

Why Copper Matters in the UK's £725 Billion Infrastructure Overhaul

The case for copper in delivering safe, sustainable, and future-proofed infrastructure.

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Executive summary

If steel is the backbone of our buildings, copper is the circulation system that keeps them alive. It carries clean water, delivers heat safely, and supports the critical services on which society depends. Unlike plastic alternatives, copper pipework does not degrade quickly, burn, or release toxic fumes in fire - and it can be recycled infinitely without loss of quality.

The UK is investing £725 billion in a ten-year infrastructure programme. Unless the role of copper tube is secured within this plan, we risk building systems that will fail sooner, cost more over their lifetime, and place unnecessary strain on future generations.

This white paper sits within the context of the UK government's publication, *UK Infrastructure: A 10-Year Strategy*, which commits capital investment to economic and social infrastructure over the next decade¹.

The Copper Sustainability Partnership's (CuSP) position is that copper is already critical across energy, water, and healthcare infrastructure. As such, it aligns directly with government goals on net zero and industrial strategy.

This white paper presents the full case for copper piping in Britain's infrastructure transformation. It highlights copper's economic value to the UK, its unique role in reducing long-term costs, and its contribution to circularity and sustainability.

With global demand rising and recycling technology eliminating the need for newly mined material in tube production, copper stands out as the only truly infinite plumbing product.

Accordingly, this publication is a call to policymakers, industry leaders, and advocates to secure copper's role in Britain's infrastructure transformation.

Our key policy and planning recommendations are:

- Recognise copper as a critical material within national infrastructure standards across energy, water, and healthcare systems.
- Embed copper within circular economy policy and procurement frameworks to reduce reliance on non-recyclable plastics and lower lifecycle costs.
- Prioritise copper in public-sector procurement to reduce long-term maintenance costs and strengthen UK supply chains.
- Learn from international best practice and incorporate copper into UK infrastructure guidelines to ensure resilience and competitiveness.

The paper is timed to support Copper Awareness Day on the 29th October 2025 - an annual event created by CuSP to highlight copper's essential role in the built environment and its contribution to a more sustainable infrastructure system².

¹

https://assets.publishing.service.gov.uk/media/6853c5db99b009dcdcb73649/UK_Infrastructure_A_10_Year_Strategy_Web_Accessible.pdf

² <https://www.cuspuk.com/cusp-launches-copper-awareness-day/>

CuSP stands ready to work with government, industry, and campaigners to ensure Britain's infrastructure investment is safe, sustainable, and built to last.

The hidden risk in Britain's infrastructure plan

In June 2025, Chancellor Rachel Reeves announced a £725 billion, ten-year strategy to deliver what she described as a “decade of national renewal”. This is a once-in-a-generation investment across healthcare, education, justice, and critical infrastructure³. The political intention is to rebuild Britain's public services and the foundations they depend on.

The risk of overlooking copper tube

Despite these ambitions, the government's infrastructure strategy does not name copper explicitly as a strategic material. If copper tube is not embedded in planning from the outset, the systems built under the programme risk being less safe, less sustainable, and more expensive over their lifecycle.

Substituting copper tube with plastic piping exposes hospitals, schools, and housing to clear hazards. Plastics can degrade prematurely, increasing maintenance costs and replacement needs.

In fire conditions, they may burn, melt, or release toxic fumes. They also carry higher risks of water contamination and poorer recycling performance. These weaknesses undermine long-term safety, sustainability, and cost efficiency.

Copper's critical role in modern infrastructure

Copper's role in the UK is easy to take for granted. It underpins the safe delivery of water, heating, and medical gases. It provides a durable, fire-safe, and recyclable foundation for essential services.

With lifespans that can reach 70–80 years, copper piping avoids the premature failures and hidden costs that plastics introduce⁴. It also supports the UK's broader energy and net zero ambitions, enabling efficient heat pump systems and sustainable building standards.

Unless copper tube is recognised and embedded as a strategic material, Britain's infrastructure transformation risks being compromised by short-term choices that carry long-term consequences.

Aligning copper with government priorities

Embedding copper into Britain's infrastructure plan would directly support the government's own priorities. Net Zero 2050 cannot be achieved without copper-intensive renewables and efficient heat pump systems.

The UK's modern industrial strategy depends on resilient domestic supply chains, to which copper manufacturing and recycling already make a significant contribution. A commitment to economic resilience requires infrastructure that is safe and durable across every region.

³ <https://www.gov.uk/government/news/decade-long-infrastructure-strategy-to-deliver-stability-investment-and-national-renewal>

⁴ <https://www.cuspu.com/news/how-long-do-copper-pipes-last>

The Labour government has also pledged to accelerate a circular economy⁵. Copper, which can be recycled infinitely without loss of quality, aligns perfectly with this ambition. Unless the material is named and embedded as part of the strategy, the UK risks undermining delivery of the government's own goals.

⁵ <https://researchbriefings.files.parliament.uk/documents/CBP-9888/CBP-9888.pdf>

An indispensable material for essential services

Britain's infrastructure transformation will succeed or fail based on the materials at its core. From safe water and heating to resilient healthcare facilities, copper tube is essential to the systems that keep the UK running. Its contribution across these areas shows why it should be designated and managed as a strategic material.

Water and heating

Copper is the backbone of the UK's plumbing and heating networks. It delivers clean drinking water, supports heating systems in homes and schools, and carries medical gases safely in hospitals. Unlike plastics, copper tube does not burn, melt, or release toxic fumes in a fire. It is also naturally antimicrobial, offering resilience against pathogens such as Legionella.

By contrast, laboratory tests conducted by CuSP find that plastic piping carries clear risks. The tests show that multi-layer composite pipes (MLCP) produce 248 times more carbon monoxide than copper pipes when burned for 8 minutes⁶.

Likewise, recent research from Fire Safety Matters found that corrugated stainless steel tubing (CSST) produces 761 times more smoke than copper, while cross-linked polyethylene (PEX) plastic emits 507 times more⁷.

These figures underline the fire hazards posed by plastic alternatives and reinforce copper's role in meeting health and safety standards, particularly in sensitive environments such as hospitals.

Healthcare and resilience

Copper piping contributes directly to resilient healthcare. Its antimicrobial properties make it uniquely suited to supporting resilient public services. For example, in clinical environments, copper surfaces have been shown to dramatically reduce the presence of dangerous bacteria.

One cornerstone study conducted by Michael G Schmidt et al found that copper-surfaced objects in hospital environments (from bed rails to call buttons) achieved an 83% reduction in microbial burden compared to controls. Average levels dropped from 2,674 CFU/100 cm² to 465 CFU/100 cm² ($p < 0.0001$)⁸.

When combined with copper piping in building systems, these properties contribute to safer, more resilient healthcare environments, fully aligned with the NHS Net Zero plan and the UK Health Infrastructure Plan.

⁶ <https://www.cuspuk.com/mlcp-pipes-vs-copper>

⁷ <https://www.fsmatters.com/Plastic-pipes-pose-major-threat-to-life-in-fires>

⁸ <https://pmc.ncbi.nlm.nih.gov/articles/PMC3405627/>

Low-carbon buildings

Copper tube is also fundamental to the UK's transition to low-carbon housing and public buildings. It is already the material of choice for heat pump installations, district heating schemes, and hot water systems that will replace older, less efficient networks.

Because copper pipework can endure for decades without failure, it supports the delivery of sustainable heating infrastructure that aligns with the government's net zero commitments. Unlike plastics, copper does not deteriorate under high temperatures or pressures, ensuring reliable performance in systems designed to last the lifetime of a building.

Its recyclability also means that as the UK upgrades its housing stock, copper tube removed from older systems can be recycled into new ones with no loss of quality. This makes it the only truly circular plumbing material, helping to lower lifecycle emissions while guaranteeing long-term safety and efficiency.

For example, Westminster's Pimlico District Heating Undertaking⁹ has operated continuously since 1950 with copper at its core. Likewise, Southampton's District Energy Scheme¹⁰, which was established in the 1980s, now serves hospitals and thousands of residences with several kilometres of copper pipework.

Recommendation:

To ensure safety, sustainability and resilience across the country's essential services, copper must be formally recognised as a critical material within national infrastructure standards across water, healthcare systems, and low-carbon buildings.

⁹ <https://www.westminster.gov.uk/sites/default/files/media/documents/pdhu-working-group-nov23.pdf>

¹⁰ https://www.iea-dhc.org/fileadmin/documents/DHC_CHP_Case_Studies/KN1640_Southampton_v2.pdf

Building a sustainable, circular infrastructure

Unlike many other materials used in construction, copper tube can be recycled indefinitely without any loss of quality. It already has some of the highest recycling rates of any construction material, and it aligns directly with the government's net zero, waste reduction, and circular economy pledges. Recognising this potential is critical if the government is to meet its circular economy commitments.

Infinite recyclability

Copper's ability to be recycled without degradation makes it uniquely valuable. The International Copper Study Group reports that 50% of the copper used in Europe already comes from recycled sources¹¹.

Across Europe, large-scale smelting capacity now makes it possible to recycle grades of copper scrap that previously could not be processed. These "dirty scrap" streams, which include mixed or contaminated materials, are being recovered and transformed back into high-quality copper tube. The result is that Europe's plumbing and heating systems can be supplied almost entirely from recycled copper, with minimal reliance on newly mined material.

Producing copper tube from recycled scrap also delivers significant energy savings. According to the International Copper Association, recycled copper requires 85 percent less energy than primary production¹². No other plumbing material offers this combination of circularity and efficiency.

Moreover, CuSP's research has found that the recycling rates for plastics used in construction are alarmingly low. Post-consumer polyvinyl chloride (PVC), the most used plastic in the industry, has a recycling rate of just 3% across Europe¹³.

Copper therefore reduces reliance on virgin material extraction, directly supporting the Labour government's waste minimisation commitments.

Durability, lifecycle value, and net zero delivery

Copper combines long service life with a recyclability profile that plastics and composites cannot match. Its durability means fewer replacements and lower maintenance costs across the lifetime of a building or system.

CuSP's research finds that copper pipes significantly outlast plastic alternatives, with copper installations often lasting 70–80 years¹⁴. This resilience translates into reduced waste, lower long-term costs, and performance that aligns with green building standards such as BREEAM, LEED and the UK's Net Zero Strategy, all of which emphasise lifecycle value.

¹¹ <https://internationalcopper.org/resource/circularity-and-recycling-in-the-eu/>

¹² <https://www.wri.org/insights/pivotal-role-recycled-copper-energy-transition>

¹³ <https://www.cuspuk.com/news/new-research-reveals-soaring-rates-of-plastic-waste-from-uk-construction>

¹⁴ <https://www.cuspuk.com/why-copper/copper-vs-plastic-pipes>

These qualities also make copper essential to the UK's net zero programme. Meeting government targets of 600,000 new heat pumps annually by 2028, alongside expansion of low-carbon housing and district heating, requires materials that are durable, recyclable, and safe¹⁵.

Copper tube delivers on all three. It ensures new heating and water systems can operate reliably for decades while feeding into a circular supply chain that reduces reliance on virgin material.

By contrast, plastic systems degrade sooner, are harder to recycle, and pose greater safety risks. Unless copper is explicitly specified in policy frameworks, the UK risks undermining its own climate commitments by relying on materials that compromise long-term value, resilience, and safety.

Policy alignment with circular economy goals

The Labour government has made a commitment to accelerating the circular economy and promoting sustainable materials.

Copper already contributes to this framework by reducing waste, lowering lifecycle costs, and supporting recycling at scale.

Plastics, however, largely follow a linear model of production, use, and disposal, with limited re-entry into the system.

Recommendation:

To deliver on the UK's net zero and circular economy commitments, copper tube must be embedded within procurement and policy frameworks. It is the only truly infinite plumbing product that is durable enough to serve for generations, and recyclable enough to keep serving for generations more.

¹⁵ <https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-low-carbon-heat-scheme>

Economic and strategic value

Copper offers measurable long-term economic and strategic benefits for the UK. The choices made today about what materials to use in national infrastructure will determine operating costs, impact supply chains, and influence resilience for decades to come. By reducing risk and cost over the long-term, copper strengthens the financial and strategic foundations of Britain's ambitious infrastructure programme.

Reducing long-term maintenance costs

Plumbing and heating systems built with copper last longer, fail less often, and cost less to maintain over their lifetime. Plastics, however, are more prone to degradation and premature failure - problems that may not appear in initial budgets but emerge later as hidden costs.

A lifecycle analysis by the Copper Development Association found that compared to high-density polyethylene (HDPE) and PEX plastic systems, copper delivers around \$3,300 in savings per service line over its lifetime¹⁶.

This makes copper the more cost-effective, durable, and sustainable option overall. For a government focused on value-for-money and efficient public spending, copper offers clear economic benefits that plastics cannot match.

Supporting UK supply chains and jobs

According to the British Metals Recycling Association, Britain's metals recycling sector already comprises around 2,000 businesses, processes nearly 11.8 million tonnes of scrap metal annually, and supports over 15,000 jobs¹⁷.

Because copper is infinitely recyclable, this existing foundation offers a strategic opportunity to expand copper-specific recycling and manufacturing capacity, aligned with the government's circular economy agenda.

This has direct political relevance. By embedding copper in national infrastructure planning, policymakers can strengthen regional economies and contribute to the green jobs agenda.

Building resilient and secure infrastructure

Copper tube strengthens the resilience of the UK's infrastructure by reducing dependence on fragile, linear supply models. Unlike plastics, which are often imported and difficult to recycle, copper benefits from an established recycling base across Britain and Europe.

¹⁶ https://copper.org/applications/plumbing/water_service/resources/A4119_service_line_false-initial-cost-economy-fact-sheet.pdf

¹⁷ <https://www.recyclemetals.org/static/5a3f2ac4-c928-4287-bb176ef2a3ddb56b/BMRA-Metals-Recycling-Factsheet-final-October-2023.pdf>

This means that essential plumbing and heating systems can increasingly be supplied from material already circulating in the economy, rather than relying on volatile global markets or virgin extraction.

The growth of advanced European smelters has made it possible to recycle complex scrap streams into high-quality copper products, ensuring that tomorrow's tube can be produced from yesterday's waste. By harnessing these capabilities, the UK can build a more secure supply chain, protect against price shocks, and guarantee the long-term availability of safe, durable piping.

Recommendation:

To maximise value-for-money and secure reliable supply chains, copper should be prioritised in public sector procurement. It reduces long-term maintenance costs, strengthens domestic supply chains, and enhances the resilience of essential plumbing and heating infrastructure.

Case studies and global comparisons

Examples from the UK and overseas demonstrate copper's measurable benefits in safety, sustainability, and resilience - insights that should inform national planning.

UK case studies

Copper is already helping the UK meet its sustainability and health goals.

For example, the SNUG Homes project, developed through the Materials in Mind partnership, uses copper piping alongside heat pumps and solar technologies to create low-carbon modular homes¹⁸. The material was chosen for its recyclability, fire safety, and antimicrobial properties.

Similarly, the GreenSquareAccord project delivered one of the UK's first virtually plastic-free homes. Copper was integrated into water and heating systems to replace plastic components, demonstrating how the material can cut plastic reliance while improving safety and long-term performance¹⁹.

European comparisons

In Germany, Aurubis AG provides a clear example of copper's role in delivering circular infrastructure at scale²⁰.

As Europe's largest copper recycler, Aurubis operates a multi-metal recycling system that processes end-of-life electrical goods, industrial scrap, and copper-bearing residues back into high-quality copper products.

This industrial-scale recycling capability demonstrates how copper supports the EU's circular economy objectives by reducing reliance on virgin material extraction, lowering waste, and strengthening domestic supply chains

Global lessons for the UK

Beyond Europe, copper is recognised globally as a strategic material. In Asia, Reuters reports that Indonesia's \$3.7bn Gresik copper smelter (launched in 2024) will process 1.7 million tonnes of concentrate into 650,000 tonnes of copper cathode annually – an example of how economies are building domestic capacity to support renewable infrastructure²¹.

This reflects a wider trend of nations securing domestic copper supply to implement their energy transition, something the UK must also consider.

Healthcare is another area where copper's benefits are well documented. A clinical trial conducted at Sentara Leigh Hospital in Virginia, U.S. by C.D. Sifri et al found that copper

¹⁸ <https://www.cuspuk.com/materials-in-mind>

¹⁹ <https://www.cuspuk.com/greensquareaccord>

²⁰ <https://www.aurubis.com/en/products/recycling>

²¹ <https://www.reuters.com/markets/commodities/freeport-indonesia-launches-37-bln-gresik-copper-smelter-2024-06-27/>

surfaces reduced *Clostridium difficile* infections by 83% and cut multidrug-resistant organisms by 78% overall²². These results underline copper's ability to improve resilience in critical public services.

Recommendation:

The UK should learn from international case studies by embedding copper into infrastructure guidelines and planning standards. This will ensure the capital investment is resilient, safe, and internationally competitive.

²² <https://www.ajicjournal.org/action/showPdf?pii=S0196-6553%2816%2930696-4>

A once-in-a-generation opportunity

The UK is committing £725 billion to a unique infrastructure overhaul. This is a rare political and economic moment that presents an opportunity to renew the foundations of public services and set new standards for safety, sustainability, and resilience.

But there is also a risk. If copper tube is not explicitly embedded in planning, Britain could spend billions on systems that are less safe, less sustainable, and more expensive in the long-term. Omitting copper would lock the UK into infrastructure with shorter lifespans, higher maintenance burdens, and greater vulnerability to system failures.

The material is a strategic enabler of the UK's infrastructure goals, including its net zero pathway, and its circular economy commitments to the creation of safe and durable housing, schools, and hospitals. Copper's recyclability, fire safety and proven long-term performance make it indispensable to the national transformation now underway.

This paper is a call to action:

- Policymakers must integrate copper into national standards and procurement frameworks.
- Industry leaders need to adopt copper specifications to improve lifecycle performance and cost efficiency.
- Advocates should continue to highlight copper's role in achieving net zero and circular economy outcomes.

To develop infrastructure that endures for generations, the UK must rely on materials with proven performance and sustainability. Copper provides the proven foundation on which lasting infrastructure must be built.

CuSP is ready to work in partnership with government, industry, and campaigners to ensure that this unprecedented investment delivers on its promise.

About the Copper Sustainability Partnership (CuSP)

The Copper Sustainability Partnership (CuSP) was created by two competing copper tube manufacturers - Lawton Tubes and Mueller Europe. The companies joined forces in 2021 to promote the environmental benefits of copper and fight back against the plastics greenwash.

CuSP aims to challenge norms and achieve greater environmental thinking, insight sharing and collaboration, using copper as the driving force for a better future.

The Partnerships welcomes organisations and academia to become involved in developing a UK-wide network to support the use of copper and the reduction of plastics within the trades.

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