

# Unlocking Investment to Finance the UK's Clean Energy Transition

A white paper

# Standard Life and Santander are delighted to have collaborated on this report on unlocking investment to finance the UK's clean energy transition

## Standard Life foreword

**At Standard Life we believe that transitioning to net zero will deliver better outcomes for our customers, our business and society. That's why we're targeting net zero by 2050 and acting at scale to decarbonise our operations, supply chain and investment portfolio.**

We want our actions to drive real-world change. The transition will require huge investment, and one of the most impactful things we can do as a large asset owner is invest in climate solutions and transition-aligned projects. Our long-term ambition is to invest up to £40 billion in sustainable, transition or UK productive assets, where they support good customer outcomes.

Delivering a clean energy system will enable much of the UK's wider transition to net zero and form the backbone of its future economy. It will help bring down customers' bills, strengthen the UK's energy security and boost economic growth. But delivering it requires at least £511 billion of investment between now and 2040.

Collaboration will be crucial to unlock this investment at the necessary scale and pace – which is why we are delighted to have partnered with Santander on this report on unlocking investment to finance the UK's clean energy transition.

In this report we make clear, actionable recommendations on how banks, institutional investors, project developers and Public Finance Institutions can work together to finance the UK's energy transition as efficiently and effectively as possible – ensuring finance is available to flow at scale and pace and delivers value for UK Plc.

We want the report to catalyse action, and we look forward to collaborating with all our stakeholders to scale our investment in the clean energy transition while helping our customers on their journey to and through retirement and shaping the world they retire into.



**Nuwan Goonetilleke**

Interim Group Chief Investment Officer,  
**Standard Life**

## Santander foreword

**The UK's Clean Power Mission represents a generational challenge. Delivering a cleaner, more secure and resilient energy system will require huge investment across renewables, networks, storage and emerging low-carbon technologies. Success will strengthen energy security, economic growth and resilience, while delivering long-term benefits for households, businesses and community.**

Our analysis suggests that over £500 billion of investment will be required by 2040. Yet the challenge is not simply the availability of capital. The UK benefits from deep, sophisticated financial markets and a strong track record in infrastructure investment. The more pressing issue is ensuring the right forms of capital are deployed at the right stages, with risks allocated to those best placed to manage them.

Santander has long supported the renewable energy sector worldwide, financing projects across technologies and working with developers, investors and policymakers to bring schemes to market. Our collaboration with Standard Life brings together banking and institutional investor perspectives to explore how more long-term capital can be mobilised into UK clean energy infrastructure.

The opportunity lies in bringing banks, institutional investors, project developers and public finance institutions together more effectively. Greater institutional participation could lower financing costs, expand capacity and enable more efficient recycling of capital. Approaches including credit enhancement, guarantees and blended finance can help broaden participation and support investment at scale.

Ultimately, mobilising capital efficiently is not only a financial challenge but a national imperative. By strengthening collaboration, policy stability and delivery focus, the UK can unlock the investment and innovation needed to build a cleaner, more secure and prosperous energy future.



**Andrew Wilson**

Director of Communications,  
Marketing & Responsible Banking,  
**Santander**

# Acknowledgements

**Standard Life** and **Santander** would like to thank **Baringa Partners** for conducting the research and analysis that underpins this report.

We would also like to thank all those who participated in the research and contributed to the production of this report, in particular the members of the **Association for British Insurers** and **UK Finance** who generously gave their time and expertise.

Whilst all contributors share an aspiration to unlock investment to finance the UK's clean energy transition, their involvement does not necessarily signify endorsement of the entire report and its recommendations.



## Context

**The UK's clean energy transition requires at least £511bn of investment by 2040:** The UK's Clean Power Mission is one of the most significant infrastructure investment programmes ever, with £511bn of investment needed between now and 2040. Almost a third (£137bn) is expected to come from project finance debt.

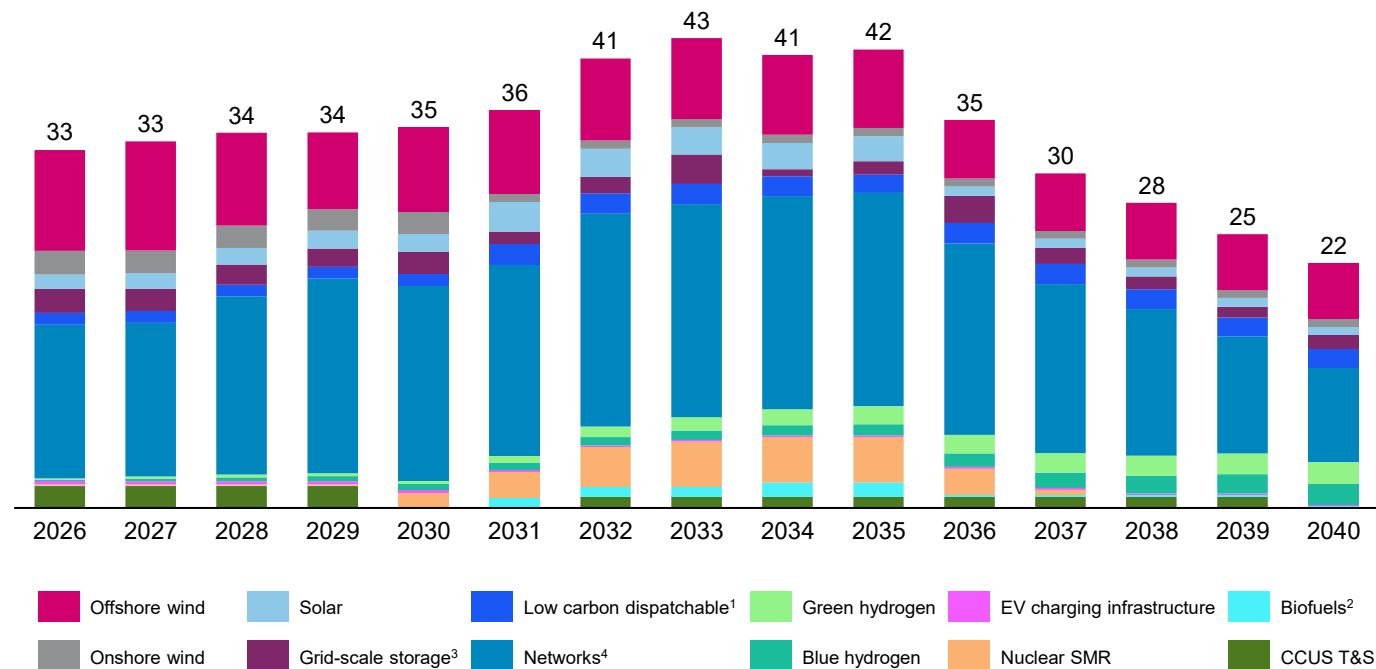
**Banks play a critical role, but future lending capacity could become constrained:** Banks currently provide around 90% of clean energy project finance debt and are critical to the financing ecosystem, particularly during construction and early operational phases where risks are highest and financing requirements are most complex. As overall financing demand increases, there may be opportunities to broaden participation from institutional investors alongside banks, helping diversify sources of capital and support continued growth in project delivery.

**Institutional investors are well placed to invest alongside banks and have a strong appetite but currently face barriers:** Insurers and pension funds can play a complementary role to bank finance given their natural appetite to invest in long-dated assets with predictable cash flows. However, their participation remains limited, with credit risk, scale, a lack of standardisation and inertia all acting as barriers to investment.

### Key barriers to scaling institutional investment:

- Credit risk:** Projects are often sub-investment grade during early stages, limiting eligibility for Matching Adjustment ('MA') portfolios and constraining insurer participation.
- Scale:** Many individual projects (<£100m) are sub-scale and not investable.
- Lack of standardisation:** Inconsistent financing approaches increase execution costs and delays deployment.
- Inertia:** Tendency towards traditional financing approaches limits the pool of capital available to project developers.

### UK clean technology investment opportunity 2026-2040 by technology (£bn)



**£511bn**

total investment  
needed by 2040

**£137bn**

of total investment will  
be project finance

**90%**

of this is currently  
provided by banks

<sup>1</sup> Low-carbon dispatchable includes gas CCS and hydrogen power <sup>2</sup>Biofuels include BECCS and biomethane. <sup>3</sup>Grid-scale storage includes short duration (1-9hrs), medium duration (12-100) and pumped storage. <sup>4</sup> Includes transmission, OFTOs, distribution and interconnection.

# Solutions

We have identified six opportunities for institutional investors to play a greater role alongside banks in financing the UK’s clean energy transition:

### Large offshore wind syndication

Institutional investors could participate in £1bn-plus offshore wind projects, where 20-year Contracts for Difference (‘CfDs’) increase tenor pressure for banks.

---

**£33bn opportunity**

### Refinancing operational renewables assets

Institutional investors could participate in post-construction refinancing once construction risk has fallen and projects achieve investment-grade ratings.

---

**£17bn opportunity**

### Greenfield financing of mid-sized renewables

Banks can provide shorter-tenor debt while institutional investors take longer-term exposure, sculpted to project cashflows.

---

**£24bn opportunity**

### Smaller renewables projects

Aggregation vehicles can combine smaller renewable assets into investable portfolios capable of attracting institutional investor capital.

---

**£6bn opportunity**

### Network infrastructure

Networks offer many of the characteristics sought by institutional investors, including regulated revenues, predictable cash flows and long asset lives.

---

**£21bn opportunity**

### Emerging technologies

As emerging technologies mature and are de-risked they could become an increasingly attractive investment opportunity for institutional investors.

---

**£19bn opportunity**

### Unlocked through five solutions



Guarantees



Blended finance



Aggregation



Standardisation



Collaboration

Enabling earlier institutional investor participation and more efficient capital allocation

### Collective impact



**£120bn**  
Financing opportunities



**£3bn**  
Potential financing savings



**£137bn**  
Bank capital recycled

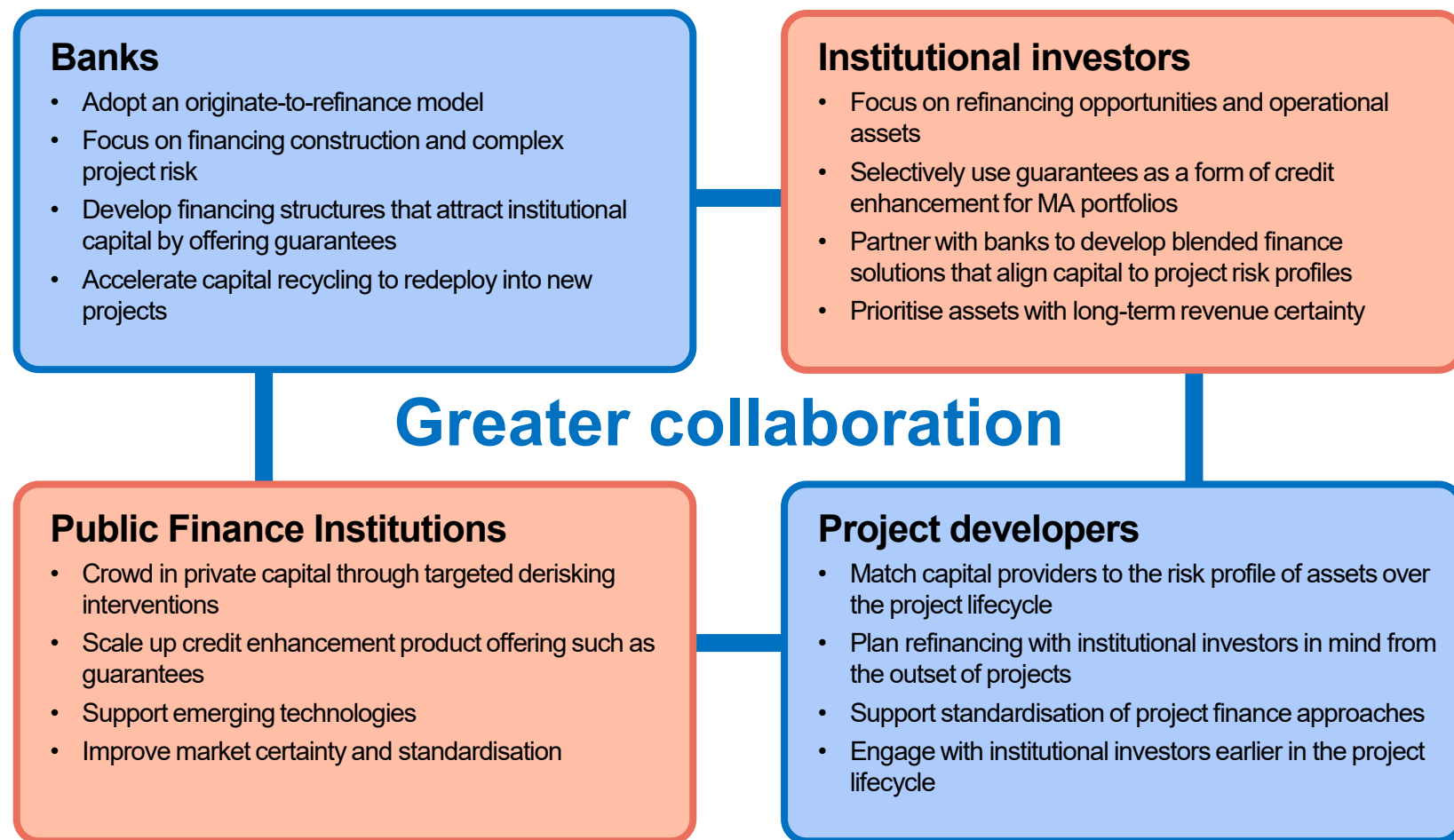
## Recommendations

Banks, institutional investors, project developers and Public Finance Institutions ('PuFIns') such as the National Wealth Fund all have critical roles in unlocking capital, improving risk allocation and supporting delivery. The analysis presented in this report demonstrates that the UK's clean energy ambitions are achievable, but only if financing structures evolve to unlock the scale of investment required.

Banks should focus on providing short- to medium-term debt, arranging fees and ancillary services; institutional investors should scale up their provision of long-term capital; developers should design projects with institutional investor financing requirements in mind from the outset; and PuFIns should act as catalytic enablers by using targeted interventions to crowd private capital into the market.

While specific recommendations differ by stakeholder, a common theme emerges throughout the research: collaboration. Ultimately this is what will allow each stakeholder to play to their strengths and enable more efficient capital allocation to deliver the UK's Clean Power Mission.

### Key recommendations by stakeholder group



# Chapters

|                                     |           |
|-------------------------------------|-----------|
| <b>01 Introduction</b>              | <b>08</b> |
| <b>02 Sizing the opportunity</b>    | <b>10</b> |
| <b>03 Assessing the barriers</b>    | <b>17</b> |
| <b>04 Identifying the solutions</b> | <b>19</b> |
| <b>05 Recommendations</b>           | <b>26</b> |
| <b>06 Conclusion</b>                | <b>29</b> |



# Introduction



Standard Life 

 Santander

# The UK's Clean Power Mission is one of the most significant infrastructure investment programmes undertaken in recent decades

**Delivering a predominantly clean power system and remaining on track for net zero by 2050 will require substantial investment across renewable generation, electricity networks, energy storage and low-carbon technologies. If done successfully it will strengthen energy security, reduce exposure to volatile fossil fuel markets, support economic growth, create skilled jobs and help deliver lower long-term energy costs.**

The UK has already demonstrated its ability to attract private capital into energy infrastructure. Stable policy frameworks and revenue support mechanisms, particularly CfDs, have helped create one of the world's most successful offshore wind markets and established the UK as a leading destination for infrastructure investment.

Similar approaches are now being extended to carbon capture utilisation and storage ('CCUS'), long-duration energy storage ('LDES') and hydrogen, demonstrating the important role Government plays in creating predictability of future revenue streams to attract long-term investment.

The UK's renewable success to-date has largely been financed through a bank-led project finance model. Banks remain critical to financing energy infrastructure, particularly during the early phases of a project's lifecycle, where risks are highest and financing is most complex.

However, future investment needs are rising and projects are increasingly supported by long-duration revenue support mechanisms. Asset lives can range from 15 to 40 years, while financing structures often involve a combination of shorter and longer-term debt solutions. As projects increasingly benefit from long-duration revenue support and capital needs grow, there is an opportunity for banks and institutional investors to work together to align financing structures more closely with project lifecycles.

Institutional investors offer a complementary source of long-term capital, with investment horizons aligned to the predictable cash flows of operational assets. However, their participation in clean energy project finance is currently limited due to a range of barriers. There is an opportunity to develop a more efficient financing ecosystem in which banks and institutional investors play complementary roles across the project lifecycle.

The objective is a sustainable financing model aligning capital with the risks each lender is best placed to manage. Banks will continue to play a critical role through origination, structuring, risk management and broader banking services. Greater institutional investor participation could broaden available capital, lower financing costs and enable banks to recycle capital into new projects.

PuFIs such as the National Wealth Fund have an important role to play in catalysing private finance investment into clean energy infrastructure. This report shows that PuFI support in the form of credit enhancement guarantees can help to bridge the gap between project risk profiles and institutional investors' investment grade requirements.

Against this backdrop, Standard Life and Santander commissioned this research to explore how the financing ecosystem can evolve to support the UK's Clean Power Mission and the wider transition to net zero. Drawing on engagement with banks, insurers, developers, advisers and PuFIs, this report examines barriers that constrain investment and assesses solutions to unlock capital at scale.

It focuses on earlier institutional participation, improved risk allocation and more efficient bank capital recycling. Achieving the UK's clean energy ambitions will depend not only on the volume of capital available, but how effectively it is deployed. By leveraging the complementary strengths of banks, institutional investors and PuFIs, the UK can unlock investment at scale, accelerate infrastructure delivery and support a cleaner, more secure and prosperous energy future.

## £511bn

total investment needed to deliver clean power by 2040

## £40bn

of investment needed per year on average

# Sizing the opportunity

Standard Life 

 Santander

# To deliver the UK's Clean Power Mission at least £511 billion of investment will need to be unlocked from across the capital spectrum

**We estimate that at least £511 billion investment, around £40 billion a year on average, will be needed between now and 2040 across 12 clean energy technologies. Investment is expected to peak in 2032–2035 to hit renewables deployment targets and bring less mature technologies to final investment decision, before falling back as fewer assets enter construction.**

The scale of investment required reflects both the continued expansion of mature renewables and the emergence of newer technologies that will play an increasingly important role in the future energy system. The size of the investment opportunity is our best estimate but we note the exact profile and timing of investment may change over time.

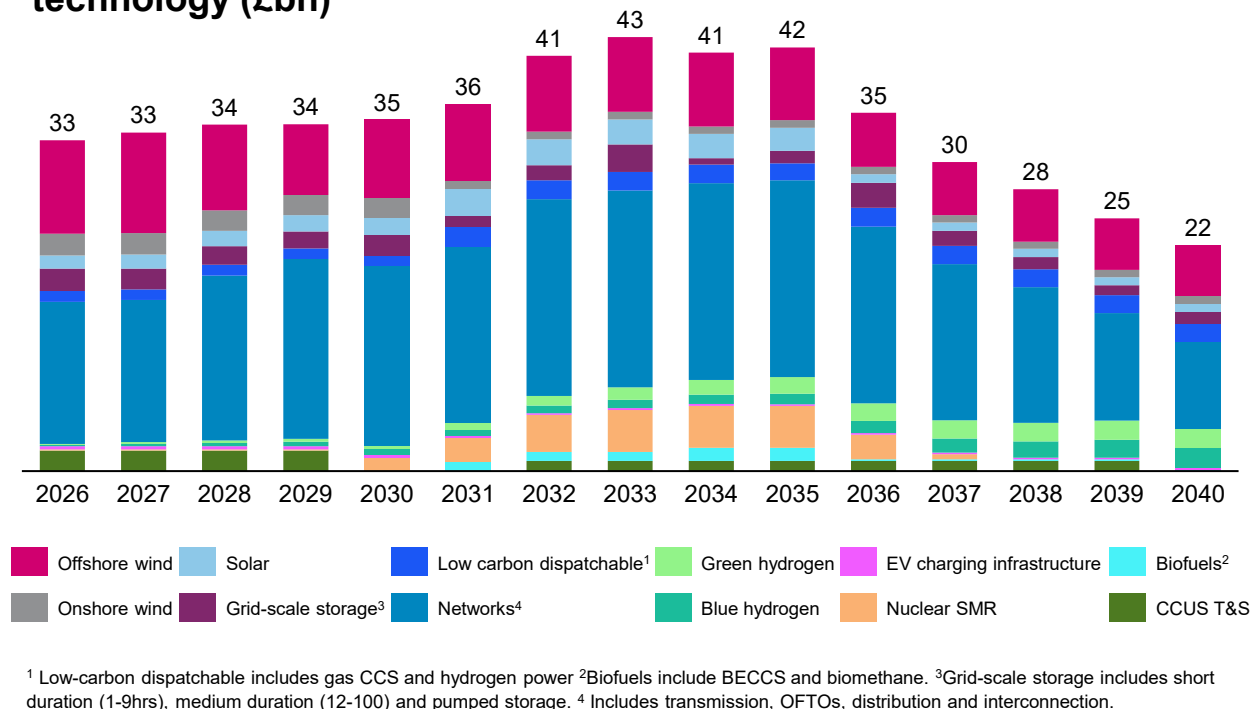
Renewable power generation and storage account for much of the early investment need: offshore wind investment is expected to peak in 2030, in line with Climate Change Committee ('CCC') 7<sup>th</sup> Carbon Budget targets of 43–50 GW, while onshore wind rises towards 27–29 GW by the same date. Solar capacity grows steadily before accelerating between 2031 and 2035 to reach 70 GW. Battery storage also scales rapidly, reaching 23–27 GW by 2030, based on NESO Future Energy Scenarios 2025.

Electric vehicle charging infrastructure will require rapid installation growth of around 40% per annum to reach the Government's target of 300,000 EV chargers by 2030. Biofuels are also expected to expand significantly, primarily driven by Drax's plan to retrofit two biomass units with Carbon Capture and Storage ('CCS') by 2035.

Nuclear Small Modular Reactor ('SMR'), Carbon Capture Utilisation and Storage ('CCUS') and hydrogen scale later: nuclear SMR investment is expected to peak in 2035 during the phased construction of seven reactors under the UK SMR Programme. In parallel, the government aims to develop four CCUS clusters with 20–30 MtCO<sub>2</sub> of capacity by 2035, following a credible sequencing pathway through to 2040; and the UK is targeting 10 GW of low-carbon dispatchable (gas CCS and hydrogen) by 2030, with stronger growth later in the decade.

Achieving clean power depends on expanding the grid and cutting connection and delivery times: transmission investment is expected to peak during 2030–35, while distribution investment assumes a 30% increase from 2028 under Ofgem's price control framework. Interconnector estimates are based on the CCC's 7<sup>th</sup> Carbon Budget targets and offshore transmission owner ('OFTO') investment is based on offshore wind roll out and historical project costs.

**UK clean technology investment opportunity 2026-2040 by technology (£bn)**



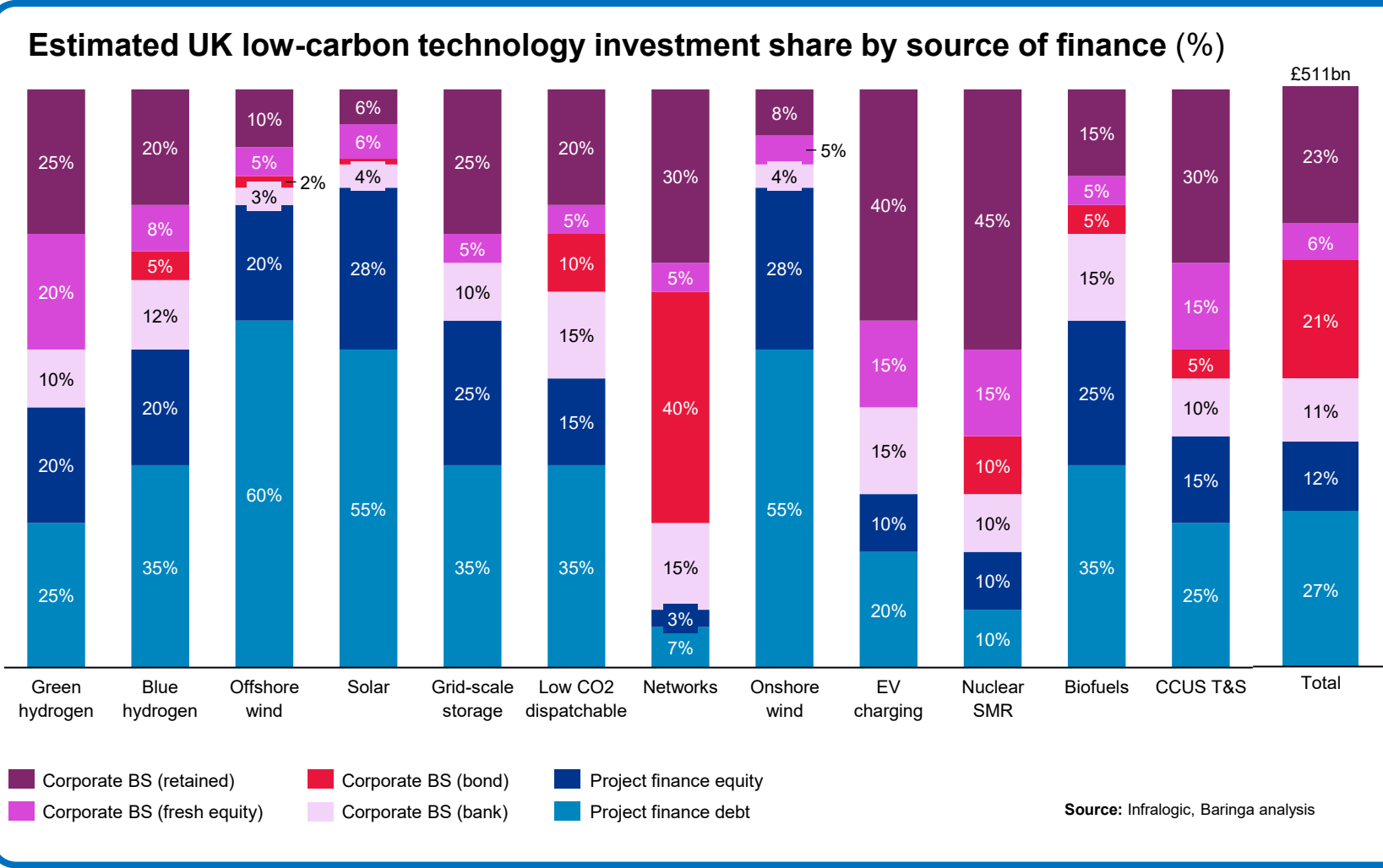
Most of the financing for clean energy is expected to come from project finance debt, presenting a significant investment opportunity for banks and institutional investors

Assuming future financing approaches follow existing trends, project finance debt is expected to remain the primary source of finance for clean energy infrastructure projects, particularly outside of networks, accounting for up to £137bn (27%) of the total financing needed to deliver a clean energy system in the UK by 2040.

Demand for asset-level financing for capital intensive, contracted or semi-contracted infrastructure is primarily driven by the need to meet ambitious renewables deployment targets between 2030-35. Project finance debt particularly dominates the financing of offshore wind (60%), onshore wind (55%) and solar (55%). This presents a significant investment opportunity for banks and institutional investors.

Given that high leverage is preferred for more mature assets, equity plays a subordinate role to debt, with project finance equity and fresh equity driving 12% and 6% of total investment. This will primarily be used to fill construction risk and merchant exposure gaps where debt is constrained.

Investment from all sources of finance is projected to peak in 2032-35 after a short to medium-term push to meet renewables deployment targets and financial investment decisions for immature technologies such as nuclear SMR and CCUS.



# Banks currently provide the majority of debt finance, however there is an opportunity to unlock complimentary sources of capital

**Banks currently dominate the financing of clean energy infrastructure in the UK, providing more than 90% of project finance debt. The combination of proven technologies, established revenue support mechanisms and deep banking expertise has enabled the UK to attract significant volumes of private capital into clean energy infrastructure.**

With the exception of network infrastructure, many clean energy projects are considered sub-investment grade during the early stages of development and operation. This can be due to construction, demand, merchant, revenue or counterparty risks. The sub-investment grade status of these projects means that many projects sit outside of institutional investors' risk appetite and remain heavily reliant on bank financing, unless some form of credit enhancement is used such as guarantees.

Banks' expertise in financing construction, supporting early operational phases and providing wider ancillary facilities and banking services throughout the life of projects means that they will continue to play a leading role in financing and delivering new infrastructure projects.

Banks typically provide funding over shorter time horizons, often providing lending with tenors of up to around ten years. As more projects secure long-duration revenue support and annual financing requirements continue to increase, pressure may grow on banks to extend beyond their natural lending horizons or retain exposures for longer periods than is optimal. This creates three related challenges:

1. A growing reliance on refinancing events
2. Increasing capital requirements reinforce the value of attracting complementary pools of long-term capital alongside bank financing
3. A potential mismatch between project characteristics and the capital providers best suited to hold them over the long-term

Banks will remain central to financing construction, providing ancillary facilities and supporting projects throughout their lifecycle. However, increasing capital requirements and a growing pressure on bank balance sheets creates a strong case for greater institutional participation alongside banks.

## Project finance characteristics of UK low carbon technologies

| Technology         | % bank financed                                        | Asset life | Observed bank tenor <sup>1</sup> |
|--------------------|--------------------------------------------------------|------------|----------------------------------|
| Offshore wind      | 99%                                                    | 30 yrs     | Short, V. Long (5 – 20 yrs)      |
| Onshore wind       | 95%                                                    | 30 yrs     | Short (5 – 10 yrs )              |
| Solar              | 89%                                                    | 30 yrs     | Short (5 – 10 yrs)               |
| Grid-scale storage | 94%                                                    | 15 yrs     | Short (4 – 10 yrs)               |
| EV charging        | 81%                                                    | 15 yrs     | Short (5 – 10 yrs)               |
| Biofuels           | 100%                                                   | 20 yrs     | Long (12 – 18 yrs)               |
| CCUS T&S           | 100%                                                   | 25 yrs     | Long (10 – 20 yrs)               |
| Networks           | Principally financed through corporate bonds           |            |                                  |
| Green H2           | Immature technology – project finance not yet observed |            |                                  |
| Nuclear SMR        |                                                        |            |                                  |

<sup>1</sup> Observed tenors based on information from Infralogic and practitioner insight.

# Institutional investors have a strong appetite for clean power projects, but currently have limited access to investment opportunities

**The UK pensions and insurance sectors collectively manage £3.1 trillion in assets<sup>1</sup> and have the potential to play a significant role in providing the capital needed to finance clean energy infrastructure in the UK.**

Pension funds and insurers have large Defined Benefit ('DB') portfolios that require long-term, stable cashflows from their investments in order to match their liabilities. This typically means using debt instruments to invest in long-dated, investment grade infrastructure assets with highly predictable cashflows. Institutional investors are therefore well-suited to providing the finance for clean power assets, such as renewables with government-backed revenues.

In addition, institutional investors are increasingly looking to allocate their Defined Contribution ('DC') funds to private markets in support of seeking growth opportunities and better returns for customers. Through Government-backed initiatives such as the Mansion House Accord, institutional investors are being encouraged to invest more of their DC funds into private markets to support growth sectors in the UK such as clean energy<sup>2</sup>.

Despite a strong appetite for investing in clean power assets, institutional investors are struggling to access investment opportunities. This is due to a variety of factors but often because projects do not meet institutional investors' ticket size requirements (minimum £40m) and a tendency towards established project finance approaches that are often more readily suited to bank participation.

However, the primary barrier for pension funds and insurers in the UK is that investment in long-term projects using DB portfolios needs to happen in accordance with strict regulatory frameworks such as Solvency UK whereby projects must meet the MA eligibility criteria<sup>3</sup>.

Under the current regulation, many clean power projects are considered sub-investment grade due to higher construction and operational risk and revenue uncertainty. This includes assets where returns are expected to be highly predictable but lack an empirical record.



## The Matching Adjustment criteria under Solvency UK

To protect policyholders, insurers must hold capital against liabilities and assets that meet the MA criteria under the PRA's Solvency UK regime. Eligible assets must deliver highly predictable payments and typically be investment grade. This allows insurers to increase discount rates on predictable liabilities when backed by cashflow-matching. This supports long-term debt investment but favours lower-risk, investment-grade projects.



## The Mansion House Accord could unlock £50bn

The Mansion House Accord, launched on 13 May 2025, is signed by 17 major pension providers. Under the Accord, providers pledge to invest at least 10% of their DC default funds in private assets by 2030. This initiative, supported by the UK Government, aims to stimulate economic growth by channelling pension savings into infrastructure, clean energy and innovation.

<sup>1</sup> Pensions Policy Institute (2024) <sup>2</sup> HM Treasury (2025) <sup>3</sup> Bank of England (2025)

# There are six opportunity areas where greater collaboration between banks, institutional investors, project developers and Public Finance Institutions could unlock capital at scale

We have identified six opportunity areas where institutional investors could play a greater role in financing clean energy infrastructure projects alongside banks. These opportunities are a subset of the **£137bn** of the project finance debt requirement by 2040 identified on page 12.

The six areas represent a £120bn opportunity, with a clear role for banks, institutional investors and PuFIs. These projects could be financed through a blend of institutional investor capital, bank finance and targeted public finance support. We assume that institutional investors play an increasing role in financing projects, with banks continuing to play a critical role in financing construction, refinancing and providing ancillary facilities.

The macro-level investment opportunities were identified through a combination of interviews with stakeholders across industry and research into the financing need across the 12 clean energy technologies – shown on page 11. A high-level quantitative analysis was completed for each technology to determine the current principal revenue models (e.g. CfD, Regulated Asset Base), sources of finance, asset lives, tenors and average project sizes.

### Join syndicated lending for large offshore wind projects

**£33bn** opportunity

Institutional investors could participate alongside banks in £1bn-plus offshore wind projects, complementing existing bank lending and broadening the pool of long-term capital available. Current deals rely on strong sponsors or 10-plus lenders; the priority is making large transactions institutional-ready, acknowledging the limited scope to influence structure or pricing.

### Refinancing short-tenor renewables loans

**£17bn** opportunity

Institutional investors could participate in post-construction refinancing once construction risk has fallen and projects achieve investment-grade ratings. Institutions can provide lower-cost, longer-tenor finance, freeing up bank balance sheets to recycle capital into new investments multiple times.

### Greenfield financing for mid-sized renewables

**£24bn** opportunity

Credit enhancement and standardised blended finance could be used to make mid-sized onshore wind and large solar projects bankable for institutional investors, for example for 20-year CfDs where banks can provide shorter-tenor debt while institutional investors take longer-term exposure, sculpted to project cashflows.

### Smaller renewables projects

**£6bn** opportunity

Smaller renewables projects could be aggregated into investable portfolios via infrastructure funds, corporates or platforms to reach investable scale. Aggregation adds costs, including sourcing and portfolio management, but can create efficiencies in procurement, risk management and operations.

### Transmission, distribution and interconnectors infrastructure

**£21bn** opportunity

Institutional investor capital could be mobilised into onshore networks, offshore transmission owners ('OFTOs') and interconnectors. Network owners may need additional capital routes, particularly for carved-out projects with stable, regulated or contracted cashflows.

### Emerging technology

**£19bn** opportunity

Hydrogen, nuclear and CCUS should be treated as refinancing opportunities, not primary institutional finance targets, while technology and construction risks remain high. Once large £1bn-plus projects are built and operational, institutional investors can provide long-term capital against de-risked cashflows.

# Greater institutional investor participation represents a £120bn investment opportunity, which could deliver £3bn in potential financing savings and enable banks to recycle £137bn of their capital

Our modelling assumes greater institutional investor participation in projects as bank balance sheets approach capacity. A wider pool of capital should therefore tighten the cost of finance at the margin.

Over time, more institutions joining could further tighten spreads or enable institution-to-institution refinancing, thereby bringing in more institutions with lower risk appetite. This enable banks to recycle more of their capital for deployment into new projects and leads to cost of finance savings for project developers – even after factoring in the cost of using guarantees as a form of credit enhancement for insurers.

The opportunity is sufficiently large that there is a role for everyone across the ecosystem. However, there are a number of barriers that currently prevent institutional investors from participating in projects.

|                                                               | Investment opportunity | Cost of finance saving                                                           | Cost of finance saving | Bank capital recycling |
|---------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------|------------------------|------------------------|
| Join syndicated lending for large offshore wind projects      | c.£33bn                | 10 bps                                                                           | £346m                  | £33bn                  |
| Refinancing short-tenor renewables loans                      | c.£17bn                | 50 bps                                                                           | £680m                  | £34bn                  |
| Greenfield financing for mid-sized renewables                 | c.£24bn                | 75 bps + 2.0% refinancing cost (all-in) less 50 bps credit guarantee for 2 years | £1,782m                | £24bn                  |
| Smaller renewables projects                                   | c.£6bn                 | up to 50 bps                                                                     | ~£200m                 | £6bn                   |
| Transmission, distribution and interconnectors infrastructure | c.£21bn                | 0 bps                                                                            | N/A                    | £21bn                  |
| Emerging technologies                                         | c.£19bn                | 0 bps                                                                            | N/A                    | £19bn                  |
| <b>Total</b>                                                  | <b>c.£120bn</b>        |                                                                                  | <b>c.£3bn</b>          | <b>c.£137bn</b>        |

**Collective impact:**

**£120bn**

of financing opportunities for greater institutional investor participation

**£3bn**

in potential financing savings over project lifetimes

**£137bn**

in bank capital recycling opportunities

# Assessing the barriers



Standard Life 

 Santander

## There are four key barriers to scaling the finance needed to meet the UK's Clean Power Mission

Through engagement with actors across the finance ecosystem, including institutional investors, banks, project developers and PuFIns, we identified four structural barriers to scaling clean energy finance in the UK.

These are **credit risk** (project credit rating), **scale** (project ticket size), **lack of standardisation** (in financing approaches) and industry **inertia** (a tendency towards historical financing approaches that often exclude institutional investors).

Together these barriers are preventing institutional investors from accessing investment opportunities which in turn means that banks cannot easily recycle capital to redeploy into financing the construction of new projects where their risk-appetite is better suited. This misalignment of capital across project lifecycles could lead to potentially higher financing costs.

PuFIns also have an important role to play in scaling the finance needed. Targeted public finance support for projects can be effective at de-risking projects and improving financing efficiency. This support could be scaled up to crowd in greater institutional investment into projects.

### 1. Credit risk

The majority of clean energy infrastructure projects are considered sub-investment grade due to perceived construction risk, operational risk and revenue uncertainty. This limits the ability of institutional investors with MA-portfolios to participate in clean energy infrastructure projects as they often do not meet MA eligibility criteria.

### 2. Scale

Many clean energy infrastructure projects are sub-scale (<£100m) and do not meet institutional investor ticket sizes, such as small-scale solar projects and biofuels. In order to access wider pools of capital these fragmented projects require aggregation into investible portfolios.

### 3. Lack of standardisation

A lack of a standardisation in financing approaches and contracting leads to increase execution costs and delays capital deployment. To achieve investment in projects at scale, common contractual arrangements, data standards and financing structures are required across the market.

### 4. Inertia

A tendency towards traditional financing approaches limits the pool of capital that project developers could otherwise access. A lack of collaboration between banks, institutional investors, developers and PuFIns means that there is a gap in understanding the investment mandates of institutional investors, in particular requirements for insurers' MA portfolios.



# Identifying the solutions



Standard Life

Santander

# We have identified five solutions which could help to address barriers and unlock opportunities

Through this research we have identified five practical solutions which could address the structural barriers to scaling clean energy finance by improving project bankability, reduce financing costs and facilitate a more efficient allocation of risk across the project lifecycle.

The solutions identified include targeted **guarantees** with MA-compatible features, **aggregation** vehicles, the **standardisation of financing structures**, **blended finance vehicles** and greater **collaboration** between banks, institutional investors, project developers and PuFIns.

Implementing these solutions can help unlock the investment opportunities identified on page 15. The following pages set out each solution in more detail, including the value it can create for banks, institutional investors, project developers and UK plc.

### Solutions

**1. Guarantees (MA-eligible)** are designed to improve the credit rating of projects, helping to make assets eligible for insurers' MA portfolios. Greater institutional investor participation enables earlier capital recycling for banks and lowers borrowing costs for developers.

**2. Blended finance** solutions match different sources of capital with asset risk profiles to ensure that cash flows are aligned with liabilities. This allows banks to reduce long-term exposures and lowers the weighted cost of capital and reduces refinancing risk.

**3. Aggregation** vehicles pool smaller assets into scalable portfolios to reach institutional investor ticket size. This enables smaller assets to reach scale and access capital markets.

**4. Standardisation** by designing repeatable financing structures that utilise institutional investor capital can reduce execution complexity and speed up capital deployment.

**5. Collaboration** between banks, institutional investors, project developers and Public Finance Institutions to structure project finance in a way that draws on the strengths of all actors will ensure capital is deployed more efficiently across the system.

### Barriers addressed

**Credit risk**

**Inertia**

**Lack of standardisation**

**Scale**

**Credit risk**

**Inertia**

**Lack of standardisation**

**Scale**

**Credit risk**

**Inertia**

**Lack of standardisation**

**Scale**

**Credit risk**

**Inertia**

**Lack of standardisation**

**Scale**

**Credit risk**

**Inertia**

**Lack of standardisation**

**Scale**



### Solution 1: Guarantees (MA-eligible)

#### Description

- Investment in early-stage energy infrastructure projects via insurers' MA-portfolios is currently constrained due to projects often being sub-investment grade.
- As a result, banks hold risk for longer and balance-sheet capacity is constrained. This leads to higher system-wide financing/borrowing costs and slower deployment, despite available public finance and strong insurer appetite.
- Targeted credit enhancement guarantees, provided by banks or PuFIns, can be used to de-risk projects, supporting earlier take-out by institutional investors and freeing up bank capital for new lending.
- Credit enhancement guarantees should be designed with MA-compatible features (e.g. clear payout rules, predictable cashflows, long-term certainty) so that insurers can use them for MA portfolios.
- PuFIns should prioritise offering guarantees over grants for mature clean-power projects to crowd in private capital.

#### Value for stakeholders

##### Banks

Earlier refinancing lets banks recycle capital into new construction and early-operational projects, easing balance-sheet constraints on infrastructure delivery.

##### Institutional investors

Guarantees can improve credit quality, downside protection and cash-flow certainty, helping assets better align with long-term liability profiles and MA portfolios.

##### Project developers

A broader capital pool can increase competition, reduce refinancing risk and lower financing costs across the asset lifecycle, making more projects bankable.

##### UK plc

Additional, targeted and transparently priced guarantees can crowd in private capital while limiting fiscal exposure — supporting delivery, resilience and better value for consumers and taxpayers.

#### Barriers addressed

**Credit risk**

**Lack of standardisation**

**Inertia**

**Scale**

#### Opportunities unlocked

**Join syndicated lending for large offshore wind projects**

**Refinancing short-tenor renewables loans**

**Greenfield financing for mid-sized renewables**

**Smaller renewable projects**

**Transmission, distribution and interconnectors infrastructure**

**Emerging technologies**

### **Solution 2: Blended finance**

#### Description

- Blended finance combines bank lending, institutional capital and targeted public finance into a single structure that allocates risk to the investors best placed to manage it.
- Used well, it can provide cost-efficient, long-term financing by matching each source of capital to the project's risk profile and maturity over its lifecycle.
- This is particularly relevant for assets with stable or indexed revenues, such as projects supported by CfDs, where debt service can be structured around predictable cash flows.
- Banks can provide shorter-tenor construction or early-operational finance, while institutional investors provide longer-dated capital once risks are better understood.
- PuFIs can participate where additionality is clear, including through guarantees, subordinated debt or first-loss protection, provided support is transparently priced and on terms that crowd in, rather than displace, private capital.

#### Value for stakeholders

##### Banks

Blended structures allow banks to shorten exposure, recycle capital into new projects and retain roles in origination, arranging, ancillary services and relationship banking.

##### Institutional investors

Institutional investors gain access to longer-maturity assets with more stable risk profiles, supported by bank origination expertise and, where needed, targeted public risk mitigation.

##### Project developers

A broader and more resilient capital structure can reduce refinancing risk, lower the weighted average cost of capital and improve the bankability of projects with long-term revenue visibility.

##### UK plc

By mobilising private capital at scale, well-designed blended finance can accelerate infrastructure delivery while limiting public balance sheet exposure and supporting better value for consumers and taxpayers.

#### Barriers addressed

**Credit risk**

**Lack of standardisation**

**Inertia**

**Scale**

#### Opportunities unlocked

**Join syndicated lending for large offshore wind projects**

**Refinancing short-tenor renewables loans**

**Greenfield financing for mid-sized renewables**

**Smaller renewable projects**

**Transmission, distribution and interconnectors infrastructure**

**Emerging technologies**



### Solution 3: Aggregation

#### Description

- Many renewable and distributed energy assets — including solar PV, battery storage, biofuels and biomethane — are individually too small to meet institutional investors' minimum ticket sizes.
- Aggregation addresses this by pooling sub-scale assets into larger, diversified portfolios with standardised contracts, operating models and financing structures.
- Scale can be achieved through corporate platforms, portfolio companies or holdco structures that use balance-sheet capacity, bank debt, private equity and, where sufficiently mature, capital markets finance. Specialist infrastructure funds can also aggregate assets directly, with project- or operating-level debt typically used to preserve tax efficiency and align financing with asset-level cash flows.
- Successful aggregation depends on disciplined underwriting, consistent documentation, robust data, active asset management and clear governance across the portfolio.

#### Value for stakeholders

##### Banks

Aggregation diversifies exposure across multiple assets, counterparties and locations, reducing idiosyncratic project risk and creating larger, more financeable portfolios.

##### Institutional investors

Institutional investors gain access to scaled portfolios of smaller assets that would otherwise be uneconomical or too small to hold directly.

##### Project developers

Aggregation provides clearer exit routes for smaller developers, supports capital recycling and can reduce financing frictions by standardising documentation and processes.

##### UK plc

Aggregation can accelerate deployment of smaller-scale assets that are essential to a flexible, decentralised energy system, supporting regional investment, resilience and system efficiency.

#### Barriers addressed

**Credit risk**

**Lack of standardisation**

**Inertia**

**Scale**

#### Opportunities unlocked

**Join syndicated lending for large offshore wind projects**

**Refinancing short-tenor renewables loans**

**Greenfield financing for mid-sized renewables**

**Smaller renewable projects**

**Transmission, distribution and interconnectors infrastructure**

**Emerging technologies**



# Solution 4: Standardisation

## Description

- Project finance remains highly bespoke, limiting price transparency, slowing execution and increasing transaction costs for developers, lenders and long-term investors.
- Where possible, greater standardisation of term sheets, eligibility criteria, covenant packages, reporting requirements and due diligence processes would improve comparability without eliminating necessary project-specific risk assessment.
- A prototype blended-finance loan structure for long-dated CfD-backed projects could help establish common market expectations on tenor, security, cash-flow waterfalls, refinancing mechanics and investor protections.
- Regulators, PuFIs and market participants could support adoption by identifying simplification measures that improve bankability while maintaining robust underwriting and consumer value.

## Value for stakeholders

### Banks

Standardised documentation and risk metrics can make loan portfolios easier to originate, compare, distribute and refinance, supporting capital recycling and secondary market activity.

### Institutional investors

Greater comparability across projects can reduce diligence friction, improve pricing confidence and help institutional investors deploy capital at scale within defined credit and regulatory parameters.

### Project developers

Clearer financing processes and more familiar documentation can shorten execution timelines, increase lender competition and support tighter pricing for bankable projects.

### UK plc

Standardisation can broaden the pool of bankable projects and mobilise institutional capital more efficiently, supporting delivery of clean infrastructure and wider government targets.

## Barriers addressed

Credit risk

Lack of standardisation

Inertia

Scale

## Opportunities unlocked

Join syndicated lending for large offshore wind projects

Refinancing short-tenor renewables loans

Greenfield financing for mid-sized renewables

Smaller renewable projects

Transmission, distribution and interconnectors infrastructure

Emerging technologies



# Solution 5: Collaboration

## Description

- Industry inertia can constrain institutional investment as much as project-level risk. Developers tend to default to familiar bank lenders, banks may not always identify where long-term institutional capital can add value, and institutional investors may lack early visibility of investable deal flow.
- Structured engagement between developers, banks, institutional investors and PuFIs can improve market coordination at relatively low cost, helping each participant deploy its comparative strengths across the project lifecycle.
- Deeper bank–institutional investor relationships can support earlier investor engagement, clearer refinancing pathways and practical demonstrator transactions, including prototype blended finance structures for assets with long-term revenue visibility.
- Effective collaboration should focus on repeatable transaction models, shared risk assessment, transparent pipeline development and lessons learned from early projects.

## Value for stakeholders

### Banks

Collaboration allows banks to continue focussing on origination, arranging, syndication, risk management, ancillary services and project financing while creating additional pathways for long-term capital participation.

### Institutional investors

Institutional investors gain earlier access to a broader pipeline of opportunities, supported by bank origination expertise, market intelligence and clearer visibility of future refinancing needs.

### Project developers

Developers can access a wider pool of financing capacity and specialist structuring expertise, improving execution certainty and supporting more competitive financing outcomes.

### UK plc

Better coordination across the financing ecosystem can mobilise private capital more efficiently, reduce avoidable financing frictions and support lower whole-system costs for consumers over time.

## Barriers addressed

**Credit risk**

**Lack of standardisation**

**Inertia**

**Scale**

## Opportunities unlocked

**Join syndicated lending for large offshore wind projects**

**Refinancing short-tenor renewables loans**

**Greenfield financing for mid-sized renewables**

**Smaller renewable projects**

**Transmission, distribution and interconnectors infrastructure**

**Emerging technologies**

# Recommendations

# Institutional investors, banks, project developers and Public Finance Institutions each have a critical role to play in unlocking capital to finance the UK's energy transition

**Institutional Investors** are well placed to provide long-term capital for operational infrastructure assets and have a significant opportunity to expand their participation across the clean energy sector.

### 1. Use guarantees as a form of credit enhancement

- Use credit enhancement products to bring projects up to investment grade earlier in the project lifecycle, bridging the gap between project risk and MA-eligibility criteria for insurers.

### 2. Focus on refinancing and operational assets

- Enter projects where construction risk has been reduced and asset cash flows are more visible.

### 3. Support standardisation

- Scale will depend on repeatable structures, which means investors should push for common underwriting frameworks, data standards and documentation across project types.

### 4. Partner with banks across the project lifecycle

- Identify opportunities to partner with banks during early phases of project financing through co-lending, refinancing or risk-sharing structures.

### 5. Prioritise assets with long-term revenue certainty

- Give priority to opportunities supported by durable frameworks and long-dated contracted revenues, because policy certainty is a recurring determinant of the ability to invest in projects.

**Banks** will remain the primary providers of early-stage finance, ancillary facilities and complex project financing solutions and should focus on originating and managing construction risk and to support a larger volume of projects through more effective recycling of capital.

### 1. Adopt an originate-to-refinance model

- Structure financing with a clear pathway for institutional participation and refinancing once construction risks have reduced.
- Engage institutional investors early in project financing discussions.

### 2. Focus on construction and complex project risk

- Prioritise construction and complex financing requirements where banks create the greatest value.
- Reduce long-term exposure to operational assets where refinancing opportunities exist.

### 3. Develop financing structures that attract institutional investor capital

- Support the development of blended finance structures and credit enhancement products that enable institutional investor participation.
- Standardise documentation and financing structures for mid-market technologies such as solar, onshore wind and battery storage.

### 4. Accelerate capital recycling

- Explore refinancing platforms, warehouse structures and risk-transfer solutions that improve balance sheet efficiency and support new lending.

# Institutional investors, banks, project developers and Public Finance Institutions each have a critical role to play in unlocking capital to finance the UK's energy transition

**Project developers** play a critical role in ensuring projects are structured in a way that attracts capital efficiently throughout the project lifecycle.

### 1. Design projects to access a wider pool of capital

- Consider financing requirements alongside technical design from the earliest stages of development.
- Prioritise revenue certainty and credit quality wherever possible.

### 2. Plan refinancing from the outset

- Build clear pathways for institutional participation and refinancing into project structures at financial close.

### 3. Standardise project structures

- Standardise documentation such as term sheets, financing approaches and contractual arrangements across project portfolios to improve scalability and reduce transaction costs.

### 4. Engage capital providers earlier

- Foster early collaboration with banks, institutional investors and PuFIs to ensure financing solutions are aligned with project requirements.
- Match capital providers to the risk profile of assets over the project lifecycle to ensure access to lowest cost of capital.

**Public Finance Institutions** have an important role to play in addressing market failures and crowding private capital into areas where risks remain difficult for commercial investors to absorb.

### 1. Crowd in private capital

- Focus support on mechanisms that mobilise private capital rather than replace it.
- Target interventions where relatively modest support can unlock significant private investment.

### 2. Scale up credit enhancement guarantee offering

- Develop repeatable guarantee structures that address specific risks and improve project credit quality.
- Ensure products are designed to support long-term institutional investment where appropriate.

### 3. Support emerging technologies

- Use blended finance and targeted risk-sharing mechanisms to support technologies that remain outside mainstream institutional investment criteria, including hydrogen, CCUS and other first-of-a-kind projects.

### 4. Improve market certainty and standardisation

- Promote standardisation of data, documentation and financing structures across the market.
- Continue efforts to improve policy certainty and project pipeline visibility.

# Conclusion



# Greater collaboration between institutional investors, banks, Public Finance Institutions and project developers can unlock the investment needed to finance the UK's clean energy transition

**The UK's clean energy ambitions will require significant investment over the coming decades. However, the challenge is not a lack of market-wide capital. The UK benefits from deep capital markets, sophisticated financial institutions and substantial pools of long-term investment capital. The challenge is ensuring that capital is allocated efficiently and matched to the risks it is best placed to manage.**

This report demonstrates that banks and institutional investors should be viewed as complementary participants within the same financing ecosystem. Banks are particularly well placed to finance construction risk, support projects through early operational phases and provide ancillary facilities and wider banking services throughout the asset lifecycle. Institutional investors, meanwhile, are naturally suited to long-duration infrastructure assets supported by predictable cash flows and long-term revenue visibility.

A key barrier remains the large proportion of projects that fall below investment-grade thresholds. While many clean energy projects possess strong long-term fundamentals, construction risk, technology risk and revenue uncertainty continue to limit institutional investor participation.

Improving project credit quality and creating investable structures is therefore likely to have a greater impact on mobilising institutional capital than simply increasing the volume of available funding.

The analysis suggests that credit enhancement guarantees and blended finance structures represent some of the most promising solutions to these challenges. By improving project bankability and supporting greater institutional investor participation alongside banks, these mechanisms can help create a more resilient financing ecosystem, expand overall financing capacity and enable banks to support a larger volume of projects. Government's role is not to replace private capital, but to create the conditions that allow it to flow at scale through targeted interventions that crowd private investment into strategic infrastructure.

Greater institutional investor participation has the potential to unlock approximately £120 billion of investment opportunities, generate around £3 billion of financing cost savings and enable more than £137 billion of capital recycling opportunities for banks. These benefits would strengthen the resilience of the financing ecosystem, broaden the pool of available capital and support a greater volume of infrastructure investment over time.

Ultimately, achieving a clean power system is a challenge of aligning capital, risk and delivery. Success will depend on banks, institutional investors, project developers and PuFIs working together to create financing structures that allow each participant to play to their respective strengths. No single stakeholder can deliver the clean energy transition alone, which is why greater collaboration is identified as a key solution.

Getting this right has implications far beyond the finance sector. Mobilising capital efficiently will support the deployment of the renewable generation, networks, storage and emerging technologies needed to strengthen energy security, improve economic resilience and support long-term growth. It will help create the infrastructure that underpins a more competitive economy, supports businesses and communities across the UK and reduces exposure to future energy shocks.

The UK has the capital, expertise and policy foundations required to succeed. The challenge now is ensuring that these strengths are brought together effectively. If achieved, the prize is substantial: a more resilient financing ecosystem, accelerated infrastructure delivery and a cleaner, more secure and more prosperous future.

**Standard Life**



**Santander**

# Unlocking Investment to Finance the UK's Energy Transition

September 2026

[www.standardlife.co.uk](http://www.standardlife.co.uk)

Phoenix Life Limited, trading as Standard Life, is registered in England and Wales (1016269) at 10 Brindleyplace, Birmingham, B1 2JB.

Phoenix Life Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority.

© 2026 Phoenix Group Management Services Limited. All rights reserved.

