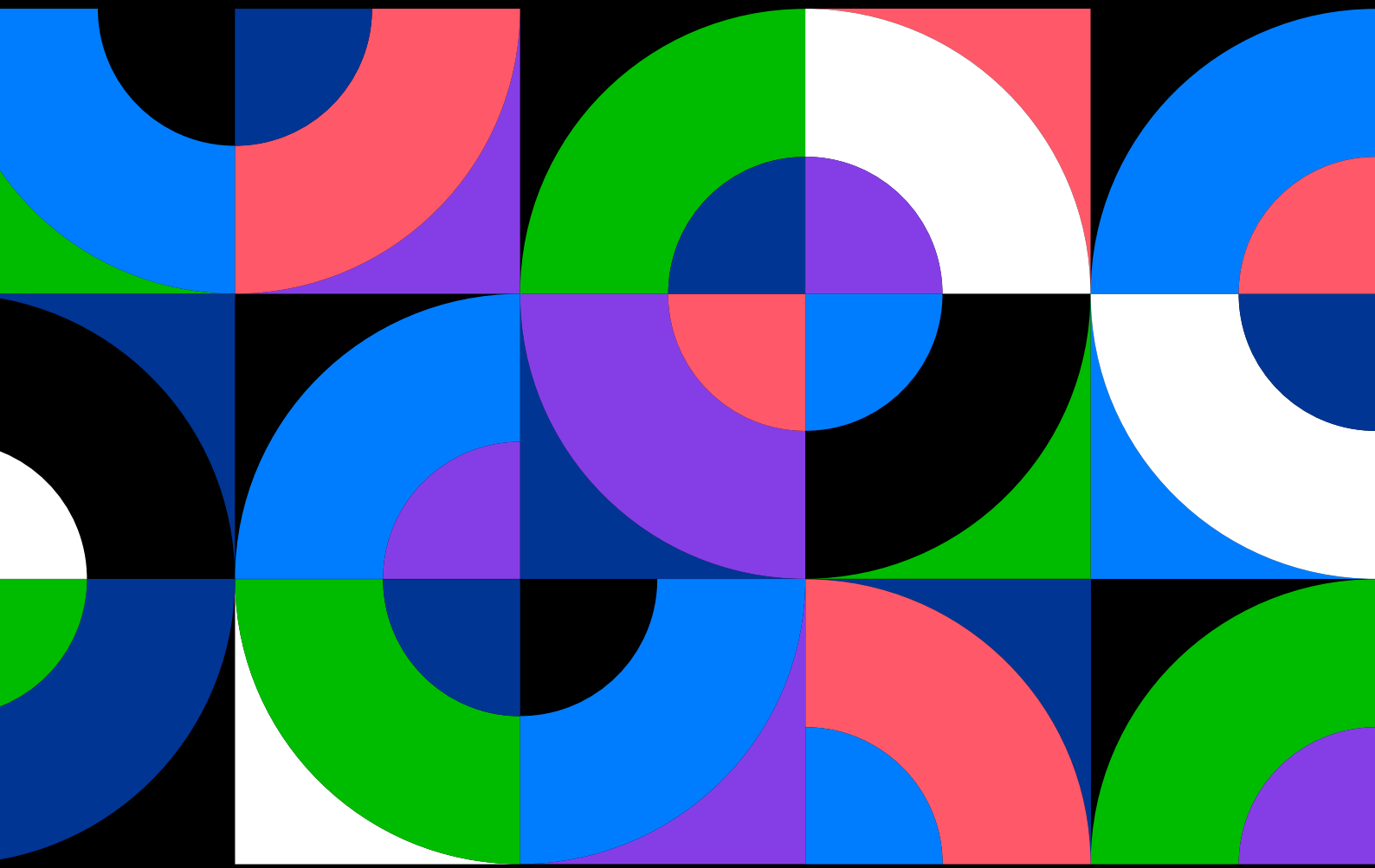
ICC United Kingdom

Why patents are essential for innovation and growth

June 2025



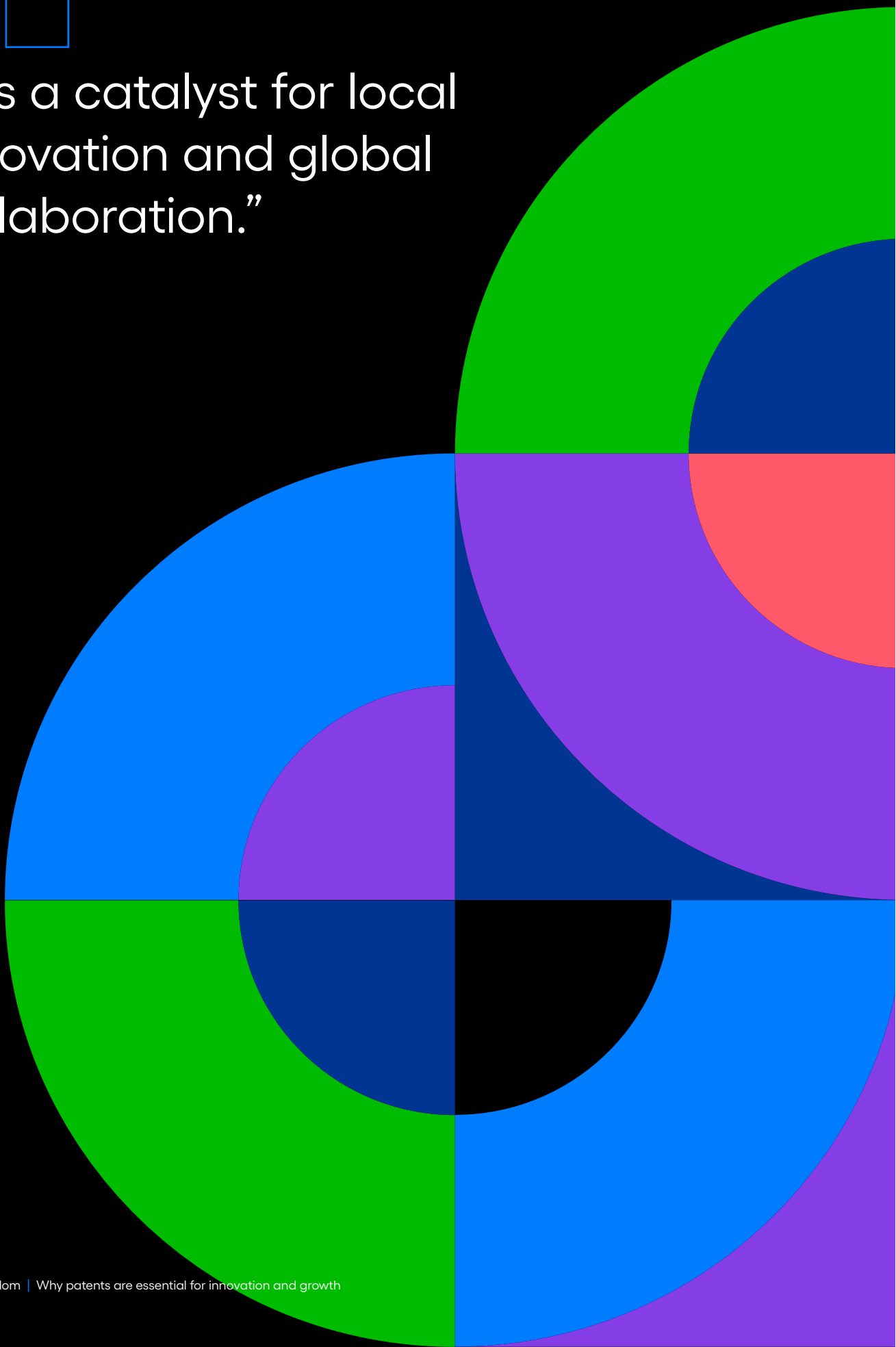
Produced in partnership with

CIPA THE CHARTERED INSTITUTE OF PATENT ATTORNEYS

IP FEDERATION

Foreword

“IP is a catalyst for local innovation and global collaboration.”



In a world where knowledge-driven economies are shaping the future, intellectual property (IP) – and the rights that protect it (IPRs) – play a critical role in driving economic growth, enabling sustainable development, and building long-term resilience. Far from being abstract legal concepts, IPRs underpin the systems and incentives that fuel research, attract investment, and empower start-ups and scale-ups.

This joint publication presents compelling real-world case studies that demonstrate how IP, viewed through the lens of patents, acts as a catalyst for local innovation and global collaboration. Whether promoting sustainability and the clean energy transition, or enabling access to 6G and AI, these examples highlight the practical power of IP to drive meaningful progress.

The findings and recommendations in this report support the ICC's global priorities of promoting multilateral cooperation and enabling global trade. The global patent system has supported innovation for over a century around the world, but it now faces pressures that risk undermining the value of these rights – and, in turn, the innovations developed on the back of strong patent protection. Businesses in all countries must not be disincentivised from investing in sustainable innovation. If exceptions or waivers erode the commercial incentives to innovate, we all stand to lose – economically, environmentally, and socially.

The UK is uniquely positioned to lead on the global stage in creativity, knowledge, and innovation–and to support other countries' sustainable development through its innovations. With world-class universities, thriving R&D-intensive industries, innovative SMEs, and a globally respected IP framework, the UK has cultivated a dynamic ecosystem where ideas are not only generated but also protected, scaled, and successfully commercialised.

ICC United Kingdom, the Chartered Institute of Patent Attorneys (CIPA), and the IP Federation are committed to working with governments, industry, international institutions such as the WTO and WIPO, and other like-minded partners to champion effective approaches that protect, promote, and strengthen international IP frameworks.

If we are serious about driving innovation, sustainability, and inclusive economic development, we must be equally serious about protecting and promoting intellectual property.

Chris Southworth
Secretary General
ICC United Kingdom

Bobby Mukherjee
President
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Adrian Howes
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Overview and findings

In today's global economy, knowledge, creativity, and technological innovation are key drivers of economic growth and social progress. In this context, intellectual property (IP) and the rights that protect it (IPRs) play a vital role in fostering innovation, attracting investment, creating high-quality jobs, enhancing global competitiveness, and supporting the broader goals of sustainable development.

IP refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names, and images used in commerce. IP is protected in law by, for example, patents, copyright, and trade marks. These protections empower individuals, businesses–from SMEs to multinationals–universities, and indigenous and local communities to earn recognition or financial return from what they invent or create. By striking the right balance between the interests of innovators and the wider public, the IP system fosters an environment in which creativity and innovation can thrive.

Among the various forms of IP, **patents play a key role in fostering innovation** because they grant inventors exclusive rights to their inventions, incentivising investment in research and development. Patents protect novel technical solutions – often the result of costly, time-intensive work. This protection not only rewards inventors but also promotes knowledge sharing through the requirement of public disclosure, enabling others to learn from and build upon prior innovations. For those developing new technologies – especially in high-risk, high-cost sectors such as pharmaceuticals or engineering – patents provide the legal certainty needed to attract investment and bring breakthrough ideas to market.

Calls for changes to enable equitable access to technologies across sectors, including in the context of public health, climate change, and sustainable development, should not risk the erosion of robust systems that provide stability and legal certainty. While these proposals are often framed as efforts to improve equity and access, they risk undermining the long-term incentives that patents provide for innovation and investment.

For all countries, in both the Global South and the Global North, strong IP systems are not optional; they are essential for building resilient economies and inclusive societies, and for empowering local innovators. Addressing urgent national and global challenges – such as expanding healthcare access, delivering clean energy, strengthening food security, and tackling the digital divide – depends on sustained investment in research, development, and innovation. Weakening or undermining IP protections, especially patents, risks stifling innovation, deterring investment, and deepening reliance on foreign technologies.

Five reasons to protect, promote, and strengthen national and international patent frameworks, using examples from patented technologies in the UK and developing countries

1

Patents protect innovation and reward risk

Innovation requires significant risk, time, and capital. Patents provide exclusive rights that allow innovators to protect and commercialise their ideas, ensuring a return on their efforts and capital investment.

Colorifix, a UK-based biotech firm, uses patented microorganisms for eco-friendly textile dyeing. Without patent protection, its technology could have been easily co-opted by larger competitors. Similarly, **EnsiliTech**, another UK-based biotech start-up, has developed a patented silica coating that stabilises vaccines without the need for refrigeration. Its reliance on intellectual property is key to maintaining a competitive edge and ensuring global relevance.

NanoFreeze, a Colombian startup, developed a patented bio-nanotech coolant that cuts refrigeration energy use by 50%. Their patent-protected formulation transformed university research into scalable technology tackling food loss and off-grid cooling challenges.

- **Where innovators lack scale, patents are essential to defend and grow homegrown solutions.**

2

Patents attract investment and enable partnerships

Investors and global partners prioritise businesses with strong patent protection, which signals unique, defensible innovations and reduces risk.

EnsiliTech secured major funding after proving the strength of its patent portfolio. **GeoPura**, a clean energy startup, used early international patents to secure collaboration with Siemens Energy. These examples show how IP rights unlock capital and cross-border partnerships.

NanoFreeze's IP has been instrumental in attracting local and international investment. It enabled pilot partnerships with AB InBev and Repsol, helping scale their technology in Latin America and expand into Europe and Africa.

- **Weak patent systems deter internal investment and limit access to essential global partnerships.**

3

Patents facilitate global innovation participation

Patent rights enable countries to both contribute to and benefit from global standards and technologies. In the **telecoms sector**, patents have incentivised technological contributions from all over the world to develop the 4G/5G standards, generating royalties, and ensuring fair participation in the innovation and standardisation ecosystem.

- **If patent protections are undermined, countries risk exclusion from global technology platforms and emerging industries like AI and 6G.**

4

Patents support sustainable, responsible growth

Patents allow companies to scale their innovations responsibly, aligning growth with sustainability and ethical values.

Colorifix licenses its technology under terms that support environmental goals. Its biological process to dye fabrics without hazardous chemicals significantly reduces water, energy, and chemical use in textile production.

EnsiliTech's vaccine stabilisation method is ideal for low-resource settings. In both cases, IP enables strategic, controlled expansion–addressing both global and local challenges.

NanoFreeze supports climate action, reduces food waste, and enables low-energy cooling in rural areas. Their IP ensures their solution remains environmentally safe and commercially viable as they grow.

- **Without patents, impactful innovations may never reach or benefit vulnerable communities.**

5

IP encourages technology transfer and capacity building

Strong IP protections through trade secrets and patents enable innovators to share technology confidently through licensing and partnerships, fostering local skills and strengthening innovation ecosystems. This exchange is vital for countries to build resilience and compete globally. Patents also require public disclosure of the protected innovation, enabling others to build on top of the innovation.

By safeguarding its technology through patents and know-how, **NanoFreeze** is laying the groundwork for licensing and technology transfer globally. Their case shows how innovators in the Global South can enter and influence international markets and sustainability agendas through IP and how they can learn from past innovations which may otherwise have been kept secret without patent protection incentivising disclosure.

- **Weakening IPRs risks blocking these opportunities and isolating developing countries and emerging markets.**

Policy recommendations

- Protect and strengthen national patent frameworks and enforcement capacity.
- Support innovators in using IP strategically, including for protection.
- Encourage active participation in global patent and standards systems.
- Leverage patents in public-private partnerships and development financing.
- Promote a strong innovation ecosystem and prioritise IP-backed growth in health, clean tech, energy, telecoms and agriculture.

Conclusion

Far from being a barrier, patents are a bridge to innovation, investment, and inclusive growth. For all countries, strengthening patent protections is essential to building sustainable, competitive economies and becoming active players in the global innovation landscape.

Innovation needs protection to grow and thrive. Weakening or removing patent rights will disincentivise innovation and deter investment in essential technologies for the future.

MAIN TYPES OF IPRs

Type of IPR	What it protects	Examples	Typical duration
Patents	New inventions and technical solutions	Water purification systems; biodegradable packaging; solar panel technology; battery storage innovation	Usually 20 years
Copyright	Literary, artistic, and musical works	Books, films, software code	Usually life of author +70 years
Trade marks	Brand names, logos, slogans	Product names, company logos, advertising taglines	Potentially indefinite, with renewal
Industrial designs	The visual design or appearance of products	Furniture shape, fabric patterns, bottle shapes, smartphone design	Usually 10–25 years
Trade secrets	Confidential business information	Manufacturing processes, formulas, client databases	Indefinite, as long as kept secret

Case studies

CASE STUDY

The importance of patenting to the sustainable textile colour company, Colorifix

Colorifix is a pioneering company at the intersection of biotechnology and sustainable fashion. It has developed an innovative, eco-friendly dyeing process that eliminates the need for toxic chemicals, reducing water and energy consumption in textile production. As the fashion industry grapples with environmental concerns, Colorifix's technology has emerged as a game-changer. A crucial element in the company's success has been its strategic approach to intellectual property (IP) protection.

Colorifix's invention and journey

Founded in 2016 by Professor Jim Ajioka and Dr Orr Yarkoni, Colorifix stemmed from synthetic biology research at the University of Cambridge. The company's breakthrough technology replicates the way nature produces colour by engineering microorganisms to create pigments, which can then be used to dye fabrics. Unlike traditional dyeing methods that rely on harsh chemicals and excessive water usage, Colorifix's biological process harnesses bacteria to deposit pigments directly onto textiles in a sustainable and resource-efficient manner.

Colorifix's journey from academia to commercialisation involved significant challenges, including scaling up laboratory research, securing funding, and convincing manufacturers to adopt an entirely new dyeing process. By focusing on sustainability and cost-effectiveness, the company has successfully partnered with textile manufacturers worldwide, integrating its method into commercial production. The journey has been marked by strategic decisions in research, collaborations, and, importantly, intellectual property protection.

The importance of patenting to Colorifix's success

For a startup in a competitive industry like sustainable textiles, patent protection is essential. Colorifix has invested significantly in securing patents to safeguard its proprietary technology. Early engagement with Patent Attorney Craig Titmus of Mathys & Squire was instrumental in patenting its bioengineered dyeing process, allowing Colorifix to:

- **Protect its innovation** – Patents ensure that Colorifix retains exclusive rights to its technology, preventing competitors from replicating or modifying its process without authorisation.
- **Attract investment** – Investors are more likely to support a company with robust IP protection, as patents signal innovation, uniqueness, and potential market dominance.
- **Secure commercial partnerships** – Major fashion brands and textile manufacturers require assurances that the technology they adopt is legally protected and exclusive.
- **Enable sustainable growth** – By holding patents, Colorifix can license its technology under controlled terms, ensuring that it is used responsibly and aligns with its sustainability mission.

Without strong patent protection, Colorifix would risk losing control over its innovation to larger corporations or industry players seeking to capitalise on its discoveries without contributing to research and development. This protection has helped the company navigate competitive markets and establish itself as a leader in sustainable textile dyeing.

Environmental benefits and Earthshot Prize success

One of Colorifix's most significant contributions to sustainability is its ability to drastically reduce the environmental footprint of textile dyeing. The traditional dyeing process consumes vast amounts of water, releases toxic effluents, and requires heavy energy use. Colorifix's biotechnology-based approach eliminates these issues, offering:

- **Up to 90% water reduction** – By using natural processes, Colorifix minimises water consumption in dyeing.
- **Elimination of toxic chemicals** – Traditional dyes rely on heavy metals and synthetic compounds, which Colorifix's process completely replaces.
- **Lower energy consumption** – The bioengineered dyes work at lower temperatures, reducing carbon emissions from heating water.
- **Circular and regenerative practices** – The use of natural pigments and microorganisms promotes a circular economy in fashion.

Colorifix's groundbreaking work has not gone unnoticed. In 2022, the company was awarded the prestigious **Earthshot Prize**, an initiative launched by Prince William to recognise environmental innovation, after being nominated by both the Chartered Institute of Patent Attorneys (CIPA) and the Mills Fabrica. This global recognition reinforced the value of Colorifix's technology and boosted its market credibility, leading to increased demand from fashion brands looking for sustainable solutions.

Jim Ajioka said: "Being finalists for the Earthshot Prize 2023 recognised not only our commitment to innovation but also the tangible impact of our technological advancements.

> **"Our collaboration with CIPA has played a great role in navigating the complex landscape of intellectual property. We remain steadfast in our dedication to pushing the boundaries of technology."**

Conclusion and the future

Looking ahead, Colorifix aims to scale its operations further, making its eco-friendly dyeing process the industry standard. With continued innovation and a strong patent portfolio, the company is well-positioned to lead the transition toward a sustainable fashion industry. Its success underscores the importance of patenting not only for commercial growth but also for driving meaningful environmental change.

Colorifix's story is a testament to how innovative companies can leverage IP protection to revolutionise industries while addressing global sustainability challenges.

CASE STUDY

Revolutionising vaccine storage and distribution — Dr Asel Sartbaeva and EnsiliTech

Dr Asel Sartbaeva founded EnsiliTech to address difficulties in vaccine storage and distribution. Her innovative technology stabilises vaccines without the need for refrigeration, addressing a critical global health challenge. This case study explores the crucial role that patenting has played in her journey and the broader impact of her invention.

The journey and innovation

Dr Sartbaeva began developing her technology in 2012, inspired by the challenges she observed in vaccine storage during her daughter's vaccination. Her ground-breaking innovation involves encasing vaccines in a silica shell, protecting them from thermal damage and eliminating the need for distribution via the "cold chain" system. The cold chain is the refrigerated supply chain that involves the storage, transportation and distribution of perishable goods such as vaccines and other perishable products. This breakthrough has the potential to significantly reduce vaccine spoilage – a major issue in both developed and developing countries.

EnsiliTech spun out from the University of Bath in 2020. The company has developed and patented a silica-based coating which grows a shell on top of the biological molecule by mimicking its surface and structure, a process Dr Sartbaeva describes as "ensilication." The potential to save millions of lives by transforming global vaccine distribution is clear.

Importance of patenting

Patenting has been crucial to EnsiliTech's success. The first patent for the ensilication method was filed in 2017, providing legal protection and enabling the company to secure funding and partnerships. Patents have allowed EnsiliTech to maintain a competitive edge by safeguarding their unique technology from competitors. This protection has been instrumental in attracting investors, leading to significant financial support, including a £1.2 million pre-seed funding round. Additionally, patents have facilitated collaborations with major pharmaceutical companies, further advancing the development and commercialisation of the technology.

Dr Sartbaeva emphasised the importance of patents in the company's development:

> **"When we were raising the first investment, our lead investor did a very thorough due diligence check looking into our patents. When we were signing our first contract, our patents were again important because we were able to talk about what elements of the partnership would be covered by whose intellectual property. We are applying for two more patents and that is exciting because I know that it's going to really uplift our company. Our intellectual property is our greatest asset."**

The company's patent attorney, biotech specialist Isobel Finnie, of HLK, said: "Dr Sartbaeva and EnsiliTech have developed something that could revolutionise healthcare on the planet, not only for humans, but also for animals. The scale of the issues EnsiliTech's technology is addressing is incredible. It's a privilege to be able to work with a company that is trying to save lives and create a more sustainable world."

Global health and environmental sustainability

EnsiliTech's technology offers profound benefits for global health and environmental sustainability. By eliminating the need for refrigeration, ensilication can improve vaccine accessibility in remote and low-income regions, potentially saving millions of lives. The reduction in cold chain dependency also decreases the carbon footprint associated with vaccine storage and transportation, contributing to environmental sustainability. EnsiliTech's innovation not only addresses a critical healthcare challenge but also supports global efforts to combat climate change.

The Bristol-based company has recently secured a contract with one of the world's largest animal vaccine producers and is working with partners on a new mRNA vaccine. mRNA vaccines use a copy of messenger ribonucleic acid (mRNA) to create an immune response and were the main vaccines used during the UK's COVID-19 campaign.

The future

Through strategic patenting, EnsiliTech has secured the necessary resources and partnerships to bring its groundbreaking technology to market. The ensilication method holds the promise of saving millions of lives and promoting environmental sustainability, making it a truly game-changing invention.

The company is now seeking further investment to achieve its full potential. Dr Sartbaeva said: "The new funding is critical because we want to create bespoke vaccines, fully developed by us, so we can offer a thermally stable vaccine which is completely free of refrigeration."

The Chartered Institute of Patent Attorneys has nominated Dr Sartbaeva and EnsiliTech for a 2025 **Earthshot Prize**, in recognition of the company's contribution towards a more sustainable world.

CASE STUDY

GeoPura – powering the future through green hydrogen

GeoPura is a trailblazer within sustainable innovation. They provide a zero-emission solution for generating, storing, and distributing the energy needed to drive the global transition to clean power by giving customers the power to decarbonise their consumption of temporary, backup, off-grid, and grid augmentation energy.

At the heart of their offering is their proprietary hydrogen power technology, the HPU, which is produced in collaboration with Siemens Energy (UK) and a network of hydrogen production sites. It is a collaboration Julian Hobbs, CEO at Siemens Financial Services UK, has said is tangible evidence of "real progress in the UK hydrogen value chain, from ever-growing production capacity to downstream processing."

Their creation of the HPU™ has seen them create a series of landmark successes within the cleantech sector.

They closed £22 million in investment to fund the expansion of their fleet and its global deployment, pioneering green hydrogen finance in the UK in the process. This was the first major asset-backed debt funding announcement for a green hydrogen business in the UK. They received long-term funding support from a distinguished consortium of financial institutions, including BNP Paribas Leasing Solutions, Close Brothers Asset Finance, HSBC UK and Siemens Financial Services.

This first of a kind asset-backed financing followed an earlier £36 million Series A funding round in February 2023 and a £56 million investment round in February 2024. Through these investment rounds GeoPura has achieved a strong and diverse backing from key global investors GM Ventures, Barclays Sustainable Impact Capital, SWEN CP through its fund SWEN Impact Fund for Transition 2, Siemens Energy Ventures and the National Wealth Fund.

The company has set a roadmap explaining how they will use this unprecedented level of funding to accelerate their expansion plans, plans that will see the manufacture and deployment of over 3,600 HPU™ generators by 2033 and build on an already impressive client list that includes the DP World Golf Tour, the BBC, Balfour Beatty, and the National Grid.

How IP played its part in GeoPura's success

As you can imagine, Potter Clarkson's involvement with GeoPura is linked to the development of the intellectual property (IP) portfolio. The company was at great pains to create IP that could support the development and commercialisation of their hydrogen power technology and HPU™ brand.

We were approached early on in their relationship with Siemens Energy as they recognised the critical need to put IP in place, as Potter Clarkson partner and long-term GeoPura collaborator, Dave Clark, explains:

> **"During COVID we met up to brainstorm exactly what they had and how they planned to use their IP to move their collaboration with Siemens forward. This ended up with us filing what I can only describe as a monster patent application covering 12 different inventions which we filed internationally as a PCT patent application.**

This initial application was designed to really put a marker down, to get them as much scope for obtaining patent protection down the line in as cost-effective way as possible. Taking this approach was very deliberate; it meant it would be another 2½ years before they had to do much else or incur much more cost on the patent side. I felt sure that by that time GeoPura would be in a very different position because of how strong their technology and their plans for it were."

It was also clear that trade marks as well as patents would play a major role in their future. Harrison Lee, Senior Associate in Potter Clarkson's trade mark team and a core member of our GeoPura team, takes up the story:

"My first involvement was to talk to the GeoPura team about where they saw their brand going, how they planned to develop it. From there we could see what needed to be protected immediately. he first priority was protecting their name GeoPura and then, subsequently, the name for their hydrogen power technology – the 'HPU'. The latter has been the real vehicle for their growth and was even more important because while they were on version one, version two was in the pipeline. We spent a lot of time helping them protect the GeoPura name and the HPU logo in the UK, EU, Australia, the US, Canada, New Zealand, and India.

As with the patent coverage, we needed to get the trade mark coverage right, particularly in the early stages, as it was important to future proof their portfolio."

With a broad range of IP coverage in place, GeoPura then went to speak to investors, a series of conversations that ended in the success reported at the beginning of this case study.

Potter Clarkson was first involved at this stage in their meeting with a potential investor to help GeoPura tell their IP story.

Much of this story revolved around the chosen strategy. For the investors, filing a single PCT application could sound like quite an unusual approach, but it was the best option for the client. Our job was to explain why and provide more detail as to how we had built their patent specifically to distinguish it from an earlier product that had been on the market, assuring the investors the product would launch with the scope for protecting it in a way that it would need to succeed.

From these initial filings, Potter Clarkson has continued to provide updates on their burgeoning IP portfolio to support the subsequent rounds of funding they have very successfully undertaken.

As with all investments, being able to see exactly what IP a potential investee has is a massively persuasive factor for an investor and a key component of their final investment decision. As such, the ability to prove the required IP is in place and actively being used to build the business' value cannot be underestimated.

Dave continues the story:

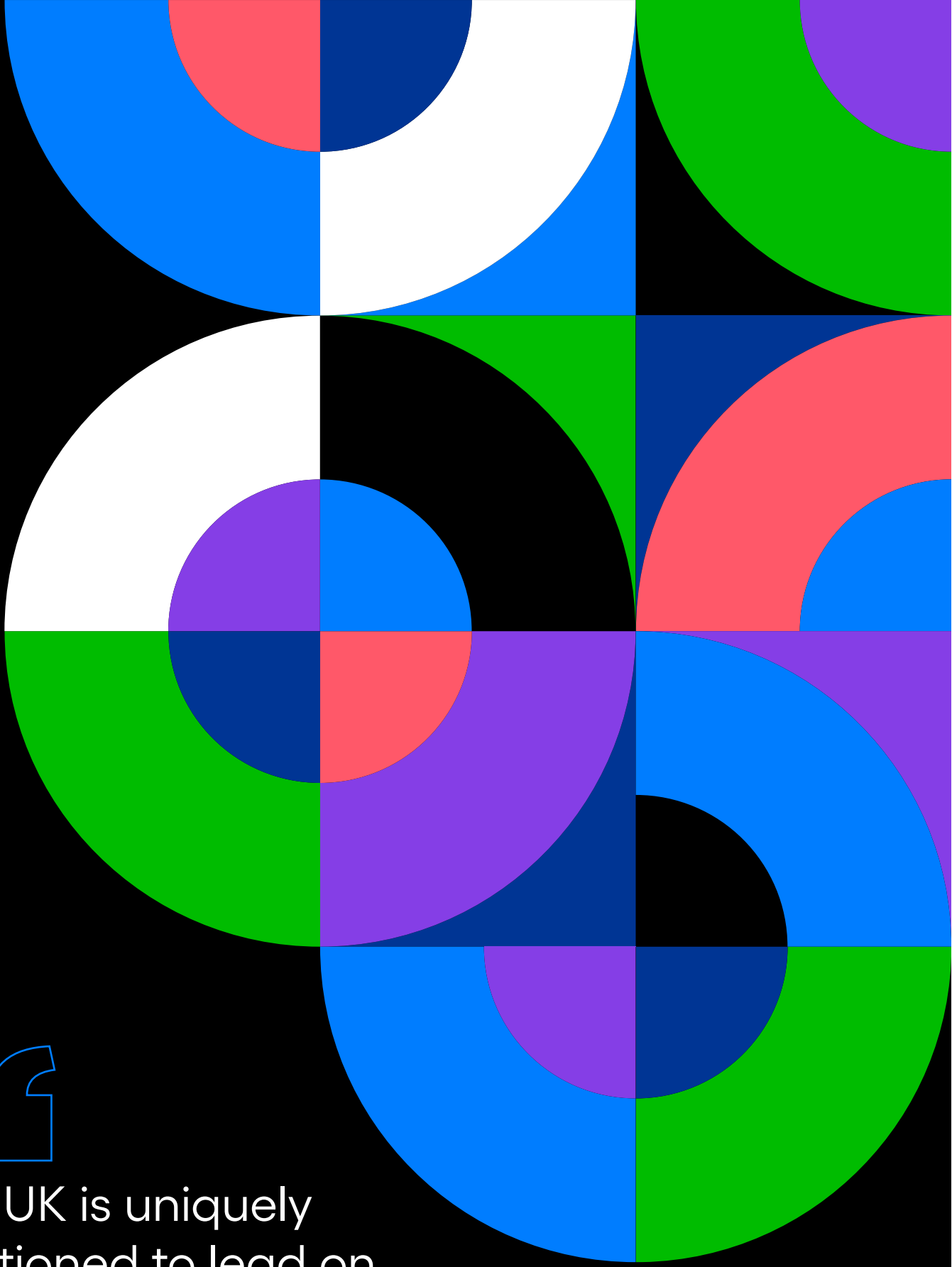
> **Our from that fact GeoPura have got genuinely great technology – technology that provides a very real solution for the core environmental problem they identified at the start of their journey – the best bit of working together has been to see the business grow so quickly to see them earn the recognition that they so richly deserve.**

It's grown from Andrew Cunningham and a few others to what is now a significant sized team, a team that now includes their newly appointed General Counsel. This is an appointment that underlines the importance they place on maintaining very hands-on management of their IP given the part their portfolio has played in their success and the accolades and plaudits their tech has earned."

From a branding specialist, Harrison is also a firm believer in their ability to market the brand so effectively:

"In a relatively short period of time, they have gone from being a start-up to being recognised as a top green tech company. They were recently recognised in the inaugural edition of The Sunday Times top 100 Tech companies, ranking Britain's fastest-growing private technology companies. This position has been reinforced by a series of appearances on the BBC – Spring Watch presenter Chris Packham has been a very public advocate – and Sky TV. The HPU™ generators are also increasingly being used to power gigs, festivals and sporting events. This coverage has springboarded their success by putting GeoPura in full public view."

GeoPura is now one of the largest hydrogen producers in the UK, operating a fleet of over 60 HPUs and employing 130 skilled workers around the UK.



“The UK is uniquely positioned to lead on the global stage in creativity, knowledge, and innovation.”

CASE STUDY

Nanofreeze — harnessing bio-nanotechnology for sustainable cooling

NanoFreeze is a climate-tech startup based in Colombia that has developed a revolutionary bio-nanotechnology for natural cooling solutions. While the technology has endless applications across the entire refrigeration industry – it can be applied to air conditioners, trucks, and ships – NanoFreeze has created the Natural Freezers, which reduce energy consumption in refrigeration systems by up to 50%. This not only significantly lowers carbon emissions but also enables access to sustainable refrigeration in regions with limited energy access. Through nature-inspired innovation, we aim to decarbonise the cold chain while reducing food waste and empowering rural economies.

Innovation and journey

Our journey began as a scientific collaboration between designers, microbiologists, and engineers at Universidad de los Andes, driven by a simple yet powerful question: *How can we preserve food or medicines in remote places?*

By studying how the bacteria *Pseudomonas Syringae* causes freezing at higher temperatures to protect itself from plants, the company discovered Ice Nucleating Active enzymes. These enzymes could be used to create a coolant that freezes at higher temperatures and lasts longer.

NanoFreeze has evolved from academic research into a scalable, real-world solution tested in retail points, health coolers, cold exports, and transportation systems. Our system not only provides a long-lasting cold chain but also delivers up to 50% in energy efficiency in cooling systems – all while being biodegradable, non-toxic, and compliant with international environmental standards.

The role of intellectual property

Protecting our innovation through intellectual property has been fundamental to our growth and credibility. Our patents ensure the exclusivity of our core bio-nanotechnological formulation, which is the engine behind our temperature stabilisation solution. This protection has been crucial in building trust with global partners, attracting investment, and laying the foundation for future licensing models in various geographies.

Our IP portfolio allows us to expand globally without compromising the integrity of our innovation, while also encouraging scientific collaboration and technology transfer across the Global South.

Global impact

NanoFreeze tackles four critical global challenges:

- **Climate change:** Refrigeration is responsible for 17% of the world's electricity demand. Our solution cuts energy use by up to 50%, reducing emissions at scale.
- **Cost efficiency:** NanoFreeze products can reduce energy bill costs by half, depending on the type of business and the share of refrigeration in total energy consumption. This means businesses that rely on refrigeration become more profitable by using NanoFreeze.
- **Food waste:** Every year, an estimated $121 billion is lost due to inefficiencies in the cold chain. NanoFreeze stabilizes temperatures to prevent food spoilage during transport and storage.
- **Access to cooling:** By enabling off-grid and low-energy refrigeration, we empower small farmers, rural businesses, and micro-retailers to safely preserve food and medicine.

We've partnered with corporations like AB InBev, Altoque Terpel, and Repsol to pilot and scale our technology in Latin America, and we're now exploring applications in Europe, Sub-Saharan Africa, and Southeast Asia.

Looking forward

NanoFreeze envisions a world where cooling is not a source of emissions, but a tool for resilience. We are scaling our manufacturing, expanding our IP portfolio, and entering strategic markets with high rates of food loss and climate vulnerability. With strong patent protection, mission-driven partnerships, and proven impact, NanoFreeze is well positioned to redefine the future of refrigeration.

There are 2.9 billion coolers around the world. If we can scale up to reach at least 30% of the total coolers, the impact would be enormous – we could save billions of tons of carbon dioxide per year. Our journey reflects how science, sustainability, and intellectual property can converge to generate global impact from the Global South, starting with a simple, nature-inspired question.

Contact: Isabel Pulido, CEO & Co-Founder
nanofreeze.com.co

CASE STUDY

Mobile Telecommunications – collaborative innovation powered by intellectual property

It is estimated that there are 5.8 billion unique mobile subscribers in the world. It is commonly said that more people have access to a mobile phone than to clean drinking water. Sadly, this is probably true. Nevertheless, it shows the rapid and widespread success of this technological development.

Global standards, global success

This success is founded on collaboration between industry, research institutes and academics from around the world. It is enabled through the creation of technical standards at standard development organisations (SDOs) such as 3GPP, ETSI and ATIS. These standards are more commonly referred to as 2G (GSM), 3G (UMTS), 4G (LTE) and 5G, marking each generation of mobile technology.

Developed over the last several decades, these standards have enabled mobile data speeds to increase by nearly nine orders of magnitude – a billion-fold – while the cost of data has dramatically fallen. They have driven connectivity, economic growth, and inclusion worldwide.

The standards themselves consist of hundreds of technical specifications, some numbering around a thousand pages each, and represent millions of person-hours of collaborative technical work. No single entity or company could develop them alone. It requires collaboration among a wide range of highly specialised engineers and researchers. This is facilitated by SDOs, which set up the development framework for these standards.

A new generation of mobile standards typically takes around 10 years to create from inception. At the moment, the 5G standard is being further enhanced through 5G Advanced, while the early stages of 6G development are already underway. This development comes from technical contributions made to the standard by thousands of engineers who compete to get the best technological solutions into the standard to meet its goals.

Why IP rights are essential to collaboration

While SDOs provide the framework for standardisation, they do not themselves have the necessary funds to develop the standards. They therefore depend on their members, typically from industry, to provide the resources and experts to do the research and development for their standards. This is where intellectual property rights – particularly patents – play a vital role. Patents ensure that those who contribute to the standard, often direct competitors, have a commercial incentive to share their innovations.

Historically, the primary incentive for standardisation was that competitors could benefit from building on a shared platform. For example, adding a camera to a phone to share pictures through a mobile network using common standards for both picture compression and mobile communications. Standards succeeded when all contributors shared in the benefits and costs of development.

However, over the last couple of decades, a growing divide has emerged between those who use/implement the standards and those who contribute to them. To address this imbalance, SDOs have ensured that contributors can benefit from their underlying patented technologies included in the standard by licensing them – provided that the licensing terms are fair, reasonable and non-discriminatory.

This approach has worked. By allowing patented technologies to be included in global standards, development has accelerated. Contributors can fund future R&D and support research teams through royalty payments from users of them. This creates a virtuous circle of innovation.

In the early years, mobile/cellular standards were created primarily by European and Norh American companies. However, in recent years, Asian companies have become increasingly involved. This reflects the openness of the SDOs to anyone, regardless of jurisdiction. Therefore, anyone with the technical know-how can contribute – and potentially benefit – if their patented technology is adopted into the standard, as has been the case for many thousands of Asian technologies, in addition to those from Europe and North America.

Looking ahead: why this matters now

Without patents, this virtuous circle of innovation would not be possible – nor would the ability for anyone, anywhere, to participate and help in developing the next generation of mobile telephony. The next generation of mobile standards will focus on AI and sustainability, as well as further enabling the Internet of Things, which can help improve energy and resource efficiency in farms, factories, transport networks, and cities across the world.

But none of this will happen without the right incentives. Innovation needs investment. Investment needs reward. And reward needs IP. It is therefore important to support both standardisation and the patenting – and rewarding – of the technologies that underpin it.

#WeAreICC

ICC is the world's largest business organisation representing 45 million companies with 1 billion employees in over 170 countries.

The International Chamber of Commerce is the only business organization with UN Observer Status and acts as a leading voice for business at the UN, G7, G20, World Trade Organization and other major international institutions.

ICC United Kingdom is the representative voice for ICC in the UK and provides a mechanism for UK industry to engage effectively in shaping international policy, standards and rules. We are the leading voice on digital trade ecosystems, act as the ICC representative to The Commonwealth and Co-Chair the B2B Cluster for the Commonwealth Connectivity Agenda.

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