

# MOBILISING UK PENSION AND INSURANCE CAPITAL FOR CLOSURE, DECOMMISSIONING, REMEDIATION & REDEVELOPMENT



**BNP PARIBAS**  
**ASSET MANAGEMENT**

# EXECUTIVE SUMMARY

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The UK Government's Modern Industrial Strategy<sup>1</sup>, published in June 2025, sets out a 10-year plan to boost investment, productivity and economic resilience by targeting growth in key sectors. It builds on the Invest 2035 green paper and forms part of the government's broader growth mission to raise living standards. The strategy identifies eight priority "IS-8" sectors including advanced manufacturing, clean energy, digital and technology and seeks to support them through improved business conditions, enhanced access to finance and skills, and strengthened regional development.

Within this context, the UK faces a complex industrial transition from legacy energy, manufacturing, and infrastructure to a Net Zero economy. Closure, decommissioning, and environmental remediation are costly, but they present a unique opportunity to channel long-term institutional capital into sustainable projects. The UK's nuclear, oil and gas, and heavy industrial sectors collectively carry around £240 billion in end-of-life liabilities. These are currently financed primarily by corporate balance sheets and the public sector, but represent the same duration, inflation linkage, and cash-flow characteristics sought by pension funds and insurance portfolios.

This paper outlines how UK pension and insurance capital can fund decommissioning and redevelopment, generate stable, inflation-linked returns and support environmental and regional regeneration. We argue that:

- Decommissioning and redevelopment are **two sides of the same lifecycle**: one releases capital, the other redeploys it.
- **Institutional investors**, particularly pension schemes and insurers, are natural partners in financing this lifecycle.
- The UK government can catalyse investment by **legislating for the provision of Decommissioning Reserve Funds (DRFs), Transition Bonds, and Redevelopment Trusts**, classifying them under "productive finance" reforms.
- **Early pilot programmes** - in nuclear, North Sea oil & gas, and coal-to-renewables conversions - demonstrate the feasibility of structured, revenue-backed investment vehicles.
- Targeted regulatory clarity and co-investment guarantees could **unlock billions of private pension capital** for decommissioning-linked projects by 2035.

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1 <https://www.gov.uk/government/publications/industrial-strategy>

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## MOBILISING UK PENSION AND INSURANCE CAPITAL FOR CLOSURE, DECOMMISSIONING, REMEDIATION & REDEVELOPMENT

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Prepared for institutional investors, fiduciaries, and policymakers, January 2026

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# DECOMMISSIONING EXPOSURE: THE INVESTOR BLIND SPOT CLOSING FAST

An Asset Retirement Obligation (“ARO”) is a legal or contractual requirement to dismantle, remove, and remediate an asset and its surrounding environment once operations cease. Examples include plugging offshore wells, removing North Sea platforms, closing coal mines, rehabilitating tailings dams, and decommissioning refineries and pipelines. Under accounting rules, AROs must be recognised on the balance sheet once estimable and accrete over time as the settlement date approaches.

**ARO**s are future cash commitments. When material, they behave like long-dated debt. If recognised prematurely (due to transition or regulatory shifts), they can erode credit quality rapidly. Rating agencies increasingly reference AROs in credit notes, though treatment remains inconsistent.

ARO

s are generally distant and heavily discounted. Under energy-transition pathways (1.5 to 2°C), policy tightening, ageing assets, and earlier-than-planned closures mean AROs are moving forward in time and increasing in size. For many fossil-fuel or mining companies, decommissioning liabilities may exceed current provisions by multiples. Examples of how these risks could unfold for investors:

- **Balance-sheet risk:** Under-recognised AROs distort corporate leverage, weaken equity, and understate future cash outflows.
- **Credit risk:** If assets close early, AROs are recognised sooner, impairing balance sheets and weakening debt-coverage ratios.
- **Liquidity risk:** Large clusters of assets reaching end-of-life can produce simultaneous cash calls.
- **Regulatory and litigation risk:** Stricter decommissioning standards (e.g., offshore safety, methane leakage rules) raise costs.
- **Stranded-asset risk:** Declining demand and unfavourable economics may render late-life assets uneconomic, forcing early abandonment and crystallising liabilities sooner than anticipated.
- **Social and Just Transition risks:** Asset closures often entail workforce displacement, community disruption, and regional economic impact. Poor management of these issues can lead to operational delays, increased remediation costs, regulatory intervention, and heightened execution risk.
- **Reputation risk:** Investor exposure to companies with weak transition or decommissioning plans is increasingly scrutinised by regulators, beneficiaries, and civil society. This may lead to adverse public perception, challenges to fiduciary practice, and escalation through stewardship frameworks such as Climate Action 100+ (CA100+).

In a 4 December 2025 note, Fitch assigned “BBB+” to proposed senior-unsecured notes issued by Canadian Natural Resources Limited (CNRL)<sup>2</sup>. In its credit assessment commentary, Fitch notes that CNRL’s ARO liabilities - stated as CAD 8.6 billion at year-end 2024 - are “manageable for the company.” That suggests AROs are now being explicitly considered by Fitch in its debt-rating analyses, but in this case they were not judged to be a material constraint on creditworthiness -likely because CNRL also had “large upstream production scale, diversified assets, lean cost structure, limited leverage” per Fitch’s notes.

The implication is that AROs are recognised and disclosed, and in credit analysis they can be “absorbed” if other fundamentals (e.g. reserves, leverage, cash flow) remain strong - but they are part of the calculus. Other institutions are taking the same view.

In the sector-wide analysis by Institute for Energy Economics & Financial Analysis (IEEFA) - the report “European Oil: Navigating Credit Risk Towards Net Zero” (March 2025):

- Argues that the long-term credit-risk outlook for oil & gas companies should fully account for “transition risks” including decommissioning, AROs, “stranded assets,” demand decline, and regulatory change. (IEEFA); and
- Notes that while major credit rating agencies (CRAs) have developed various tools to assess transition risks, these are not yet systematically integrated into formal credit-rating metrics for many oil & gas firms - meaning the risk of decommissioning liabilities may remain under-priced or under-accounted.

The authors recommend that CRAs should take a “long-term credit view,” not just near-term ratings, when evaluating fossil-fuel companies - arguing that the structural shift away from hydrocarbons poses a material risk even if near-term leverage looks acceptable.

Regulations such as the PRA’s CP10/25 (updating SS3/19) and the UK pension climate-governance rules require insurers, banks, and pension schemes to assess material climate-related financial risks, including transition-driven balance-sheet impacts. In our view, AROs sit directly within this definition. It is therefore likely that institutional investors are going to pay much attention to this topic.

In parallel with robust risk-management practices, investors have two other key levers aligned with their fiduciary obligations: active stewardship and capital allocation towards solutions that mitigate or manage these risks. As we are going to see below, they all enhance the attractiveness of the opportunity.

<sup>2</sup> <https://www.fitchratings.com/research/corporate-finance/fitch-rates-canadian-natural-resources-proposed-senior-unsecured-notes-bbb-04-12-2025>

# THE SCALE OF THE UK CLOSURE, DECOMMISSIONING AND REMEDIATION CHALLENGE

The UK is currently facing closure, decommissioning and remediation liabilities / AROs in at least four sectors: nuclear power, oil & gas, mining and heavy industry.<sup>3</sup>

**The Nuclear Decommissioning Authority** (NDA) oversees 17 sites across the UK, including Sellafield, Magnox, and Dounreay.

- In its 2024/25 report, the NDA estimated the undiscounted lifetime cost of decommissioning its estate at £124 billion, with a potential range from £99 billion to £232 billion depending on inflation and technology outcomes.
- The Sellafield site alone could add more than £100 billion to this cost, with lifetime projections now reaching £136 billion to 253 billion (as reported by the UK Treasury and National Audit Office).
- Annual spending on nuclear clean-up averages £3 billion per year and is expected to continue for decades.
- The Nuclear Liabilities Fund (NLF), established from British Energy assets and designed to fund EDF Energy's AGR and Sizewell B reactors, held £20.6 billion in March 2024 against £24.7 billion in forecast liabilities, leaving a funding gap of over £4 billion. This gap highlights the need for external capital and presents an opportunity for long-term investors to participate in structured prefunding vehicles.

**The North Sea Transition Authority** (NSTA) projects total UK continental shelf decommissioning expenditure at £44 billion (2024 constant), with £27 billion to be spent between 2023 – 2032.

- Annual spend in 2024 reached £2.4 billion, the highest on record. More than 2,000 wells and 100 platforms are expected to be decommissioned by 2035.
- The UK Treasury provides sizable tax relief on decommissioning costs (approx. 40–60%), representing a fiscal liability of an estimated £10.8 billion. However, recent experience shows that cost over-runs amount on average to 76% and these can materially affect the total liability notwithstanding possible technological mitigants.

Beyond nuclear and oil & gas, the UK holds thousands of legacy **industrial and mining sites** requiring remediation.

- The Coal Authority manages over 80 mine-water treatment schemes, with annual remediation costs exceeding £50 million for the foreseeable future. The best estimate for the total remediation liability is currently around £1.6 billion.
- The UK government estimates the total cost of restoring abandoned industrial and mining sites to safe standards at between £12.6 billion to 22.4 billion.
- Local authorities carry further contingent liabilities for land remediation under Part 2A of the Environmental Protection Act (for example, an estimated £370 million for abandoned metal mine legacy over 10 years).

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<sup>3</sup> Note that offshore wind assets will also need decommissioning at one point in the future but it is not an immediate challenge.

We have summarised the headline costs in the table below.

(£ bn)	Latest estimate (value / range)			Date of estimate	Primary source	
	Discounted <sup>4</sup>					Undiscounted
	Minimum	Best Estimate	Maximum			
<b>Nuclear - Civil legacy / NDA estate</b>	49.3	110.1	115.4	c £99bn to c £232bn / best est. c £216.0bn	Mar-25	NDA AR&A 2024/25 (Note 24)
<b>Nuclear - Sellafield programme</b>	57.7	67.6	125.8	c £116bn to c £253bn / best est. c £136bn	Mar-Oct 2024	NAO / PAC reporting on Sellafield
<b>Oil &amp; Gas - UKCS (remaining industry total)</b>	41.0	44.0 <sup>5</sup>	77.4		Jul-25	NSTA Decommissioning Cost & Performance Update 2025 / NAO for cost over-run risk (+76%)
<b>Oil &amp; Gas - Exchequer tax relief</b>	10.8	10.8	14.8		Dec-24	HMRC/NSTA note on Exchequer cost
<b>Mining - Coal mine legacy (Great Britain)</b>	1.6	1.6	3.7	c. £4.1bn underlying cash flows (undiscounted)	Mar-2024 (provision); 2025 (cash-flow forecast)	Coal Authority / Mining Remediation Authority AR 2023/24 & 2024/25 update
<b>Mining - Abandoned metal mine legacy (England)</b>	0.4	0.4	0.4	No national total published; historic c. £370m for 10yrs for priority waters (old)	2011 (historic); 2025 baseline of 1,491 km polluted	EA technical report (2011); Defra / EA 2025 baseline
<b>Industrial remediation (England) - Dangerous cladding</b>	12.6	16.6	22.4		Nov-2024 to Mar-2025	NAO & PAC
<b>Total (Excl. tax relief)</b>	<b>162.5</b>	<b>240.3</b>	<b>345.1</b>			

Many of the related sites occupy strategic redevelopment areas within freeports, investment zones, and the UK's planned Green Industrial Clusters. They represent an opportunity to recycle stranded assets into revenue-producing infrastructure, e.g., solar, logistics, or low-carbon manufacturing.

However, given that the total estimated closure, decommissioning and remediation cost amounts to c. £240 billion but could go as high as £345 billion, unlocking these opportunities would require capital inflows largely exceeding the UK central and local government's current budgetary capacity.

We believe that institutional investors are both strategically and financially well placed to meet this challenge and to play a central role in financing the decommissioning and redevelopment opportunity at scale. In the next sections, we analyse the investment opportunity, the financial firepower of UK institutional investors, focusing on pensions funds and insurance companies as well as other financial asset owners.

4 Some of the discounted estimates below have been produced by BNP Paribas Asset Management assuming steady cash flows over the period and extrapolating a discount curve using gilt yields as of 05-Dec-2025 (source: Bloomberg).

5 Including £27 bn of expenditures before 2032.

## THE INVESTMENT OPPORTUNITY

Investing in decommissioning and redevelopment assets aligns with the long-term objectives of institutional investors. These assets are domestic, productive, and sustainable and can deliver **attractive risk-adjusted returns**. Proactive management allows investors to identify mispriced assets, support transition pathways, and strengthen portfolio resilience. Transforming liabilities into investable themes enables innovation, sustainability, and value creation also aligned with the fiduciary duties of institutional investors.

The benefits for investors are material

- Decommissioning liabilities, with timelines of 30 to 100 years, match the duration, cash-flow profile, and inflation linkage of pension and insurance obligations.
- Decommissioning liabilities – especially those which align with institutional 1.5-2DC climate commitments – support industrial decarbonization objectives for climate-focused investors. These investments resemble Liability-Driven Investments (LDI)<sup>6</sup>, offering immediate and long-term financial benefits for both investors and corporations. For smaller scale redevelopment opportunities, one can also turn to private markets. They offer flexible financing instruments to support the repurposing late-life assets.
- Investors can press for **materially improved disclosure and governance** of retirement liabilities **through stewardship**. This includes requesting undiscounted ARO values, assessing whether the timing of recognition is aligned with Paris-consistent production-decline pathways or Nationally Determined Contributions, and challenging companies to reflect accelerated end-of-life assumptions. Investors can also engage for credible Just Transition plans linked to decommissioning activities. These expectations are equally relevant in private-markets negotiations, where greater transparency on long-dated liabilities and closure planning can be incorporated into due-diligence, legal terms, and ongoing monitoring.
- Funding decommissioning shortfalls and mitigating cost, legal, and regulatory risks can **reduce overall investment risk**.

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<sup>6</sup> LDI is an investment strategy that focuses on aligning a portfolio's assets with its future liabilities, such as pension payouts. Its primary goal is to reduce the risk of a funding shortfall by mitigating interest rate and inflation risks, which can cause the value of liabilities to change unpredictably. LDI is commonly used by organizations with long-term financial obligations, like defined-benefit pension plans and life insurance companies.

The benefits for corporates are also substantial

- **Lower operating expenditures** compared to mothballing the assets. Redevelopment helps avoid maintaining environmental liabilities on balance sheet and dealing with recoveries from scrap / recycling activities. It offers option value from reusing grids, foundations, or rights-of-way (especially for SMRs, wind repowering and CCUS) contract for difference<sup>7</sup> and reduces long-term revenue volatility and cost of capital. Additionally, we noted that redevelopment in the mining sector can lead to up to 40% lower remediation costs.
- Some nuclear assets can be redeveloped on land with existing permits, streamlining project approval.
- **The creation of inter-generational equity** to ensure that future generations are not burdened with liabilities; and
- **Improved credit ratings** Transforming legacy sites into revenue-generating assets (renewables, industrial parks, logistics hubs, conservation lands, data centres) strengthens balance sheets and credit assessments.
- **Access to sustainability-linked financing.** At the same time, this can lead to the issuance of labelled instruments to finance Green and Transition projects.

Redevelopment also delivers substantial **environmental, social, and governance (ESG) benefits.**



**ENVIRONMENTAL**

- Expected materially lower environmental footprint
- Faster habitat recovery
- Stabilisation & improved water management



**SOCIAL**

- Retained and transitioned employment
- Supply-chain continuity
- Regional regeneration
- Reduced blight via accelerated reuse
- Stronger social licence to operate



**GOVERNANCE**

- Converts liabilities into productive assets
- Prefunding builds trust
- Stronger ESG & transparency
- Supports credit ratings & financing
- Consistent end-of-life governance

<sup>7</sup> A Contract for Difference (CfD) is a long-term agreement for electricity generators that provides a stable price for their electricity.

# THE INVESTMENT FIREPOWER OF INSTITUTIONAL INVESTORS IN THE UK

## Pension assets

UK pension assets totalled £3.2trn at the end of 2024, supported by contributions, investment returns, and growth in defined contribution (DC) schemes. The market is shifting from defined benefit (DB) to DC arrangements, with ongoing asset transfers between segments (e.g., DC members purchasing annuities). We notice several biases in UK pension funds' allocations towards **productive, domestic and sustainable investments**.

- **Productive assets:** Public sector DB and DC funds allocate nearly 80% of assets to productive finance (private equity, property, alternatives, listed equities, corporate bonds), compared to 40% for private sector DB. Annuities are mostly invested in UK-based productive assets (over 85%). Public sector DB and DC funds invest about 26% domestically; private sector DB, about 40%. Overall, 60% of total funds are invested productively, with one-third in the UK. Annuity providers, regulated under Solvency UK, concentrate portfolios in gilts and investment-grade bonds.<sup>8</sup>
- **Domestic investments:** DB and DC plans invest significantly in UK public markets. DC schemes often using passive strategies and maintaining strong allocations to UK equities. Major equity indices' exposure to the energy sector varies. The FTSE UK 100 has the highest allocation (c. 10%).
- **Sustainable investments:** Most UK asset owners aim for Net Zero by 2050 or sooner, supported by sustainability teams and portfolio-level decarbonisation strategies. Sustainability is now seen as a strategic lever for long-term value (not just a moral imperative) and investors recognise the importance of aligning climate objectives with credible returns.

## Summary Table of Institutional Investors' net zero objectives and achievements to date

Fund/Foundation	Net Zero Target	Interim Targets	Key Actions	Achievements to Date
Church of England PF	2050 (10 years ahead)	7% annual WACI reduction	FTSE TPI Index, engagement, divestment	10 years ahead of trajectory, oil/gas <0.3%
USS	2050	25% by 2025, 50% by 2030	Climate tilt, renewables, stewardship	39% emissions intensity reduction
Nest	2050 (or earlier)	70% engagement coverage by 2030	Divestment, manager oversight, advocacy	Top ranking for climate action
BTPS	2035	25% by 2025, 33% RE by 2025	Portfolio reallocation, engagement, scenario analysis	62% emissions reduction (equity/credit)
Wellcome Trust	2030 (Scope 1/2), 2050 (Scope 3)	Annual reporting, research funding policy	Building retrofit, renewables, ESG integration	60% Scope 1/2 reduction, sector leadership

<sup>8</sup> <https://www.gov.uk/government/publications/pension-fund-investment-and-the-uk-economy/pension-fund-investment-and-the-uk-economy>

## Pensions private assets:

Active investments (and to some extent stewardship) are key for advancing Net Zero and climate goals. There is growing appetite for investments in climate solutions, such as renewables and clean infrastructure.

- **DC Schemes:** By 2030, DC assets could reach £735 billion. With at least 10% of default funds in private markets (5% in UK private markets), this could mobilise £50 billion for private markets, with £25–26 billion for the UK economy.
- **Local Government Pension Scheme (LGPS):** Expected to reach £550 billion by 2030. Allocating 5% to UK-focused investments could generate £27.5 billion for infrastructure and regional projects supporting local economic activity and employment.
- **Combined Impact:** DC and LGPS reforms could channel over £50 billion into the UK economy by 2030, supporting growth and long-term economic resilience.

## Insurance private assets:

**Pension Risk Transfer** deals allow DB schemes to hand future pension payments to insurers, removing long-term balance-sheet risk for employers while securing member benefits. Schemes pay insurers to assume these liabilities, via structures such as buy-ins or buy-outs. Higher gilt yields in 2023 / 2024 boosted funding levels and transaction activity, as insurers expanded capacity.

- Independent studies show **continued momentum**, with volumes close to £50bn in 2023 and £45 / 50bn in 2024 and similarly high levels expected in 2025. The market is supported by specialist annuity insurers and new entrants. Annuity providers invest 40% / 50% of their assets in private assets and a significant amount of this is in UK productive finance.

## Other Institutional investors

Other institutional investors like non-life insurers, endowments, and charitable foundations are increasingly exploring investment opportunities in private markets, seeking inflation-resilient, income-generating investments that align with long-term missions. Across these groups, interest in infrastructure, real assets, and impact-aligned strategies in the UK is rising as they balance return targets with risk management and governance requirements.

### Alignment with DB Pension's and Life Insurance's Liabilities and Investment Requirements

Investment Need	How Redevelopment Assets Meets It
Duration & Inflation Matching	Multi-decade cashflows, often CPI-linked
ESG & Impact	Environmental remediation; Just Transition
Diversification	Low correlation with traditional credit
Regional Regeneration	UK-based, policy-aligned investments
Fiduciary Return Target	Stable 4-7% annualised returns achievable with blended capital

# HOW TO INVEST IN ASSET DECOMMISSIONING AND REDEVELOPMENT

The main challenge is to structure financial vehicles that transform public and corporate liabilities into investable, risk-rated instruments. Decommissioning and redevelopment projects can use several funding and investment vehicles, depending on project type, investment objectives, and risk management needs.

## Decommissioning Reserve Funds (DRFs)

DRFs are ring-fenced funds built from operator contributions to prefund closure liabilities. Properly designed, they invest in inflation-linked and ESG-screened fixed income assets (or private market equivalents) until needed for decommissioning payments. They typically take the form of escrow accounts or independent trusts.

- **For corporate sponsors** (i.e. the owners of decommissioning liabilities), DRFs offer the opportunity to crystallise the decommissioning liabilities and lower the risk of shortfall (indirectly lowering the risk to the taxpayer). They provide long-duration inflation-linked returns, regulated governance structures and social and environmental impact alignment when they invest in green private projects.
- **The Nuclear Liabilities Fund<sup>9</sup>** is an early example. Similar frameworks exist in oil & gas, mining and industry globally. Co-investment in public and private securities and projects alongside pension funds and insurance companies is already common in the US and France and is being explored in other Western countries.

## Climate Transition Bonds (CTBs)

CTBs can be issued by corporates or public entities to prefund closure and decommissioning obligations.<sup>10</sup> CTBs often but not always include use-of-proceeds certification (for example “brown-to-green transition bond”), revenue linkage to redevelopment projects, and eligibility for ESG bond portfolios and Solvency UK matching-adjustment portfolios. A decommissioning bond backed by future CfD-style revenues from repurposed assets could yield CPI + a spread, attractive to pension funds in self-sufficiency mode and to annuity providers.

- **Transition Loans** can fund entire transition projects or specific components (whether existing or new projects) that are essential to a broader decarbonisation strategy. These components may include capital expenditure, operational expenditure, research and development costs, or phase-out (including decommissioning) costs. Transition Loans are suitable for early-stage funding if the company has strong cash flows or backup security, though less ideal for long time horizons due to the loan servicing weighting on the long-term financial stability of the company or entity.
- **Financial Assurance / Regulatory Instruments:** Governments may require companies to provide financial assurance through surety bonds; trust funds; letters of credit; escrow accounts; performance bonds and insurance.<sup>11</sup>

9 The **AGR decommissioning programme** highlights the value of prefunding mechanisms. The **Nuclear Liabilities Fund** covers decommissioning of eight AGR stations and Sizewell B. The liabilities allocated to the NLF were c. £23.5 bn (2021) and its assets were c. £14.8 bn, thus a shortfall of £8.7 bn. A restructured DRF or transition bond issuance, with co-investment from pension funds and insurers, could address this gap.

10 Climate Transition Bond Guidelines: [Climate Transition](#) » ICMA

11 U.S. federal regulators increasing required bonding for offshore oil/gas wells to ensure that if an operator fails or abandons, government (or public) isn't left with the cost. (IER).

## Captive or Insurance-Linked Structures

Liabilities can be transferred to special-purpose or captive insurance vehicles. Institutional investors may take tranches of risk with pre-agreed loss distributions, like catastrophe bonds. These structures offer diversification, stable returns, and regulatory recognition, but require robust legal and environmental due diligence due to complex decommissioning cash flows, created by their uncertain nature and long-tail risks.

## Blended public / private vehicles

Partnerships with the National Wealth Fund (NWF) – formerly UK Infrastructure Bank - can provide catalytic first-loss capital and reduce risk for investors. Blended structures may include government guarantees on early-stage closure projects; co-investment mandates with LGPS pools and / or preferential access to Freeport and Investment Zone redevelopment rights.

- **Port of Blyth & Ardersier (Scotland):** Old oil fabrication yards are being repurposed into offshore wind marshalling and hydrogen-energy hubs. Private capital (including insurers and infrastructure funds) financed site remediation and redevelopment under long-term lease models - a template for blended public-private funding.
- **Wylfa site on Anglesey (North Wales):** The UK's first Small Modular Reactor (SMR) project will be developed by Rolls-Royce SMR, which has been selected to build three reactors, potentially expandable to eight, by publicly-owned Great British Energy-Nuclear, aiming for grid connection mid-2030s, creating thousands of jobs, marking a major investment in Welsh low-carbon energy, and leveraging a former British Energy nuclear site (already permitted).

## Redevelopment trusts and brownfield funds

Once decommissioning is complete, sites can be transformed into new economic zones. Investors may participate through brownfield redevelopment funds focused on clean energy or logistics, public / private trusts, clean-up, and infrastructure, nature-based or BNG investment vehicles, delivering returns through ecosystem credits.

- **North Sea Decommissioning and CCUS Repurposing:** With £27 bn of near-term expenditure, North Sea decommissioning is a major investment pipeline. The offshore infrastructure underpins the carbon-capture, utilisation and storage (CCUS) and hydrogen transport sectors. Reuse of pipelines and platforms can convert liabilities into productive assets, providing investable opportunities for institutional investors once integrated into structured vehicles. The Acorn Project (St Fergus) demonstrates dual outcomes with the reuse of pipelines for CO<sub>2</sub> transport and hydrogen with a public-private investment via CCUS funding. This creates an opportunity for transition bond structures.
- **Longannet (Fife):** Scotland's last coal station is being redeveloped into a clean energy park with on-site renewables and port logistics. This model integrates closure, remediation, and reuse, supported by regional regeneration grants and private equity, aligning with pension fund ESG objectives.

## Repurposing stage: private equity funding

Once major decommissioning and rehabilitation work has made a site safe or stable, repurposing / redevelopment often requires new capital. Private equity (PE) and other private capital (infrastructure investment, impact investment) sources are willing to take risk in novel or higher return repurposing projects. This can fund redevelopment, bringing expertise and locally supporting growth, jobs, and innovation. Battery Energy Storage Systems and nuclear fusion are attracting significant interest.

## Potential investments and expected returns

The following table summarizes key investment vehicles, roles, expected returns, durations, and targeted investors. Please note that this is a very high-level summary and many additional investment strategies can be added depending on the type of asset to be decommissioned and the type of asset to be redeveloped.

### Landscape

Investments	Role	Expected Return (Real)	Duration	Targeted investors	Appeal	Key Risks / Barriers
<b>Debt</b>						
Decommissioning Reserve Fund	Debt / equity investor	2.0-3.0%	20-60 yrs	Operators / state / local authorities	Long-term inflation-linked cashflows; predictable; ESG-aligned	Regulatory recognition; counterparty risk
Transition Bond	Bondholder	3.0-4.0%	10-30 yrs	Institutional investors with transition ambitions under IG investment	Yield + labelled sustainability; duration	Credit / covenant enforcement
Captive / ILS	Risk-bearing tranches	5.0-7.0%	5-15 yrs	Reinsurers and ILS investors	Diversification; higher returns	Complexity; model risk
Blended Fund	Co-investor	4.0-6.0%	10-25 yrs	Public private investment programmes	Risk sharing; policy alignment	Execution risk; bureaucratic delays
<b>Equity</b>						
Redevelopment Trust	Equity / mezzanine	5.0-8.0%	5-15 yrs	DC funds and infrastructure equity investor	Revenue from repurposed land / assets	Permitting, planning uncertainty

It is worth noting that despite mitigation activities (environmental due diligence, guarantees, insurance...), repurposing and redevelopment present several challenges for institutional and private investors. First, the environmental legacy, the contamination and the regulatory risk can all turn into material financial liabilities. Then, there is always an uncertainty over demand for the repurposed assets over their cost (grid, roads and other types of infrastructure projects). That is why institutional investors and PE firms are generally attracted to specific business models for the repurposed use of large decommissioned industrial and energy installations (like renewables, logistics, recreation, tourism,...) and often expect incentives (tax breaks, subsidies, carbon credit revenues) and partnerships with state or local governments to mitigate the risk profiles of these investments.

## Case Study: Rothesay and the NWF

Rothesay, one of the UK's largest annuity providers, represents a leading example of how private institutional capital can work alongside the state through the NWF to finance long-term, productive infrastructure in the UK. In 2025, Rothesay and the NWF co-invested in core infrastructure assets with inflation-linked cashflows. The partnership focused on regulated energy networks, renewable generation, and housing regeneration projects across regional UK markets, aligning annuity capital with national priorities.

The co-investment was designed under a blended finance model, combining state catalytic capital from the NWF with private long-duration annuity capital. The structure provided risk-sharing mechanisms and credit enhancement features that made the projects investable within Rothesay's risk and solvency framework. The initiative aimed to unlock over £500 million of new investment in green energy infrastructure and affordable housing by 2030. It demonstrated how annuity balance sheets can support national priorities such as decarbonisation, regional regeneration, and the Net Zero transition.

This partnership is one of the first to explicitly connect annuity capital with the NWF, illustrating the potential for insurance investors to play a more active role in UK productive finance. It aligns long-term savings with sustainable economic growth and sets a template for future collaboration between insurers, pension funds, and the state.

Source: Rothesay, HM Treasury, National Wealth Fund announcements, 2025.

## CHALLENGES AND LIMITATIONS

Direct investment by UK pension and insurance capital in decommissioning assets is limited. Most exposure is indirect, through infrastructure and transition investments, rather than dedicated decommissioning finance vehicles.

**Lack of investable structures:** Most decommissioning obligations today sit on the balance sheet of operators and are treated as liabilities. Investors cannot invest directly in a “liability” unless it is repackaged into tradable, yield-bearing instruments (e.g., bonds or securitised vehicles). Standardised investment vehicles are rare.

- **Limited access to existing funds:** DRFs, such as the UK Nuclear Liabilities Fund, are government-managed and not open to direct partnerships with DC, LGPS, or annuity providers.
- **Few dedicated products:** Major UK annuity providers and DC master trusts disclose significant allocations to infrastructure, utilities, and energy transition assets but do not explicitly allocate to UK nuclear or North Sea decommissioning projects. LGPS pools report exposure to renewables, regulated networks, and brownfield redevelopment, but not to decommissioning-specific funds.

**Unclear revenue models:** Decommissioning and rehabilitation are seen as costs, not revenue generators. Without redevelopment or securitised revenue streams, these investments lack predictable cash flows, making them unattractive to institutional investors unless explicitly linked to redevelopment and associated revenues.

- **Positive example:** the Wales Pension Partnership (LGPS pool) invested in repurposing the former Uskmouth coal power station into a battery energy storage facility and industrial park, demonstrating how institutional capital can support asset conversion.

**Perceived (and real) complexity and risk.** At least four types of risks can impact a decommissioning and redevelopment programme.

- **Technical risk:** dismantling and decommissioning require specialist expertise and carry large uncertainty. Lack of standardisation and data complicates benchmarking. Every project (oilfield, mine, nuclear site) is different, with bespoke regulation, contracts, and risk profiles. There is no common data taxonomy or pricing history for decommissioning-linked investments.
- **Environmental and legal risk:** contamination, remediation failures, and liability tails can persist for decades.
- **Social and reputational risk:** funding clean-up of “polluting” industries can be misunderstood as enabling them.
- **Policy risk:** shifting regulations or political changes can alter the economics of decommissioning projects.

**Regulatory and accounting barriers.** Pension and insurance regulation (e.g., Solvency II / Solvency UK, IORP II, TPR rules) favour highly rated, liquid, and predictable assets. Decommissioning projects are long-dated, illiquid, and carry performance risk, resulting in high capital charges unless mitigated by guarantees or tranching. Liabilities are often split among governments, operators, and special-purpose funds, making it difficult for investors to price or structure investments.

As a result, institutional capital remains largely on the sidelines, with funding responsibility falling to governments, corporate balance sheets, and dedicated funds.

Given the UK's multi-decade nuclear, offshore decommissioning and industrial pipeline, and the growing focus on productive finance, there is an opportunity to design investable structures suitable for long-duration pension capital. Such vehicles could align cashflow characteristics and impact objectives of annuity, DC, and LGPS investors with the UK's decommissioning and site-repurposing needs.



# UNLOCKING INSTITUTIONAL INVESTMENT

The UK government has supported redevelopment through favourable regulations and financial support. To further unlock institutional investment, several targeted steps are recommended.

**As a priority, closure, decommissioning and remediation must be linked to redevelopment revenue** by coupling clean-up with new productive use of land and (renewables, hydrogen, logistics, housing, ...) infrastructure. Integrate closure, decommissioning, and remediation with new productive uses of land and infrastructure (e.g., renewables, hydrogen, logistics, housing). Redevelopment revenues (e.g., land leases, energy tariffs) can cross-subsidize decommissioning costs, creating circular investment models with both liability reduction and asset creation.

**Establishing a central UK Decommissioning & Redevelopment Investment Framework** with ring-fenced, regulated funds and transparent governance to support institutional investment by

- **Standardising investment governance and access:** Develop templates for project eligibility, financial structures, and governance. Allow life insurers, DC schemes, and LGPS pools to allocate a portion of assets to closure-linked productive finance. Clarify risk-weighting of long-dated environmental liabilities in Solvency UK/TPR guidance.
- **Expanding funding instruments:** Broaden the use of funding tools such as Climate Transition and Decommissioning Bonds, offering inflation-linked returns and backed by government or operators.
  - One solution would be to classify DRFs and Redevelopment Trusts as productive-finance vehicles under Treasury definitions and turn them into securitised rehabilitation trusts (bundling multiple small-scale rehabilitation projects into portfolios with diversified risks to translate long-dated liabilities into investable cash-flow generating assets).
  - Another solution would be to design alternative investment vehicles to attract institutional capital while delivering local regeneration, circular economy benefits, and long-term economic value.
- **Investment taxonomy and transparency:** Regulators should explicitly include closure and rehabilitation in “transition” categories of sustainable-finance taxonomies (as the EU and OECD now propose), clarifying their eligibility for ESG investment mandates. It would also be beneficial to coordinate oversight between BEIS, HMT, the FCA and The Pensions Regulator.
- **Investment standard performance and risk metrics:** Establish benchmarks for costs, timelines, discount rates, and failure rates. Support rating methodologies for decommissioning funds and train independent trustees for transparency.

**We also recommend expanding the NWF mandate** by introducing public risk-sharing mechanisms and blended finance to lower perceived risk. Decommissioning and remediation must be included in the investment scope encourage co-investment and credit enhancement. This can make projects “investment grade” under pension / insurance rules.

**Rationalising the management of end-of-life assets in the UK** would be extremely beneficial and can be achieved by

- **Integrating closure / reuse in planning** and require environmental permits and planning approvals to include redevelopment scenarios and costed reuse options, ensuring investment visibility.
- **Creating a national project pipeline** and publish a public registry of UK sites approaching closure with key data (sector, estimated liability, reuse potential, planning status, and indicative investment needs) to support investor planning and due diligence.
- **Promoting regional transition funds** and establish cluster-based vehicles (e.g., Teesside, Humber, Grangemouth) co-financed by LGPS pools, NWF, and local authorities that would link investments to regional job-creation and Net Zero objectives.<sup>12</sup>

Finally, we recommend initiating **a reform of the financial sector** and of the investment practices of institutional investors to support investments in decommissioning and redevelopment projects.

- **Incentivise participation via regulation:** The FCA could allow decommissioning-linked investments to qualify for matching-adjustment portfolios under Solvency UK, and the government could provide tax incentives or capital-relief for pension or insurance allocations to approved vehicles. This would Encourage LGPS pools and infrastructure mandates to treat decommissioning and redevelopment as “productive finance”.
- **Build specialist investment management capacity:** Governments, Multilateral Development Banks, and universities could create centres of excellence or specialist transition-asset funds combining financial and engineering know-how.
- **Further foster public / private partnerships (PPPs):** Develop PPP models, where the public sector defines outcomes and pays availability-based revenues, while private investors finance and deliver clean-up. One can imagine a “Remediation PPP” - a 20-year concession for site clean-up with milestone payments indexed to inflation – paying investors predictable income streams.
- **Expand ESG and impact frameworks** by clarifying that responsible closure contributes to SDG 12 (Responsible Consumption & Production) and SDG 15 (Life on Land) and explicitly count “closure of harmful assets” as positive impact.
- **Educate Trustees and Fiduciaries** and develop professional development modules on closure finance, transition risk, and productive-finance vehicles.
- **Expand investment** by encouraging the integration of decommissioning and redevelopment into strategic asset allocations.

<sup>12</sup> An illustration of this approach has been detailed in following Policy White Paper from June 2025: The Decommissioning and Energy Transition Challenge in the North Sea, [https://am.bnpparibas.com/decommissioning/assets/P2506021\\_Decommissioning\\_Energy\\_Transition\\_North\\_Sea\\_EN.pdf](https://am.bnpparibas.com/decommissioning/assets/P2506021_Decommissioning_Energy_Transition_North_Sea_EN.pdf)

# CONCLUSION

Decommissioning and redevelopment represent a once-in-a-generation opportunity for UK pension schemes and insurance companies to align their fiduciary duties with the country's Net Zero and regeneration goals. The UK's c £240 billion in closure and decommissioning liabilities can be transformed into investable assets, unlocking institutional capital not only to remediate legacy sites but to create skilled jobs, rebuild local supply chains, and anchor new industrial activity in regions most affected by industrial decline. When linked to redevelopment, decommissioning can support construction, engineering, environmental services, clean energy, advanced manufacturing, and place-based innovation, delivering durable economic value alongside environmental outcomes.

To realise this opportunity, policymakers should:

- **Link clean-up to redevelopment revenue** by integrating closure with new productive uses of land and infrastructure.
- **Establish a central investment framework** with standardised, ring-fenced funds and transparent governance.
- **Expand eligible funding instruments** such as Climate Transition Bonds and Decommissioning Reserve Funds, classifying them as "productive finance".
- **Clarify regulation and offer incentives** to enable pension and insurance allocations to closure-linked investments, including tax relief and capital support.
- **Improve transparency** by publishing a registry of sites approaching closure and their investment needs.
- **Foster regional and public-private partnerships** to share risk and accelerate investment.
- **Develop investment taxonomy and benchmarks** for costs, risks, and ESG impact.
- **Build specialist capacity** through education and centres of excellence in decommissioning and regeneration.

By implementing these steps, the UK can mobilise long-term capital, accelerate remediation, and set a global standard and establish leadership position for investment in industrial transition.

# APPENDICES

## Appendix A

### Case Study on Transition Credits for Early Coal Plant Retirement in Asia

The Monetary Authority of Singapore (MAS) has become a leading policy-architect and market-builder in the carbon credit/transition-credit space. Through initiatives like the Transition Credits Coalition, targeted grants for financial-sector participation, and a national ambition to host a carbon-credit hub, MAS is shaping how carbon credit transactions (especially transition-oriented ones) can be structured and financed. For participants (investors, project developers, intermediaries) the MAS case highlights the importance of integrating policy, finance, and integrity in building viable carbon-credit markets. One concrete example of MAS's activity in this domain is the early-coal-plant-retirement work:

- MAS and McKinsey's paper (2023) argued that retiring a coal plant ~5 years early imposes an economic gap (approx US\$70m per GW for Asia) which credits / transition finance can help to bridge.
- The pilot project example: In December 2022, ACEN Corporation, The Rockefeller Foundation and MAS announced a collaboration to develop the world's first transition credit project (coal-to-clean) for the 246 MW SLTEC plant in the Philippines. The project uses the early retirement and replacement of the coal plant to generate credits; MAS plays an enabling and advisory role.
- The idea: Use "transition credits" to help unlock finance for early retirement, create a credible revenue stream (from the credit issuance or sale) and thereby help mitigate the stranded-asset risk and business case barrier.

#### Why this is significant:

- Moves beyond "offsetting" and towards "transition enabling" – i.e., using credits to accelerate real structural change (coal-exit) not just incremental abatements.
- Highlights the role of a regulator/central bank (MAS) as convener of coalitions, standard-setter, and ecosystem builder rather than only a supervisor.
- Demonstrates the financing dimension: credits need structuring, risk modelling, investor engagement—which MAS is facilitating via grant programmes and market-building.

#### Challenges identified:

- Ensuring integrity (Are the credits real, additional, not simply business as usual?). MAS and TRACTION emphasise rigorous standards.
- Demand creation: lowering supply risk helps, but demand from buyers must be credible. MAS acknowledges more must be done.
- Capacity building: financial institutions need skills in credit structuring, verification, insurance; hence MAS's support grant.

## Appendix B - Policy References and Sources

- **UK Government, BEIS / NDA:** Nuclear Provision: Explaining the Cost of Cleaning up Britain’s Nuclear Legacy (2024).
- **National Audit Office (NAO):** The Decommissioning of the AGR Nuclear Power Stations (2022).
- **North Sea Transition Authority (NSTA):** UKCS Decommissioning Cost Estimate 2024.
- **HM Treasury & DWP:** Mansion House Compact – Productive Finance Framework (2023).
- **OECD (2025):** Sustainable Finance for Industrial Transition.

## Appendix C – UK Initiatives Supporting Infrastructure Investment through Private Assets

There have been numerous initiatives to unlock UK investment opportunities, the table below summarises these initiatives.

Initiative	Description / Lead	Example Trade or Case Study	Why It Matters for Private Assets
Sterling 20	Launched 2025 by HM Treasury, City of London Corporation, and ~20 major pension/insurance groups to mobilise UK savings into infrastructure and productive finance.	Legal & General committed £2 billion for UK regeneration and housing; Phoenix Group allocated to UK energy-transition infrastructure funds.	Creates an investor-government forum and pipeline of investable UK projects.
National Wealth Fund (formerly UK Infrastructure Bank)	Government vehicle providing equity, debt, and guarantees to crowd-in private capital for clean energy, transport, and housing.	Co-investment with Octopus Energy Generation in battery storage and with Gresham House in regional solar-and-storage assets.	De-risks early-stage projects and enables institutional investors to participate alongside the state.
UK Infrastructure 10-Year Strategy (2025)	Long-term government framework covering transport, energy, housing, digital, and water; aims for over £700 billion investment pipeline.	Macquarie Asset Management invested in National Grid Gas Transmission (£9.6 billion EV, 2022), consistent with regulated-asset model.	Provides long-term policy visibility and reduces risk premiums for private capital.
Infrastructure Pipeline (IPA)	Live database of ~780 public/private projects to attract institutional and corporate investors.	Aviva Investors used the pipeline to identify and finance student housing and regional transport projects through its Real Assets platform.	Improves deal-flow visibility and origination efficiency for institutional mandates.
Private Finance Initiative / Public-Private Partnership (PFI/PPP)	Model where private consortia design-build-operate public infrastructure under long-term contracts.	John Laing Group’s PFI portfolio includes schools, hospitals, and A19 road improvement schemes.	Demonstrates contractual, inflation-linked cashflows suitable for annuity investors.

Initiative	Description / Lead	Example Trade or Case Study	Why It Matters for Private Assets
<b>Infrastructure &amp; Projects Authority - Unlocking Private Investment Programme</b>	Cross-government coordination programme aligning £700 billion infrastructure need with private-funding capability.	Helped mobilise private co-investment into Hydrogen East and Net Zero Teesside projects.	Builds standardised frameworks and cross-departmental coordination for blended finance.
<b>Major Green &amp; Energy Infrastructure Projects - Accelerated Approvals</b>	Policy drive (2025) to streamline consenting for strategic energy, transport, and digital projects.	Ørsted's Hornsea 3 offshore wind project reached £8 billion final investment decision with UK pension debt participation.	Reduces planning uncertainty and encourages long-duration institutional capital participation.
<b>Sector Focus Initiative - Seven Sectors to Watch</b>	Government-supported effort highlighting data centres, solar, wind, battery, digital comms, hydrogen, and PPPs.	Time Investments launched UK Infrastructure Income Fund targeting solar PV, energy storage, and digital infrastructure assets.	Provides sectoral clarity and investor confidence to launch UK-focused private-asset funds.
<b>Locational Private Finance Models for Infrastructure (NAO Review)</b>	Analysis of regional PPP and local-authority models for private-sector financing.	Greater Manchester Pension Fund invested £150 million in local housing and transport projects under devolved PPP structures.	Encourages regional deployment of pension capital into productive infrastructure.
<b>UK Parliament / Commons Library Infrastructure Fact Base</b>	Independent evidence base for infrastructure policy and investment performance.	Referenced in Institution of Civil Engineers' 2025 report supporting Northern Powerhouse Rail private-finance mobilisation.	Strengthens transparency and policy legitimacy for sustained private-asset flows.

Source: UK Government, HM Treasury, Infrastructure and Projects Authority, industry reports, 2025.

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