

PEAK CLUSTER

PROJECT INFORMATION PACK

November 2026

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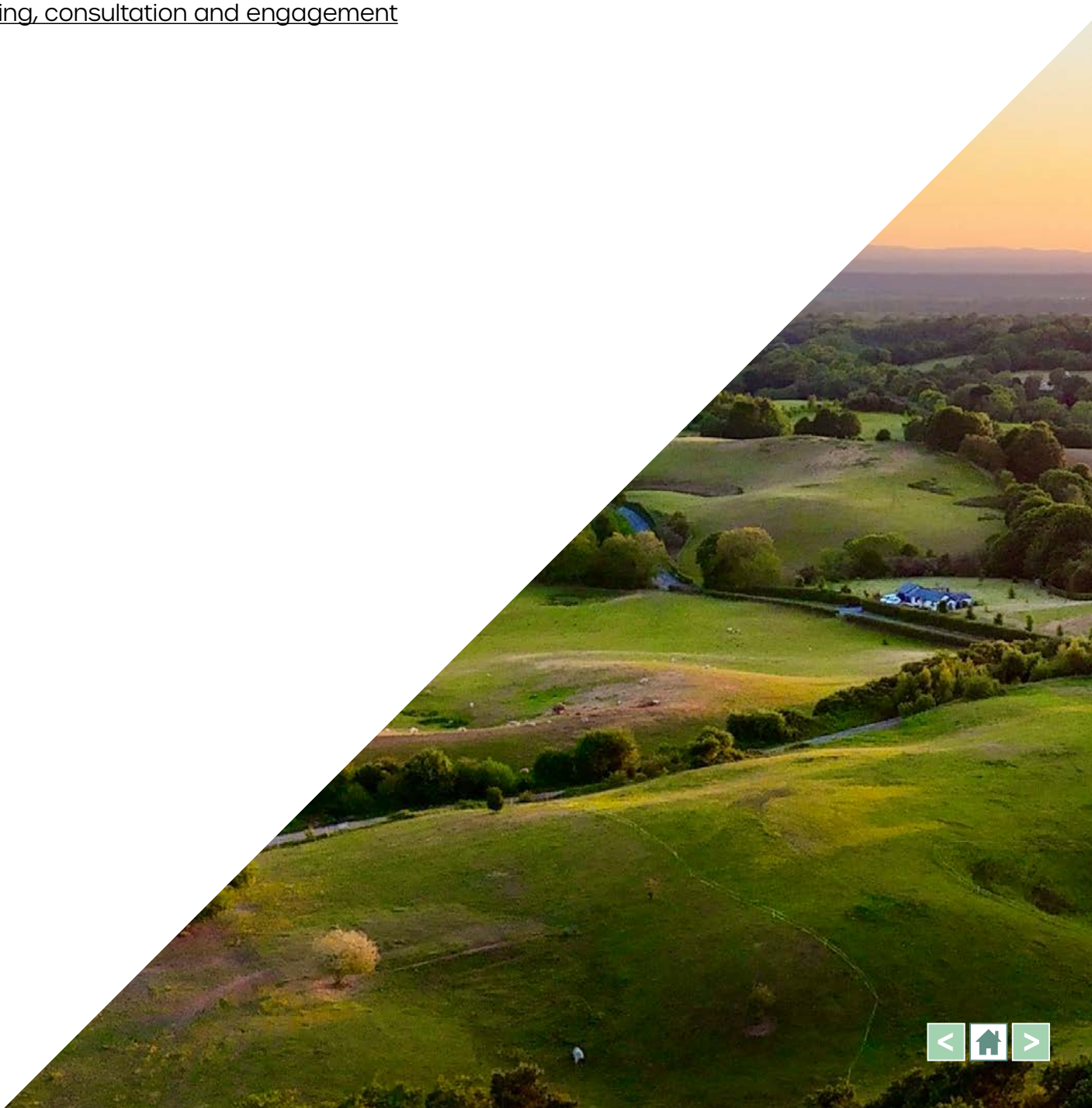
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PEAK CLUSTER

ABOUT PEAK CLUSTER



Four major cement and lime producers have come together to form Peak Cluster, a project aiming to secure a sustainable future for these essential British industries. As a society, we rely on cement and lime for building important infrastructure including homes, transport, schools and hospitals, and in water treatment and agriculture.

However, during the manufacturing process, a large amount of carbon dioxide (CO_2) is produced, with a majority being unavoidably emitted when processing the main raw material – limestone. Peak Cluster would use a process called carbon capture and storage (CCS) to capture the CO_2 generated during the manufacture of cement and lime at plants in Staffordshire and Derbyshire, preventing this climate-changing gas entering the atmosphere. It would be transported through Derbyshire, Staffordshire, Cheshire and the Wirral via a newly built buried pipeline for permanent storage beneath the seabed of the East Irish Sea.

By doing this, Peak Cluster would:

Secure a sustainable supply of British-made cement and lime

Safeguard more than 2,000 jobs

Prevent over 3 million tonnes of CO_2 from entering the atmosphere each year

Establish the UK as a global leader in the production of low-carbon cement and lime

Reduce reliance on imported cement and lime





Peak Cluster: the partners explained

Peak Cluster is being developed through a partnership including four major cement and lime producers who will each install carbon capture technology at their sites.

These partners are supported by investment from Summit Energy Evolution Limited, the UK National Wealth Fund and Progressive Energy Ltd. Together they form a joint venture company, Peak Cluster Limited.

The offshore transport and storage system is being developed separately through Morecambe Net Zero (MNZ), led by Spirit Energy.

Why Peak Cluster matters

Although cement and lime producers have already made significant progress to decarbonise how they manufacture the materials we rely on in our daily lives, the majority of CO_2 released is an unavoidable consequence of the chemical process.

Carbon capture and storage is widely recognised by industry experts as one of the best ways to tackle CO_2 emissions at scale from hard-to-abate industries that cannot decarbonise through methods such as electrification. Peak Cluster would capture and permanently store 3 million tonnes of CO_2 every year – that's around 25% of the total CO_2 emitted in Staffordshire and Derbyshire each year, equivalent to removing all the petrol and diesel cars in Cheshire, the Wirral, Staffordshire and Derbyshire from the road.

How the project is funded

Peak Cluster Limited has currently raised around £60 million in investment from the project shareholders to fund the development of the project. This funding is enabling us to undertake detailed environmental and technical assessments, engineering design on the pipeline and consultation with stakeholders and communities. The individual cement and lime plants are funding this work for their capture facilities independently. This work will inform the detailed plans that we'll submit to government as part of Peak Cluster's Development Consent Order (DCO) planning application.

Should the DCO be granted, we'll need to secure additional funding to build and operate the project. This may include direct investment from the cement and lime producers (and their parent companies), project finance provided by banks and lenders, further equity from existing shareholders and government support.

Why does the project need government's financial support?

Under the UK Emissions Trading Scheme (UK ETS) – set up to drive industrial decarbonisation – cement and lime producers must pay for the CO_2 they emit. This is designed to create an incentive to reduce emissions. The cost of carbon capture is currently far higher than the UK ETS carbon price. This means that the cost of deploying CCS remains too high for most companies without additional support. Without financial support, manufacturers investing in CCS could face significantly higher costs than overseas competitors, risking jobs, investment and domestic production.

Government funding can offer the financial support to help bridge that gap and enable emissions to be reduced while protecting the competitiveness of UK homegrown industry.

Who would own and run the project?

We're designing the pipeline as a long-term infrastructure asset with an initial design life of around 40 years. The capture plants at the cement and lime sites are being designed for decades of operation. With appropriate inspection, maintenance and integrity management programmes, and any necessary approvals at the relevant time, infrastructure can continue operating safely well beyond its original design life.

Peak Cluster Limited is expected to own and operate the onshore pipeline infrastructure. When developing major infrastructure, it is often the case that, prior to construction, some of the current shareholders may transfer ownership to a specialist infrastructure owner/operator with experience in managing regulated pipeline assets. This new owner would assume responsibility for financing, construction, operation, maintenance and long-term obligations associated with the pipeline.

Morecambe Net Zero (MNZ) is currently developing plans for all infrastructure from and including the Coastal AGI, the pipeline from here offshore and the storage system. MNZ would own and operate these aspects of the project.

Could the project accept CO_2 from other industries and countries, or connect to other projects in future?

We're developing Peak Cluster in order to capture and store CO_2 from the four cement and lime plants in Staffordshire and Derbyshire. At current expected emissions rates, we estimate that the MNZ store has capacity to accept CO_2 from the plants for over 300 years.

As there is significant capacity in the MNZ store, there is the potential for other industries to use the Peak Cluster pipeline to transport their CO_2 emissions to storage in the future, however any proposals would need to undergo their own engineering design, environmental assessment and consultation process. This would be evaluated through the planning process and would only go ahead if separate planning and other consents were given.

Early-stage engineering studies conducted by other parties considered whether existing industrial terminals at Stanlow and Tranmere could eventually receive imported liquid CO_2 before transferring it into a pipeline connected to offshore storage. These studies remain at feasibility stage. No shipping import facilities are included as part of the current Peak Cluster project.



How is the project being developed?

The Development Consent Order (DCO) process for Nationally Significant Infrastructure Projects (NSIPs), such as Peak Cluster, is a well-defined, rigorous and structured process that has been used for over 150 projects across England and Wales over the last decade. It is designed to ensure that proposals are thoroughly developed, assessed and scrutinised before a final decision is taken on whether a project should go ahead.

Peak Cluster is taking a phased and iterative approach to project development. This involves identifying an initial pipeline route corridor, infrastructure locations and system design, undertaking technical studies, environmental impact assessment, and consultation and engagement. As new information becomes available through these activities, the project design, route and locations of associated infrastructure are reviewed and refined.

Throughout the project development, we undertake 'design freezes'. These mark key points at which elements of the design are firmed up to enable assessments to be completed and the project to progress, while ensuring decisions are informed by the latest technical evidence and stakeholder feedback.

The DCO process includes extensive consultation and independent public examination. Peak Cluster must demonstrate that potential environmental effects, the consideration of alternatives, engineering requirements, land needs and stakeholder and community feedback have been carefully considered in developing the proposals.

Project timeline



*Please note, this timeline is indicative



PEAK CLUSTER

WHY DO WE NEED CARBON CAPTURE AND STORAGE?



Climate change occurs as a result of greenhouse gases, such as carbon dioxide (CO_2), being emitted through human activity and building up in the atmosphere. This causes the earth to heat up, which has a detrimental effect on the environment, leading to extreme weather, flooding, storms and droughts.

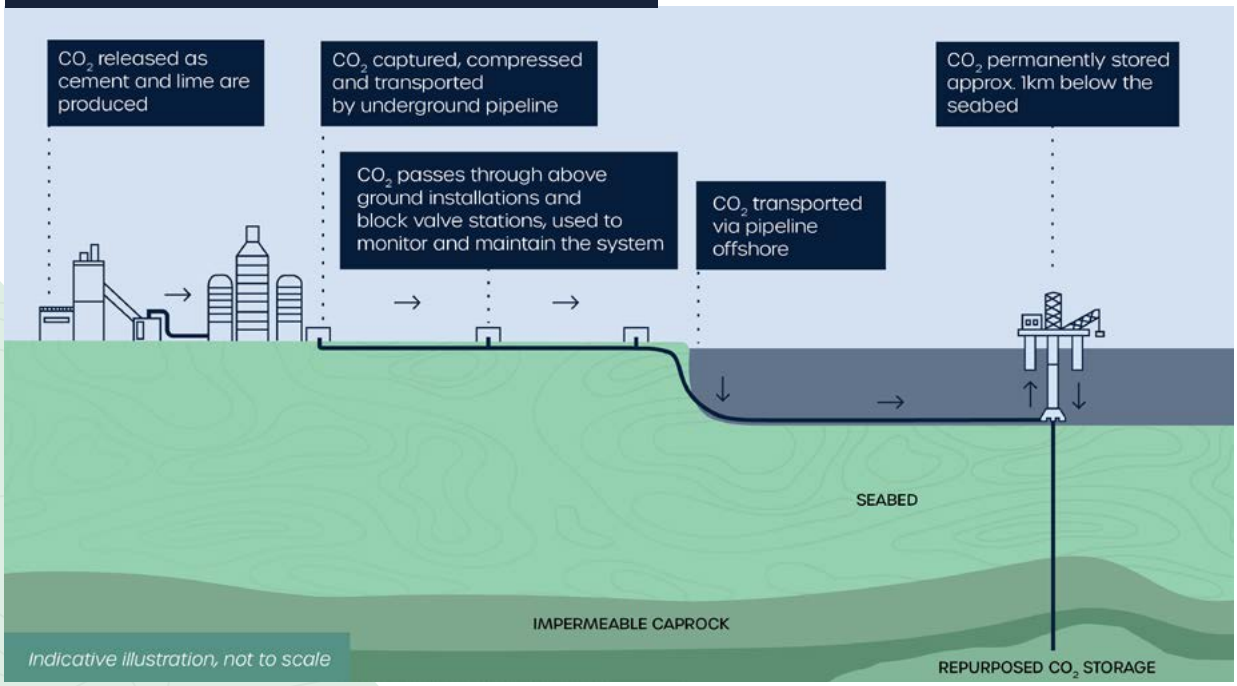
By law, the UK must reach net zero by 2050, cutting greenhouse gas emissions as far as possible and balancing whatever remains with removals from the atmosphere.

Modern society needs cement and lime. However, large amounts of CO_2 are unavoidably released from the raw material – limestone – as a by-product of the manufacturing process. Simply switching to electricity or low-carbon fuels as a way to reduce CO_2 emissions would not allow full decarbonisation of the process.

By using carbon capture and storage (CCS) technology, Peak Cluster would prevent over 3 million tonnes of CO_2 emissions per year produced at the four Peak Cluster cement and lime plants in Staffordshire and Derbyshire from entering the atmosphere. This is almost a quarter of the current total annual emissions from the two counties.

For heavy industry, such as cement and lime, CCS is currently considered by many governments, regulators and climate institutions to be the only credible route to achieving significant emissions reductions at industrial scale, supporting industry's transition to producing carbon-neutral products.

What is carbon capture and storage?



Is carbon capture proven to work?

Carbon capture and storage technology has been used since the early 1970s and there are now more than 8,000km of CO_2 pipelines operating globally. Across the world, there are more than 800 CCS projects either in development or operating. The UK's first two CCS projects, HyNet in Cheshire and North Wales and East Coast Cluster in Teesside, are both under construction.

Capturing and storing CO_2 is a proven, safe process that is already being utilised to decarbonise a range of industries around the world, including the Northern Lights project in Norway which has been operating for over a year, building on a long development history of the Sleipner and Snøhvit projects, which have been capturing a million tonnes of CO_2 each year for 27 years and 15 years respectively.

There are many other projects being developed globally, including in the UK with Heidelberg Materials' Padeswood in Flintshire and Encyclis' Energy-from-Waste plant in Cheshire, both part of the HyNet project.

Is carbon capture regulated?

Carbon capture technology has been used safely in industrial settings for many years and is subject to robust regulation in the UK. For projects such as Peak Cluster, safety is a fundamental consideration throughout the design, construction, operation and maintenance of the infrastructure.

There is a clear regulatory framework within which Peak Cluster would be designed, operated and maintained. The pipeline would be regulated by the Health and Safety Executive (HSE) under Pipeline Safety Regulations (1996), and the storage site would be regulated by the North Sea Transition Authority (NSTA).

The carbon capture plants also require environmental permits, which are regulated by the Environment Agency. These permits set strict requirements for matters such as emissions, monitoring and operational performance.



The carbon capture facilities

Carbon capture facilities would be built at the four cement and lime plants in Derbyshire and Staffordshire. Each plant is exploring the best type of capture technology for its unique circumstances. The appearance and footprint of each capture facility would depend on the technology selected.

The carbon capture facilities would prevent around 90% of the CO_2 produced during cement and lime manufacturing from being emitted into our atmosphere as it is currently.

As the CO_2 is generated, the facilities would:

- capture the CO_2 directly
- clean and purify the CO_2so it meets the required standards
- compress the CO_2 on site so it can be safely transported
- prepare the CO_2 for transfer into the pipeline.

What would the facilities look like?

The capture facilities would be located within the footprint of each existing cement and lime plant ('brownfield land'). They would require both existing plants to be reconfigured and new infrastructure to be built.

They are likely to require a range of features including:

- parking, access and maintenance routes
- new chemical storage areas, vessels and tanks
- compression technology
- new or upgraded utility connections
- an above ground installation (AGI) to transfer CO_2 from the capture facility into the pipeline
- landscaping and drainage areas, including biodiversity enhancements
- lighting for safe access and operations.

The design of the capture facilities will continue to be developed and refined as further engineering and environmental assessment work is undertaken, informed by ongoing community and stakeholder feedback.



Building the capture facilities

The construction programme will vary between the four capture facilities and will be refined as the design and environmental assessment progress; however, it is currently anticipated to take around three to four years. Construction would begin at the capture facilities once all necessary planning consent, and financing is secured.

How long would the capture facilities operate?

The lifespan of the carbon capture facilities would vary depending on the technology chosen by the operators, but each facility is being designed to be operational for at least 25 years. With appropriate maintenance and operation, it is expected that the capture facilities could continue to function well beyond the initial design life. It is normal practice for different aspects of projects to have varying design lives (in this case 25 years for the capture facilities and 40 years for the pipeline). With appropriate maintenance of equipment, it is expected that the capture plants and pipeline can run concurrently for many years.



The carbon cost of building the project

Although we can't know the exact carbon impact of delivering Peak Cluster until a full design has been developed, we've undertaken a preliminary life-cycle carbon assessment to understand the potential carbon impacts associated with the construction, operation and decommissioning of the project.

The assessment:

- considers all the equipment and materials we're likely to need to build the project throughout its lifetime
- identifies the embedded carbon from the entire life cycle of a product (manufacture, transportation and use of those materials and components)
- estimates the operational carbon likely to be emitted from the construction process.

The assessment compares these emissions against the carbon savings the project is expected to deliver by capturing CO_2 emissions from cement and lime production. The results indicate that, although constructing and operating Peak Cluster would generate some CO_2, this would be outweighed by the emissions captured through the project within a relatively short period of operation – estimated to be within a matter of months. Thereafter, Peak Cluster would provide a substantial net reduction in CO_2 emissions over its operational lifetime.

PEAK CLUSTER

ABOUT THE ONSHORE PIPELINE AND HOW WE'D BUILD IT



The pipeline at a glance

The Peak Cluster pipeline will transport captured carbon dioxide (CO_2) from cement and lime plants in Staffordshire and Derbyshire to the Wirral coast, ready to be transferred to the Morecambe Net Zero (MNZ) offshore storage site beneath the seabed of the East Irish Sea.

Feature	Detail
Length	There would be around **200km** of new onshore pipeline. Once our proposed pipeline route design has been finalised, we'll know the exact length.
Diameter	The onshore pipeline would be **up to 91.4cm (36 inches) in diameter**.
Material	The pipeline would be manufactured from **high-grade carbon steel**. The thickness of the pipeline wall will be determined through our detailed design process, and will vary along the route according to engineering requirements. Current studies indicate that the pipeline would typically be **25mm** thick in some sections.
Depth	The pipeline would typically be **buried with at least 1.2m of soil covering the top of the pipe**, which is standard across the UK's extensive network of natural gas pipelines. In locations where ground conditions make this depth difficult to achieve, such as areas of shallow rock, site-specific engineering solutions will be developed. These could include excavating deeper into the rock, making minor adjustments to the pipeline route, using thicker pipe walls, installing additional concrete protection, or applying other appropriate protective measures to ensure the pipeline can be operated safely and reliably. Additional depth of cover will be used where needed to take account of land use, farming activities, crossings of roads, railways or utilities, or where identified through detailed risk assessments.
What it carries	The pipeline is being designed to transport CO_2 in **gas phase**, which means it can operate at **a significantly lower pressure than many existing pipelines**.
Pressure	We intend to operate the pipeline in gas phase at **approximately 40 bar gauge (barg)** – a unit of pressure measured relative to the surrounding atmospheric pressure. The expected operating pressure is around half that of comparable natural gas transmission pipelines. The project will not operate in dense phase onshore at any point in the project lifetime.
Design life	The onshore pipeline design life is specified as **40 years**, but with proper operation and maintenance, its lifespan could be extended, subject to the regulatory requirements applying at that time. Much of the UK's natural gas transmission network was constructed in the 1960s to the 1980s and continues to operate safely and reliably today. There is a legal framework which requires carbon capture and storage (CCS) operators to plan and provide for future decommissioning costs rather than leaving those costs to future generations.

The project boundary

Like all large infrastructure projects, Peak Cluster is being developed through an iterative design process. As engineering, environmental and land information becomes available, and as we receive feedback from communities and stakeholders, we continue to refine our proposals. Following our phase 1 consultation, we've reduced the proposed boundary for the permanent elements of the project from 300m to around 100m in most locations.

The boundary we are now consulting on remains wider than the land expected to be permanently required for the pipeline. This provides flexibility to accommodate further design refinement as the project progresses and more detailed information becomes available.

All construction activity is expected to take place within the current project boundary, which now includes temporary construction compounds and access roads, in most areas.

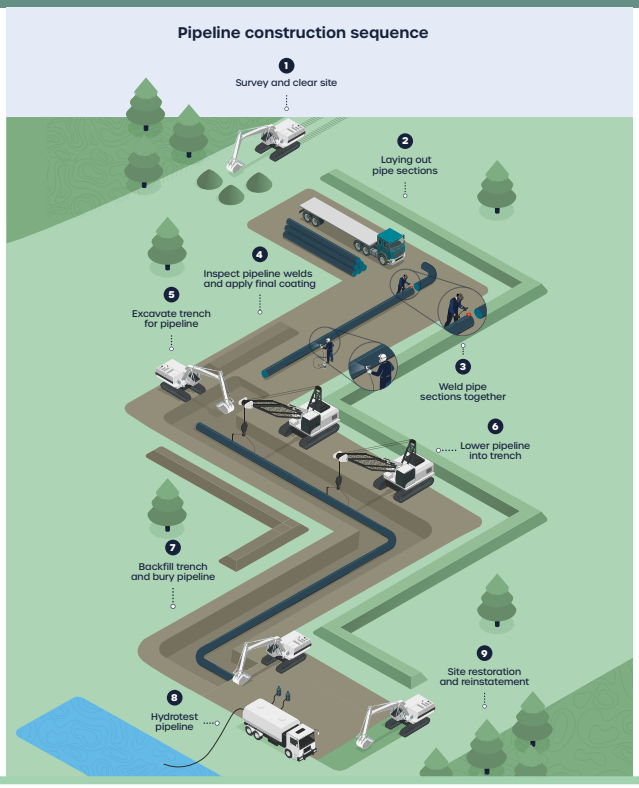
How we'd build the pipeline

Open-trench construction

The majority of the onshore pipeline would be installed using conventional open-trench construction. This is where a trench is excavated, the pipe sections are laid and welded together, inspected and coated, then lowered into the trench and backfilled.

To build the pipeline in this way, we'd establish a temporary construction corridor, known as a 'working width', which would typically be up to 40m wide along most of the route. This provides a safe area for workers undertaking the construction activities and space for construction vehicles, equipment and materials.

In some locations, the working width may need to be widened or narrowed to account for local environmental, engineering, land or access constraints. Where this is proposed, it will be shared within plans at the relevant phase of consultation.

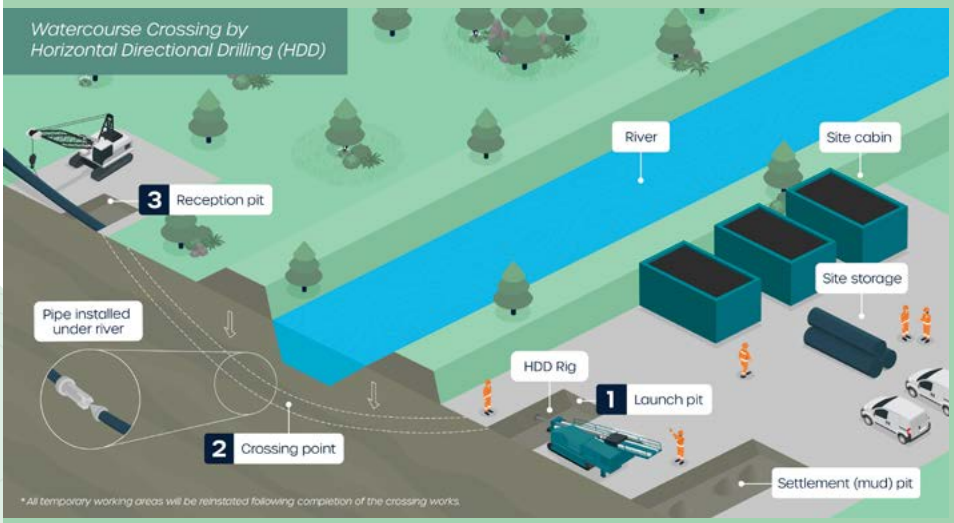


Other construction methods

Most of the pipeline can be installed using conventional open-trench construction as described above. However, some sections of the route cross features such as roads, railways, rivers, canals and environmentally sensitive areas. In these locations, alternative construction techniques, known as trenchless methods, may be used to avoid or reduce disturbance at the surface.

Every crossing along the route is assessed individually. Engineers select the most appropriate construction method by considering a range of factors, including public safety, protection of the environment, engineering feasibility, construction duration, traffic and access, effects on neighbouring communities and overall value for money.

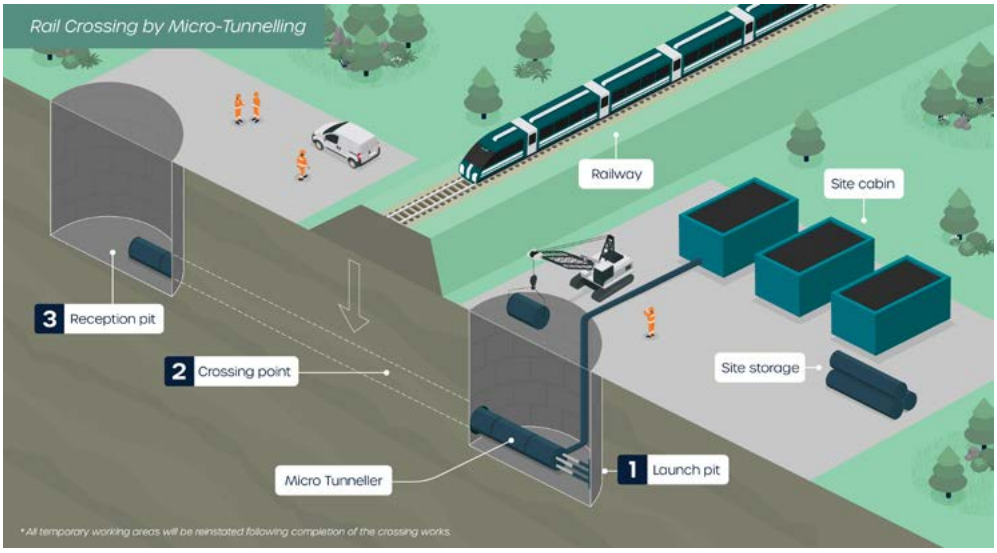
The preferred construction method for each crossing will be identified as the design develops and informed by ongoing environmental, engineering and will be land assessments.



Horizontal directional drilling

Horizontal directional drilling (HDD) is a trenchless construction method that can be used where the pipeline needs to pass beneath features such as rivers, roads or environmentally sensitive areas. By installing the pipeline underground, HDD can reduce disruption at the surface and avoid the need for open-trench construction in these locations.

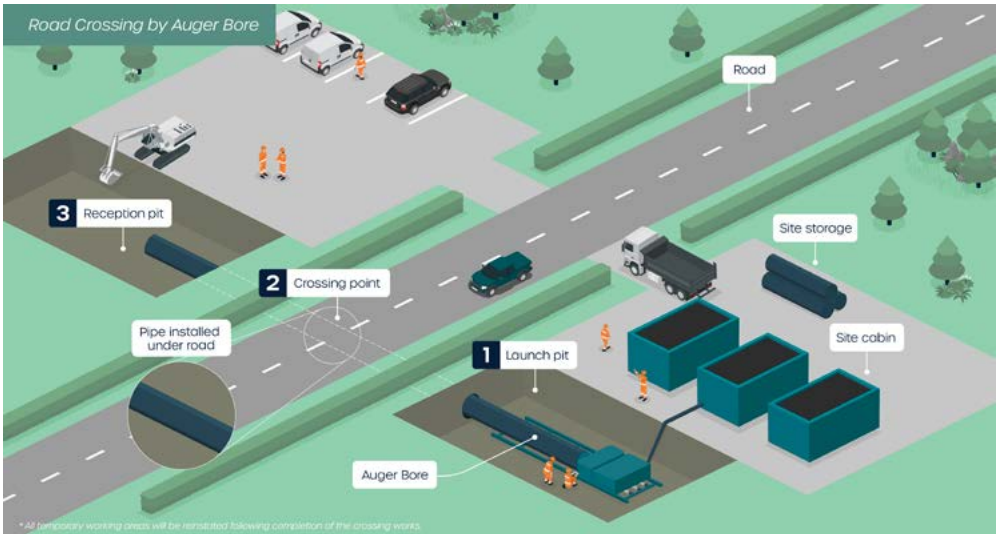
To carry out HDD, temporary drilling compounds are established at each end of the crossing. A controlled underground bore is then drilled beneath the feature being crossed and enlarged to create a pathway through which the pipeline can be pulled.



Micro-tunnelling

Micro-tunnelling is a trenchless construction method typically used where the pipeline crosses major roads, railways or other locations where open-trench construction may not be appropriate.

Temporary shafts are constructed on either side of the crossing, from which a remotely operated boring machine excavates a tunnel beneath the feature being crossed. Depending on the design requirements of the crossing, the pipeline may be installed either directly within the tunnel or within a carrier pipe (or sleeve) installed as part of the tunnel construction. Once installation is complete, the shafts are backfilled and the ground restored.



Auger boring

Auger boring is a trenchless construction method typically used for shorter crossings beneath roads and other infrastructure where open-trench construction may not be appropriate.

Temporary pits are excavated on either side of the crossing. A steel casing is then pushed beneath the feature being crossed, while excavated material is removed mechanically. The pipeline is subsequently installed within the casing before the pits are backfilled and the ground restored.

Construction timescales

The pipeline would be constructed in sections, with the construction programme progressing along the route rather than taking place across the entire pipeline at the same time. Multiple construction teams are expected to work simultaneously in different areas to reduce the overall programme timeline. We would seek to minimise the amount of time that any individual section of trench remains open by excavating, installing and backfilling the pipeline as efficiently as possible.

Typically, many of the pipeline construction activities, including main earthworks and reinstatement programme, take place between April and October, when ground and weather conditions are generally most suitable. Although active construction in any one location would usually be much shorter than this, the temporary working width may remain available for construction traffic and access throughout the construction season to help manage logistics and reduce impacts on the local road network.

Construction activities would continue throughout the year in locations where trenchless construction techniques are required, and at sites where above ground installations, block valve stations and other permanent infrastructure are being constructed.

Temporary construction infrastructure

To construct the pipeline and associated above-ground infrastructure, we would require temporary areas for access and construction. Some of these areas may remain in place for much of the construction programme, whereas others would only be needed for specific phases of work. Temporary infrastructure could be required for up to three years in some locations.

Construction compounds and laydown areas

Construction compounds and laydown areas would provide space for site offices, welfare facilities, parking, construction equipment and materials storage areas, security fencing and lighting, and roadways or tracks.

At locations where trenchless methods are being used to build the pipeline, compounds may also accommodate specialised equipment such as drilling or tunnelling equipment, launch and reception pits, and pipe assembly areas.

The duration each compound would be active would depend on its purpose and location. Some may remain in place for much of the construction programme, while others would be removed once work in a specific area has been completed. All temporary compounds and laydown areas would be removed and the land would be restored as close as reasonably practicable to its previous condition and use following construction.

Access and maintenance roads

Temporary access roads and tracks may be required in some places to enable construction vehicles, equipment and construction workers to safely reach the pipeline route construction areas. These would also connect our construction areas to existing roads. Access tracks would be included within the temporary working width area and would help reduce construction traffic on the surrounding local road network.

Where possible, existing roads and tracks have been identified that are suitable for construction traffic. In some locations, temporary improvements or upgrades may be required to safely accommodate the temporary additional construction traffic associated with the project.

Managing disruption

We recognise that construction would cause temporary disruption for some local communities, landowners and businesses and we are committed to minimising these impacts wherever reasonably practicable.

During construction, contractors would be required to work in accordance with a detailed Construction Environmental Management Plan (CEMP). This document will set out how the impacts of building the pipeline and above ground infrastructure will be managed on a day-to-day basis.

The CEMP will be included as part of our Development Consent Order application, which we'll submit to government and which will cover:

- working hours
- dust suppression
- traffic management
- noise control
- pollution prevention
- ecological protection
- reinstatement of affected land
- waste management.

Protecting and restoring land

Working with landowners during construction

Before work begins, we'd work closely with landowners to understand how their land is used and identify opportunities to minimise disruption. This may include agreeing access arrangements, maintaining livestock movements, planning construction activities around harvesting or other seasonal activities and agreeing appropriate land restoration measures.

We'd continue to engage with affected landowners throughout the construction period to help ensure that potential impacts are identified and managed wherever reasonably practicable.

Looking after soils and agricultural land during construction

Before construction starts, we'd undertake detailed ground investigations to better understand local ground conditions and inform the final design and construction approach.

Depending on the location, this may include installing additional drainage, stabilising softer ground, strengthening the trench or surrounding soils or providing additional protection above the pipeline where required.

Protecting soil quality and supporting the effective restoration of agricultural land would be an important consideration throughout construction. In all cases, topsoil would be removed carefully and stored separately from the underlying soils to maintain soil structure and quality. Following construction, soils would be reinstated in the correct sequence to help restore agricultural productivity and enable land to return to its previous use as far as practicable.





Public rights of way

Ensuring the safety of our workforce, local communities and all those using the surrounding area would be our highest priority throughout construction. While we'd endeavour to maintain existing uses of the land and public access wherever reasonably practicable, temporary restrictions may be required in some locations to allow works to be carried out safely.

This may include the temporary closure or diversion of public rights of way, local roads or access routes. Where restrictions are necessary, we'd provide advance notice and clear signage and seek to minimise the duration of any disruption wherever possible.

Restoring the land

Once the pipeline has been installed and tested, trenches would be backfilled, topsoil replaced and temporary fencing removed. Construction compounds would be dismantled and temporary access roads would be removed unless their retention has been otherwise agreed with the landowner, and relevant planning consent is in place if required.

Following construction, most agricultural land could return to its previous use. Farming activities can continue largely as before, and hedgerows and other field boundaries can usually be reinstated following construction.

To protect the pipeline and allow future access for inspection, maintenance and emergency response, some restrictions would apply within the pipeline easement. For example, new buildings could not be constructed directly above the pipeline and the planting of deep-rooted trees or shrubs may be restricted. However, agricultural activities would typically be able to continue and features such as fencing, gates, tracks and certain types of planting may be permitted.

Once construction is complete, there would generally be little visible evidence of the buried pipeline. The principal permanent surface features would be occasional marker posts.

Land agreements and compensation

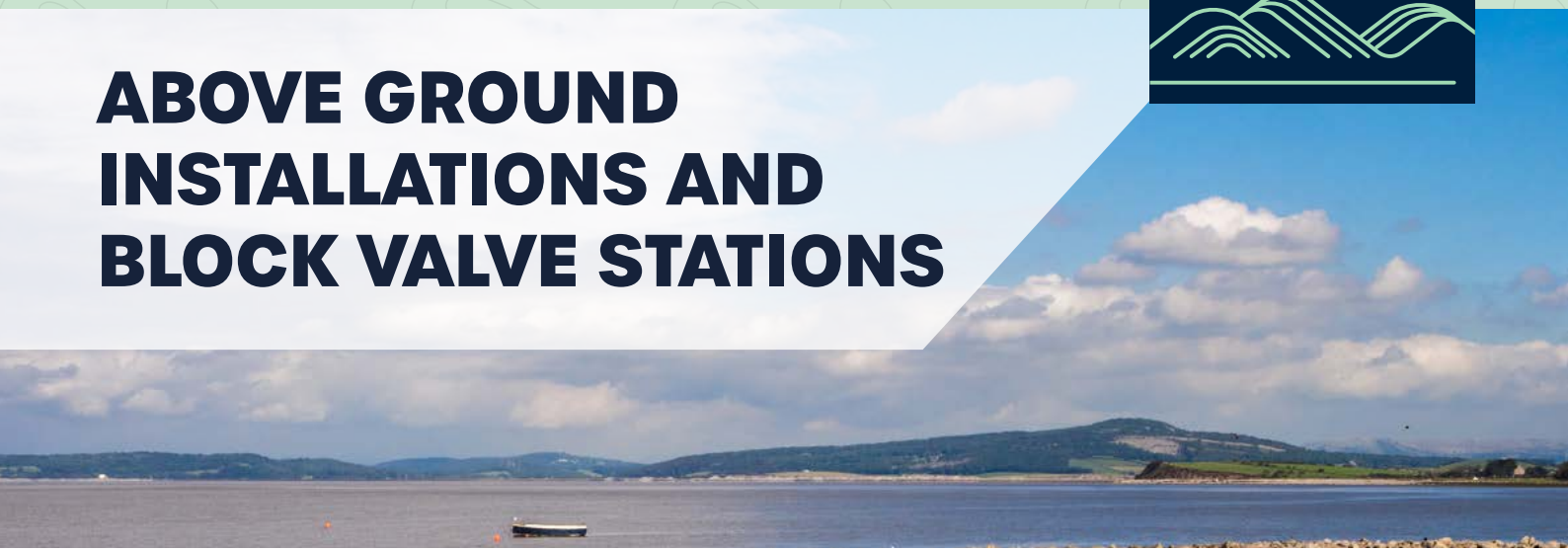
Once the preferred pipeline route has been identified, and subject to the necessary consents being granted, we would need to secure the appropriate land rights required to construct, operate and maintain the pipeline. Our preference is to reach voluntary agreements with landowners wherever possible.

For most of the route, we do not anticipate needing to acquire ownership of the land. Instead, we'd seek to secure long-term rights over a defined strip of land, known as an 'easement'. The precise width and terms of the rights will depend on the final design and we'll work with individual landowners to develop appropriate legal arrangements. Landowners would receive compensation where appropriate, for land access and temporary disruption during construction.



PEAK CLUSTER

ABOVE GROUND INSTALLATIONS AND BLOCK VALVE STATIONS



Although almost all of the proposed Peak Cluster pipeline would be buried underground, the project would also require a number of above ground installations (AGIs) along the pipeline route. AGIs are used to connect sections of pipelines and support the safe, efficient operation of the system by providing access for maintenance, monitoring and routine inspections.

Block valve stations (BVSs) would also be located along the pipeline between AGIs. They would be used to isolate sections when required for maintenance and safety purposes.



Typical above ground installation

Indicative visualisation to provide a general sense of scale. Final designs may differ.

Above ground installations

AGIs contain the equipment required to connect, isolate, monitor and safely operate different parts of the pipeline system. Depending on their location and function, they may include:

- above-ground pipework and valves
- metering and control equipment
- electrical and instrumentation kiosks
- access and parking.

The footprint of a typical AGI is around 80m x 80m, however the final layout and dimensions will be confirmed through detailed design.

Block valve stations (BVSs)

BVSs are smaller AGIs, placed at intervals along the pipeline route, which enable us to isolate specific pipeline sections to ensure safety when carrying out planned maintenance or in response to an abnormal operating condition. Depending on their location and function, they may include:

- low-level pipework
- valves
- a small single-storey control kiosk.

The footprint of a typical BVS is likely to be around 25m x 25m.



Indicative visualisation to provide a general sense of scale. Final designs may differ.

Typical block valve station

Updates to the infrastructure required in the Wirral

We carefully reviewed comments received during the phase 1 consultation alongside the findings of technical studies and environmental surveys to identify an alternative technical solution for transporting carbon dioxide (CO_2) through the network. This means we have now removed the need for compression infrastructure on the Wirral, originally proposed as part of the Coastal AGI.

We now propose to build a smaller AGI which will cover an area around 80m x 80m. Together with a block valve station proposed in this area (which will be around 25m x 25m) this is an 85% reduction in land required from previous proposals. The proposed vent stack has also been reduced to a maximum height of 10m, from the originally proposed 50m. Final height will be determined through further engineering studies. This change also means that only one smaller 36-inch pipeline from this AGI offshore will be required, where previously two pipelines of up to 42-inch diameter were proposed. We have reduced flow rates through the pipeline and have introduced compression offshore at the MNZ store.

Operating AGIs and BVSs

Both AGIs and BVSs would be remotely operated and would not be permanently manned, although routine inspections and maintenance visits would take place throughout the year.

Each AGI and BVS site would require permanent access from a road to allow for maintenance vehicles to attend as required. As a result, operational traffic associated with these sites would be limited and regular site lighting would not normally be required.

They will not be permanently lit and will only require lighting during periodic maintenance.

As the AGIs and BVSs will only contain pipework and minor electrical equipment, they will generate very minimal noise – likely to be no louder than that created by a small air conditioning unit. The level of noise generated would be assessed as part of the Environmental Impact Assessment.

All sites will include drainage infrastructure and secure fencing. Landscape and visual mitigation will be developed where appropriate, informed by the environmental assessment and site-specific context.



Building AGIs and BVSs

The construction of an AGI or BVS would be similar to many other small-scale civil engineering projects. Work begins with preparing and levelling the site, followed by the installation of drainage, foundations, access roads and underground services. Security fencing and other associated infrastructure would then be constructed. All construction activities would take place within the proposed project boundary.

Depending on the size and complexity of the installation, construction is expected to take around 12 to 24 months.

Potential effects during construction, such as those from traffic, noise, dust and visual disturbance, will be assessed as part of the Environmental Impact Assessment. Measures to avoid, reduce or mitigate potential effects on local communities, businesses, landowners and the environment will be developed through the assessment and incorporated into the project design and construction arrangements, where appropriate. Contractors will work in accordance with a Construction Environmental Management Plan (CEMP), which will set out the measures and controls to be implemented during construction.

Once construction is complete, temporary working areas would be reinstated where no longer required, and any landscaping associated with the site would be established in accordance with the approved design.

How close to residential areas would AGIs and BVSs be built?

We're designing Peak Cluster in accordance with the Pipelines Safety Regulations 1996, which require operators to design and operate projects in a way that is as safe as is reasonably practicable.

In the UK, there is no prescribed minimum distance that pipelines or AGIs must be located from homes, businesses or other community facilities. Instead, pipeline operators must demonstrate that the pipeline has been designed, constructed, operated and maintained safely, in accordance with regulatory requirements and to the satisfaction of the Health and Safety Executive (HSE).

We're embedding safety considerations throughout the design process. As the project develops, detailed assessments, which will inform the siting of AGIs and BVSs, are being undertaken to understand and manage potential risks. These will include technical risk assessments, environmental assessment and engineering studies, alongside consideration of factors such as access requirements, topography, environmental constraints and planning considerations. AGI and BVS siting will continue to be refined through engineering, safety assessment, Environmental Impact Assessment (EIA) and consultation.

In addition, the HSE will be consulted as part of the Development Consent Order (DCO) process during which they will review relevant aspects of the project's design and safety approach.

The DCO application will also contain information relating to safety, Environmental Impact Assessment and Environmental Statement and the design of the project. This will enable communities, landowners and other stakeholders to understand how safety has informed the project's design and development.

Who would operate AGIs and BVSs?

Peak Cluster Limited is expected to own and operate the onshore pipeline infrastructure up to the Coastal AGI. However, it is anticipated that some of the current shareholders may transfer ownership to a specialist infrastructure owner or operator with experience managing regulated pipeline assets prior to the project being built.

This new owner would assume responsibility for financing, construction, operation and long-term obligations associated with the pipeline and above ground infrastructure.

PEAK CLUSTER

MEAN LOW WATER SPRINGS (MLWS) TO MORECAMBE NET ZERO (MNZ) STORES



THE REGULATORY REGIME

Spirit Energy – a Peak Cluster partner – is leading the development of all works proposed beyond Mean Low Water Springs, including the construction and operation of the offshore pipeline and the Morecambe Net Zero (MNZ) stores – depleted gas fields off the coast of Barrow-in-Furness which will provide permanent, safe and secure carbon storage.

Mean Low Water Springs (MLWS) is a low tidal measure, which marks where the regulations governing onshore planning (and therefore the aspects of the project covered by Peak Cluster's Development Consent Order) will end.

To develop, build and operate the project, Spirit Energy will seek the necessary permissions from:

- the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) under the Offshore Environmental Impact Assessment (EIA) Regulations 2020
- the Marine Management Organisation (MMO) under the Marine and Coastal Access Act 2009 (MCAA)
- the North Sea Transition Authority (NSTA) under the Energy Act 2008 and the Carbon Dioxide (Licensing etc.) Regulations 2010.

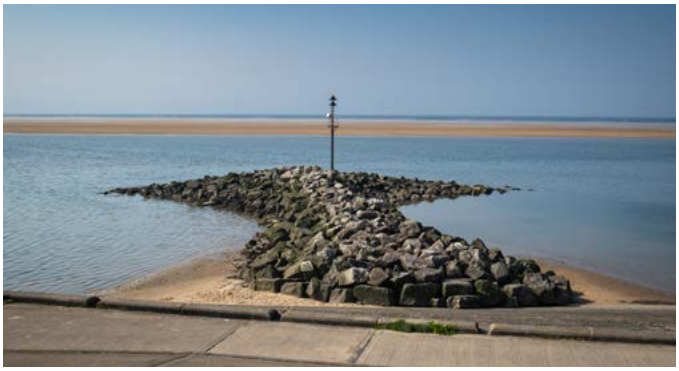
The offshore pipeline

The distance from landfall to the MNZ Store is approximately 70km. The pipeline in shallow water would be trenched and backfilled after it's been pulled through the landfall from offshore. In locations where trenching is not possible, such as under seawalls as the pipeline goes offshore, trenchless installation techniques may be used. Following construction, the pipeline in shallow water would be fully buried.

Beyond MLWS, the offshore pipeline will be trenched and buried. Where the pipeline is required to cross existing infrastructure (e.g. other pipelines), specific crossings will be designed to protect that infrastructure. This is a standard installation method for pipelines that has been used in the North Sea for over 50 years.

The offshore pipeline from MLWS to the MNZ stores will be regulated by the NSTA.





The Morecambe Net Zero stores

Spirit Energy was granted a carbon storage licence by the NSTA in 2023, to develop the depleted Morecambe natural gas fields under the East Irish Seabed (EIS) as carbon dioxide (CO_2) stores. The MNZ Stores form two adjacent and separate carbon storage sites, Morecambe South and North. Combined, the stores have a maximum storage capacity of approximately up to 1 billion tonnes of CO_2.

Geology

The reservoirs for the natural gas fields were deposited in the Triassic Period around 240 million years ago, when sandstones from dunes and rivers settled in an ancient desert. Over the millennia, further sediments covered the sandstone creating enough heat and pressure to convert deeper coal layers into natural gas (methane), which migrated into the reservoirs. The sediments provided strong, porous and permeable rocks for the natural gas to accumulate in. The sandstones are sealed by 600m of strong Triassic caprocks, composed of alternating layers of salts and mudstones; this trapped the natural gas over millions of years. The caprock that sealed the natural gas in for all this time will safely store the Peak Cluster CO_2 in the same way.

Safety

MNZ is a safe and proven gas store. However, it must still be demonstrated that it can safely store Peak Cluster CO_2. MNZ must conduct several assessments and activities to confirm that the stores are safe and suitable for long-term storage. These include:

- **Assessing naturally occurring seismic activity**: In 2024 Spirit Energy carried out a detailed seismic imaging survey of the rock layers below the seabed, across an area of around 500 square kilometres.
- **Undertaking high resolution surveys to map the stores**: As part of the seismic studies, Spirit Energy created a 3D image of the stores and caprocks which geoscientists and engineers use to confirm how the injected CO_2 will behave and remain safely stored.
- **Gas well decommissioning**: Wells that have been drilled for the natural gas production phase will be fully decommissioned to industry standards for CO_2 storage. Any wells already decommissioned will be assessed to confirm their suitability for CO_2 storage and any remediation required will be completed prior to injection of CO_2. All CO_2 injection wells will be new ones, specifically designed for CO_2 operations.
- **Ongoing monitoring**: It is a regulatory requirement for the lifetime of MNZ to confirm safe storage of the CO_2. This includes installing monitoring systems in the injection wells and on the seabed to map the CO_2 deep underground and confirm that it remains safely stored.
- **Developing robust response plans**: These will address any differences between the model forecasts and observations from the monitoring survey data, and will include clear procedures in place to respond quickly and effectively, ensuring the storage sites are managed safely.



The marine ecosystem

The seabed around the MNZ stores provides a mixture of habitats which support marine life, including fish, shellfish, seabirds and marine mammals that use the wider area. Ensuring that this marine environment is protected is important. Spirit Energy will carry out detailed surveys along the proposed offshore pipeline route. These surveys, along with the 45 years of environment monitoring at the existing platforms, will help Spirit Energy understand the seabed, wildlife, fishing activity, shipping routes and other uses of the sea.

The information gathered will help to identify and assess any potential effects of the project and, where needed, develop measures to avoid, reduce or manage them.

During construction, the project will be subject to further regulatory approvals, as well as monitoring programmes and environmental management plans to ensure potential impacts are carefully managed. Following installation of the pipeline, monitoring will continue.

PROJECT AND PIPELINE SAFETY



Pipelines are one of the safest, most reliable and most efficient ways of transporting large volumes of material, gases, oil, chemicals and other industrial products over long distances.

There are over 20,000km of high-pressure, steel pipeline operating across the UK today, as Major Accident Hazard Pipelines (MAHP) under the Health and Safety Executive's Pipeline Safety Regulations (1996). The country has decades of experience designing, constructing and operating pipelines and has an excellent overall safety record.

Safety is being considered at every stage of the project, from design and construction through to operation and maintenance. The pipeline is being designed in accordance with recognised UK standards and industry best practice, including the same design standards used for high-pressure natural gas pipelines (including BS PD8010 and other applicable standards) and would only be allowed to operate in accordance with strict regulatory requirements. In addition, the pipeline will be subject to ongoing inspection, monitoring and maintenance throughout its operational life.

How the pipeline would be regulated

In March 2026, the Health and Safety Executive (HSE) – the UK's independent regulator responsible for overseeing pipeline safety – confirmed that CO_2 will be defined as a 'dangerous fluid' for the purposes of pipeline design and operation.

Peak Cluster supported this decision, having recommended this approach in the HSE's consultation in 2025. Under this classification, CO_2 pipelines will be regulated as a Major Accident Hazard Pipeline (MAHP). An MAHP is a pipeline that transports specified hazardous substances, placing them under the strictest enhanced regulatory oversight by the HSE. These pipelines are subject to the most rigorous design requirements and constructed, operated and maintained to some of the highest-level of pipeline safety requirements and standards in the UK.

This is the same regulatory framework that applies to the UK's high-pressure natural gas transmission network.

The HSE's regulatory regime requires us to:

- design the pipeline to recognised engineering standards, considering corrosion, damage, proximity to communities, flooding and ground movement, to demonstrate compliance with 'As Low as Reasonably Practicable' (ALARP) principles:
- operate and maintain the pipeline safely
- monitor the condition of the pipeline
- maintain emergency procedures
- cooperate with emergency services and local authorities
- submit to inspection and audit.

If a pipeline operator doesn't comply with these principles, the regulator can take enforcement action. If Peak Cluster can't demonstrate compliance, we won't build and operate the pipeline.

Measures we've taken to ensure pipeline safety:

Pipeline safety does not rely on a single protective measure. It relies on multiple independent layers of protection designed to prevent failures from occurring.

Gas-phase operation	Peak Cluster would transport CO_2 in gas phase at an operating pressure of approximately 40 barg. Operating below dense-phase pressure changes the inventory and release behaviour and is one factor considered in the project's safety assessment. Detailed hydraulic, materials, consequence and risk studies will confirm the operating envelope and the measures needed to reduce risk as low as reasonably practicable.
Pipeline materials	The pipeline would be constructed from high-strength steel designed specifically for high-pressure operation. The pipe wall would typically be 25mm thick, although the exact thickness would vary depending on local conditions, such as the surrounding environment, ground conditions and the proximity of roads, railways or other infrastructure. The pipeline would be designed in accordance with recognised engineering standards, with the wall thickness and other design features selected to ensure the pipeline can be operated safely throughout its lifetime.
Pipeline testing	Before the pipeline is brought into operation, it would undergo hydrostatic pressure testing. This involves filling the pipeline with water and pressurising it to approximately 1.5 times its maximum operating pressure. This testing would demonstrate the integrity of the pipeline and that it can safely withstand pressures significantly higher than those expected during normal operation.
Corrosion protection	Steel pipelines can corrode if exposed in certain environmental conditions over long periods of time. To protect against this, the pipeline would be coated with specialist protective coatings and fitted with a cathodic protection system which helps prevent corrosion from occurring. The condition of the pipeline would be monitored throughout its operational life. This would include routine corrosion monitoring and periodic in-line inspections using specialist inspection tools that travel through the pipeline to assess its condition and identify any issues at an early stage. These inspection and monitoring programmes help ensure the pipeline continues to operate safely and reliably throughout its lifetime.
CO_2 monitoring and control	The composition of the CO_2 entering the pipeline would be tightly controlled. The gas would need to meet strict limits for water content, oxygen and impurities. Its composition would be continuously monitored and, if it fell outside these required specifications, automatic safety systems would prevent it from entering the pipeline.
Damage prevention	Damage to pipelines can be caused by external activities such as construction, excavation or agricultural activities. To help prevent this, the pipeline route would be clearly marked with posts at locations such as road crossings, field boundaries and access points. These markers would provide emergency contact details and the pipeline would be recorded in national utility databases for contractors to consult. This is in line with established best practice across all UK MAHP pipelines. Additional damage prevention measures include burying the pipeline below normal agricultural depths – typically 1.2m of soil cover to the top of the pipe. The pipeline itself would be constructed from high-strength, thick-walled steel. Regular inspections of the pipeline route would be undertaken to identify any activities taking place close to the pipeline and to help prevent accidental damage before it occurs. In addition, the pipeline would be subject to ongoing integrity monitoring. Specialist inspection tools, known as pipeline inspection gauges or 'smart pigs', would periodically travel through the pipeline to assess its condition. These tools can detect changes in wall thickness, dents or other deformation that may indicate damage, allowing any issues to be identified and addressed. In the unlikely event that the pipeline is damaged, established reporting and response procedures would be followed to ensure the issue is managed safely and promptly.
Monitoring and leak detection	Rapid leak detection and isolation are important components of pipeline safety. The pipeline and associated infrastructure would be assessed using a combination of leak-detection methods. These could include pressure and flow monitoring, computational pipeline monitoring and fibre-optic sensing. Each method has different detection capabilities and will therefore be combined with isolation systems, surveillance and emergency response. The pipeline would incorporate leak detection technology using a specialised Distributed Fibre Optic Sensing (DFOS) system installed alongside the pipeline. These systems can detect leaks or abnormal operating conditions by continuously monitoring changes in pressure, temperature, sound and ground movement along the pipeline route. If an issue is detected, the system can rapidly identify its location, enabling operators to quickly shut down and isolate the affected section of the pipeline.

Assessing the risks

As part of the development process, we'll undertake:

Quantitative Risk Assessment (QRA): a formal engineering process used to identify hazards, assess failure scenarios and quantify risk, which will consider:

- all credible failure mechanisms
- the likelihood of each type of failure
- the potential consequences of each scenario
- population exposure
- terrain and weather conditions
- emergency response arrangements.

Structured hazard studies (including hazard and operability study (HAZOP) – a systematic engineering review used to identify potential hazards and abnormal operating conditions – and Layer of Protection Analysis (LOPA), which evaluates the independent safety systems that prevent incidents or reduce their consequences.

As Low as Reasonably Practicable (ALARP) assessment: An HSE principle to guide safety level tolerance.

How likely is a leak?

Although comparing historical UK pipeline performance provides useful evidence, the risk assessments being carried out for Peak Cluster use failure data and consequence modelling which is appropriate to the diameter, pressure, materials, route and CO_2 service of the specific pipeline it would install.

Data published by the United Kingdom Onshore Pipeline Operators' Association (UKOPA) show that leaks on the UK's network of pipelines (of which there are over 20,000km) are rare and are typically small in size. In addition, there has not been a full-bore rupture, where a pipeline breaks completely across its diameter, on a UK onshore Major Accident Hazard Pipeline (MAHP) in the last twenty years (please see the 'How the pipeline would be regulated' section for more detail on MAHP).

Is there a risk to people?

Carbon dioxide is naturally present in the atmosphere and is already emitted directly into the air from industrial processes. It is not flammable, unlike natural gas.

However, in the very unlikely event of a leak, elevated concentrations of CO_2 can present a risk to human health because it can displace oxygen in the surrounding air. This is one of the reasons why CO_2 pipelines are subject to detailed engineering design, comprehensive risk assessment and strict regulatory oversight.

The pipeline would incorporate multiple layers of protection, including rigorous design standards, corrosion protection, continuous monitoring, leak detection systems, routine inspections and emergency shutdown systems.

While no industrial system can ever be entirely risk-free, the risk of a major pipeline incident is considered to be extremely low when pipelines are designed, constructed, operated and maintained in accordance with UK regulatory requirements.



Emergency planning

Emergency response preparedness is an important part of pipeline safety management.

Under the Pipelines Safety Regulations, the pipeline operator is required to develop and maintain emergency procedures to ensure that appropriate actions can be taken quickly and effectively to secure the pipeline in the unlikely event of an incident.

These procedures would cover matters such as incident response, communication, isolation of the affected pipeline section and coordination with emergency services.

The regulations also require the relevant authorities to prepare and maintain emergency plans which describe how a major pipeline incident would be managed and how local communities would be protected.

Emergency planning would be undertaken in collaboration with:

- local authorities
- local resilience forums
- emergency services
- first responders
- relevant regulatory bodies.



PEAK CLUSTER

ENVIRONMENTAL SURVEYS, ASSESSMENT AND MITIGATION



As Peak Cluster develops plans for our proposed pipeline and associated infrastructure, we need to understand the existing environment in and around the areas where the project may be built. Surveys help us establish existing environmental conditions, inform the development of the project design and identify potential environmental effects and opportunities to avoid, reduce or mitigate them.

The information we collect during surveys helps us:

- better understand local wildlife, habitats and environmental features
- design the pipeline route and associated infrastructure sensitively
- minimise disruption to landowners, farming operations, businesses, communities and the environment
- develop appropriate mitigation measures where effects cannot be avoided
- meet legal and planning requirements for major infrastructure projects.

What surveys are we undertaking?

The surveys required vary depending on local conditions, the developing project design and the information needed to support the environmental assessment. The following surveys are expected to be required during the project:

Survey	What it looks for
Agricultural land and soil surveys	Soil conditions, agricultural land and land drainage
Arboricultural surveys	Trees and woodland that may be affected by the project
Archaeological surveys	Archaeological remains and evidence of past environments above and below ground
Engineering, utility and topographical surveys	Ground levels, existing structures, utilities and other physical features
Ground investigations	Soil, rock, groundwater and potential ground contamination
Intertidal and marine surveys	Habitats, species and environmental conditions around the coast and intertidal area
Landscape and visual surveys	Existing landscapes, views and features that contribute to local character
Noise surveys	Existing noise conditions
Terrestrial ecology surveys	Habitats, plants and wildlife, including protected and notable species
Traffic surveys	Existing traffic levels and how local roads are currently used
Water environment surveys	Watercourses, drainage, and existing water conditions

Not every survey will be required in every area. We are working closely with landowners to establish which surveys are needed depending on local conditions and the information required to inform the developing project design and assessment.

When will surveys take place?

Most survey visits are relatively short, lasting from a few hours to a day, depending on the survey type and the size of the area being assessed. Some surveys may require repeat visits at specific times of year to ensure accurate results.

Standard survey working hours are typically between 7am and 8pm. However, certain specialist ecological surveys may take place at particular times to coincide with wildlife activity. For example, some bat, bird, great crested newt and invertebrate surveys may need to be undertaken early in the morning, during the evening or overnight in line with recognised best-practice guidance.

What happens during a survey?

Most surveys involve trained specialists visiting a site on foot to record what they see and collect information.

Depending on the type of survey, our specialist teams may:

- walk across fields and existing access routes
- observe and record habitats, vegetation, wildlife activity, watercourses, hedgerows, trees or landscape features
- take small samples, photographs and GPS records
- use specialist equipment such as bat detectors or survey cameras
- make notes about existing environmental conditions.

Survey teams will seek to minimise disturbance, follow relevant guidance and leave the land in the same condition as they found it.

We work with landowners to arrange the dates within which we may survey land; however, we're not always able to provide specific dates times. This is to give us the flexibility required to adapt to weather conditions and other factors which could impact when we need to carry out the surveys. Our teams will, where possible, make themselves known to the landowner and will always carry ID.

What about surveys below ground?

Until now, Peak Cluster has only carried out 'non-intrusive' surveys. As the project develops, intrusive ground investigations may be required to provide more detailed information about conditions beneath the surface. Small drilling machines or other specialist equipment may be used to obtain information about soil, rock and groundwater conditions. The type and extent of investigation required will depend on the developing design of the pipeline, above ground installations, block valve stations and crossings.

How we use survey information

Environmental surveys form a key part of the Environmental Impact Assessment (EIA) process that will support our application for a Development Consent Order (DCO).

The EIA is an iterative process that considers the existing environmental conditions, identifies and assesses the likely significant environmental effects of the project, and helps inform the development of the project design and appropriate mitigation. The assessment also takes account of matters including relevant alternatives, engineering design and feedback received through consultation.

The findings of the EIA will be reported in an Environmental Statement (ES), which will be submitted as part of the DCO application. Environmental assessment is already underway and will continue as surveys are completed and the project design develops.

We are engaging with the relevant organisations, including stakeholders such as Historic England, the Environment Agency, Natural England and wildlife trusts, to gather their input throughout this process.



What the Environmental Statement will cover

The Environmental Statement will cover:

- air quality
- biodiversity
- noise and vibration
- terrestrial and marine biodiversity
- historic and cultural heritage
- landscape and visual amenity
- water environment and flood risk
- geology and ground conditions
- greenhouse gases and climate change
- socioeconomics and health
- traffic and movement
- waste and materials
- major accidents and disasters.

The assessments will consider the relevant stages of the project, including construction and operation and, where appropriate, decommissioning.

During our phase 2 consultation in summer 2027, we'll provide information on the environmental assessment work undertaken at that stage, and seek feedback to help inform the ongoing development and assessment of the project.

The completed Environmental Statement will subsequently be submitted as part of the DCO application. During the DCO examination, interested parties will have opportunities to make representations on the application and the environmental information supporting it.



Potential mitigation

The findings of environmental surveys and assessments are helping us identify measures to avoid and reduce potential environmental effects wherever practicable. Survey information, digital mapping and other environmental data are being used to help refine the pipeline route and associated infrastructure and, where possible, avoid environmentally sensitive areas and features.

Where effects cannot be avoided, measures to reduce or mitigate them will be developed through the ongoing design and environmental assessment process.

This may include making local changes to the project boundary to avoid or reduce effects on individual trees, woodland, other environmental features or land uses. We'll work closely with landowners where these changes affect their land.

In some locations, trenchless construction techniques, such as tunnelling or drilling beneath particular features, may be considered where appropriate to avoid or reduce potential effects. The suitability of these techniques will be informed by engineering design and environmental assessment.

Where hedgerows require temporary removal, this will be kept to the minimum practicable and appropriate measures will be developed to minimise ecological effects, including consideration of seasonal constraints where relevant. Hedgerows will be reinstated following construction wherever practicable.



Biodiversity net gain

Biodiversity net gain (BNG) is an approach to development that aims to leave biodiversity in a measurably better state than before development.

BNG is a legal requirement for Nationally Significant Infrastructure Projects (NSIPs), such as Peak Cluster, from November 2026. We're therefore required to deliver at least a 10% increase in biodiversity value against the pre-development baseline.

Our approach will focus first on avoiding and reducing impacts on biodiversity through the development of the project design. Where impacts cannot be avoided, appropriate measures will be developed to mitigate those effects and deliver the biodiversity gains required. These may include creating new habitats or enhancing existing habitats, either within or outside the project area.

Habitat created or enhanced to meet the biodiversity net gain requirement would be secured, managed and maintained in accordance with the applicable legal requirements.

The biodiversity net gain assessment will continue to be developed as environmental surveys are completed and the project design and environmental assessment progress. Our DCO application will set out how the required biodiversity net gain will be achieved, secured, managed and monitored.

Restoring the land

Once the pipeline has been installed and tested, trenches would be backfilled, topsoil replaced and temporary fencing removed. Compounds would be dismantled and temporary access roads would be removed unless otherwise agreed with the landowner.

Most agricultural land can then return to its previous use. Farming can continue largely as before, and hedgerows and field boundaries will usually be reinstated. Where specific environmental mitigation, habitat creation or biodiversity enhancement is required, the approach to reinstatement will reflect those requirements.

Working with landowners

Peak Cluster is committed to working constructively and respectfully with landowners and tenants throughout the development of the project. They know their land best and their knowledge will help us refine the route, plan surveys and minimise disruption.

Because we may need to undertake a survey on a piece of land, this does not mean that the pipeline will necessarily be built there. We may need to survey land outside the eventual pipeline route to cover wider areas or particular features, such as watercourses.





PEAK CLUSTER

ROUTE CHOICE AND ALTERNATIVES TO CCS



HOW WE CHOSE THE PROJECT ROUTE

To identify a suitable route for the proposed pipeline between the cement and lime plants where carbon dioxide (CO_2) will be captured and permanent offshore storage, we began by assessing potential connection points for the onshore pipeline and offshore infrastructure. We identified possible locations along the coastline from North Wales to Cumbria. We then considered how the pipeline could connect the plants to these potential locations.

This was a staged process, first considering potential carbon storage locations and coastal connection areas, then broad pipeline corridors, before developing and refining the preferred route.

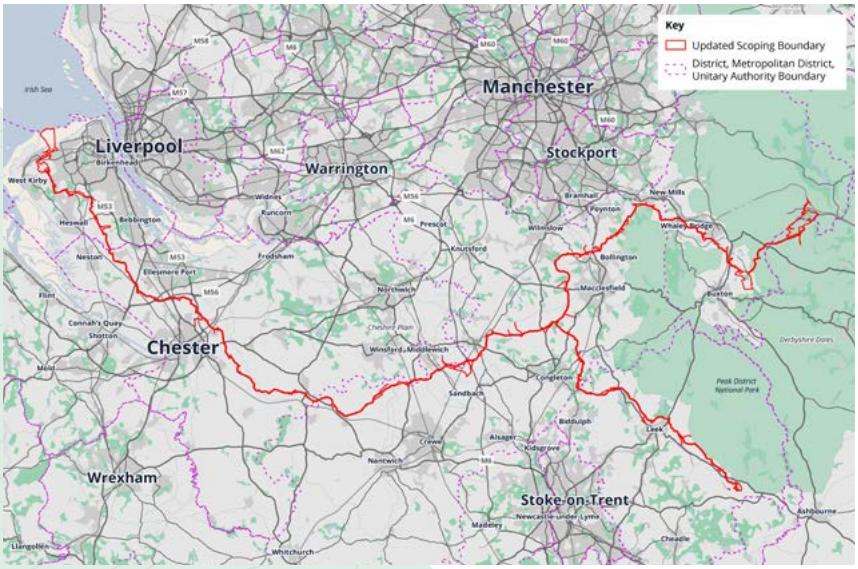
When identifying and assessing route options, we considered a wide range of factors, including existing towns and villages, topography, ecologically designated sites, protected landscapes and heritage assets such as scheduled monuments and listed buildings. Within these parameters (known as constraints), where possible, we sought to identify the shortest feasible route as this can help reduce the amount of land affected, shorten the duration of construction activity and minimise overall environmental impact.

Following this assessment, the proposed route from the cement and lime plants in Derbyshire and Staffordshire, through Cheshire and the Wirral to the coast, emerged as the most suitable option.

As with all large infrastructure projects, Peak Cluster's design has continued to evolve as more information has become available.

During the phase 1 consultation (held early in 2026), we invited communities and stakeholders to provide feedback on our initial proposals. We've carefully considered the feedback received alongside information from our environmental surveys, technical studies and ongoing engagement with landowners. This information helped us to refine the project design and develop an updated project boundary. This now includes the anticipated locations of above ground installations (AGIs), block valve stations (BVSs), and temporary construction areas and access roads in most locations.

We're currently consulting on these updates and welcome feedback to help inform the next stage of the project's development.



Why not go through Wales, or further north or east?

When assessing potential routes, we also considered the following options:

Route	Why we didn't select it
West to Wales	Routes to viable landfall locations would need to cross the Clwydian Range and Dee Valley National Landscape, with potential effects on landscape character. These routes would also be longer than the proposed route and involve more variable topography, increasing environmental and construction complexity.
East to the coast	Routes east would require up to approximately 15km more pipeline within the Peak District National Park and would have greater interaction with the Peak District Moors (South Pennine Moors) Special Protection Area (SPA) and Special Area of Conservation (SAC). They would also involve more major road, rail and river crossings, more developed areas and more complex terrain, making construction more challenging.
North to South West Lancashire	Routes towards South West Lancashire would be more constrained by coastal development and internationally and nationally protected habitats along the Sefton Coast. This would provide less flexibility to identify a suitable route and increase construction complexity, including a greater requirement for trenchless construction techniques.
North to North West Lancashire	Routes towards North West Lancashire were considered technically feasible and provided some flexibility to avoid more constrained coastal areas. However, they would generally require a longer pipeline route than the Wirral option.
North to Cumbria	Routes towards Cumbria were also considered technically feasible. However, they would require substantially longer pipeline routes and would need to navigate sensitive areas around Morecambe Bay and the Duddon Estuary, with some options also influenced by the Lake District National Park.

Why not follow the Dee or Mersey?

Routes along the Dee or Mersey estuaries were considered. Both contain extensive internationally protected habitats and would require considerably longer sections of pipeline to pass through sensitive estuarine environments. Shallow water, extensive mudflats and sandflats, navigation and existing development also create significant construction challenges and environmental effects. The proposed route seeks to minimise the length of pipeline interacting with these sensitive areas while providing a practicable connection between the onshore and offshore pipelines.

Why not join HyNet?

Peak Cluster and HyNet are both helping industry reduce carbon emissions. However, they are separate projects, working with different industrial partners. Peak Cluster has been developed specifically to support the cement and lime industries in Derbyshire and Staffordshire, while HyNet serves industrial clusters in North West England and North Wales.

The amount of CO_2 that could be captured from Peak Cluster industries is significant, at more than 3m tonnes each year. Developing dedicated infrastructure and storage capacity is therefore essential if the cement and lime industry is to continue to supply 40% of the UK's required demand, while reducing carbon emissions to a level that enables the UK to meet climate change targets.

Connecting the Peak District industries to HyNet would still require substantial new onshore pipeline infrastructure to transport the captured CO_2 from the cement and lime plants towards the existing HyNet network.

Peak Cluster intends to connect to Spirit Energy's Morecambe Net Zero carbon store, which provides substantial long-term storage capacity for the CO_2 captured by the project. The assessment of alternatives also found that routes west towards Morecambe Net Zero offered advantages compared with alternative routes to other storage locations.

Options considered for transporting CO_2

As part of our early feasibility work, we examined a range of ways to reduce carbon emissions from the cement and lime plants and transport the captured CO_2 to be permanently stored. The options considered included:

1. Relocate cement and lime production closer to the coast. Owing to UK geology, the limestone used to make cement and lime is naturally found, and quarried, in Derbyshire and Staffordshire. Relocating production would mean transporting millions of tonnes of raw materials over significant distances by road or rail, creating significant environmental and logistical challenges.

2. Transport captured CO_2 by road in trucks or by rail. This option would require captured CO_2 to be loaded onto specialist vehicles and transported to the storage site at the coast. We estimated this could add around 800 HGV or 16 train journeys to local road and rail infrastructure every day. It would also require compression and temporary storage facilities close to the coast.

3. Capture and transport the carbon dioxide emitted via a buried pipeline. This would allow CO_2 to be transported directly from the cement and lime plants to permanent offshore storage infrastructure.



Following our assessment, an underground pipeline was identified as the most practical solution, with the lowest overall impact on local communities, businesses and the environment over the long term.

For large-scale CCS, pipelines are widely recognised as the most efficient and reliable way to transport CO_2 because they:

- transport very large volumes continuously and efficiently
- avoid hundreds of additional HGV journeys on local roads every day
- reduce congestion, noise and vehicle emissions
- have a smaller long-term environmental footprint
- are highly energy efficient
- are subject to a robust regulatory and safety framework.

Could the captured CO_2 be stored closer to the cement and lime plants?

Carbon dioxide can only be stored safely and permanently in suitable geological formations with the right characteristics. These formations must be capable of securely containing the CO_2, undergo extensive assessment and receive approval from independent regulators.

The geology beneath the Peak District is not suitable for large-scale CO_2 storage. Across the UK, suitable storage sites are rare onshore and are typically located offshore, deep beneath the seabed.

Peak Cluster intends to connect to Spirit Energy's Morecambe Net Zero (MNZ) store in the seabed of the East Irish Sea. The store is expected to have the capacity to safely and permanently contain up to 1 billion tonnes of CO_2 over its lifetime. This would provide sufficient capacity to store the emissions captured from the four Peak Cluster cement and lime plants for more than 330 years.

Alternatives to carbon capture and storage

Why do we not use the CO_2 instead of storing it?

Carbon dioxide is used in a range of industries, including food and beverage production, horticulture, chemicals, industrial processes and synthetic fuels research.

However, the amount of CO_2 that can currently be used is much smaller than the amount that needs to be removed from Peak Cluster's industry. Total UK demand for commercial use of CO_2 is estimated to be around 700,000 tonnes per year.

By comparison, Peak Cluster could capture and permanently store around 3 million tonnes of CO_2 every year, more than four times the UK's current commercial demand.

Although new technologies that use captured CO_2 may play an important role in the future, they are not yet available at the scale needed to deal with the millions of tonnes of CO_2 produced by industries such as cement and lime manufacturing.

For this reason, permanent geological storage is currently the most practical and effective way to prevent large volumes of industrial CO_2 from entering the atmosphere, while supporting the transition to lower-carbon manufacturing.

Why not plant trees?

Tree planting has an important role to play in tackling climate change and supporting nature recovery. However, tree planting alone can't address the scale of emissions produced by industries such as cement and lime.

To absorb a similar amount of CO_2 that Peak Cluster would capture, an area equivalent to the 555-square-mile Peak District National Park would need to be planted with trees every two and a half years. Even then, it would take many decades for those trees to grow and remove the carbon from the atmosphere.

The UK simply does not have enough available land to rely on tree planting alone to offset industrial emissions at this scale, if it still to meet competing demands such as food production and housing.

For this reason, the Climate Change Committee and the UK Government identify both nature-based solutions, such as tree planting, and technologies like carbon capture and storage as complementary approaches in the fight against climate change.



What about low-carbon cement?

Portland cement has been the standard type of cement used around the world for about 200 years. The construction industry knows it well and trusts it. Engineers, architects and builders work to strict product standards because the safety of buildings, bridges and other infrastructure depends on how well the materials perform.

Researchers around the world are working on lower-carbon alternatives. One approach is to reduce the amount of clinker in cement. Clinker is the key ingredient that makes cement work, and producing it releases CO_2. Some clinker can be replaced with other materials, such as slag from steelmaking, but there is a limit to how much can be replaced.

It is essential that this innovation continues. However, most new approaches are still in early research or small-scale testing, and are not yet ready for use on the scale that industry needs.

Could we just use less concrete?

Cement and lime are essential for building the homes, hospitals, schools, transport networks and energy infrastructure that the UK relies on. In fact, concrete (of which cement is the key ingredient) is the second most used substance on the planet, after water.

Tackling climate change requires a combination of approaches, and using less concrete where possible is an important part of reducing emissions. However, even after reductions have been made, the UK's concrete usage will still be incredibly high; it is, therefore, essential that we take action beyond reducing its use as we tackle climate change.

Using alternative materials can help in some situations but they cannot replace concrete in every application. Historically, the two main alternatives to concrete for construction purposes have been steel and timber. However, neither material can offer the versatility that cement does and both are carbon intensive. Currently, steel is more carbon-intensive per tonne than concrete and around 80% of the UK's construction timber is imported.



PEAK CLUSTER

PLANNING, CONSULTATION AND ENGAGEMENT



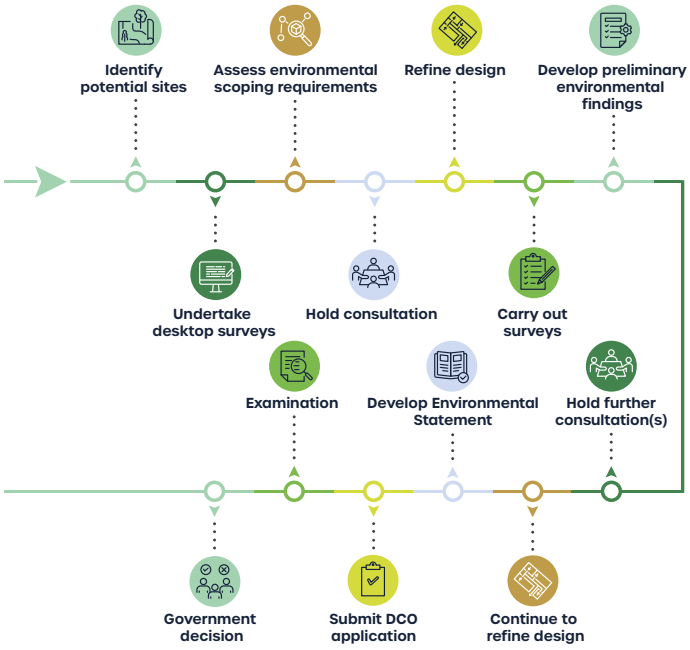
We understand that proposals for new infrastructure can raise questions and concerns for people who live in, work in or visit the area. We also recognise that these communities have valuable knowledge, perspectives and insights that they can input into the project's development, ensuring their needs are considered within the design.

That's why community engagement is a central part of our project design's development approach. Alongside regular periods of consultation, we're committed to maintaining ongoing dialogue with local communities throughout the development of the project. By listening, sharing information and responding to feedback, we aim to ensure communities have meaningful opportunities to help inform the project as it evolves.

How infrastructure projects are developed

Developing a large infrastructure project is an iterative process, starting with a broad search for potential locations before designs are refined over time through assessments, studies and feedback provided by stakeholders and communities. Each stage helps shape and improve the project, ensuring it can deliver its purpose while avoiding or reducing impacts where possible.

Listening to stakeholder and community feedback on our plans as they evolve is an essential part of this process.



Why consultation and engagement are so important

Peak Cluster is a Nationally Significant Infrastructure Project (NSIP). This means that we are required to submit a Development Consent Order (DCO) application to the Government's Planning Inspectorate to apply for permission to build the project. The final decision on whether Peak Cluster will receive approval will be made by the Secretary of State for Energy Security and Net Zero.

As part of the DCO process, we're required to carry out extensive public and stakeholder engagement and consultation, alongside the consideration of potential environmental impacts, alternative options, engineering design and land requirements.

However, for us, this is not a tick-box exercise. We want to hear from those who know their area best, to help us develop the project in the best possible way, which carefully considers the needs of local communities and the environment. We received over 5,500 pieces of feedback as part of our phase 1 consultation in early 2026, which has contributed towards significant changes to the project route.

What we've done so far

We've developed our approach to consultation and engagement in accordance with the Planning Act 2008 and recently published Government guidance on DCO pre-application consultation and advice for applicants. We've sought input from Local Authorities and other stakeholders, as we planned and delivered our consultation and engagement activities.

We chose to engage with communities and stakeholders early in our development process, to enable them to help shape and refine the project as it evolves. Our phase 1 consultation ran from 12 January to 28 February 2026 and, as part of this, we provided communities and stakeholders with multiple ways to learn about the project and share their views. This included:

- community drop-in events to meet the team
- webinars with Q&A
- newsletters posted to over 110,000 addresses
- digital mailouts to stakeholders and interested people
- an online consultation hub with materials and an interactive map
- a contact centre for letters, emails and calls
- information points with hard-copy materials
- promotion in local news publications and on social media.

We also undertook additional engagement with Wirral communities from 31 March to 8 May 2026, to help increase the understanding of our proposals for the project in the area.

Alongside our public and stakeholder consultation activities, we have also been engaging directly with landowners who may be affected by the project and we continue to consider their feedback as we develop the project.

Current consultation

We're holding an additional consultation on the proposed project boundary from 12 November to 18 December 2026, to gather feedback specifically on:

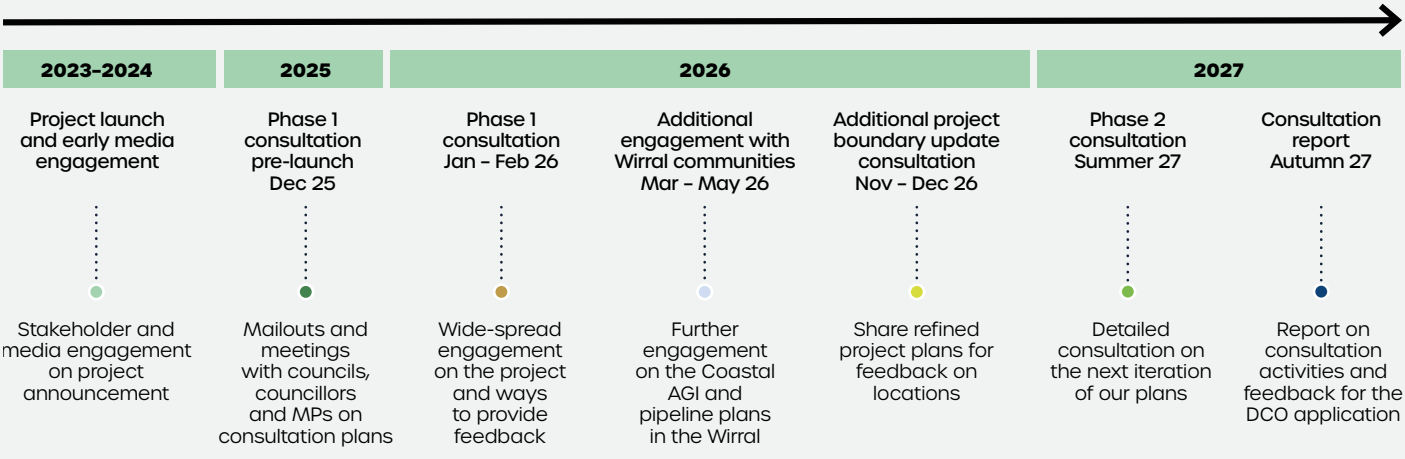
- updates to the project boundary – the area within which we propose to build permanent infrastructure including the buried pipeline
- the proposed locations of above ground installations (AGIs)
- the proposed locations of block valve stations (BVSs)
- the proposed locations of temporary construction compounds and access roads in most areas.



Summer 2027: Phase 2 consultation

We're currently anticipating that we'll carry out our **phase 2 consultation in summer 2027**. At this time, we'll share more information on:

- further updates to locations for infrastructure, the pipeline and construction areas
- the designs of AGIs and BVSs
- the outcomes of preliminary environmental assessments, and how these have helped us develop the project
- how we'd build the project, including construction controls and traffic management
- project safety
- land required for the project, including land used temporarily during construction.





GET IN TOUCH

If you'd like to talk to a team member about the project, or for us to send you copies of our consultation materials, you can get in touch in the following ways:

Website: www.peakcluster.co.uk

Email: consultation@peakcluster.co.uk

Phone: 0800 0129 167 (freephone)

Write: FREEPOST PEAK CLUSTER



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