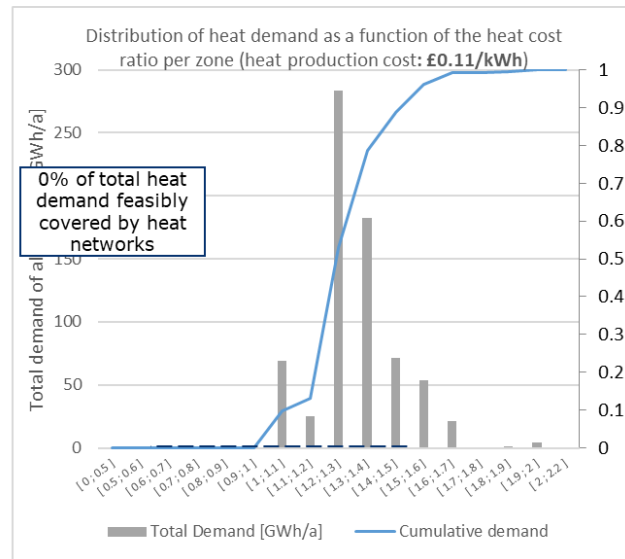
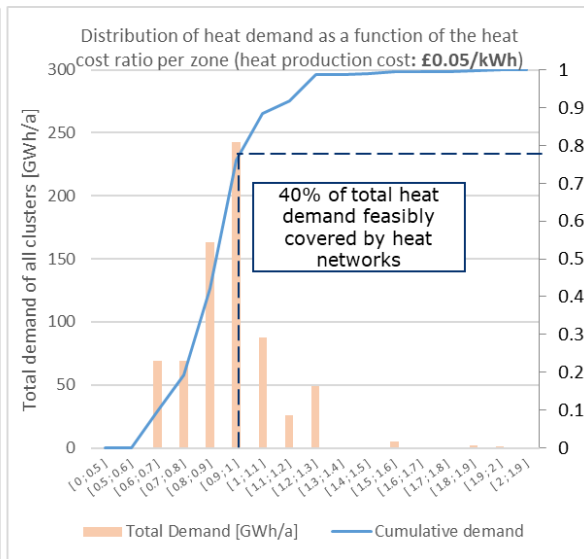
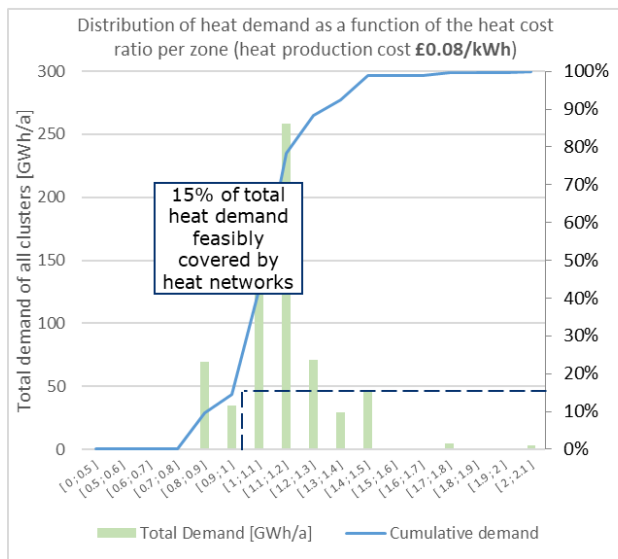
IF $r < 1$, district heating is more economically feasible

IF $r > 1$, heat pump is more economically feasible

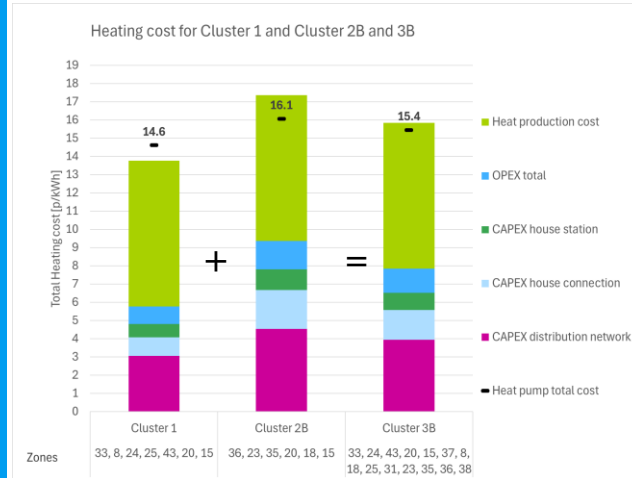
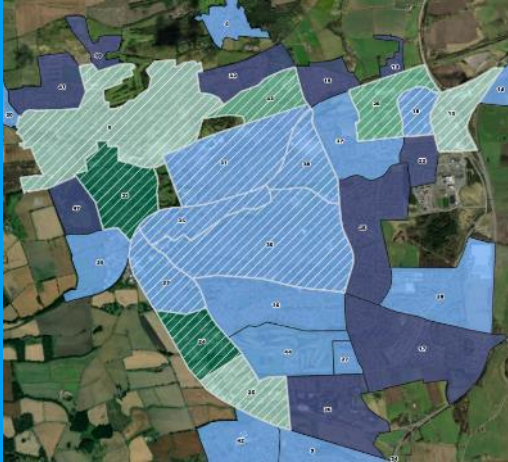


Exploring cost effective routes to decarbonisation

- We have examined the cost-effectiveness of various approaches to heat decarbonisation at a zone level. This analysis involved calculating the undiscounted levelised cost of energy (LCOE) for heat production under two scenarios: (1) a heat network solution and (2) an individual air-source heat pump (ASHP) solution.
- Our methodology assumed a baseline heat production cost of 8p/kWh, with sensitivity analysis conducted at 5p/kWh and 11p/kWh. This assumed cost accounts for the combined capital expenditure (CAPEX), operational expenditure (OPEX), and replacement expenditure (REPEX) required for heat production within a district heating network. By incorporating the estimated costs of network infrastructure and consumer connection, we derived an estimated LCOE at a zone level. A similar calculation was performed to determine the zonal LCOE for an individual ASHP.



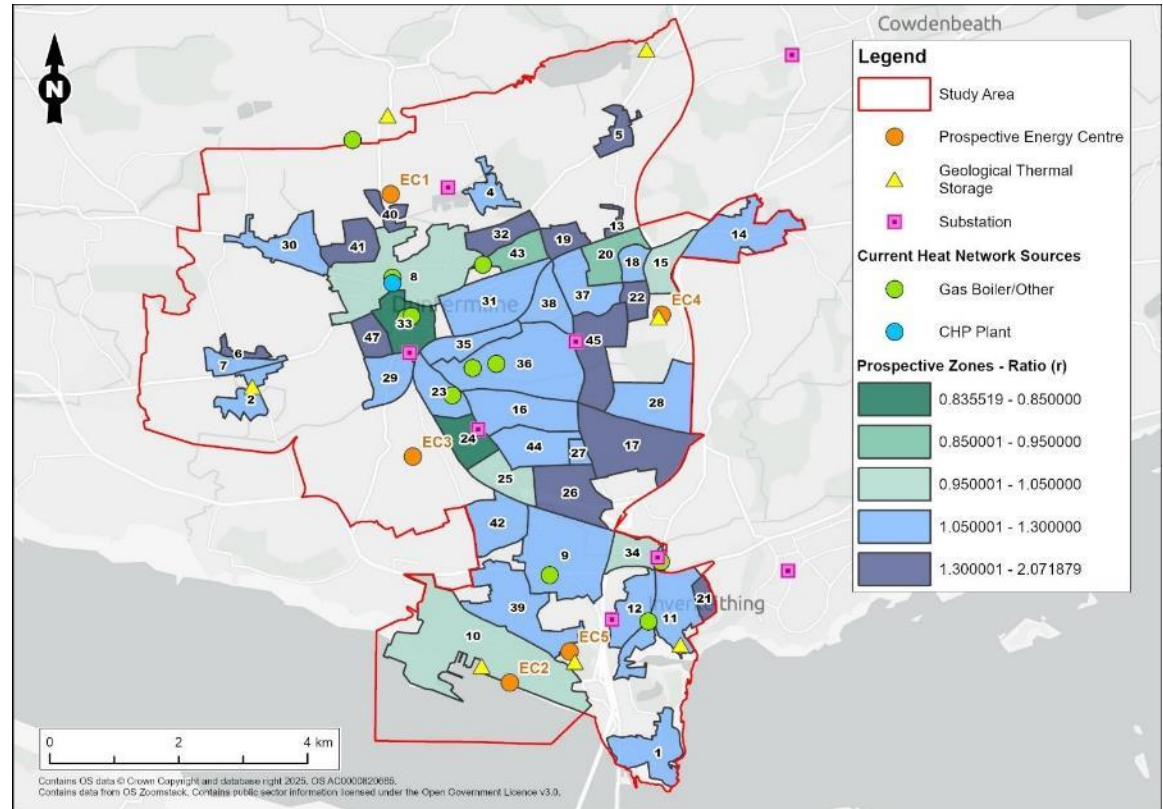
Exploring cost effective routes to decarbonisation



- On review by Fife Council – Cluster 3b (Left) was selected as the refined zone geography
- This is the maximum financially viable interconnected zone when focusing on the most fuel poor zones.
- The **levilised cost of heat** for this cluster is estimated to be 15.4 p/kWh (assumed heat production cost of 8p/kwh)
- This is a **new finding** for the Dunfermline & Rosyth area, where previous zoning work didn't include the Abbey View estate.

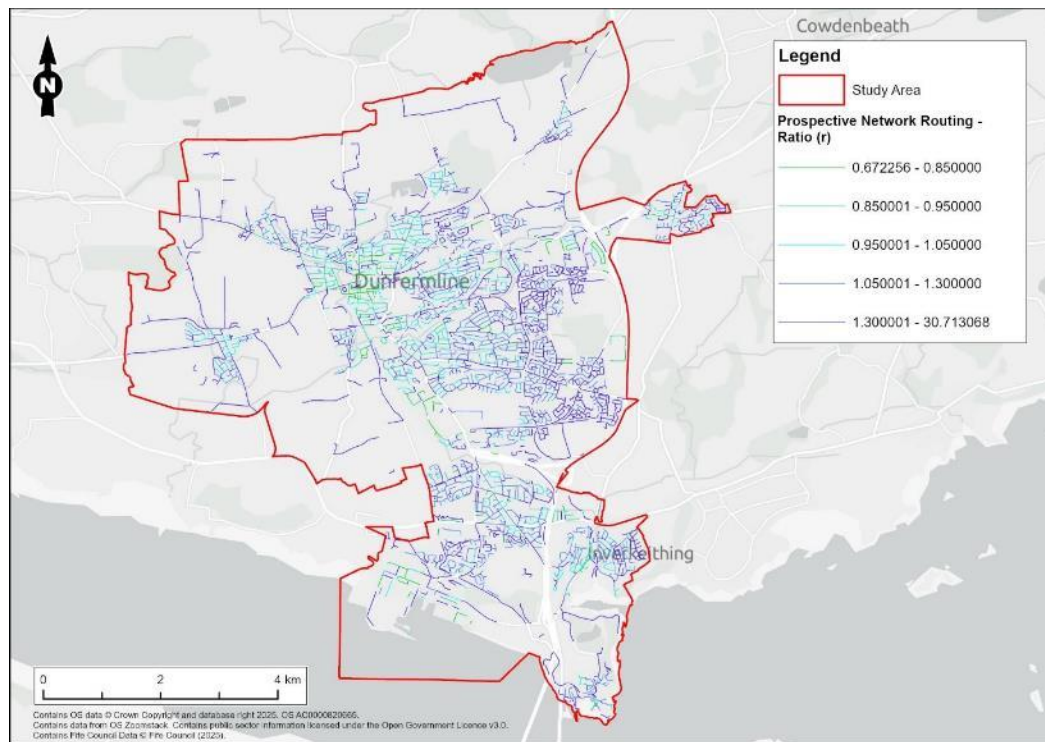
- SPEN Power
- Demands & anchor loads
- EfW Data Centres Forth Pifarnine
- Early TEM viability

Connecting the dots



- Early District 1 and techno-economics modelling

Connecting the dots



Where to next?

- Continue to deliver LHEES
- Designate heat network zones
- Potential for more energy plans – Kirkcaldy, Glenrothes, Levenmouth, etc.
- Further exploration of heat storage
- Exploration of heat sources



Mine water
treatment schemes



Waste water
treatment schemes



Distilleries



Ground source



Mine water
borehole



Sewer pipes/
pumping centres



Bakeries



Landfill?



Forth & Tay



Westfield EfW



Solar thermal



Other
business/industrial?



Thank you

Hamish Martin – Strategy Officer (LHEES), Fife Council
Bobbie Milligan - Principal Engineer, Ramboll

Session 4: Innovation & Fife's future

Karen Primrose

*Director, The Eden Campus
University of St Andrews*



An aerial photograph of the Eden Campus, showing a large industrial-style building with a grey roof and a brick building with vertical glass panels. The campus is situated on a riverbank, with a bridge crossing the river in the foreground. The background features rolling green hills and a residential area.

Eden Campus

Innovative energy projects at Eden Campus

Karen Primrose
Director of Eden Campus



University of
St Andrews

ST ANDREWS
INNOVATION
/ For Impact

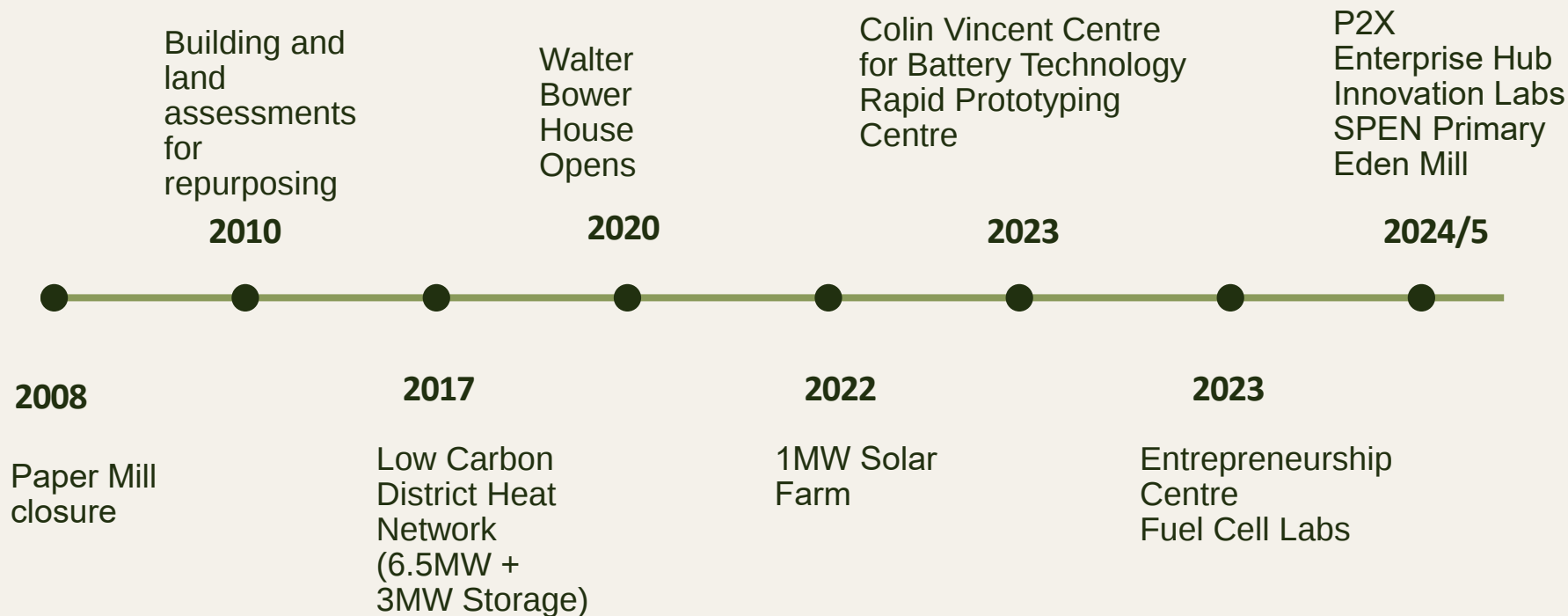


1810-1860
Seggies Distillery

1874-1992
Guardbridge Paper Mill

1993-2008
Curtis Fine Papers

Timeline







Core Facilities



District Heat Network

- Biomass district heating system
- 6.5MW biomass boiler
- 3MW thermal storage
- 26km pipe – 1°C loss
- Heat and hot water for 3,000 student bedrooms
- Reduced university's energy carbon emission by 20% since 2018



Walter Bower House

- Professional Services staff
- Conference facility
- Library (15km long shelving)
- Café – Tindal's



Solar Array

- 1MW solar array
- Running since 2022
- Reclaimed land
- Powers campus
- Battery storage upgrade planned

Our research focus

Sustainable Materials and Circular Economy



Clean Energy and Decarbonisation



Aquaculture and Environmental Resilience



Advancing Life Sciences



Batteries & Sustainable Materials



Colin Vincent Centre for Battery Technology

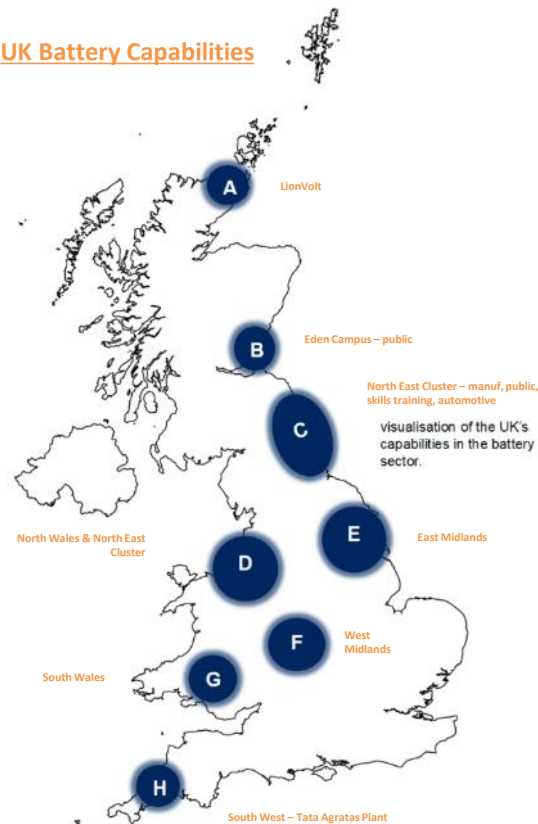
- Opened in 2023
- Tay Cities, Faraday, and European Regional Development Fund
- First of its kind in Scotland
- The UKRI Faraday Battery Challenge which aims to make the UK a science superpower for batteries
- <https://www.nexgenna.org>

Fuel Cell Lab

- Opened in 2025
- Tay Cities, Faraday and European Regional Development Fund



UK Battery Capabilities



Colin Vincent Centre for Battery Technology



15 Partners and growing....



INTEGRALS
POWER



UK BATTERY
INDUSTRIALISATION
CENTRE

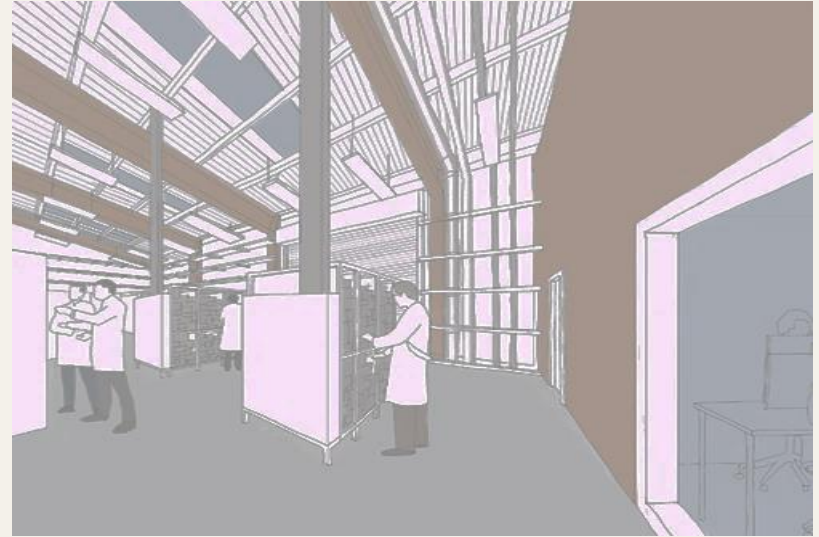


Clean Energy and Decarbonisation



P2X Phase 1 - Discovery Phased Research & Industry

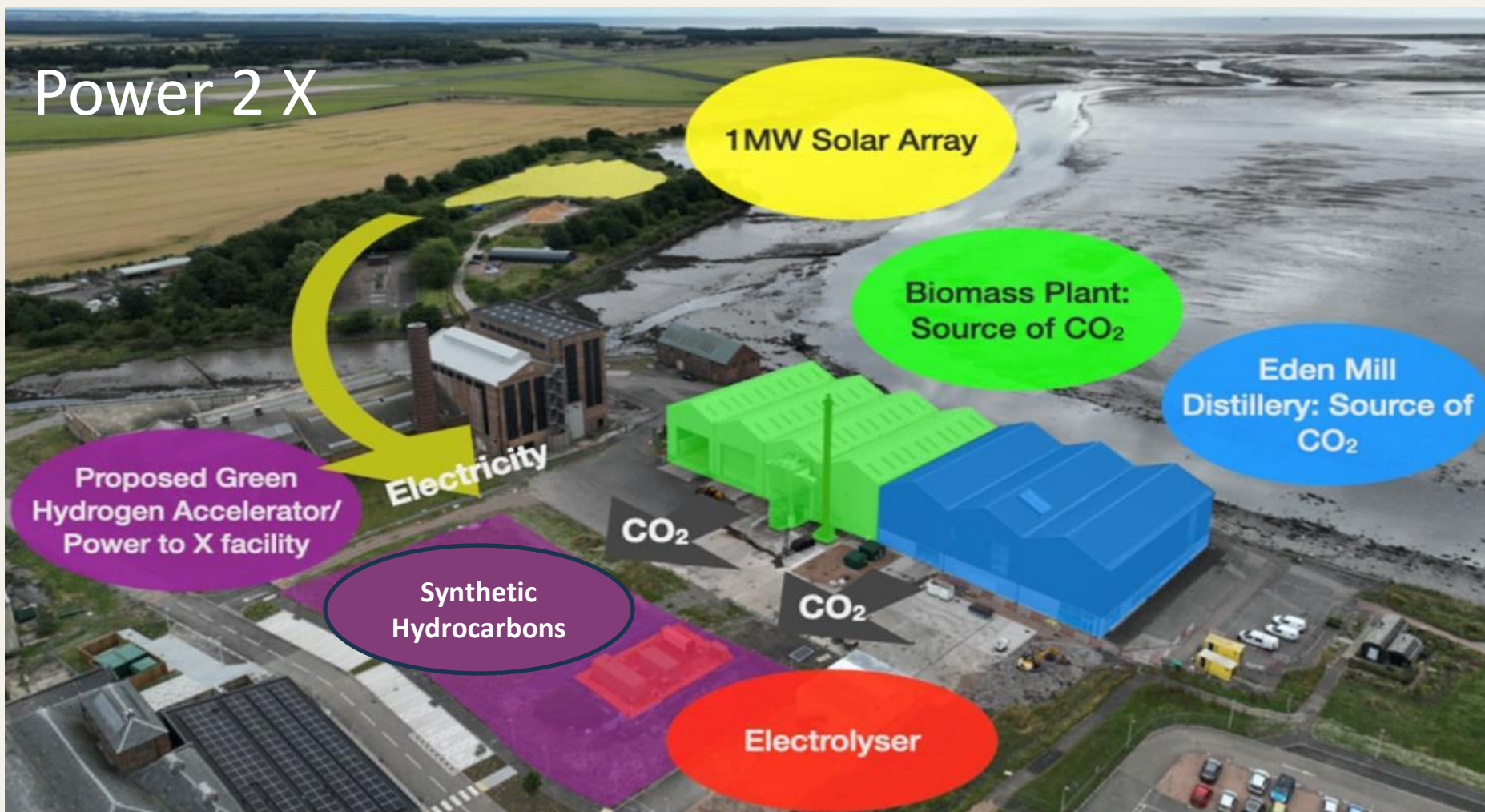
University led research and development & industry
Operational early 2026



P2X Phase 2 - Open Innovation

Space Plug and Play for developers
Enhanced facilities planned for 2027

Power 2 X



Business Links

Eden Mill Distillery

- Start up brewery
- Beer, gin and now whisky
- Distillery and visitor experience
- Carbon capture utilised by P2X



Rastech



- Sustainable approach to growing land based king prawns
- Working with academics to produce an aquaculture alkalinity supplement from limestone quarry waste and captured CO₂ – testing in lab – move to P2X

D'Arcy Thompson Simulator Centre

- Virtual world space
- Available to a variety of disciplines
- Visualisation of complex models, like the transition to adapt to climate change that connects energy companies and consumers in an easy-to-understand experience.
- Energy Digital twin model of Eden Campus
- Energy research project with **New Resource Partners** – energy investment & property development & University of St Andrews



Projects

Battery Energy Storage

An enhanced Battery Storage project aims to maximise the current renewable energy sources at Eden Campus, through the installation of an additional 420 kWh of batteries to the existing 180 kWh currently in place which will support Grid Flexibility Trading.

Project Completion Summer 25

Innovation Yard

We are transforming our repurposed chipping yard into an innovative space for small scale start-ups to come and test technology and scale up

Ready Summer 25

Enterprise Hub

In collaboration with Fife Council, we will establish a new Enterprise Hub creating office and industrial space for start-ups and businesses.

Project Target 2027

Grangemouth & Green Free Port

Future synergies with other innovation clusters such as Grangemouth and P2X and engineering biology.



Why Fife?

- 3 District Heat networks
- Only mine water geothermal project in Scotland
- Fife Green Freeport - free trade and investment zone
- Only domestic H2 project in UK
- Fife College – renewable skills training
- University of St Andrews – Eden Campus – space to bring academia & industry together

Any Questions?

Karen Primrose - direden@st-andrews.ac.uk

edencampus.st-andrews.ac.uk

Audience Q&A



Closing Remarks

Pam Ewen

Head of Planning Services

Fife Council



Event feedback survey





Fife – A Place for Energy

Exploring Fife's innovative approach to the energy transition through our Big Energy Move