

Financing a rooftop energy revolution

Policy briefing | Chaitanya Kumar and Jesse Griffiths | July 2026

Executive summary

The UK faces a sustained cost of living crisis, with energy bills consistently among the highest in advanced economies. High exposure to volatile international gas markets and underinvestment in domestic energy infrastructure have left households and businesses vulnerable to rising costs. Rooftop solar, particularly when paired with battery storage, offers a practical and rapid solution. Unlike large-scale infrastructure, rooftop solar panels with batteries can be installed quickly, connect directly to existing networks and help relieve pressure on the grid by using stored power during peak periods.

The challenge is not technological but financial. Rooftop solar and batteries require upfront investment, while financing costs shape affordability, payback periods and the pace of deployment. These barriers affect government, businesses and households alike, but fall most heavily on households that stand to benefit most from lower bills but face the greatest borrowing constraints.

This paper argues that the UK already possesses a proven mechanism capable of addressing this challenge: preferential or dual interest rate facilities operated by the Bank of England. International experience demonstrates how central banks can provide lower-cost funding to lenders under clear conditions, allowing cheaper finance to be directed toward strategic public policy goals.

Detailed modelling undertaken by the New Economics Foundation and Finance Innovation Lab examines how lower-cost finance could transform the affordability of rooftop solar and battery deployment. The model estimates that a scheme offering low-interest loans at 2% would allow more than 8m households to install rooftop solar and batteries at no upfront cost and save £251 a year on electricity bills over 15 years.

The UK does not lack rooftop space or proven technology. It lacks affordable finance. A rooftop energy revolution is achievable if we choose to finance it accordingly.

Background

The UK continues to face a sustained cost of living crisis, with energy bills a key driver. UK household electricity prices remain among the highest in advanced economies because of exposure to volatile international gas markets and historic underinvestment in domestic energy infrastructure.

Rooftop solar - both domestic and commercial - is a direct tool to address energy affordability, particularly when paired with battery storage. Unlike large-scale infrastructure, rooftop systems can be installed relatively quickly and can connect directly to existing distribution networks. Pairing with batteries can relieve pressure on the national grid, by using stored power during peak hours.

According to government research, a typical UK household installing rooftop solar can save as much as £500 per year under the Q2 2025 energy price cap. However, this assumes that the household has already found a way to finance the upfront cost of the investment, which is a major barrier.¹ Other research suggests that solar could reduce energy bills for low-income households by up to 24 per cent, and lift as many as 1.2 million people out of fuel poverty.²

The current government reconvened the solar taskforce and published the UK Solar Roadmap, which reflected broad industry consultation. It identified key financial and non-financial barriers to deployment, including grid access, planning, supply chains, skills and financing costs. The recent Warm Homes Plan allocates £15.2 billion up to 2030 in grants and loans for energy efficiency and low-carbon technologies.³ The plan places much greater emphasis on rooftop solar, representing a marked shift from “insulation first” approaches by previous governments.

Research by the UCL Energy Institute found that there is potential for up to 117GW of solar panel capacity on rooftops and other developed spaces across England.⁴ Other estimates suggest that at least 50% of UK homes are highly suitable for rooftop solar, with a further 17% having east or west-facing roofs that would also be appropriate for installation. As it stands, government ambition of 10GW by 2030 falls significantly below this potential.

A financing challenge

Rooftop solar and batteries require upfront investment in exchange for long-term savings. As with many clean technologies, the economics are shaped less by operating costs than by the cost of capital used to finance installation.

This financing challenge operates at three levels:

- **Cost to government.** Public spending on net zero has become politically contested, placing pressure on policymakers to identify delivery mechanisms that do not rely exclusively on direct public subsidy.
- **Cost to businesses.** Financing costs materially affect the viability of commercial rooftop solar projects, particularly for small and medium enterprises (SMEs), landlords and third-

¹ Department for Energy Security and Net Zero. (2025). *Solar roadmap: United Kingdom powered by solar*. <https://www.gov.uk/government/publications/solar-roadmap>

² Leather, Z. (2025). *Sunny day savings. Assessing Government support for solar panels*. Resolution Foundation. <https://www.resolutionfoundation.org/publications/sunny-day-savings/>

³ Department for Energy Security and Net Zero. (2026). *Warm homes plan*. <https://www.gov.uk/government/publications/warm-homes-plan>

⁴ Campaign to Protect Rural England. (2023). *Shout from the rooftops: Delivering a common-sense solar revolution*. <https://www.cpre.org.uk/wp-content/uploads/2023/05/Rooftop-Revolution-Report.pdf>

party developers. Higher borrowing costs lengthen payback periods, increase perceived risk and reduce the attractiveness of investment propositions.

- **Cost to households.** Upfront costs and limited access to affordable finance remain among the most significant barriers to adoption.⁵ This challenge falls most heavily on households that could benefit most from lower bills but face the greatest borrowing constraints.

Any credible strategy for a rooftop energy revolution must therefore address three linked problems simultaneously: eliminating or minimising upfront costs; ensuring meaningful bill reductions from day one; and shortening payback periods sufficiently to overcome concerns about debt, mobility and investment risk.

How to use financial policy tools to reduce costs

The UK already possesses a tried and tested mechanism for reducing financing costs for rooftop solar and battery deployment: preferential or “dual” interest rate facilities through the Bank of England.

Using this instrument to support the already growing rooftop solar with batteries industry represents an exciting opportunity to launch a nationwide Solar Saver scheme.

A key solution: targeted preferential interest rates

The Bank has long used targeted funding mechanisms to support monetary and financial stability. Through the Term Funding Scheme,⁶ introduced after the Brexit referendum, the Bank enabled commercial banks and building societies to borrow at rates close to the Bank’s overnight deposit rate for up to four years. A similar facility was deployed during the Covid-19 crisis⁷, providing long-term funding at, or close to, 0.1% to support lending to households and businesses.

Other countries make far more use of this tool than the UK. For example:^{8,9}

- The Bank of Japan has offered long-term, low interest funding to banks for climate-related lending, including green loans and sustainability-linked instruments.¹⁰

⁵ Department for Business, Energy and Industrial Strategy. (2021). *UK Rooftop Solar Behavioural Research: A report by Basis Social*. <https://assets.publishing.service.gov.uk/media/60edea3b8fa8f50c7f08ae1e/uk-rooftop-solar-panel-behavioural-research.pdf>

⁶ Bank of England. (2018). *Quarterly Bulletin 2018 Q4: Topical article, the Term Funding Scheme: design, operation and impact*. <https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2018/term-funding-scheme-web-version.pdf>

⁷ Bank of England. (n.d.). *Our response to coronavirus (Covid)*. (Retrieved June 17, 2026) <https://www.bankofengland.co.uk/coronavirus>

⁸ Ng, A., & Abdelli, M. (2024). *Asian central banks are leading green policy innovation*. OMFIF. <https://www.omfif.org/2024/10/asian-central-banks-are-leading-green-policy-innovation/>

⁹ Five out of 50 central banks offer subsidised loans and green preferential targeted refinancing lines according to World Wide Fund for Nature (2024). *Sustainable financial regulations and central bank activities (SUSREG): 2024 annual report*. <https://susreg.panda.org/>

¹⁰ Shirai, S. (2022). *Japan's green lending scheme presents opportunities and challenges*. Green Central Banking. <https://greencentralbanking.com/2022/08/02/japan-green-lending-scheme-sayuri-shirai/>

- The People's Bank of China launched a green refinancing programme that has channelled substantial funding at preferential interest rates into clean energy and emissions-reducing projects, in support of longer-term decarbonisation goals.¹¹
- The Central Bank of Malaysia also introduced its own measures specifically targeted to help SMEs build their technical capability and improve access to finance for low-carbon projects.¹²

The principle underpinning these programmes is straightforward: when the central bank lowers funding costs for lenders under specified conditions, cheaper credit can be transmitted into key sub-sectors to advance targeted public policy goals. Rooftop solar and battery deployment could be one such goal.

Under a preferential interest rate facility – also known as a dual interest rate facility – the Bank would provide funding to participating banks and building societies at preferential borrowing rates conditional upon lending for qualifying rooftop solar and battery installations.

The mechanism would operate in three stages.

- First, the Bank would establish a dedicated funding facility linked to clearly defined lending outcomes. Participating financial institutions would be able to borrow at a lower rate than would otherwise be available through wholesale markets, reflecting the public policy objective of accelerating clean energy deployment.
- Second, access to this facility would be conditional. Banks would agree to pass on lower funding costs through defined loan products for eligible rooftop solar and battery systems. These products would be required to meet agreed conditions on pricing and consumer outcomes, ensuring that the reduced cost of capital translated into genuine affordability.
- Third, lenders would monitor and report, to verify deployment and ensure accountability. The purpose is not to replace commercial lending but to shape it, using central bank funding conditions to support rapid investment in productive, bill-reducing infrastructure.

Given the major impact the UK's reliance on volatile fossil fuels has had on recent inflation episodes, this is squarely within the Bank's mandate of reducing inflation. The fact that it is very targeted to one particular sub-sector means its wider macro-economic impacts would be minimal.

What the model shows

To test the practical implications of these financing mechanisms, we developed a detailed model to examine the impact of reduced financing costs on rooftop solar and battery deployment. Its

¹¹ People's Bank of China. (2024, April 16). *China Monetary Policy Report Q4 2023*.

<https://www.pbc.gov.cn/en/3688229/3688353/3688356/4756453/5330013/2024041610102997035.pdf>

¹² Bank Negara Malaysia (2024). *Supporting SMEs transition to greener practices*. *BNM Annual Report 2023*.

https://www.bnm.gov.my/documents/20124/12142010/ar2023_en_box8.pdf

purpose is not merely to model financing costs in isolation but to examine how alternative lending structures reshape the economics facing households.

The model tests what households could realistically receive under a nationwide programme designed around three clear commitments: no upfront costs, shorter payback periods and lower electricity bills from day one. Using reasonable, evidence-based assumptions about household demand, installation costs, financing terms, solar generation and battery performance, the model calculates how improved financing conditions could influence uptake, costs and electricity bills.

Like all policy models, its outputs depend on assumptions and should be interpreted as informed and transparent estimates rather than precise forecasts. Continued industry engagement and peer review will strengthen confidence in specific parameters, particularly around installation cost trajectories and consumption profiles. However, the model provides a robust basis for assessing the scale of opportunity created by cheaper finance. A more detailed description of the model is set out below.

How the Solar Saver model works

The Solar Saver model focuses only on residential rooftop solar. It allows the user to test different combinations of:

- Size of solar panel system: 3, 4 and 5kWp
- Battery size: 3.5, 5 and 8kWh
- Five household archetypes based on roof orientation, geography, and likely solar yield

In effect the model produces 15 scenario variations across archetypes and panel sizes, with battery size selectable as an additional parameter.

In summary, the model works as follows:

- It assumes a fixed installation cost for each solar and battery combination based on current costs. These costs have reduced significantly in recent years and are expected to continue to fall, so using current costs represents a conservative assumption.
- It estimates annual solar generation for each archetype and panel size based on best available data.
- It assumes a standard annual electricity demand for the household, based on data from Ofgem's Typical Domestic Consumption Value. The outputs refer to a household with typical consumption levels.
- It assumes tariff rates, based on currently available commercial options, and adjusting these for inflation, assuming 3% per year, which might be regarded as conservative, given this is less than average inflation this century and above the Bank's 2% target. The tariff framework is based on the Octopus Flux structure, so there are separate off-peak, day and peak import prices, as well as export prices. This has been used as a representative example of the tariff structures that are rapidly emerging across the market from different suppliers.

- It splits household consumption across time-of-use periods using a simple behavioural assumption: 30% off-peak, 50% daytime and 20% peak.
- It uses a simplified optimisation logic to determine how solar generation, battery storage, grid imports and exports interact over the year.
- It then estimates bill savings and cash flows, and from that the lender payback period under different interest-rate assumptions.

Broadly, the model assumes:

- Solar generation first serves household demand
- If there is surplus generation, some of it can be stored in the battery and used to reduce grid reliance at peak times when electricity is priced the highest
- Export occurs when generation exceeds demand and battery capacity.

The main outputs are:

- Annual household bill savings and savings against monthly repayments
- Annual lender cash inflow and repayment profile
- Lender payback period
- Sensitivity of payback period to different interest rates.

The model is designed to test, using reasonable assumptions, whether lower-cost finance materially improves the affordability for households by reducing the recovery period and making the repayment structure more manageable.

There are a few important caveats:

- This is a simplified annual model rather than an hourly dispatch model
- Demand is held constant across households, rather than varying by archetype
- Electricity prices are held constant through the year
- Behavioural flexibility is assumed rather than estimated from real load profiles
- The battery/storage optimisation is stylised, so it may overstate how effectively some households can avoid imports at certain times of day.

A conservative method has been used to estimate the number of households that could benefit. Taking the total number of domestic rooftops (29m), we have subtracted flats, maisonettes, and other harder-for-solar homes (-6.4m) and those that already have solar installed (-1.6m). Of the 21m remaining, we have assumed a 40% eligibility score based on the fact that some properties are harder to install solar panels on due to a range of factors such as the building having excessive shading, listed building status, being in a conservation area, having a loft conversion, or being part of a complex ownership structures. The real number is likely to be higher than this conservative estimate.

The results

The model demonstrates that access to lower-cost capital could underpin a nationwide Solar Saver programme offering rooftop solar and batteries with no upfront costs, immediate bill reductions and manageable repayment structures.

This creates the basis for a compelling national offer: over 8 million households could benefit from rapid installation of rooftop solar and batteries with no upfront costs and bill savings from year one. Bill savings would increase significantly once the 15 year loan is paid off. If the government worked with the Bank to create a nationwide scheme of low-interest loans at 2%, we estimate average savings of roughly £251 per year over a 15 year period. This figure is the net surplus for a household after loan repayment costs, against a counterfactual of business as usual expenditure on electricity without solar and battery systems.

Using models from other countries, this could be done without direct cost to government. For example, the Japanese scheme has offered 0% interest rate financing to banks to pass on to green lending activities.¹³ A previous European Central Bank (ECB) scheme focused on response to the Covid-19 pandemic offered rates as low as -1%.¹⁴ Neither of these schemes had direct costs to the government.

The implications extend beyond households alone. Although this modelling focuses on residential deployment, the same financial architecture could be used to accelerate commercial rooftop solar, supporting SMEs, landlords and developers while increasing renewable generation and easing pressure on the wider grid.

The model does not attempt to prescribe the nature of the delivery mechanism, which it is assumed would retain the current market's flexibility of options. This includes models where homeowners own and maintain the panels and batteries themselves, models where these are leased, and models where an external company owns and maintains the panels and transmits benefits to the homeowner. Under the national scheme, the main guarantee would be that there would be no upfront costs, whichever model is chosen, and that the electricity prices for the homeowner would be guaranteed for 15 years. How these benefits would be transmitted to the owner could also be flexibly implemented, but the ideal might be direct delivery via bills.

Conclusion

The UK does not face a shortage of rooftop space or mature technology. It faces a shortage of affordable finance. The central insight from this work is that the pace, scale, and costs of deployment depend on how investment is financed. By reducing the cost of capital through targeted central bank facilities, the government can help unlock installations that are already economically and technologically viable.

¹³ Bank of Japan. (2025). *Outline of transactions for climate response financing operations*.

https://www.boj.or.jp/en/mopo/measures/mkt_ope/ope_x/opetori22.htm

¹⁴ European Central Bank. (2024). *What are targeted longer-term refinancing operations (TLTROs)?*

<https://www.ecb.europa.eu/ecb-and-you/explainers/tell-me/html/tltro.en.html>

This is not a case for permanent subsidy or open-ended public expenditure. It is a case for using existing financial institutions more strategically to support productive investment that lowers bills, strengthens energy security and accelerates the clean energy transition.

A rooftop energy revolution is achievable. The question is whether the UK is willing to finance it.

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