

Grangemouth

Land & Infrastructure Baseline Review

July 2025 Issue

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1.0 Introduction

Grangemouth Future Industry Board (GFIB) and Scottish Enterprise have identified a need to establish a detailed baseline understanding of key land and infrastructure assets within the Grangemouth cluster. The analysis is required to feed into the development of an industrial cluster strategy for Grangemouth and support a sustainable and just transition to net zero.

Scope and Purpose

The brief requires production of a cluster-wide strategic database and baseline review that will identify existing land & infrastructure assets and constraints, as well as identifying how they may impact future developments and priorities that GFIB could focus further activity on. This should include physical site data, geo-technical and environmental information, utility services, flood risk information, and geo-spatial mapping to guide future planning and decision making.

Current Position

There is significant vested knowledge around Grangemouth’s land and infrastructure assets which is held across different parties and interests. This is not currently assembled in a form/format that can most effectively inform future planning and decision making. The Baseline Study is required to address the following overlapping challenges faced by SE and GFIB partners in seeking to coordinate activity:

- Existing physical and spatial data is not available as a coordinated baseline.
- Existing utility networks (public and private) have not been reviewed and mapped on a cluster-wide basis.
- Large-scale infrastructure project proposals (i.e. Grangemouth Flood Protection Scheme, Green Freeport Proposals, etc) are not integrated within a commonly formatted database.

Project Output

A Detailed Technical baseline for Grangemouth should seek to provide a clear contemporary understanding of site planning and environmental status, utility information, transport infrastructures, and current capacities where these are known and established. Identified information gaps and/or unavailable and commercially sensitive records should be noted for review or progression with client operators/owners.

The project output is to:

- Map key land, planning, and environmental designations and frameworks and highlight specific opportunities or constraints these pose.
- Map key infrastructure assets across the cluster and as far as possible define their current status, capacity, and function.
- Identify gaps in knowledge and understanding and/or areas for further investigation.
- Consider the opportunities and constraints that emerge in the context of a transitioning cluster.
- Provide a clear data-set and framework from which to advance more detailed investigation, scenario planning, and inform future planning and decision making.

An Industrial Cluster Strategy for Grangemouth including full review of cluster-wide synergies and connections between users is being advanced separately by SE and GFIB, and will be supported by this baseline analysis.

The assessment is a desk-based study – based upon a collation and integration of existing datasets, information, and assessments. Engagement with third parties has been limited – though opportunities for further coordination and information sharing with landowners, site operators, and infrastructure and utility providers have been noted as potential next steps to further develop the findings of this study. In particular, the scope of the baseline assessment identifies and maps private utility networks as far as possible, but does not include detailed audit or review of specific network demands and capacities – and these may be commercially sensitive, rapidly changeable, and dependent on individual operator models.

Study Area and Boundaries

The study area is closely focused on the recognised boundaries of the Grangemouth Cluster – incorporating the Port of Grangemouth, major chemical and petrochemical operators and land use zones, and residential and community assets and supporting infrastructures. The boundary has been reviewed and agreed with Scottish Enterprise and GFIB.



Report Structure

Development of the study has been structured around 4 primary sub-sections. These address the multi-disciplinary scope of the study and provide a basis for thematic data-collation and spatial mapping.

- Land Use & Planning
- Environment
- Transport & Connectivity Infrastructures
- Utilities & Industrial Infrastructures

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Across all themes and topic areas – reporting is structured to:





- Provide information within a common spatial and map-based framework
- Ensure information is accessible, easy to understand, and in a re-usable format.
- Collate technical information into a strategic and concise form.

Information Sources and Data

The study is primarily desktop-based- involving collation, organisation, and synthesis of data from a wide range of sources and prior reporting. Reporting has sought to provide a referenced database linked to geo-spatial mapping that is on published data and information substantially held as part of the public record. Private utility information is presented where this is publicly available and/or where this has been consented by asset owners.

Data collection has involved limited meetings and engagement with key parties and data-holders but scope for further engagement to verify current capacities and qualitative understandings would offer value. Data sources are referenced with hyperlinks and source information, and a detailed reference list is provided within the Appendices.

Information gathering and review has sought to achieve ‘best-available’ understanding of key land and infrastructure assets. It is highlighted that data may not be complete or fully validated – especially for private utility networks, land interests, or infrastructures for which public information is limited and/or commercially sensitive.

Topic Area		Primary Source
<div>Land & Planning</div> <div></div>	Land Ownership	Scotland Land Information Service
	Land Areas	GIS Mapping
	Recent Developments / Planned Projects	Falkirk Council Planning Register Operator Press Release / Annoucements
	Planning Policy Framework	Falkirk Council LDP2 / Open Data
	Green Freeport	Forth Green Freeport / UK Government
	Vacant & Derelict Land	Vacant & Derelict Land Register (2022)
	Grangemouth Community	SIMD, Scotland Census (2022), Draft Just Transition Plan, Falkirk Council OpenData
<div>Environment</div> <div></div>	Environmental Designations	NatureScot, Historic Environment Scotland
	Flood Risk	SEPA, Grangemouth Flood Protection Scheme
	Ground Conditions	BGS, Engineering Geology of the Upper Forth Estuaty (BGS Report, Vol. 16., No. 8)
	Site Emissions	SEPA (Scottish Pollutant Release Inventory)
	PPC / CAR Licensing	SEPA – Authorisation Documents
	COMAH / Major Accident Hazards	Health & Safety Executive
<div>Transport & Connectivity</div> <div></div>	Road Infrastructure	Transport Scotland, SESTrans, Grangemouth Investment Zone, TravelTime API.
	Rail Infrastructure	SESTrans, Rail Operators.
	Port Infrastructure	Forth Ports, Energy Ports Directory
	Active Travel & Public Transport Infrastructure	Falkirk Council OpenData, Improvement Service
<div>Utilities & Industrial Infrastructure</div> <div></div>	Energy Generation	SEPA PPC Licence, Falkirk Council Planning Register, Operators.
	Power Distribution	SPEN OpenData, SPEN Distribution HeatMap
	Gas Infrastructure (SGN)	SGN Data-Sharing
	Water Infrastructure	Scottish Water
	Effluent & Waste Water	SEPA PPC & CAR Licensing
	Strategic Pipelines	Operators
	Specialist Feedstocks & Services	Operators

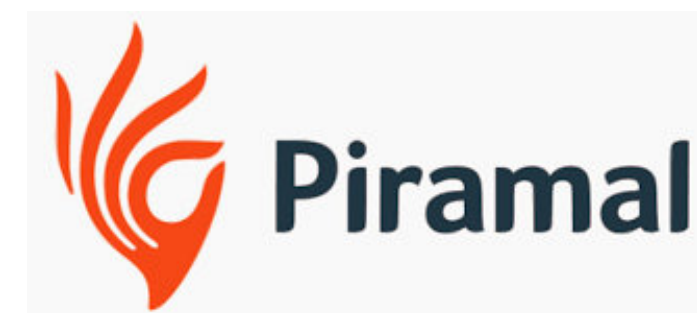
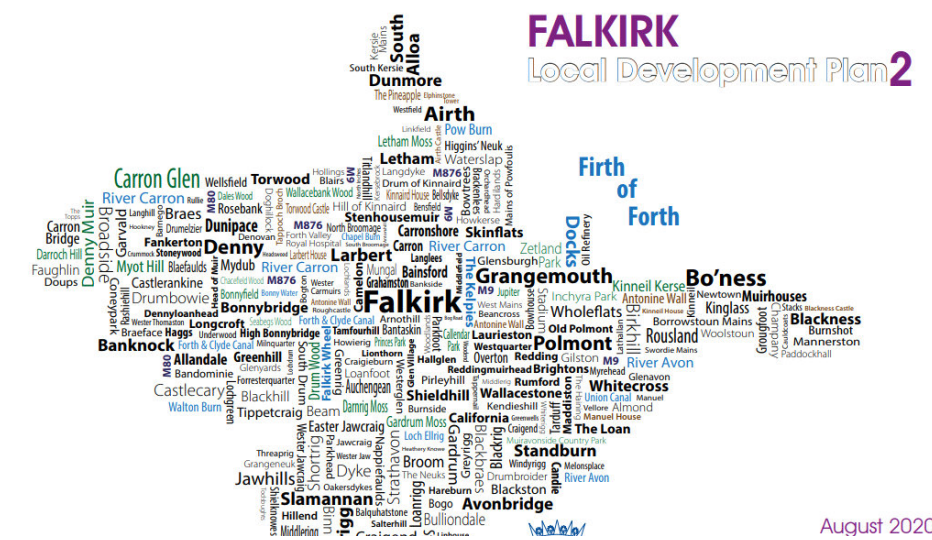
2. Land & Planning

Land and planning baseline review establishes the key land use areas and operators across the Grangemouth cluster, and how these are configured across strategic sites.

It demonstrates that while inter-connected there is considerable variability in the spatial characteristics and make-up of different land-use zones across the Cluster. Earls Road, Port of Grangemouth, Petroineos Refinery, and INEOS Chemicals Complex all comprise different ownership, current and future land availability, and sectoral activity.

While there is a stable and supportive overall planning policy framework – the Cluster is undergoing a period of flux and evolution in land use and development activity associated with forthcoming closures such as the refinery, as well as through planned new projects in hydrogen and low-carbon manufacturing sectors and through the Green Freeport.

- **Key Sectors and Operators** – identifying key land uses, sectors, and mix of operators based across the Grangemouth cluster.
- **Land Ownership & Control** – defining the extent of major / strategic land ownership interests
- **Land Areas** – identifying the spatial area and make-up of key sites and development opportunity areas.
- **Planning Policy Framework** – setting out key Development Plan policies and allocations relevant to future development in the cluster.
- **Green Freeport** – mapping the Tax Sites allocated through the Green Freeport and sites set to receive Seed Funding for enabling works.
- **Vacant & Derelict Land** – identifying land currently classed as ‘Vacant & Derelict’ by Falkirk Council and Scottish Government.
- **Recent Developments** – highlighting recent or forthcoming changes in land use and development to key sites across the cluster.
- **Grangemouth Community** – setting out key socio-economic and demographic indicators for the town of Grangemouth and mapping local deprivation as well as community infrastructure.



Grangemouth Cluster - Key Sectors & Activities

The Grangemouth Cluster includes a diverse range of users – including multi-national industrial operators alongside innovative ‘start-up’ businesses. While encompassing a wide range of sectors and industries across its full extent – the core of the Cluster has historically developed around the energy and oil & gas sectors and the associated processing, manufacturing, and distribution of products, including petro-chemicals. Over time the Cluster has developed, evolved, and incorporated wider specialisms in Fine Chemical manufacturing, strategic multi-modal distribution and logistics, and a diverse supply-chain of manufacturing and industrial services.

The nature of industrial processes within Grangemouth involves a complex eco-system of energy and product flows both inside the Cluster, as well as connected to strategic national and international supply-chains for oil & gas and chemical products. However, intra-cluster integration is limited in places due to a combination of physical geography, complexities of shared infrastructure delivery and operation, and differences in sectoral and operator requirements.

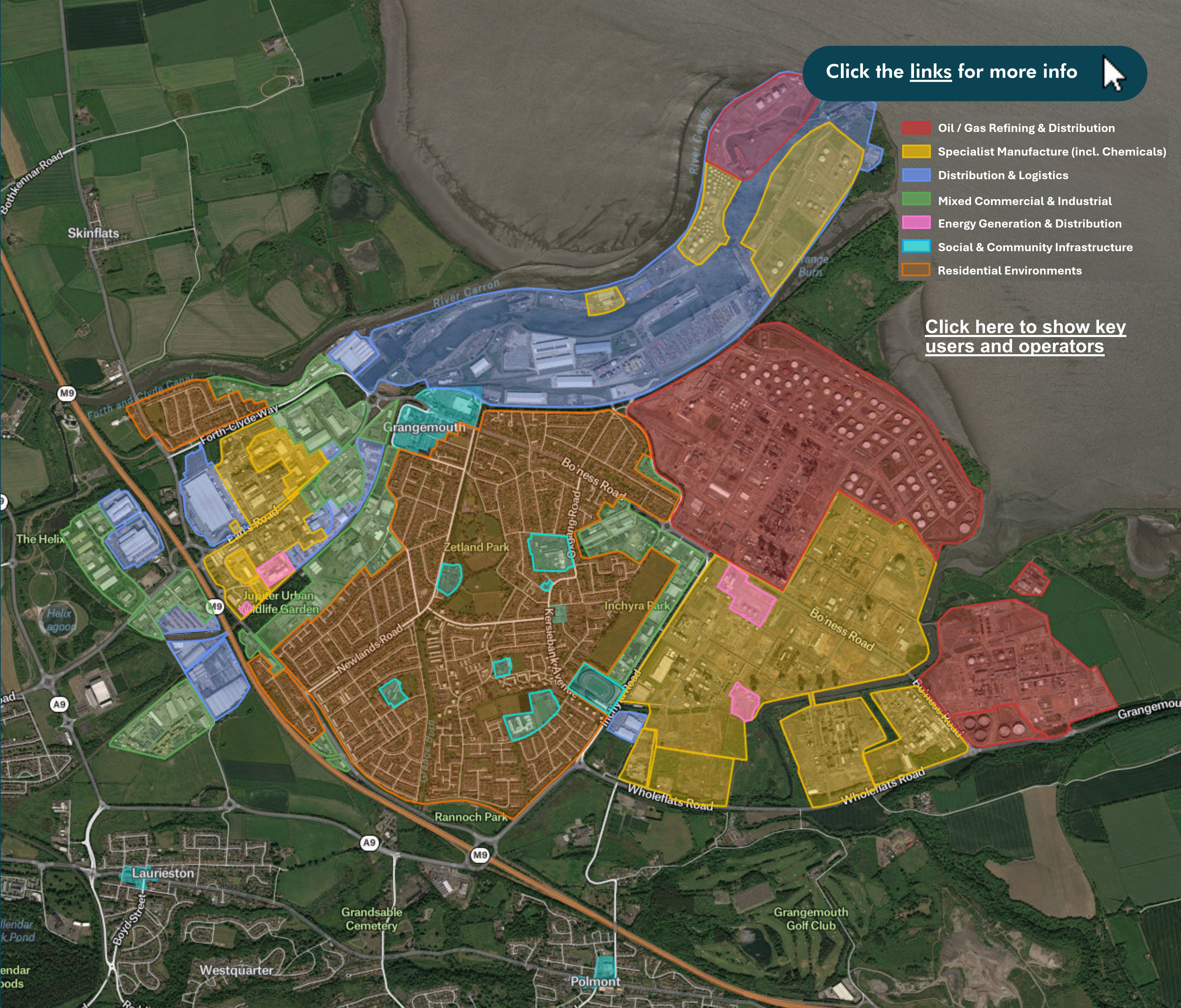
Oil & Gas Refining, Storage and Distribution – predominantly comprising the Petroineos refinery site to the north of Bo’ness Road, including tank farm and connection to jetties within the Port. The refinery site is due to close in 2025 and will be partially converted to an import terminal – though the future footprint and land-use of the site as a whole is uncertain and the subject of ongoing review and planning through Project Willow. The Kinneil FPS site at the east of the cluster is the key processing terminal for Crude Oil transported by the Forties Pipeline System.

Specialist Manufacture (incl. Chemicals) – including INEOS Chemicals Complex at Bo’ness Road producing wide range of petro-chemicals, including ethylene and olefins & polymers. Other Fine Chemical manufacturing is based at Earls Road within the Calachem mixed-use industrial estate, including Syngenta, Piramal, and Celtic Renewables, with common services and infrastructure provided by CalaChem.

Distribution & Logistics – centred around the Port of Grangemouth as a strategic multi-functional port for distribution of a wide range of bulks, cargoes and liquids, and including multi-modal rail freight terminal. Major logistics users elsewhere around Grangemouth include HW Coates (Specialist Chemicals), Asda (Food Retail), and Malcolm Logistics and JM Haulage (General Logistics)

Mixed Commercial & Industrial - supply-chain services and manufacturing across multiple locations in Grangemouth including within the Port, Inchyra Road, and Earlsgate. Key operators including: BioMar (Aquaculture), Safequip (Safety Equipment), Sportex (Sports Turf), and International Timber.

Residential & Community Infrastructure - The community of Grangemouth which is home to approximately 16,000 people and includes a range of community infrastructure including local Town Centre, schools, and community facilities.



Land Ownership

Scotland Land Information Service (SCOTLIST) records provide an indication of the overall pattern of land ownership across the Grangemouth cluster. At a strategic level major land owners and controlling parties are understood to be:

- **INEOS** own the entirety of the chemicals production complex to the north and south of Bo’ness Road, and including land to the south of the River Avon accessed from Wholeflats Road.
- **Petroineos** ownership of the refinery site encompasses the full extent of the refinery infrastructure and tank farm – with some overlapping interests and separated land interests indicated around Bo’ness Road and to the west of the site.
- **CalaChem** own significant areas of land to the north and south of Earls Road. This includes a number of tenanted sites, and key plots with capacity for consolidation and potential phasing of development.
- **Forth Ports** own and operate the Port of Grangemouth including land areas around Central Dock Road, South Shore Road, and North Shore Road – with a number plots and land areas tenanted by individual operators.
- **Falkirk Council** – In addition to private industrial operators – Falkirk Council own significant land areas across Grangemouth including areas of the former Kerse Estate within the settlement of Grangemouth, areas of open space, and potential development land at Wholeflats Road and South Bridge Street.

Land ownership is complex and has evolved over the history of the Grangemouth cluster to include a range of tenancies, dispositions and burdens within strategic landholdings, reflecting the mix of commercial interests and activities undertaken across the the site. As part of planning for future development opportunities within the Cluster further detailed review of deeds and title will be required to establish detailed make-up of land ownership interests and any associated constraints or requirements.

Land ownership plans obtained from Registrars of Scotland Land Information Service and provided for information only. Full detail on title and related burdens, dispositions, wayleaves, and leases has not been reviewed at this stage.



Land Areas

The total area of the Grangemouth cluster is some 1,600 hectares – encompassing strategic industrial sites and related infrastructures, residential and community areas, and surrounding open spaces.

Analysis of the land areas across strategic industrial sites and land use zones demonstrates the mix of scales and different typologies. Land areas to the east of the cluster around Bo’ness Road and Wholeflats Road typically present very large single operator sites operated by INEOS and Petroineos. While capable of being sub-divided and broken down into different activities, they provide single-site areas of up to 142 hectares in the case of INEOS Chemicals and 168 hectares in the case of the Petroineos refinery and associated tank farm and road tanker terminal.

The Port provides a total land area of approximately 160 hectares -to the north and south of the port basin. As well as warehousing, open storage areas and the Rail Terminal, a number of sites within the Port are leased to, and operated by, separate users including BioMar Exolum, Petroineos with undeveloped land areas relatively limited in scale.

At Earls Road there is a total industrial sub-cluster of c. 89 ha – including a range of plots sizes and configurations with a mixed industrial area. Calachem own and manage significant contiguous land areas to the north and south of Earls Road – within which there a number of operators within individual plots, and potential for further consolidation and phasing of redevelopment.

The Wood Street industrial area to the east of the railway is 23.9ha in total – though owned and operated as a mixed industrial area with a series of individual plots and land areas of 1-3 ha.



Green Freeport

The Forth Green Freeport (FGF) was established in 2024 following approval by Scottish and UK Governments. The FGF consortium partners are Forth Ports, INEOS, Babcock International, Scarborough Muir Group, CalaChem, MoD, Edinburgh Airport, Falkirk Council, City of Edinburgh Council, and Fife Council.

Through a combination of tax and customs incentives, seed funding, and access to other levels, FGF seeks to catalyse and drive large-scale investment in new green technologies, alternative fuels and renewable energy manufacturing across the Forth. It is expected to drive £7.9bn of private and public investment, deliver £8.1bn of gross value added, and create up to 34,500 jobs across the Forth as a whole.

Through its established specialist industrial capacity, multi-modal transport connections (road, rail, sea), skills-base, and land availability, Grangemouth is a key part of the Green Freeport. FGF target growth and investment sectors identified of direct relevance to Grangemouth include alternative fuels, modular manufacturing, chemicals, and logistics & warehousing.

Within the Grangemouth cluster there a number of designated **Tax Sites**, in total amounting to 233 ha of developable land. Tax reliefs available for investment in these areas include:

- Enhanced capital allowances
- Enhanced structures and buildings allowances
- A relief from Employer’s National Insurance Contributions
- Land and Buildings Transaction Tax (LBTT) reliefs
- Exemption from non-domestic (business) rates

Subject to approval of a Full Business Case anticipated in Q2 2025, £25m of seed funding (to be spent by March 2028) will be available to support site enabling works including at Council-owned land sites South Bridge Street and Wholeflats, and within INEOS Chemicals Complex and Port of Grangemouth subject to partnership arrangements.

Click the [links](#) for more info



Planning Policy

Grangemouth benefits from a planning policy framework supportive of strategic business & industrial development across the cluster. The Development Plan, against which planning applications are assessed, comprises the Falkirk Local Development Plan (LDP) (adopted 2020) and National Planning Framework 4 (adopted 2023).

The LDP provides allocations directing land use and planning requirements for a number of sites across the Grangemouth cluster.

- Core Business Areas are allocated across existing areas of industrial development including Petroineos refinery, INEOS Chemicals complex, Earls Road, Port of Grangemouth and a number of other business sites. These areas are safeguarded primarily for business and industrial use.
- Beyond the Core Business Areas - specific Business Development Opportunity Sites are identified including:
 - Earls Gate Park (BUS12) – 9.8 ha
 - South Bridge Street (BUS14) – 2.9 ha
 - Grangemouth Docks West (BUS15) – 41.2 ha
 - Bo’Ness Road (BUS16) – 100ha+
 - Wholeflats Road (BUS17) – 100ha+
 - Wholeflats Business Park (BUS18) – 4.2ha+
- Specific guidance is provided regarding development at Bo’ness Road and Wholeflats Road, recognising their specific land use as Chemical Sciences and related Business & Industry. Key principles for development include the potential for improvements to port access / integration, and local road network improvement to Inchyra Road / Wholeflats Road.

NPF4 also provides specific support for investment and development at Grangemouth to grow the cluster into a hub of low-carbon manufacturing – drawing on its strategic location, infrastructure, assets and skills base. The Grangemouth Investment Zone forms part of National Development 15 – meaning it is recognised as of National Importance and that the principle of developing low-carbon technologies, manufacturing, and related infrastructure does not need to be agreed in later consenting process (though planning permission and/or other regulatory approvals are still required).

Falkirk Council are in the early stages of preparing a new Local Development Plan which will shape growth within the cluster. An Evidence Report (the first step in LDP preparation) was submitted to Scottish Government in November 2024. The Council launched a ‘Call for Sites’ process between January-May 2025 inviting developers and landowners to put forward sites suitable for housing, employment, infrastructure and other types of development. Further consultation on the a Proposed Plan will continue throughout 2025-26 ahead of an anticipated Examination and adoption in 2027.



Project Willow

Following Petroineos announcement to convert the existing refinery to a fuels import terminal – the UK and Scottish Government’s launched Project Willow in partnership with Petroineos. The project has undertaken a strategic assessment of options for the long-term industrial future of the site – including evaluation a wide range of low-carbon technologies, extensive stakeholder engagement, and considering policy and regulatory actions to stimulate private sector investment. The report findings were published in March 2025 and a summary is available here: https://scotent-uat-sdi-website.azurewebsites.net/media/vlubfykz/project-willow_pid_v214.pdf

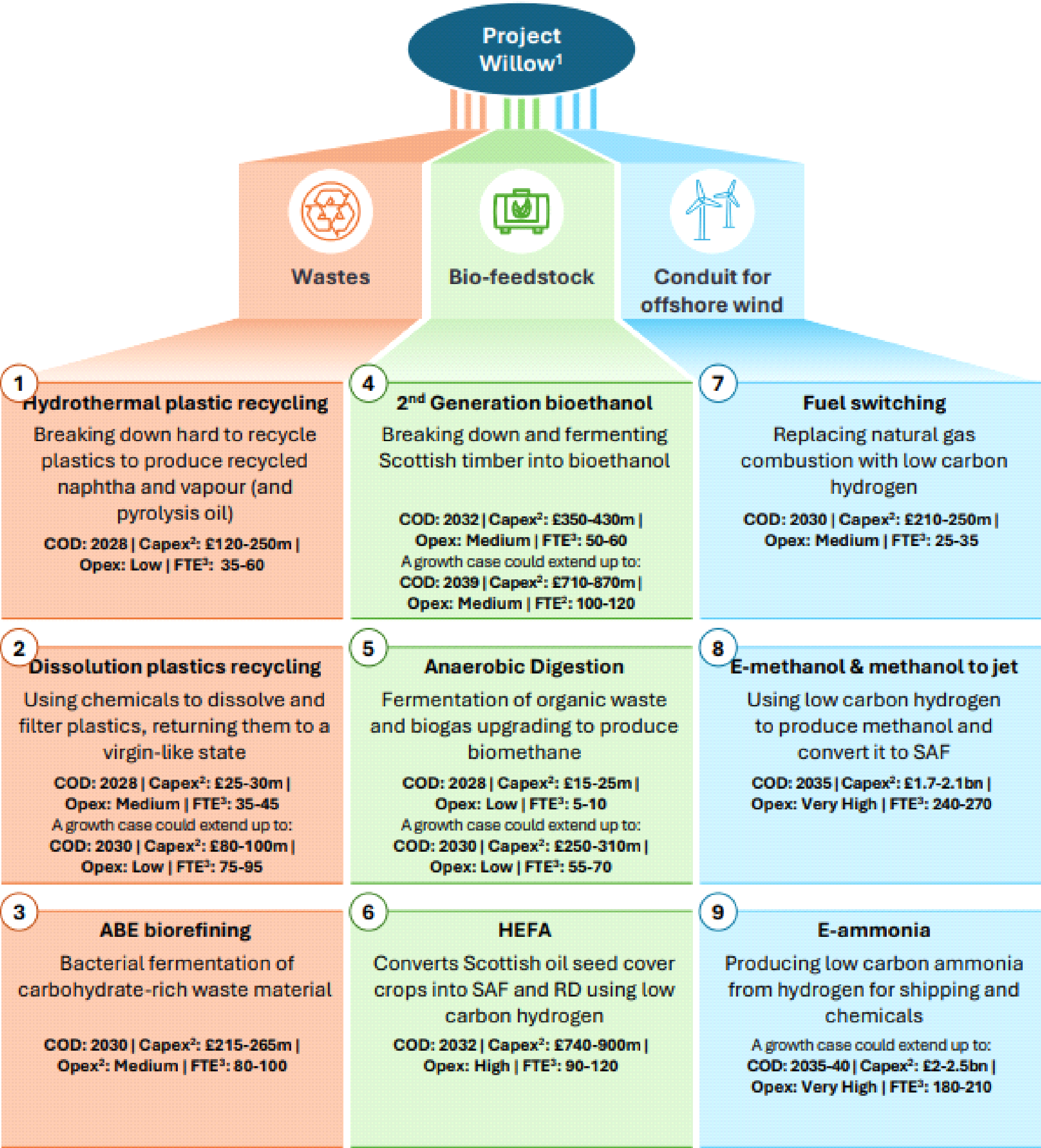
Within the categories of **wastes**, **bio-feedstock**, and **support for offshore wind**, the Project has identified nine key investment areas (pictured) with strong potential to locate at Grangemouth and enable redevelopment, renewal and investment in the refinery site.

Wastes – hydrothermal upgrading (breaking down hard to recycle plastics), chemical plastics recycling, ABE biorefining (breaking down waste material)
Bio-feedstock – breaking down Scottish timber into bioethanol, anaerobic digestion of bioresources and digestate pyrolysis, HEFA (conversion of Scottish cover crops into SAF and renewable diesel using low carbon hydrogen)
Offshore Wind Conduit – Replacing natural gas with hydrogen, using low carbon hydrogen to produce methanol and convert it to SAF, producing low carbon ammonia from hydrogen for shipping and chemicals.

The report highlights the significant challenges involved in the transformation to low-carbon fuels and delivery of these investment opportunities – due to combination of cost and viability, regulatory frameworks, and supply-chain and technological readiness levels. Substantial investment and policy support is required to enable these projects and unlock their full potential. A range of recommendations for Government to address these challenges and support potential investors and developers in the delivery of these projects and opportunity area. This includes grant funding, state sponsored investment, hydrogen economy support, biofuels market reform, and low carbon demand stimulation.

It is estimated that delivery of the Project Willow proposals could lead to the creation of up to 800 jobs as a base figure, and up to 1200 with growth over time. The annual total GVA contribution could range from £600-700 million at base, to as much as £1-2 billion with growth.

Key next steps following Project Willow include identifying and collaborating with partners that can bring projects to fruition, developing detailed business case plans, and establishing a delivery model and vehicle for implementation.



Key:
Opex (£m p.a.):
Low: <100 High: 500-1,500
Medium: 100-500 Very high: >1,500

COD: XXXX | Capex: £X-Ybn | FTE: X-Y ← 1st deployment
COD: XXXX | Capex: £X-Ybn | FTE: X-Y ← Additional deployment if potential fully realised. Note growth case figures are inclusive of 1st deployment

Vacant & Derelict Land

Significant land areas within Grangemouth have been identified as Vacant & Derelict Land by Falkirk Council and Scottish Government – amounting in total to approximately 100 hectares.

The majority of this is contained within the INEOS and Petroineos sites to the north and south of Bo’ness Road - though the exact status of the land and its current use would need to be confirmed in coordination with the site operators. The planned closure of the Petroineos refinery may result in these areas of vacant & derelict land being extended in the short-term until such time as future development proposals emerge.

Site	Area (ha)	Owner	Development Potantial (as per V&DL Register)
INEOS	20.97	Private (INEOS)	Developable – Medium Term
INEOS 2	63.87	Private (INEOS / Petroineos)	Developable – Short Term
North of BOC	1.72	Private	Developable – Medium Term
Em-Nine	1.82	Private	Developable – Medium Term
Wood Street 1	0.75	Private	Developable – Medium Term
Earls Gate Park 1	0.86	Private	Developable – Medium Term
Ex-Timber Basin	1.81	Falkirk Council	Developable – Undetermined
South of Central Dock Road	0.95	Private	Developable – Medium Term
Central Dock Road	5.19	Private (Forth Ports)	Developable – Medium Term
North Shore Road	0.82	Private (Forth Ports)	Developable – Undetermined



Recent Developments

Across the cluster there are number of projects emerging and various stages of the planning and development process, as well as planned closureseveralrrnt operations.

RWE Green Hydrogen –Proposals for a 200MWe green hydrogen production plant at Wholeflats – with potential expansion up to 600MWe. A formal planning application is yet to be submitted, though the project is anticipated to operational by 2029.

INEOS Low Carbon Manufacturing Plant (Blue Hydrogen) –Proposals for a major Blue Hydrogen production plant within INEOS existing site. Timescales for development are currently uncertain – with a critical dependency around the planned Project Acorn / ‘Scottish Cluster’ CCUS infrastructure through which CO2 will be transported to North-Sea storage. Seed Funding for site preparatory works is due to be awarded through the Green Freeport.

Syngenta, Earls Road – Planning permission was granted in December 2024 for construction of a new chemical manufacturing building as part of Syngenta’s facility at Earls Road. Specifically it will provide plant for new agricultural (Seedcare) chemical products.

Forth Ports Energy Park – As part of the Green Freeport Forth Ports are seeking to promote and deliver a new ‘Energy Park’– on land to the east of South Shore Road. Full details of the Energy Park are not yet confirmed, though could include facilities for Liquid Natural Gas as a key de-carbonisation fuel for shipping, as well as potential hydrogen and carbon capture & storage technologies.

The Falkirk Growth Deal (signed November 2024) includes funding for several inter-linked projects to support and accelerate Grangemouth’s transition to a low-carbon chemicals and manufacturing cluster. This includes The Grangemouth Sustainable Manufacturing Campus, incorporating co-located and interlinked **The Bio-Economy Accelerator Pilot Plant (BAAP) and Carbon Dioxide Utilisation Centre (CDU)** both of which received £10m of Growth Deal Funding. A further £10m of funding towards has been committed towards enabling development at **Strategic Innovation Sites** including land at Wholeflats) and South Bridge Street.

Petroineos – In September 2024 Petroineos confirmed its intention to cease refining at the Grangemouth site in Q2 of 2025 and transition the site to a fuels import terminal. Through Project Willow a range of options are being explored to develop a new long-term green industrial future for the site.

Fujifilm –In June 2023 Fujifilm announced the planned closure of its dye manufacturing facility and in March 2024 a consultation was launched on the closure of the entire facility – citing significant commercial challenges.

Versalis – In December 2023, Versalis announced its intention to permanently close its Grangemouth Chemicals Plant – citing worsening conditions in the elastomers market and increasing costs.

INEOS Ethanol – In January 2025, INEOS announced the closure of its synthetic Ethanol plant within the Grangemouth complex – citing energy costs and the impact of carbon reduction trading schemes and taxes.



Grangemouth Community

The town of Grangemouth is home to over 16,000 people – with significant economic and place-making interrelationship to the surrounding industrial cluster. The town, its residents, and the range of social & community infrastructures within, are essential to future planning for the cluster.

The area faces a number of socio-economic challenges – with five data zones in the 20% most deprived areas Scotland including Kersiebank, Bowhouse, and the Town Centre. Within these areas – income, employment, and education / skills are the most significant deprivation domains. The unemployment rate in Grangemouth is 9.1% (compared to national average of 4.6%).

The 2022 Census provides up-to-date demographic data for the town:

- Grangemouth has a total resident population of 16,016 people, of whom 2,425 are aged 0-16, 10,239 are aged 16-65 and 3,348 are aged 65 and over.
- There 8,177 households in Grangemouth, of which 3,554 are one-person households.
- There are 7,814 economically active people living in Grangemouth (excluding full-time students).
- The largest industries / employment sectors in Grangemouth are:
 - 14.6% of people are employed in Wholesale and Retail trade (compared to a Scottish average of 11%)
 - 13.5% of people are employed in manufacturing (compared to a Scottish average of 8%)
 - 9.2% of people are employed public administration (compared to a Scottish average of 9.1%)
 - 11.2% of people are employed in Human Health and Social Work (compared to a Scottish average of 14.6%).
 - 7.6% of people are employed in Transport and Storage (compared to a Scottish average of 4.9%)

Social & Community Infrastructure

Key social & community infrastructure assets within Grangemouth include:

- Carrongrange and Grangemouth High Schools
- Bowhouse, Moray, and Sacred Heart RC Primary Schools
- Grangemouth Sports Complex and Grangemouth Sports Stadium
- Zetland Park and Inchyra Park
- Grangemouth Town Centre including local retail, services, and Municipal Chambers & Town Hall.



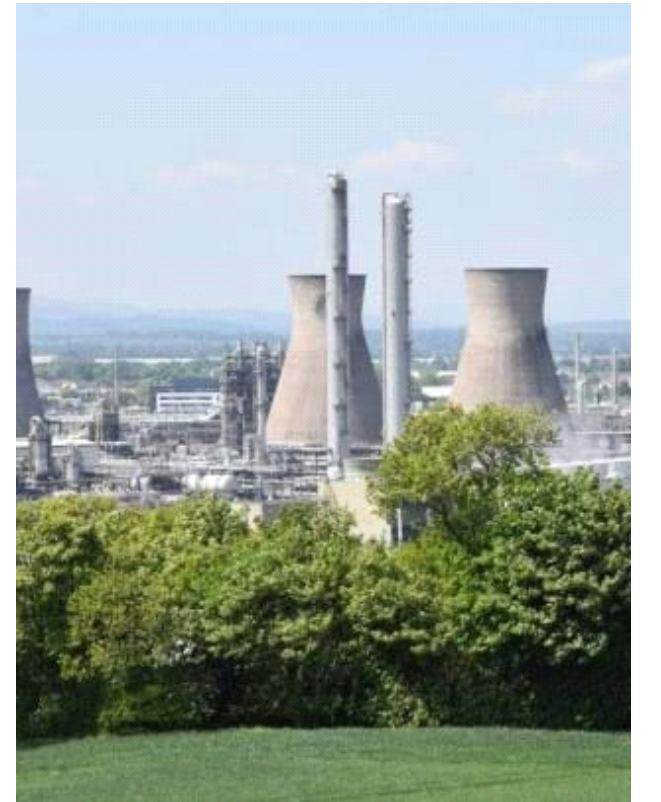
3. Environment

The Environmental baseline review identifies nationally and locally significant environmental assets around the Grangemouth cluster, including designations in the Firth of Forth.

It highlights site environmental information around coastal and fluvial Flood Risk, and Ground Conditions issues, which have historically posed issues for to development in Grangemouth and will be essential considerations in site capacity and delivery of future development.

A range of environmental and health & safety regulatory regimes applying to activity within the cluster are reviewed and mapped, including SEPA's PPC and CAR Licensing, and Health & Safety Executive COMAH and Major Accident Hazards Regulations.

- **Environmental Designations** - mapping SSSI, SPA, RAMSAR and local designations relevant to Grangemouth.
- **Flood Risk** - identifying those areas at risk of flooding and details of the planned Grangemouth Flood Protection Scheme to significantly reduce local flood risk.
- **Ground Conditions** – identifying local engineering geology across the Cluster.
- **Site Emissions (SEPA)** – highlighting and mapping highest emitting sites.
- **PPC / CAR / Licensed Sites (SEPA)** – identifying and mapping sites within which specialist activities are regulated and licensed by SEPA
- **COMAH Sites (Upper Tier / Lower Tier)** – identifying and mapping sites subject to COMAH Regulations and/or Major Accident Hazards control.



Environmental Designations

The Grangemouth cluster is situated on the southern side of the Firth of Forth – which is subject to a number of national and international designations to protect environmental and habitat features.

- **The Firth of Forth Site of Special Scientific Interest (SSSI)** covers a total area of 7,423 ha across the full extent of the Firth of Forth and the Forth Estuary – recognised for a variety of geological, geomorphological features, coastal habitats, plants, invertebrates, and breeding, passage and wintering bird populations. The SSSI directly borders the Port of Grangemouth to the east and west, and the northern edge of the Petroineos Refinery Site.
- **The Firth of Forth Special Protection Area (SPA)** covers a similar area to the SSSI, and also directly borders the Port and Petroineos Refinery site. It provides specific protection to wild bird species of European importance and their intertidal, saltmarsh, lagoon and other habitats across the Forth.
- **The Firth of Forth RAMSAR site** protects wetlands of international importance across the Forth and bird species inhabiting them. It has the same boundaries as the SPA.

While the primary industrial and development areas of the Grangemouth cluster are outside of environmental designation, they will require careful consideration in future planning and development. In particular the potential for in-direct impacts associated with emissions to air, water, and land from industrial activities may arise. Depending on the scale, nature, and location of proposals it may be necessary to undertake specialist survey work and ecological assessment to demonstrate how impacts are avoided, minimised, and mitigated, or where necessary compensated.

At a local level there a number of landscape and environmental designations around Grangemouth (made by Falkirk Council and reflected in the LDP). While not likely to pose direct constraint to future development activity and investment, these are mapped and include:

- Local Nature Conservation Sites, such as Jupiter Urban Wildlife Centre, Polmont Wood, and Bo’ness Foreshore.
- Local Landscape Areas, including the Bo’ness Local Landscape Area

There are limited major heritage designations within Grangemouth, though a number of listed buildings and structures especially within the Town Centre and Zetland Park. The Avon Bridge, crossing the Avon adjacent to INEOS FPS, is Category C listed and Listed Building Consent required for upgrade or remedial / repair works. The Swing Bridge between Western Channel and Carron Docks within the Port of Grangemouth is Category B Listed.



Flood Risk

Owing to its low-lying location adjacent to the Firth of Forth –significant areas of the Grangemouth cluster currently have high levels of coastal and fluvial (river) flood risk associated with the River Avon and the Grange Burn. In particular, large parts of the Petroineos and Ineos sites around Bo’Ness Road are identified as having High (1 in 10 year) and Medium risk (1 in 200 year) of coastal flooding from the Forth Estuary, as well as significant areas of the Port.

The Grangemouth Flood Protection Scheme (GFPS) has been in development over a number of years to address the longstanding flood risk and provide long-term protection against the effects of climate change. The Scheme is recognised as providing essential infrastructure to the protect both residential and industrial land in Grangemouth, and enabling future development.

The consultation period for the Scheme closed in June 2024 and in January 2025, Falkirk Council preliminarily approved the scheme without modification, notwithstanding unresolved objections. As of May 2025, Scottish Ministers have confirmed that the Scheme will not be called in and a Reporter has been appointed to conduct a Local Hearing. It is anticipated this will be held in Autumn 2025 to consider objectors comments further. Following the Hearing, it is likely that a final decision on the Scheme will be taken by Falkirk Council in 2026.

The timescales for construction of the GFPS, including across phases, remains subject to further review of planning, funding, and delivery arrangements between Scottish Government and Falkirk Council.

The GFPS will provide extensive flood protection across the Grangemouth cluster – involving a combination of physical infrastructure and nature-based flood protection measures. It will provide flood risk protection up to 1 in 200 year level (a 0.5% change that a location will flood in any one year). As well as providing protection to strategic industrial sites and the Port it will provide further protection to 2,760 homes and 1,200 non-residential properties in Grangemouth and surrounding area.

- The Scheme will broadly comprise c. 29km of riparian and coastal flood walls, revetments and embankments, along with ancillary interventions and features including:
- Installation of flood gates to control the flow of water
 - Replacement of flood gates within the entrance channel to the Port of Grangemouth
 - Flow control structure on the Grange Burn to limit and control downstream flow
 - Relining of the Grange Burn Flood Relief Channel to improve flows and repair damage
 - New and/or extensions to existing culverts across the area.
 - Replacement bridges (New Carron Bridge (B902), Reddoch Road Bridge, and Dalratho Road Bridge.
 - Tree planting, landscaping, access paths, footbridges, and other associated works



Ground Conditions

Ground conditions across the Grangemouth cluster are characterised by soft superficial soils comprising raised tidal flat silts, clays and sands. Typically, these exhibit relatively low ground-bearing capacities. Compression of soils creates stability risk f loaded by overlaying structures, potentially resulting deflection/ depression of the ground and disturbance of foundations.

Distance to bedrock ranges across the site between 10m and 150m. Typically profile of sites within the cluster:

- Contaminative land-use history requiring full SI and pre-development remediation
- Weak ground bearing capacities requiring non-standard foundations
- Bedrock is in excess of 25m and requiring specialist foundations /piled solutions

Sites within the cluster are potentially at risk of compressible deposits – and further site investigation (SI) will be required on site-by-site basis to assess specific risk and appropriate design of building foundations and other infrastructure.

Bedrock underlying Grangemouth predominantly comprises Passage Formation (Sedimentary) with Upper Limestone Formation towards the north and east of the area. Both bedrock geologies are part of the Clackmannan Group Type. Contamination risk is high. Contamination is typically associated with historic land-use activity (chemicals/ oil & gas) and may include historic spills, material disposal and made ground associated with the site’s industrial legacy. Further detailed investigation, including chemical /asbestos and ground water testing, would be required to determine specific risk and necessary mitigation measures across Grangemouth. Specific contamination issues would vary across the cluster but may include

- Made ground associated with historic built development and engineering works,
- Hydrocarbons associated with historic and current oil & gas activity
- Waste associated with former buildings, structures, and industrial activity
- Ground waters – potentially contaminant pathways.

Mining Remediation Authority mapping indicates that while Grangemouth is within a Coal Mining Reporting Area – there are very limited historically recorded mine workings, shafts, or evidence of surface mining across the cluster. Risk of mineral stability issues is likely to be low though should be assessed on a site-by-site basis as part of further assessment.



Click the [links](#) for more info

Additional Ground Conditions Information:

- [Mining Remediation Authority Map](#)
- [Superficial Deposit Contours \(Depth to Bedrock\) \(BGS\)](#)
- [Geo-Technical Planning Map for Heavy Structures \(BGS\)](#)

Site Emissions

The Grangemouth cluster is estimated to be responsible for approximately 7% of Scotland’s total territorial emissions. The predominant source of emissions is from refinery and petrochemical processing and manufacturing activity associated with INEOS and Petroineos sites. Emissions are largely ‘Scope 1’ direct emissions associated with combustion, processing, and use of fossil-fuel resources directly owned and controlled by Grangemouth-based operators and essential to their activities.

Operators across the cluster such as Syngenta and INEOS Chemicals are advancing decarbonisation through innovation in operations and adoption of technologies, and a number of newer operators such as Celtic Renewables and RWE (planned Green Hydrogen) involve specialist low and zero-carbon manufacturing. SEPA’s Pollutant Release Inventory shows that while Grangemouth continues to be a major source of Scotland’s CO2 Emissions, there has been a gradual decline over the last 15 years. In 2007 total emissions amounted to c. 4.5m tonnes CO2 which has reduced to c. 2.4m tonnes by 2023.

Site / Company	Carbon Emissions (kt CO2)	Main Source of Emissions	% of Grangemouth total
Grangemouth Refinery*	737.91	Scope 1 – Direct	30%
Grangemouth CHP, Bo’ness Road, Grangemouth	550.88	Scope 1 – Direct	23%
INEOS Chemicals Grangemouth Ltd, Grangemouth	466	Scope 1 – Direct	19%
INEOS Infrastructure (Grangemouth) Ltd	427.17	Scope 1 – Direct	18%
INEOS FPS Ltd, Kinneil Terminal, Grangemouth	194.76	Scope 1 – Direct	8%
Versalis UK Ltd*	34.16	Scope 1 – Direct	1%
Veolia CHP Plant, Earls Road, Grangemouth	16.07	Scope 1 – Direct	1%
(2022 figure plant now closed and replaced by Earls Gate Energy Centre)			

Adapted from Draft Just Transition Plan (November 2024).

**Note Petroineos planned closure from Q2 2025 and Versalis planned closure from 2024.*

Minor emissions associated with Syngenta, Fujifilm, and CalaChem operations are below SEPA reporting thresholds and excluded from above review.



SEPA (PPC & CAR) Licensed Sites

There are over 40 regulated sites in the Grangemouth area which are regulated by SEPA through combination of Pollution Prevention Control (PPC) Permit and Controlled Activities Regulations (CAR) Licenses.

PPC Permits regulate activities that may cause pollution to the environment or harm human health. This would include emissions to air, water and land, the treatment and disposal of waste from industrial activities, and the use of resources and energy efficiency.

CAR Licenses relate to activity in the water environment and are in place to protect rivers, wetlands, groundwater, coastal waters. Activities undertaken within Grangemouth and which are regulated through the CAR Licencing regime include abstractions from water-sources, discharges to water bodies including waste-water and treated effluent, and engineering works undertaken within, or near, water bodies.

The majority of major industrial operators and activities within Grangemouth are regulated by a combination of the PPC and CAR Regulations – which provide specific conditions and requirements for the operation of permitted installations across the cluster. This includes, for example, controls, limits and parameters on specific emissions sources associated with chemical production, oil refining, or energy generation, and details of regular monitoring and reporting to SEPA. Links to authorisation documents of key sites regulated by SEPA are below:

- [Petroineos Refinery](#) and [Ineos Infrastructure \(Power Generation\)](#)
- [INEOS Chemicals Complex](#) and [CHP](#).
- [CalaChem Effluent Treatment Plant](#)
- [Syngenta](#)
- [Piramal](#)



COMAH Licensed Sites

Across Grangemouth a large number of sites and operators are regulated under the Control of Major Accidents & Hazards Regulations (COMAH). In total there are 14 COMAH Establishments within the cluster.

- 10 COMAH Upper Tier Establishments including:
 - INEOS FPS (including Kinneil Terminal and associated PLPG and RLPG facilities across the cluster and within the Port)
 - INEOS Chemicals Complex
 - Petroineos Refinery Complex
 - Exolum (within Port of Grangemouth)
 - Syngenta (Earls Road)
 - HW Coates (Earls Road)
 - Calor Gas site (Abbotsinch Road)
- 4 COMAH Lower Tier Establishments including:
 - INEOS Infrastructure (Power Generation)
 - W.H. Malcom (Tillyflats and West Mains) storage and distribution
 - Flogas (within Port of Grangemouth)

Activities within the cluster which are regulated by COMAH across these sites include petrochemical and oil refining, power generation and distribution, fuel storage and distribution, chemical installations and storage, and production of agricultural products. The majority of sites are regulated due to the storage and use of flammable and/or explosive gases and liquids at large quantities.

The COMAH Regulations require the establishments to take all necessary measures to prevent major accidents involving dangerous substances, and to limit the consequences to people and the environment of any major accidents which do occur. The COMAH Regulations are enforced by the Health & Safety Executive acting jointly with SEPA.

The Health & Safety Executive and SEPA would be key stakeholders in the development of future proposals within the Grangemouth cluster, ensuring close consideration of implications for current and future COMAH Establishments and appropriate coordination of Health & Safety processes and potential ‘domino’ risks that may arise from the clustering of operations.



4. Transport Infrastructure

Transport baseline review establishes the core network of infrastructures that connect the Grangemouth cluster and support its function as a strategic multi-modal hub.

It highlights the Port of Grangemouth as a critical infrastructure asset that provides essential marine import/export capacity to a wide range of activities within and beyond Grangemouth – with opportunities for further development and enhancement through the Green Freeport.

The rail freight infrastructure across the Cluster emerges as a strategic low-carbon transport asset, though partially constrained by network capacity issues. The strategic road connectivity to the cluster from the M9 is a key strength, and there has been investment in upgrades to junction capacity, however local access issues remain to parts of the cluster.

- **Road Infrastructure** – mapping Grangemouth road network including Trunk Roads, local roads, key junctions and known capacity constraints.
- **Rail Freight Infrastructure** – mapping key rail assets across the Cluster including rail freight terminals and associated infrastructure.
- **Port Infrastructure** – highlighting and mapping key port infrastructure and assets within the Port of Grangemouth – including quays, jetties, working areas, and associated infrastructure.
- **Active Travel & Public Transport Infrastructure** – mapping network of walking and cycling paths across Grangemouth, and key public transport infrastructure including bus stops and routes.



Road Infrastructure

Grangemouth is strategically situated within Scotland's Road Network and highly accessible from access the Central Belt. It has direct motorway access towards Edinburgh via the M9 (45 minutes to City Centre) and towards Glasgow via the M9 / M876/ M80 (35 minutes to City Centre) and to the North via the M90 / A9 / A90 to Stirling, Perth, Dundee and Aberdeen. It is an established logistics and distribution hub – with major operators including W.H Malcolm, H.W. Coates, Asda, Whyte & Mackay, John Mitchell all having significant operations, alongside inter-modal rail and port facilities operated by Forth Parts and Malcolm Rail.

Motorway access to strategic industrial sites within Grangemouth is via the Cadger's Brae Roundabout (Junction 5) and Earl's Gate Roundabout (Junction 6). Access from the motorway network lacks full diamond interchanges with staggered junction arrangements and prior reporting has identified that inconsistent layout and restrictions result in last mile issues and poor linkages between the local and strategic road network

The Earl's Gate Roundabout does not have a southbound on-slip on to the M9 or a northbound off-slip from the M9. This means traffic routing on the M9 to and from Edinburgh must use the Cadger's Brae Roundabout. Junction 5 has a staggered arrangement whereby traffic leaving the M9 southbound carriageway joins the A905 via a signal-controlled junction.

- The A904 from Junction 6 (Earls Road) runs through the town centre (Bo'ness Road) and connects to Falkirk and Bo'ness.
- The A905 from Junction 6 forms the Beancross Road and links Junction 5 and 6.
- The A905 at Jct 6 becomes the Inchyra Road connecting to Wholeflats Road and the A904 Bo'ness Road.
- Local road network is important in servicing the local community with the key routes being Earls Road / Inchyra Road, Newlands Road, Bo'ness Road and Kylebank.

Capacity constraints have been a long-term issue for Junctions 5 /6 and Earls Road / Inchyra Road. Ineos have secured planning permission to close Bo'ness Road from Inchyra Road to Wholeflats – though this has yet to be fully implemented and its future status is uncertain given planned refinery closure. Reallocation of traffic movements has raised issues with wider network capacity. Previous Transport Assessments indicate capacity within network and include specific issues between A906 Wholeflats Roundabout and Kersiebank Avenue.

Road freight flows within Grangemouth have previously been reviewed (MDS Transmodal Study, 2017) and estimated to comprise a total of 14.3 million tonnes of freight transport to and from the Cluster, with 68% outbound and 32% inbound. 22% of outbound and 30% of inbound HGVs are making trips within the Falkirk area, with a further 70% of outbound and 62% of inbound flows to/from the rest of Scotland. Only 4% of outbound and 8% of inbound flows are to the rest of Britain.



Rail Infrastructure

Grangemouth is a major centre of rail freight traffic in Scotland, with multiple rail sidings and inter-modal terminals facilitating a range of product flows across Scotland and the UK. The Port of Grangemouth and Petroineos refinery benefit from integrated rail infrastructure, and there is a separate rail terminal cluster at the Fouldubs Junction to the immediate west of the M9 (Malcolm Logistics and DB Schenker).

The railway line broadly runs as two single-track lines – providing access to the Port and the Refinery although with several shunting sidings and loop spurs connecting to the Fouldubs marshalling yards. The Railway is electrified as far as the Malcolm Rail logistics terminal at Fouldubs, however the spurs to the Port and Refinery are not restricting access to diesel powered and/or multi-fuel locomotives.

From Grangemouth there is W9 gauge clearance to the West Coast Main Line, which allows 2.9 m (9 ft 6 in) high Hi-Cube shipping containers to be carried on “Megafret” wagons that have lower deck height with reduced capacity. From the West Coast Main Line there is direct rail freight access to the logistics ‘Golden Triangle’ in the English Midlands which is utilised by several logistics operators. It has previously been identified that rail access from the east is more challenging, as trains need to route via to Mossend and then cross-country via Shotts / Carstairs.

Previous review by SESTRANS (2022) and Scottish Enterprise (2017) has identified that there is opportunity to increase rail freight movements from Grangemouth as part of wider move to low-carbon logistics, and maximising the potential of recent infrastructure investments (Forth Ports). However, it is also noted that there a potential lack of freight capacity on the rail network around Grangemouth as well as on the wider national rail network requiring further coordination with Transport Scotland, Network Rail and DfT.

A STAG Transport Appraisal was commissioned by Falkirk Council in 2024 to explore options for improving transport provision across Grangemouth and provide an evidence base and framework for future transport improvement. A range of potential transport network improvements were identified, including consideration passenger rail station within the town. Further development will require careful consideration in the context of freight capacity requirements and operations, and alternative measures that could provide a 'Travel Hub' within the town.



Click the [links](#) for more info

Port Infrastructure

Forth Ports Grangemouth is Scotland’s largest port (400 acres) handling 9 million tonnes of cargo each year through specialist container, liquid and general cargo terminals. This cargo flow represents as much as 30% of Scotland’s gross domestic product (GDP). The port facilitates the flow of more than £6 billion worth of goods each year including fine food and drink, machinery, fuel, steel products, timber, paper and equipment for the oil and gas industry. Major deep sea shipping lines, European short sea, multimodal and tank operators service the port. Services include 7 weekly feeder vessel calls linking Scotland with worldwide deep-sea markets and European and Baltic short sea destinations.

Access to the port is available 24 hours a day via a fully impounded dock system with the water level maintained at a constant level at all berths. Berths provide for Ro-Ro / Lo-Lo operations with berthing (stern/bow or side port).

There are two main dock areas for handling ships; the Eastern Channel where all liquid petrochemical traffic is loaded/discharged and the Grange Dock where dry/ bulk, Ro-Ro and container vessels are handled. 2023 Freight traffic for included Container traffic (Lo-Lo) 131,826 units, Liquid Bulks 15,222,180 tonnes and Dry Bulk 985,389 tonnes.

As part of its distribution and logistics capabilities the Port includes 500,000 sq ft of modern warehousing for a range of products and supply-chain services. There are also manufacturing activities within the port that rely on raw materials being shipped in by sea, in particular BioMar’s facility producing fish food for the aquaculture industry.

While the port can accommodate vessels with a draft up to 12 metres, the container terminal can only handle container ships with a draft of up to 7.7 metres.

Berths	Ruling Depth (0.5m under keel clearance required)	Quayside Length
North Grange 1-7	7.7m	610m
Tongue N (Grange 8-11)	7.5m	365m
Tongue S (Grange 12-15)	6.1- 7.1m	365m
East Wall	6.2 – 8.0m	215m
South Grange	5.5 – 8.2m	630m
Eastern Channel / LBT	12.5m	-



Active Travel & Public Transport Infrastructure

Within the town of Grangemouth there a range of active travel and public transport connections – linking key community services, open spaces, residential areas, and employment sites.

- National Cycle Route 76 routes through the town (crossing Zetland Park) connecting Bo’ness to Stirling.
- The Core Path Network predominantly routes towards and through green and open spaces, including Zetland Park, Rannoch Park, and connecting to the Helix Park to the west.
- Local Bus Servies are operated by Midland Bluebird – including a Grangemouth ‘Circular’ (Nos. 3 and 4) which connects Bowhouse, Kersiebank, and the Town Centre with onward connection to Falkirk, and the Forth Valley Hospital to Bo’ness route (No. 2) which routes through the Town Centre.

The scale of Grangemouth and concentration of community infrastructure including Schools, Health Centre, Leisure Facilities, and Town Centre provide for strong 20-Minute Neighbourhood qualities within the town. The majority of Grangemouth is contained within a broad 20-Minute walk catchment and core local services are accessible via walking and cycling.

Notwithstanding strong local accessibility, public transport connections from Grangemouth to surrounding towns and the wider Central Belt are more limited. The town does not have a public train station and the nearest stations are Falkirk Grahamston or Polmont which require drive or bus connection to access.

A STAG Transport Appraisal was commissioned by Falkirk Council in 2024 to explore options for improving transport and active travel provision across Grangemouth and provide an evidence base and framework for future project development. Through the Appraisal a 'Case for Change' has been completed and transport planning objectives defined for the area. A number of project ideas have been identified, across travel modes (road / bus / rail / active travel) and including strategic as well as local and small-scale interventions to improve connectivity around Grangemouth. Further detailed appraisal, planning. and consultation, will be required to identify preferred combination of projects and advance towards delivery.



5. Utilities & Industrial Infrastructure

Review of utilities and industrial infrastructures across the cluster demonstrates the wide range of strategic power, water, gas, and other specialist services that are embedded within Grangemouth.

Heat and power generation assets are clustered around Bo'ness Road and Earls Road to meet specific user needs as part of private-wire networks, and these have undergone recent renewal and investment. Wider utility infrastructure supporting the specialist activity within the Cluster is a combination of public (SGN, SPEN, Scottish Water) and private systems which have developed over time. In many cases utility resilience is based on business-to-business agreements and can be fragmented outwith individual operators.

A range of strategic national pipelines are connected to sites within the Cluster for distribution of Crude Oil and Ethylene – and several future pipelines for Hydrogen and CO2 are planned to connect to Grangemouth though delivery timescales remains uncertain.

- **Energy Generation** – existing and proposed power plant across Grangemouth.
- **Power Distribution** – SPEN Distribution and Transmission infrastructure
- **Gas Infrastructure (SGN)** – SGN gas main assets including High, Intermediate, Medium and Low Pressure services to Grangemouth.
- **Water Infrastructure (Scottish Water)** - Scottish Water assets including Trunk and distribution water mains, as well as rising mains and combined sewers.
- **Effluent Treatment and Waste-Water** – specialist effluent and waste-water treatment plants across the cluster.
- **Strategic Pipelines** – major Crude Oil, Ethylene, and Natural Gas pipelines linked to the Grangemouth cluster, as well as planned hydrogen and CO2 pipelines.
- **Specialist Feedstocks and Private Utilities** – private utility services and networks operated within Grangemouth to service specialist industrial activity.



Energy Generation

As well as connection to electrical and gas grid networks - there are a number of bespoke energy generation plants within Grangemouth associated with strategic industrial sites. These provide direct, private-wire access to heat and power to meet specific energy-intensive needs of refining, petro-chemical, and fine chemical sectors. Energy generated is primarily utilised to serve internal site requirements, though in some cases excess power is exported to the grid.

Energy generation plants within Grangemouth are clustered around Bo’Ness Road serving the Petroineos and INEOS complexes, and around Earl’s Road serving a range of users within the CalaChem site. Over the past decade – there has been considerable evolution and renewal of energy generation plant in the cluster through the development of INEOS Combined Heat & Power Plant and a new Energy Centre within the CalaChem Earls Road site.

Earls Gate Energy Centre – an Energy Recovery Facility (CHP) facility with capacity for up to 216,000 tonnes of non-recyclable commercial and domestic waste every year. It provides the primary source of heat and power to users within the CalaChem site via Calachem's site distribution infrastructure to surrounding users.. The facility became fully operational in 2024 effectively replacing the old gas-fired CHP generator at Earls Road. The facility has capacity to produce 22MWe of baseload electricity while delivering 33MWth of heat for use in surrounding industrial plants on Earls Road.

INEOS CHP – operational since 2001, the CHP facility was acquired by INEOS (from Fortum) in 2014. It provides electricity and heat (steam) to INEOS’ petrochemical operations and to the Kinneil Kerse site. Excess electricity is sold to the National Grid. Generation is a via a gas-fired combined cycle turbine. Power generation output is up to 145 MWe and heat generation output is up to 257 MWth to meet the energy intensive demands of the INEOS operations.

Caledon Green – situated within the CalaChem industrial estate, it has been operational since 2023 as a small gas-fired ‘reserve’ power plant. It is designed to operate for short periods of time when there is insufficient electricity generated from the grid to meet demand. It has capacity to generate 22.5MWe for direct export to the grid.

INEOS Infrastructure (B&C Plant) – The B&C Power Station Plant are located on Earls Road and have provided heat and power to Petroineos operations for over 40+ years. The gas-fired plant includes a range of boilers and steam turbines – with capacity of up to 198 MWth. It is anticipated that the plant will be decommissioned as capacity is met from the INEOS CHP and New Energy Plant, and as Petroineos refinery activity ceases in 2025, though timescales are currently uncertain.

INEOS New Energy Plant (NEP) – Anticipated to replace the ageing B&C Plant, the NEP was planned to provide power and steam across INEOS and Petroineos operations, and potentially to other businesses across the cluster. Following planning approvals in 2018 and construction start in 2021, the project is currently on-hold citing cost issues and wider market uncertainty. If developed, the Plant would convert mixed gas fuel (natural gas, ethane) to superheated pressurised steam to be distributed to users within the Grangemouth complex. It would have capacity up to 435MWth and 35 MWe. The Plant is designed to be ‘hydrogen-ready’ and capable of future adaptation.



Click the [links](#) for more info

Grangemouth Power Generation

Operational

De-commissioned

On Hold

Power Transmission & Distribution: Grid Infrastructure

The Grangemouth cluster includes significant electricity network infrastructure – operated by Scottish Power Distribution (<33kv) and Scottish Power Transmission (>33kv).

The major grid infrastructure within the cluster is the 275/33kv Grid Supply Point (GSP) complex at Wholeflats where the distribution and transmission networks intersect – with a substation and associated transformer and interchange infrastructure. 275kv Overhead Lines route south from the GSP crossing Wholeflats Road – but do not otherwise pose a physical constraint to development sites within the cluster. 33kv and 11kv sub-terrain cables are located within key roads across the cluster – linking to/from the Wholeflats GSP and other primary sub-stations.

The 33kv substation at Wholeflats is recorded by SPD as having a Firm Capacity of 21 MVA, maximum load of 10.87 MVA and Minimum Load of 2.72. No generation is currently connected or contracted.

The 275kv Grangemouth substation is recorded having a Firm Capacity of 120 MVA, a Maximum Load of 63.16 MVA and Minimum Load of 15.79 MVA. There is currently 40.10 MW Generation Connected and a further 0.21 MW of Generation Contracted. While further detailed network analysis would be required regarding future generation and/or power connections the Grid Supply Point is recorded as ‘Green’ meaning that all operational factors are within tolerable limits and opportunities may exist to connect additional Distributed Generation without network reinforcement. No wider network constraints are noted.

Several 33kv substations are located within the Earls Road area including the ‘Earls Road New’ Primary Substation (adjacent to International Timber) which is recorded by SPD as having a Firm Capacity of 23MVA, maximum load of 10.54MVA and Minimum Load of 2.64MVA. No generation is currently connected or contracted. 33kv substations are also located adjacent to former Earls Road CHP and Caledon Green Gas Station – though capacity information is not available.

Based upon available SPT and SPD data –there is available high-voltage capacity (both *import* and *export*) from the Wholeflats substation and it is potentially capable of enabling further industrial development within the INEOS complex or elsewhere across the Grangemouth cluster.

This is reflected in Scottish Power’s ‘Connections Network Database’ which notes the substation as having a total GSP Capacity of 228MW and remaining *export* capacity of 202.7 MW (Firm + Non Firm) and remaining *import* capacity of 149.2 MW (Firm + Non Firm). It is noted that there is fault level headroom available and board extension possible if required, though land rights issues with INEOS may require resolution in the event of reinforcement or upgrade works required. It provides an estimated connection date of 2028 for new generation. It is important to note that grid capacity is dynamic and subject to change over time, particularly as energy-intensive development such as RWE’s Green Hydrogen come forward and are likely to utilise a significant share of capacity. Early engagement with SPEN around future connection opportunities will be essential in further planning for site development opportunities and infrastructure planning.



Gas Infrastructure (SGN)

Grangemouth benefits from strong pre-existing connections to public natural gas networks operated by SGN (Local Transmission System). This includes High Pressure and Intermediate Pressure Gas Mains serving strategic industrial sites, and Low and Medium Pressure Mains primarily serving residential areas and standard commercial and industrial occupiers.

As shown on the strategic facing plan – a High Pressure Mains (450mm) connects directly to the INEOS Kinnel FPS site, while Intermediate Pressure Mains are connected to Versalis, BOC, Calachem, and Forth Ports (Exolum) sites across the cluster.

The network of strategic ‘National Transmission’ gas pipelines routing southward from St Fergus does not connect directly to Grangemouth – but cross c. 7km to the east (Feeder XX) at Blackness and c. 7.5km to the west (Feeder XX) at Bonnybridge as they route towards Avonbridge Compressor Station. A private natural gas pipeline operated by INEOS links to the Transmission Gas Network at Blackness and connects to the INEOS Chemicals Complex providing a direct supply capacity. The pipeline is 300mm diameter with standard operating pressure of 1160 psi.

Elsewhere within the Grangemouth cluster there are private pipeline infrastructures for transmission of gas within and between strategic industrial sites. Detailed information on the location, status and capacity of these assets is more limited, but considered in the Private Utilities section below.

LTS Futures

Through its LTS Futures Programme, SGN is advancing a project to re-purpose a decommissioned 16-in 30km gas natural gas pipeline (16 inch) from Grangemouth to Granton to transport 100% hydrogen. The project is being delivered in collaboration with INEOS and has been ongoing since 2022 including a range of surveys and technical design development. Physical construction works began in 2024 on installing a 1.2km local hydrogen pipeline (3 inch) within Grangemouth to connect from the hydrogen source within INEOS complex to the wider trial pipeline.

It is anticipated that trials with the hydrogen pipeline will be initiated in 2025 for a period of six months – though further details are yet to be confirmed. Longer-term utilisation of the pipeline for hydrogen distribution will be linked to delivery of the INEOS Low Carbon Manufacturing (Blue Hydrogen) Plant and/or other hydrogen projects across the cluster.



Water Infrastructure (SW)

There are a range of Scottish Water infrastructure assets within the Grangemouth cluster – serving strategic industrial users as well as residential and other uses within the town. Water mains and pipework is predominantly situated beneath or alongside primary road network – including adjacent to and below Wholeflats Road, Inchyra Road, Bo’Ness Road, Earls Road, and Forth-Clyde Way. Strategic sites across the Cluster are directly serviced by Scottish Water, including Petroineos INEOS Chemical Complex, Kinneil FPS site, and a number of sites within the CalaChem / Earls Road area. Key assets of note and crossing key sites and development zones include:

- A 35inch diameter cast iron rising main (foul drainage) rising west to east across Wholeflats, River Avon, and Kinneil FPS site towards the Kinneil Kerse Waste-Water Treatment Works.
- 27 inch diameter asbestos cement trunk Main crossing north to south across Wholeflats and INEOS Chemicals Complex between Wholeflats Road and Bo’ness Road.
- 27 inch diameter spun iron water main runs along the north verge of Bo’ness road and connects into the Petroineos facility.
- 30 inch Trunk Main and 10 inch Distribution Main crossing the western part of the Wholeflats (Falkirk Council owned land) adjacent to Inchyra Road.
- 9 inch Distribution main beneath Earls Road as well as combined sewers connecting to Dalgrain Pumping Station, and isolated mains connected to Calachem’s Effluent Treatment Plant.

Water mains and drainage connections are available and proximate to strategic development zones across the Cluster, though available capacity for future development especially involving intensive industrial applications would require early engagement with Scottish Water.

Publicly available (Scottish Water) information on water infrastructure assets has been reviewed – though it is anticipated that landowners and site operators will hold records of privately operated water supply and drainage networks within respective sites and this would need to be confirmed through further coordination and engagement.

Further detail on specialist effluent and waste-water treatment infrastructure is provided in the following section.



Effluent & Waste Water Treatment

The Grangemouth Cluster is serviced by a combination of public and private waste water and effluent treatment plant facilities, including facilities purpose planned and operated for the treatment of specialised industrial wastes.

Earls Gate Effluent Treatment Plant – operated by CalaChem and providing essential effluent treatment services to a number of users – including piped discharge for on-site customers within Earls Road. The Plant has a range of tanks and sumps for biological and chemical treatment, blending, and filtration as well as firewater lagoons. It is capable of handling hazardous waste, and licensed to handle “Strong Stream Effluent” up to 5,000 m3/day as well as more standard industrial effluents. It also has capability for for tanker discharge for off-site / third party users. Following treatment effluent is routed to the Dalgrain Pumping Station for discharge via the Forth Estuary Outfall.

Petroineos Effluent Treatment Plant – collects aqueous effluents from the refinery, surface water, ballast water and if necessary fire water, and comprises physical, chemical and biological treatment plant with a discharge capacity of 30,000 m3 / day. The Plant may also receive aqueous effluent, by tanker or pipeline, from other parts of the installation. The Plant is connected to an outfall to the Forth Estuary at the northern edge of the Petroineos site.

INEOS Tidal Pumping Facility – collects the main portion of aqueous effluent and surface water from the chemical productions plants, and provides effluent storage and PH balancing prior to discharge. The system includes three effluent pumps and a long outfall to the Forth Estuary. Discharge is normally confined to a four hour window around high tide. Aqueous flow is limited (through PPC Licence) to 49,000m3 over two tidal cycles.

Dalderse WWTW – A Scottish Water operated Waste-Water Treatment Works located to the immediate west of Grangemouth (adjacent to the Kelpies). It undertakes public sewage treatment, sludge digestion, and waste transfer activities. Available Scottish Water data indicates capacity in the order of 4.7 l/s though further detailed engagement would be required with Scottish Water to confirm.

Kinneil Kerse WWTW - A Scottish Water operated Waste-Water Treatment Works located to the east of Grangemouth (adjacent to the Kinneil FPS facility). It undertakes public sewage treatment and waste transfer activities. Available Scottish Water data indicates capacity in the order of 1.8 l/s though further detailed engagement would be required with Scottish Water to confirm.



Strategic Pipeline Infrastructure

Linked to the oil & gas, petrochemical, and chemical manufacturing operators within Grangemouth the cluster is linked to a range of strategic pipelines for national distribution of fuels, feedstocks and products.

Strategic pipelines predominantly route to the eastern edge of the Grangemouth cluster – linking into either the Kinneil FPS Complex for distribution of Crude Oil and related products, or to the INEOS Chemical Complex for distribution of ethylene.

The presence of strategic pipelines connected to marine export infrastructure and other UK industrial clusters creates a range of future opportunities for transition and diversification of the cluster. However, the pipeline infrastructure is privately owned (INEOS), extend over very large areas, and will involve potentially significant technical, engineering, and legal / regulatory complexities to be re-purposed for alternative uses.

Crude Oil Pipelines

The Petroineos refinery and linked INEOS Chemicals complex are linked to major crude oil pipelines from the North Sea, and between oil export terminals at Hound Point and Finnart. The **Forties Pipeline System (FPS)** links offshore production platforms to Cruden Bay from which crude oil is pumped to the Kinneil FPS Terminal for stabilisation treatment. A significant proportion of the crude oil is distributed directly to the Hound Point Oil Terminal in the Firth of Forth (with interim storage at Dalmeny Oil Deport). A secondary pipeline linking to tanker export from Finnart Oil Terminal (Argyll & Bute) for tanker export also exists – however the closure of the Finnart Terminal was confirmed in September 2024 and future use of infrastructure is uncertain. Linked to the Finnart closure, Petroineos noted their intention to develop a ‘virtual pipeline’ of finished fuels from their European trading hub direct to Grangemouth jetties for dispatch to customers.

Ethylene Pipelines

Three primary ethylene pipelines connect from INEOS’s Chemicals Complex. The privately operated high-pressure pipelines enable cross-country transport of ethylene production in Grangemouth to strategic storage, consumers, and export elsewhere in the UK at Mossmorran (Fife), Wilton (Teesside), and Runcorn (Merseyside) as a key feedstock to chemicals and wider manufacturing sector.

Natural Gas Pipelines

Separate from SGN’s Gas Network, the INEOS Chemicals Complex has a privately owned direct connection to the Transmission Gas Network – via an 11km pipeline between Grangemouth and Blackness (adjacent to the Firth of Forth). The pipeline provides direct capacity for energy generation within the INEOS site – distributed within an internal private network.



6. Grangemouth Sub-Clusters Opportunities & Constraints Review

The baseline assessment across different topic areas demonstrates that within the overall Grangemouth cluster there is clear differentiation in the scale, infrastructure, energy, and specific operational needs of different zones across the cluster.

While inter-connected and all contributing significantly to the Cluster's overall proposition - these can broadly be considered as 4 'sub-clusters' each with different opportunities and challenges, and requiring varied approaches to future investment and development that reflect their existing use and function, ownership, land availability, and infrastructure capacity.

- **Refinery Site** – comprising the Petroineos refinery and associated infrastructure including tank farm, road tanker terminal, power generation infrastructure. Planned closure of the refinery and transition to an import terminal poses immediate issues and specific considerations for this site. Project Willow is ongoing to identify future development opportunities for the site.
- **INEOS Complex** – anchored by the remaining INEOS Chemicals operations and associated CHP and New Energy Plant Infrastructures at Bo'ness Road, as well as RWE's forthcoming green hydrogen development at Wholeflats Road, former Versalis site, and the Kinneil FPS site.
- **Earls Road** – An industrial estate where both Syngenta and CalaChem own land and lease portions to other businesses as well as surrounding logistics & supply-chain companies. CalaChem operates as the site's infrastructure provider, supplying essential utilities and services to all site operators, including Syngenta and other specialist chemical companies such as Piramal and Celtic Renewables.
- **Port of Grangemouth** – the entirety of the Port and operational areas, including multi-modal rail freight hub, oil & gas jetties, and wider development opportunities within the Port boundary.

The following sections provide a more detailed review of these sub-clusters and their respective characteristics, and strengths, weaknesses, opportunities, and threats emerging from land & infrastructure review.



Earls Road Sub-Cluster

CalaChem Campus and surrounding users

Earls Road is a well-established industrial estate and sub-cluster with a diverse range of users across Fine Chemicals, Pharmaceuticals, Logistics, General Industrial, and wider supply-chain services, with potential to accommodate a range of future low-carbon and circular economy uses. The sub-cluster is anchored by CalaChem as a specialist infrastructure services provider (steam, power, effluent treatment) and landowner with development plots and tenanted sites across a large contiguous land area around Earls Road.

The Sub-Cluster includes as key users: CalaChem, ASDA Distribution Depot, Syngenta, Piramal, Celtic Renewables, HW Coates, JM Haulage, and the Earls Gate Energy Centre. MiAlgae recently announced proposals to develop a bio-technology production facility at Earls Road.

The Earls Road Sub Cluster extends to 35 ha (85 acres) and includes plot sizes / typologies suitable for a range of industrial requirements, including specialist low-carbon, circular economy, and chemical sectors.

CalaChem offer flexible laboratory and office accommodation up to 700m², available for immediate entry and within a secured-site with controlled access. Within the CalaChem Campus a range of development sites and plots are available for sale/lease (subject to Ground Lease) and capable of being consolidated to enable multi-phase investment.

Through provision of strategic shared utilities & infrastructures land is capable of being serviced with:

- Private wire electricity via green EfW / Combined Heat & Power Plant (c. 22MW of available electricity)
- Intermediate and low-pressure steam (33MW of available heat)
- Industrial Gases: natural gas / piped nitrogen / compressed air.
- Potable & Raw Water supply.

CalaChem also provides a complete treatment and disposal service for third party bulk aqueous waste and for on-site customers at its large-scale, fully automated Effluent Treatment Plant (ETP). The ETP is equipped to handle strong-stream effluent and hazardous waste associated with specialist manufacturing and industrial activity. The CalaChem site also provides SHE (Safety, Health & Environment) emergency response service and assistance with COMAH specific obligations.

The Earls Road Sub-Cluster benefits from being situated in a regional selective assistance area, with grants and funding available to SME's / business. An RSA can typically cover up to 35% of the eligible costs for a small or medium-sized enterprise (SME) and 15% of the eligible costs for a large enterprise.




Earls Road

Click the [links](#) for more info

Click to show key sectors
and users within the Earls
Road sub-cluster






Earls Road - Key Utilities and Assets




Click key for more info 






Key Private Infrastructure & Services

-  CalaChem Service Assets
-  CalaChem Utility & Service Routes
-  Energy Generation Plant





Effluent and Water Treatment

-  Indicative Connections
-  Effluent and Water Treatment
-  Effluent Outfall Locations






SPD EHV Infrastructure

-  EHV Cable (33kv)
-  EHV OHL (33kv)
-  SPD Primary Substations (33kv)

SGN Network

-  Hp Pipe
-  Ip Pipe
-  Lp Pipe
-  Mp Pipe

Scottish Water Infrastructure

-  Combined Sewer
-  Distribution Main
-  Trunk Main
-  Surface Water Sewer
-  Isolated Main

Earls Road - Land Areas and Availability

Click the [links](#) for more info

Click to show [key available land areas within the Earls Road cluster.](#)

Click to show [Green Freeport Tax Sites within Earls Road \(CalaChem Campus\)](#)



Port of Grangemouth

Scotland's Largest Port

The Port of Grangemouth is a well established sub-cluster within Grangemouth, offering integrated logistics and distribution services across specialist container, liquid, and general cargo terminals. It is Scotland's largest port handling up to 9 million tonnes of cargo each year – representing c. 30% of Scotland's GDP. The container terminal and reefer facility handle over 250,000 TEU container each year.

The port works with all major deep sea shipping lines, as well as European short sea, multimodal and liquid bulk/tank operators, and is a key gateway for the Scottish economy across food & drink, fuel, steel products, timber, and paper sectors. The port infrastructure is a strategic enabler to specialist industrial activity elsewhere within Grangemouth which is reliant on import / export of feedstocks, products, and international supply-chains.

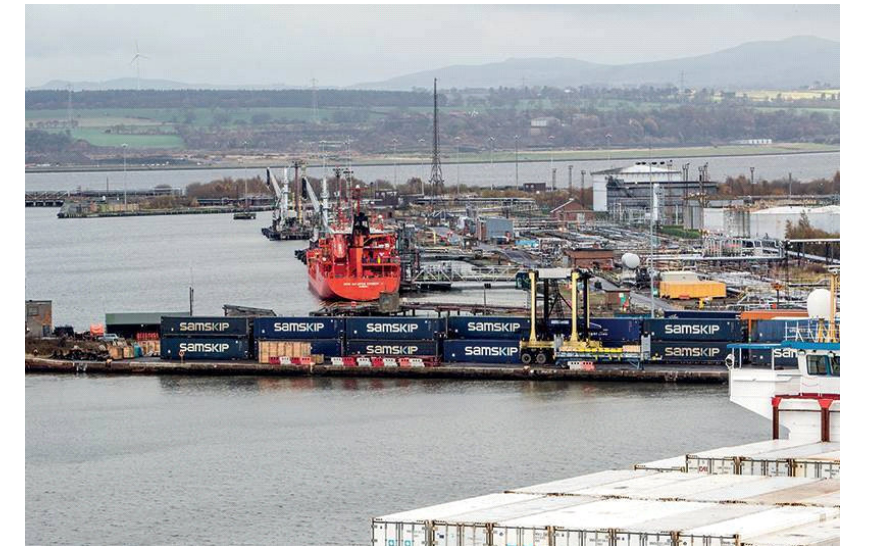
The Port is a strategic site within the Forth Green Freeport, including a number of tax sites and opportunities for development that will support long-term transformation and decarbonisation of the Grangemouth cluster. Opportunities for a new 'Energy Park' within the Port have been identified by Forth Ports, which could include LNG facilities as well hydrogen and carbon capture & storage technologies.

Forth Ports Limited is the Statutory Harbour Authority for the Port of Grangemouth and the River Forth. The Port of Grangemouth estate owned and operated by Forth Ports as a whole extends to c. 160 hectares across all quaysides and operational areas with significant areas of development land. The main quays and activity areas within the Port include:

- Eastern Channel – liquid bulk / fuel depot and jetties.
- Grange Dock Western Channel – container terminal and general cargo berths, with rail hub integration.
- Carron Dock – general cargo berths

Port infrastructure and services broadly include:

- Impounded dock capable of accepting 187 Max LOA and 27.4m width vessels
- Vessels up to 12m draft within the Eastern Channel and up to 7.7m draft within the Grange Dock.
- Private and common user oil jetties and liquid bulk storage facilities.
- All docks capable of handling Ro-Ro vessels, plus specialist Ro-Ro berth within the Grange Dock
- Container Terminal offering full intermodal services supported by 16 straddle carriers allowing fast turnaround times.
- Full bunkering services including fuels, waste water, fresh water, waste recycling
- Intermodal rail hub (775m sidings) integrated with container terminal – with regular rail link to Port of Tilbury (36 containers in each direction)
- 24/7 Operations including dunnage and stevedoring
- Modern warehousing and storage facilities of c. 500,000 sq ft.
- Supply Chain support for freight logistics, freight handling and servicing



Port of Grangemouth

Click the [links](#) for more info 

[Click to show key sectors and users within the Port of Grangemouth sub-cluster](#)

[Click to show Green Freeport Tax Sites within the Port of Grangemouth](#)



Port of Grangemouth - Key Utilities and Assets

Click key for more info



Key Private Infrastructure / Pipelines

- Ethane Lines (Indicative)
- Crude Oil Lines (Indicative)

SGN Network

- Hp Pipe
- Ip Pipe
- Mp Pipe

Scottish Water Infrastructure

- Combined Sewer
- Distribution Main
- Trunk Main
- Surface Water Sewer
- Isolated Main

SPD HV Infrastructure

- SPD Secondary Substations (11kv)
- HV Cable (11kv)



Refinery Site

Petroineos

The Petroineos refinery, a joint venture between Ineos and Petrochina, is a strategic site within the Grangemouth cluster and has been the primary producer of bulk of fuels in Scotland. In total the refinery site comprises c. 170 ha of land – encompassing power generation plant, refinery process plant and infrastructure, tank farm and fuel blending, and road and rail distribution terminals.

The site has a long industrial heritage - dating back to the 1920's with BP developing an existing oil shale facility as an oil refinery in 1924. Post war expansion with the development of BP Chemicals and subsequently the North Sea oil and Forties Pipeline system supported further expansion, investment, and creation of the refinery as it exists today.

In November 2023, Petroineos announced that the Grangemouth oil refinery would be closing with preparatory works commencing to convert the facility to an import terminal for finished fuels. The refinery is expected to cease operations in mid-2025 and convert to an import terminal. The planned closure marks a significant point of transition for Grangemouth - given the nature and scale of the refinery, and its importance as a strategic employer and industrial 'anchor' within Grangemouth.

Key land & infrastructure issues for consideration in future use and development of the site will include:

- Weak Ground Bearing capacity with alluvial soils and rockhead typically at a depth of 30-50 metres – likely requiring specialist foundations to enable large-scale industrial activity.
- Contaminative land-use history with expectation of hydrocarbon contamination. Crude oil contains a complex mixture of aliphatic, aromatic, and heterocyclic compounds and including heavy metals. Site investigations elsewhere within Grangemouth have previously identified contamination from petroleum hydrocarbons, volatile organic compounds, and semi-volatile organic compounds within the underlying tidal flat deposits. The site will likely require substantial programme of remediation to support alternative land uses and redevelopment – in compliance with the Environmental Protection Act 1990: Part IIA Contaminated Land and Contaminated Land (Scotland) Regulations 2005.
- Petroineos will retain a portion of the site for transition to a fuels import terminal facility. The footprint and specific operational requirements of the terminal are not fully established – but will require consideration in the siting and development of future land uses to maintain compatibility in terms of access, health & safety, and site operations.
- Project Willow (joint funded by UK and Scottish Government) has undertaken an extensive review of future options to develop a new future for the refinery site as a low-carbon energy and industrial hub – building on the skilled local workforce and industrial legacy of the site. Sectors and activities identified as the strongest future opportunities are within three core sectors: waste, bio-feedstock, and offshore wind support. The range of projects and activities with strong potential 'fit' to the Refinery site include ABE biorefining, 2nd generation bioethanol, anaerobic digestion, HEFA, and E-methanol and e-mmonia. Funding, delivery and development programme remains uncertain and subject to further coordination across Scottish Government, Scottish Enterprise and industry partners to advance.



Refinery Site

Click the [links](#) for more info 

[Click to show key plant facilities and infrastructures on the Refinery Site](#)

[Click to show key land areas for the Refinery Site](#)



Chemicals Complex

INEOS O&P and surrounding land

The Ineos Chemicals sub-cluster comprises c. 270ha of land around Bo’ness Road and the River Avon – and encompassing the Ineos O&P facility, KG Ethylene Cracker, Ineos HQ, Ineos CHP Plant, Ineos FPS (Forties Pipeline System), former Versalis site, and land at Wholeflats Road. These sites and operations are not directly affected by the planned closure of the Petroineos refinery and will continue as a chemical production sub-cluster within Grangemouth – with opportunities for further investment and development.

Ineos O&P (Olefins and Polymers) produce a wide range of derivative products used in finished petrochemicals and plastics. Critical infrastructure at the site includes the KG ethylene cracker which produces feedstock for the two co-located polymer plants and export product for distribution via underground pipelines to the North-East and North-West England for conversion to a wider range of chemicals. Recent investments within the INEOS estate have included ethane import infrastructure (US shale gas), a new HQ building (2016), and proposals for a new steam and power plant (currently paused). In January 2025 INEOS announced the closure of the synthetic ethanol plant on the site.

The Ineos Complex extends to c. 167 ha – including land either side of Bo’ness Road and the Ethylene Cracker accessed from Wholeflats Road. There is vacant and potentially developable land areas where third-party investment may offer strong synergies and long-term partnership around feedstocks, products, and on-site services. Site facilities and assets broadly include:

- Networked on-site utilities servicing including electricity and steam generation via Combined Heat & Power Plant. Steam at up to 125barg (existing network c44barg and 14barg & 2barg);
- Dedicated effluent treatment and drainage systems
- High pressure natural gas
- Feedstocks including oil & gas, ethane / ethylene, and industrial gases including nitrogen and compressed dry air and helium / hydrogen
- Immediate adjacency to SPT 275kv grid supply point with potential for direct connection
- Serviced land and plot area suitable for chemical sciences and low-carbon industries.

The separately operated Ineos FPS (Forties Pipeline System) is an integrated oil & gas liquid transportation & processing system operating from the Central North Sea to the Central Belt in Scotland. The Kinneil Terminal at Grangemouth provides crude oil stabilisation and gas processing and treatment facilities. It has capacity to treating 6,700 te/day of raw gas and process 775mbd of unstabilised crude oil in three trains. Emerging and planned projects within the sub-cluster include:

- RWE Green Hydrogen production (up to 600MWe) at Wholeflats announced in 2024. A planning application is yet to be submitted though the project could be operational by 2029.
- INEOS Low-Carbon Manufacturing Plant for production of blue hydrogen. Timescales for development and uncertain, with critical dependency around planned ‘Scottish Cluster’ carbon capture & storage infrastructure. Seed Funding for site preparatory works is due to be awarded through the Forth Green Freeport.
- Grangemouth Sustainable Manufacturing Campus located on Falkirk Council land at Wholeflats, incorporating co-located Bio-Economy Accelerator Pilot Plant (BAAP) and Carbon Dioxide Utilisation Centre (CDU). Each project is supported by £10m of Growth Deal Funding.



Chemicals Complex

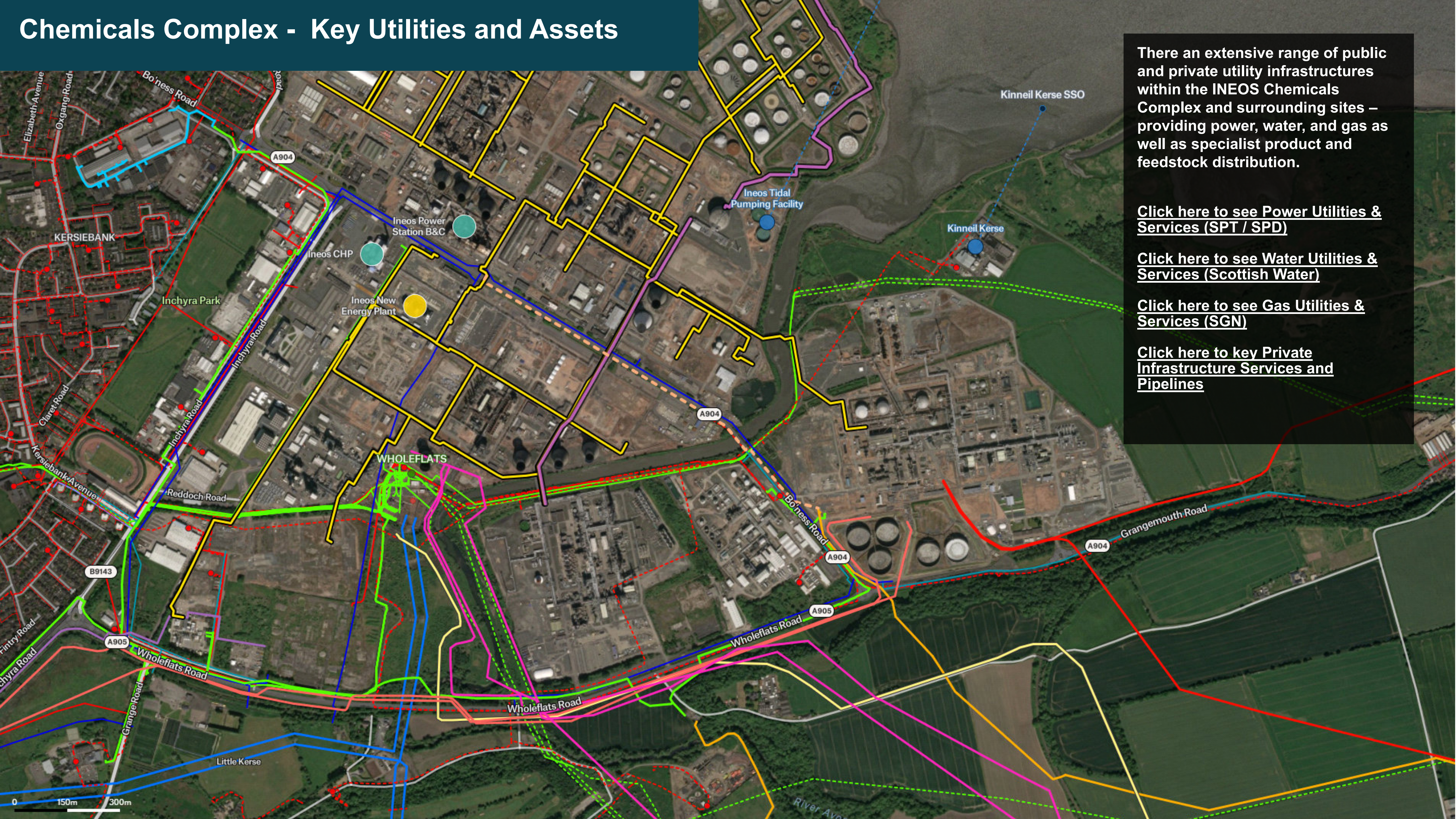
Click the [links](#) for more info

[Click to show key users and operators within the Chemicals Complex](#)

[Click to show key land areas for the Chemicals Complex Site](#)



Chemicals Complex - Key Utilities and Assets



There an extensive range of public and private utility infrastructures within the INEOS Chemicals Complex and surrounding sites – providing power, water, and gas as well as specialist product and feedstock distribution.

[Click here to see Power Utilities & Services \(SPT / SPD\)](#)

[Click here to see Water Utilities & Services \(Scottish Water\)](#)

[Click here to see Gas Utilities & Services \(SGN\)](#)

[Click here to key Private Infrastructure Services and Pipelines](#)

7. Summary Conclusions & Next Steps

The Land & Infrastructure Baseline Review has collated, reviewed, and mapped a diverse range of information and data for the Grangemouth Cluster. A multi-disciplinary approach has considered the interrelationship between physical site conditions and infrastructures, local transport, utilities, and energy networks, and a range of planning, environmental and wider regulatory issues affecting future development.

The Review has been developed to provide a clear contemporary understanding of existing land areas, infrastructure assets, and wider opportunities and constraints across the Cluster. It will inform further review of cluster-wide synergies and strategy planning undertaken by Grangemouth Futures Investment Board (GFIB), as well supporting ongoing inward investment and development activity.



Key Findings

Key findings and observations emerging from the Baseline Review are summarised as:

- Grangemouth is entering a significant period of transition and change – driven by a range of recently announced closures (Petroineos, Versalis, INEOS Ethanol Plant, Fujifilm) but also new entrants, planned development and expansions (Celtic Renewables, Syngenta, RWE Hydrogen, Pirimal, MiAlgae). Industry restructuring poses considerable challenges around Just Transition and retaining the Cluster’s core industrial base – but also opportunities for new development to build upon the clusters fundamental geographic, infrastructure, and skills-base strengths.
- There are significant land and infrastructure assets across Grangemouth with the potential to be leveraged, enhanced, and developed as part of the transition to a Low-Carbon Industrial Cluster. Key assets and opportunities include:
 - Strong chemicals and fine chemicals industrial base
 - Clear land-use policy support including Green Freeport designation
 - Multi-modal transport infrastructure and connectivity across road, rail and sea with strong distribution and logistics capacity for Scotland, UK and global supply chains through Scotland’s largest port.
 - On-site energy generation (heat + power), waste-water treatment, and specialist industrial services within private-wire / pipe networks
 - Presence of major grid infrastructure with potential import/export capacity
 - Strategic pipelines connecting Grangemouth to UK industrial clusters for distribution of key products and feedstocks.
 - Significant areas of brownfield land in accessible locations
 - Established supply-chain, skills, and business base within Chemicals and Specialist Manufacturing Sector with strong potential to transition and diversify into growing low-carbon sectors.
 - Established skills and training links with Falkirk College.
- Notwithstanding strong fundamental assets, there are a range of linked land & infrastructure constraints and risks with the potential to impact on new investment and operational resilience. While variable in the context of individual areas and sites these include:
 - Complexities of remediating and enabling areas of brownfield land with high likelihood of contamination and associated costs associated with former land use.
 - Ground conditions across the cluster characterised by low-ground bearing capacities requiring specialist foundations (deep piled foundations) for industrial development.
 - Significant areas within the Refinery Site and INEOS Chemicals site are at high risk of flooding from a combination of river and coastal sources. The planned Grangemouth Flood Protection Scheme will substantially reduce flood risk but has an uncertain timeline around funding approvals and delivery.
 - Resilience of private wire and networked utility arrangements and lack of network connections across the whole of the cluster.
 - Local transport, access, and capacity issues associated with Bo’ness Road, Inchyra Road, and M9 Junctions 5 and 6.

- The review identifies that the Grangemouth Cluster is broadly divisible into 4 clear zones and sub-clusters based on land use, operations, sectoral strengths, and infrastructure assets and capacities.
 - **Refinery Site** – comprising the Petroineos refinery and associated infrastructure, with planned closure and transition to an import terminal from Summer 2025.
 - **Chemicals Complex** – centred around the Ineos Chemicals Plant and including adjacent energy infrastructures as well as planned development at Wholeflats and the Kinneil FPS Site.
 - **Earls Road** – comprising the multi-user Earls Road estate and surrounding land, with an established and expanding Fine Chemicals specialism and clustering of logistics, industrial, and supply-chain users”.
 - **Port of Grangemouth** – the Port comprising Eastern Channel, Grange Dock, and Carron Dock and related operational areas including multi-modal rail freight hub, oil & gas jetties, and development land within the Port boundary.
- The interactions between these zones support the overall strength of the Grangemouth Cluster – and specific interdependencies exist around product import / export and feedstocks (e.g. Shale Gas import via the Port). However, the Zones predominantly operate with relative independence, under different ownerships, serving different commercial sectors and markets, and with largely internal utility networks and services to meet respective user requirements. The closure of the Refinery and planned investment in a range of low-carbon technologies (Project Willow) could be anticipated to alter dynamics across the Cluster with potential for new synergies and integrations to emerge that leverage existing assets.
- There is a strong framework in place across Local (LDP) and National Planning Policy (NPF4 – National Development) that is supportive of energy transition, low-carbon industrial development including CCUS & Hydrogen, and critical infrastructure delivery at Grangemouth. Allied to policy, there is significant investment and development incentives in place through the creation of the Forth Green Freeport, approval of the Falkirk & Grangemouth Growth Deal, and significant funding support announced by UK and Scottish Governments. Effective coordination and partnership will be essential to maximise the collective value of public sector funding mechanisms and investment. Project Willow has identified that considerable regulatory reform will be required to enable timely investment in hydrogen, bio-fuels and other low-carbon sectors identified as essential to the future of the Cluster.

Grangemouth Sub-Cluster	Key Challenges <i>Land & Infrastructure</i>	Key Opportunities <i>Land & Infrastructure</i>
Refinery Site	<ul style="list-style-type: none">• Extensive legacy industrial site and retained storage facilities, port, and railhead connections, but with complex site remediation and preparatory works required to enable redevelopment.	<ul style="list-style-type: none">• Maximising advantage of strategic connections (marine/ rail/road /land). Implementing recommendations of Project Willow and supporting Just Transition of significant land areas through investment in low-carbon technologies.
Chemicals Complex	<ul style="list-style-type: none">• Extensive site undergoing major restructuring. Challenged to identify compatible user/ operations that add to cluster strength, and capacity to produce further sector benefits / networked capacity.	<ul style="list-style-type: none">• Operational manufacturing site for Ineos O&P (including HQ). Single ownership site with capacity for inward investment and diversification associated with chemicals and energy sectors.
Earls Road	<ul style="list-style-type: none">• Maintaining and re-investing in multi-user specialist industrial cluster. Addressing core utilities resilience currently operated by stand-alone service provider.	<ul style="list-style-type: none">• Maintaining and re-investing in multi-user specialist industrial cluster. Further investment in fine chemicals, circular economy, bio-technology, and low-carbon industries to consolidate as specialist cluster and catalyst for wider Grangemouth.
Port of Grangemouth -	<ul style="list-style-type: none">• Limited and/or constrained land availability for strategic expansion and diversification.	<ul style="list-style-type: none">• Supporting port expansion as a multi-modal / multi-sectoral freight hub.• The Port remains the ‘gateway’ to Grangemouth and positioned as key supply-chain / distribution hub for growing low-carbon industry and logistics

Identifying Gaps

Through the compilation of available information the review has sought to identify existing gaps in knowledge and understanding, and identify current ‘unknowns’. Key priorities for further coordination, detailed data gathering, and technical assessment could include:

- **Private utility networks** – data on private-wire networks operated by CalaChem, Petroineos, and Ineos is based upon prior reporting and publicly available records submitted to Falkirk Council and SEPA. This identifies the location of key assets and services provided (power, pressurised steam, nitrogen, other specialist feedstocks), though contemporary detail on status, capacity, and operation of networks is limited. Where available this would inform more accurate assessment of infrastructure baseline.
- **Land Availability** – review of key sub-clusters identifies significant land areas as being vacant and potentially available for development, including land within the ownership of CalaChem, Forth Ports, and Ineos. The status of these areas and their availability as opportunity sites is uncertain and requires further coordination with landowners to provide a detailed assessment of land capacity.
- **Former Infrastructure** – desk-based review is limited in detail on the level of risk associated with redundant plant, infrastructure, and other assets present within Grangemouth. The nature of land use history across the Cluster may pose complex remediation requirements for a number of sites involving removal and disposal of hazardous wastes, chemicals, and former infrastructures. Further coordination and assessment is required to consider implications for future development.
- **Future Pipelines** –while identified as connecting to Grangemouth there is limited available detail on the delivery, timeline, and local routing of planned hydrogen pipelines (Project Union, H2 Caledonia) and CCUS networks (Project Acorn). These projects remain in development and subject to Government funding and approvals but represent a key dependency for future investment and a priority for further coordination to inform strategy for the Cluster.

Coordinating Next Steps

There are a significant number of ongoing workstreams coordinating and seeking to support future planning for the Grangemouth Cluster. Project Willow (published March 2025) has now set an ambitious plan focused around development on nine complementary low-carbon technologies, and requiring major private and public sector investment. In parallel there is continued activity and project development among the GFIB Partners, including Scottish & UK Government, Scottish Enterprise, Falkirk Council, Green Freeport, and Industry, all seeking to secure a sustainable future for Grangemouth as a thriving low-carbon industrial cluster.

The Baseline Review seeks to support and inform activity by all of these parties by providing a clear spatial framework of existing land & infrastructure assets in the Cluster. Key priorities for coordination, joint-working, and further study emerging from the Baseline Review will include:

- Direct engagement with key landowners and site operators (Forth Ports, CalaChem, Syngenta, Petroineos, INEOS) to validate data on private-wire networks and ensure contemporary issues and proposals reflected.
- Detailed coordination and joint-working with NESO around future energy scenarios for the Cluster and exploring opportunities for strategic investment ahead of need through network planning (Strategic Spatial Energy Plans, Centralised Strategic Network Plans, and Regional Energy Strategic Plans).
- Scenario planning and modelling of future development options among GFIB Partners. To identify areas of strategic constraint and challenge to delivery, key land, utility, and infrastructure requirements, and opportunities to facilitate and accelerate investment. This will develop into a long-term Industrial Cluster Strategy for Grangemouth with clear programme of investment.
- Further detailed technical assessment (site and sub-cluster) and feasibility review to inform the delivery of Project Willow projects and its recommendations. Building on Baseline Review findings through focus towards specific sites, areas, and development opportunities.

