Financing and commercialisation of cleantech innovation

April 2024 | Executive summary

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Investment Bank

Executive summary

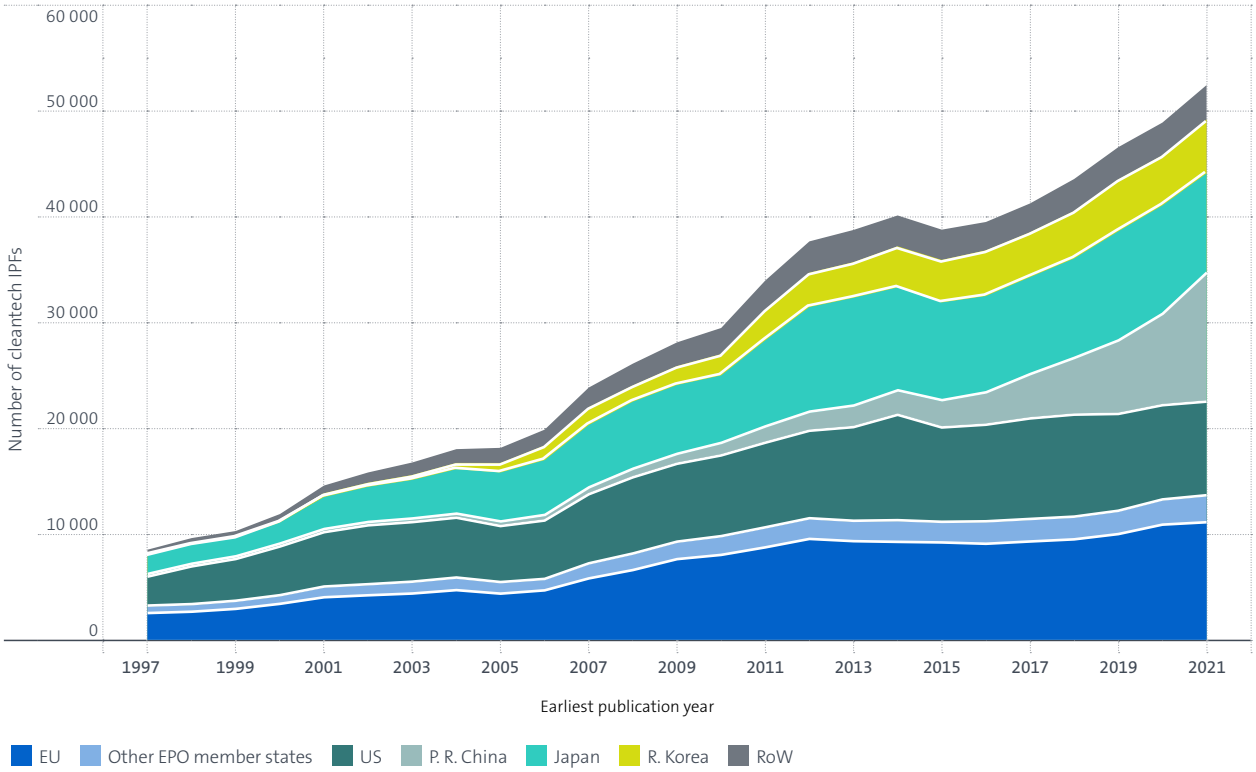
1. The transition to a cleaner, more sustainable economy is fuelling a race for innovation in which Europe is among the main contenders.

Over the past 25 years, the innovation landscape has been significantly enriched. There are now over 750 000 international patent families (IPFs) in clean and sustainable technologies worldwide, which represent nearly 12% of all IPFs. Remarkably, IPFs in clean and sustainable technologies grew faster than overall patenting activity during this period. There are two distinct phases of acceleration in cleantech patenting: 2006–2012, driven mainly by the EU and Japan, contributing 27% and 26% of the total increase in IPFs; and 2017–2021, led by China (comprising 70% of the surge in IPFs applications during this period), followed by the EU (16%).

The EU and other European countries are spearheading the wave in green innovation, together accounting for almost 27% of cleantech IPFs globally for the period 2017–2021, ahead of Japan (21%), the US (20%) and China (15%). China's rapid catch-up highlights its emerging role in the global sustainability effort, reflecting a vibrant and competitive landscape in clean and sustainable technologies.

Figure E1

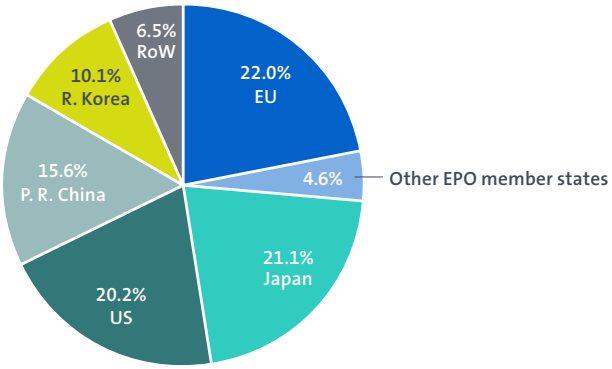
Trends in IPFs in clean and sustainable technologies, 1997–2021



Source: EPO

Figure E2

Share of cleantech IPFs, 2017–2021



Source: EPO

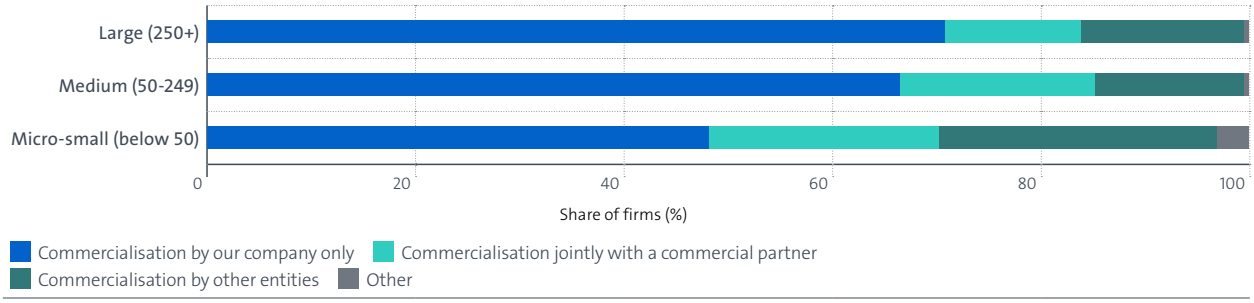
2. Patents support the commercialisation of clean and sustainable technologies.

Although more than three-quarters of international patent families in clean and sustainable technologies in the EU and US are filed by very large companies, the large majority of firms patenting in this field have fewer than 5 000 employees. The analysis of this report focuses on those firms, as they are very important for dynamic ecosystems in cleantech and more likely to face challenges when navigating through the innovation, patenting and industrialisation landscape.

Patents in clean and sustainable technologies serve the purpose of commercialisation for firms with less than 5 000 employees. In the EU, companies with less than 5 000 employees have already commercialised around 60% of the technologies for which they filed patent applications in the period 2011–2022, with an additional 28% nearing market launch. Size matters for commercialisation strategies. Around two-thirds of the technologies developed by medium and large firms (between 50 and 5 000 employees) are commercialised by the patent owner alone. Micro and small firms (fewer than 5 000 employees) instead take a more collaborative approach, with nearly half commercialising the technology either jointly with a commercial partner or with other entities. Registering a patent matters for external collaboration and financing, particularly for smaller firms. Among firms that have filed patent applications, the smallest ones emphasise most the importance of patents for setting up external partnerships, conducting technology transfers and attracting investors.

Figure E3

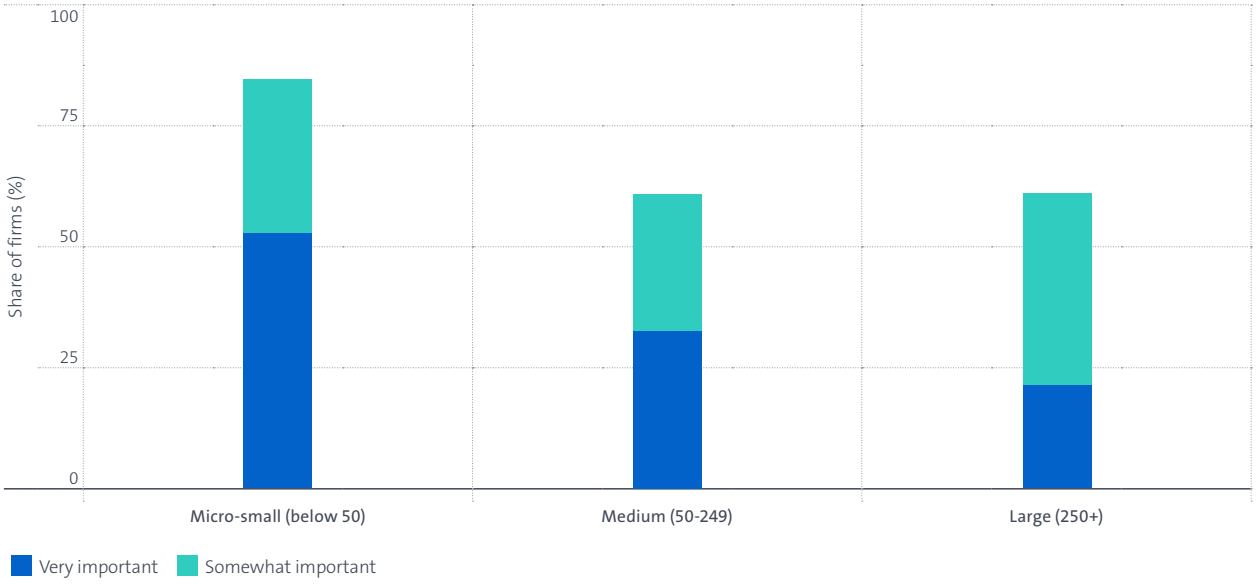
EU - Commercialisation of clean and sustainable technologies



Source: Cleantech Survey

Figure E4

EU - Role of patents for external partnerships and transfer of clean and sustainable technologies



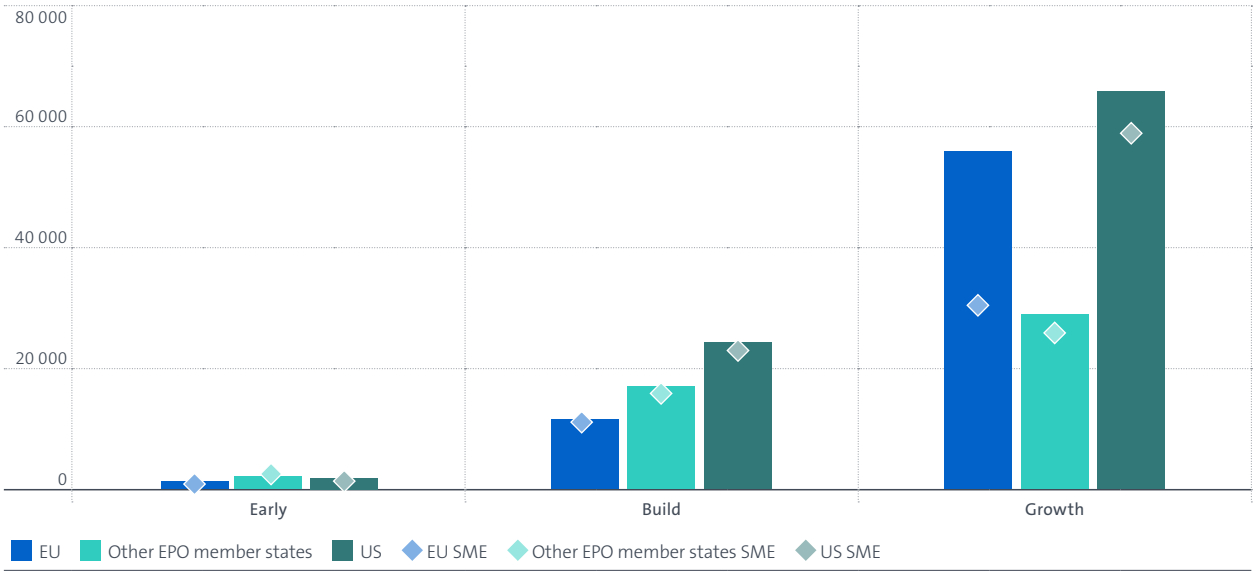
Source: Cleantech Survey

3. Funding disparities between EU and US firms are confirmed in the case of cleantech.

The capacity of firms to scale up differs substantially across regions, with innovative firms in the EU facing a financing gap versus US firms. In this respect, EU cleantech innovators are not an exception, even if the market appetite for cleantech is increasing. EU cleantech innovators are not able to raise as much significant funding as their US counterparts in all stages of growth. The median funding amount is considerably smaller than in the US, while the amounts raised at different stages increase much faster in the US than in Europe. Ultimately, EU cleantech innovators are more likely to depend on debt finance to finance their cleantech activities. By contrast, equity plays an important role as a supplementary source of external finance in the US and, to some extent, in other EPO member states.

Figure E5

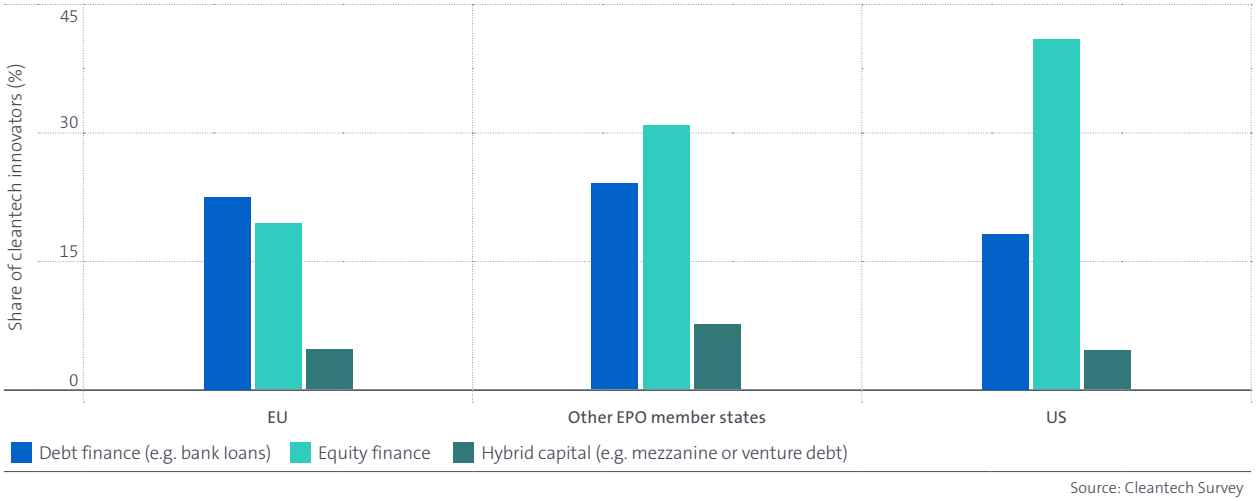
Funding received by firms at different growth stages, funding amount in USD (median), 2013–2023



Source: Crunchbase

Figure E6

Use of different forms of external finance for cleantech activities



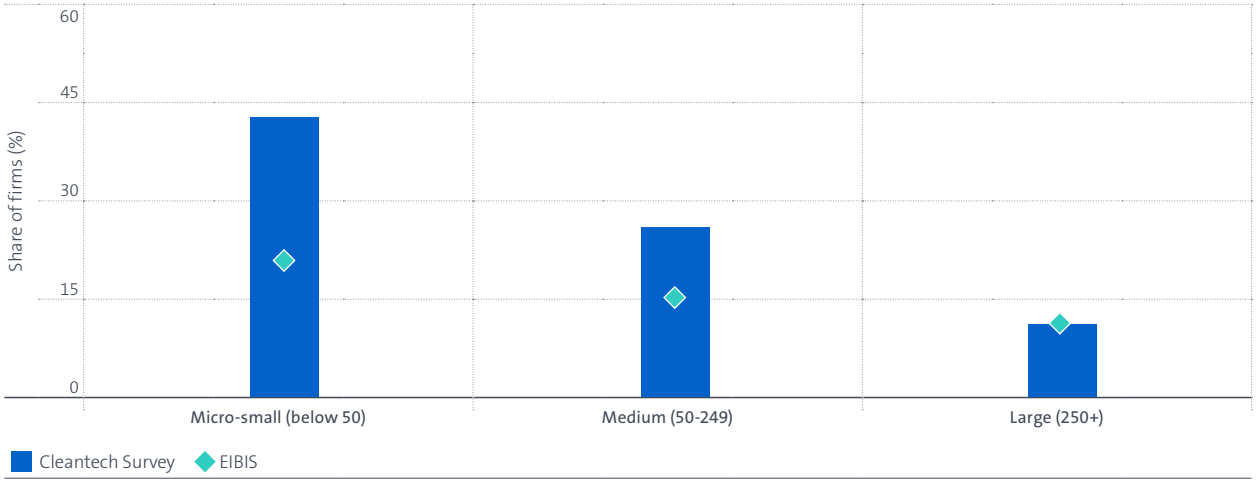
Source: Cleantech Survey

4. When looking at barriers to the commercialisation of clean and sustainable technologies, access to finance emerges as a particularly severe challenge for smaller companies.

Over 30% of EU companies identify lack of finance as a significant barrier to the commercialisation of clean and sustainable technologies. While only 12% of large companies report financing as a hurdle, 43% of micro and small companies face difficulties, indicating a more acute problem within this segment compared to the average SME in the EU (as per the European Investment Bank Investment Survey). Against this backdrop, small cleantech innovators seeking to commercialise patented technologies call for access to funding. Patents emerge as an asset for them, with the majority considering them very important in attracting venture capital (VC) investors or providing collateral for debt.

Figure E7

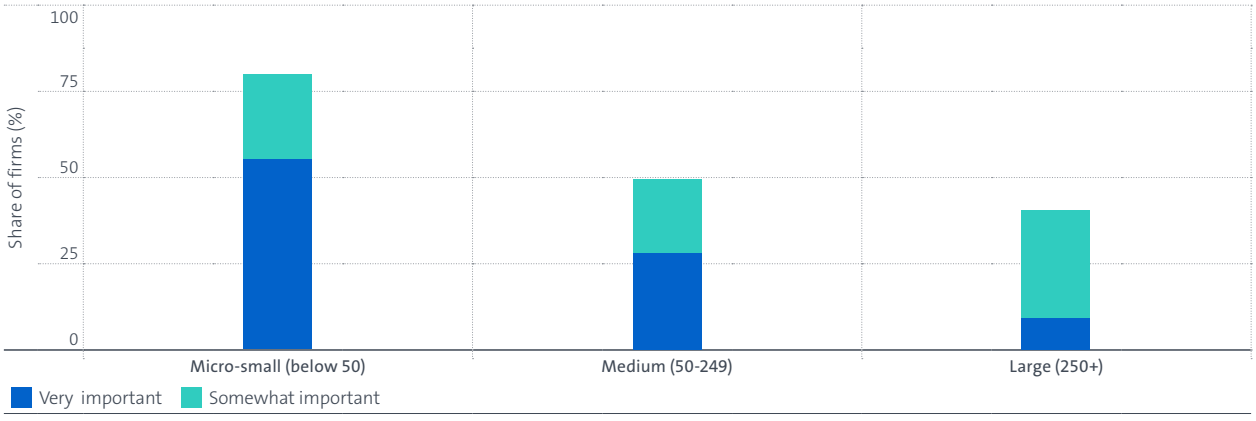
EU - Lack of finance as a major obstacle for the commercialisation of clean and sustainable technologies



Source: Cleantech Survey and EIB Investment Survey (EIBIS) 2023

Figure E8

EU - Applicants' view on the role of patents in raising funds and attracting investors



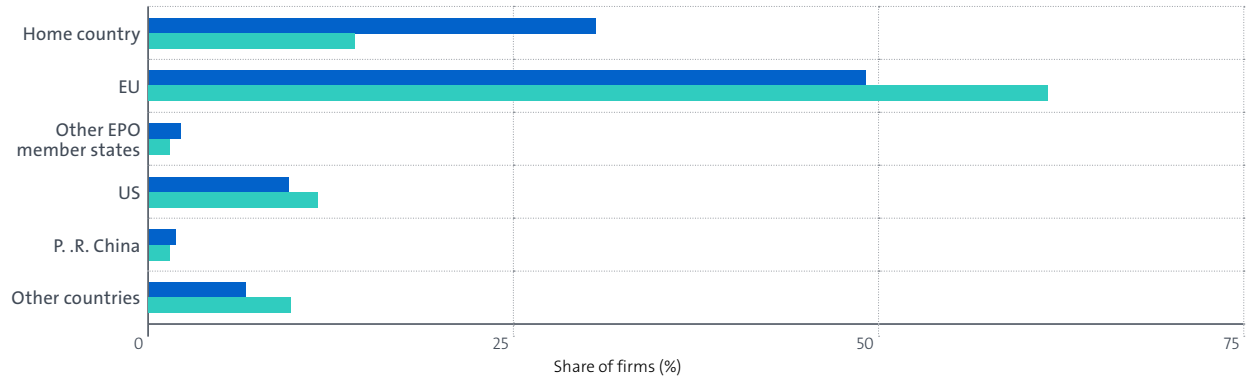
Source: Cleantech Survey

5. The EU single market is a key catalyser for scaling clean and sustainable innovation

EU cleantech innovators remain primarily focused on EU markets for their growth. Even though 29% of EU companies currently prioritise their national market, 61% view the EU as their key market for the future. Scaling up in Europe is not without challenges. Whereas small businesses mention access to finance as their priority in bringing new technology to market, a total of 43% and 55% of medium and large companies respectively cite consistent regulation in the EU as the main way to foster commercialisation.

Figure E9

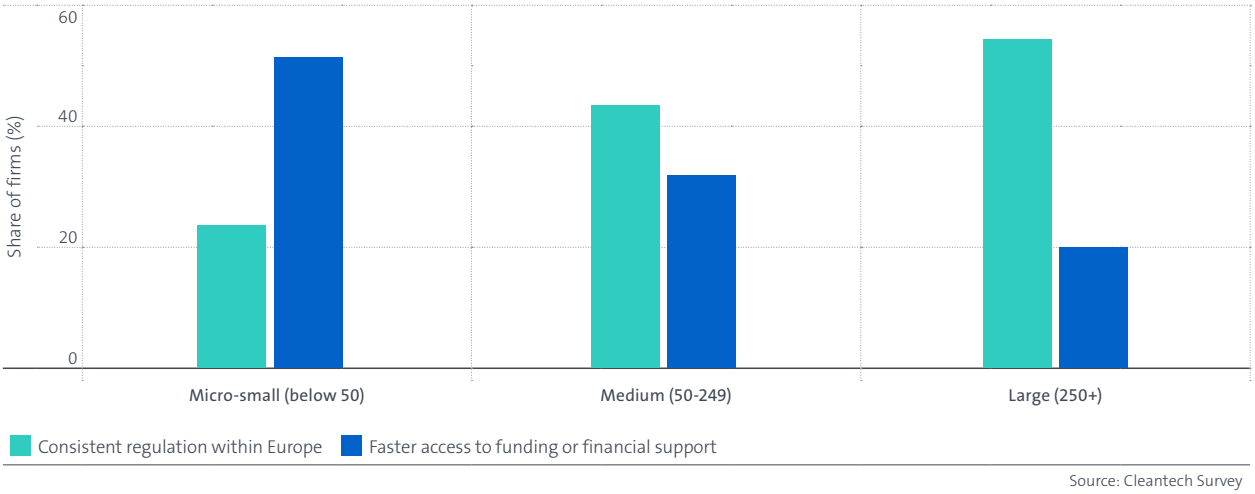
Current and future primary sales market for EU cleantech innovators



Source: Cleantech Survey

Figure E10

EU - Consistent regulation within the EU and fast access to funding are considered important for supporting innovation in cleantech



Source: Cleantech Survey

6. Navigating challenges: scaling up innovation and regulatory consistency

Europe is at the forefront of global net-zero ambitions, with a leading position at the frontier of cleantech patents. However, global competition is strong, and preserving Europe's lead requires effort.

Cleantech in Europe faces the usual funding gap that characterises innovation on the continent. Firms rely mostly on debt rather than equity finance and thus face issues in scaling up, with less finance at all different stages of growth.

The EU market remains the key focus for EU cleantech innovators and their favoured option to scale up. The importance of the EU single market is confirmed by the call for consistent and robust regulations, particularly by larger firms. This is an important feature in the context of an emerging market, where Europe has shown its ambition. Although the EU has already invested significant effort, continued focus on integration and improvement in regulatory clarity remains essential, for European cleantech innovators to derive the full benefits from the sheer scale of the single market.

Patents are a means for European cleantech companies to secure their technological lead. They are also proving to be important assets for commercialising new technologies, building partnerships and attracting funding, especially for small cleantech companies. The recent creation of the Unitary Patent opens up promising perspectives in this respect. By allowing cost-efficient access to uniform patent protection in 17 EU member states, it is a significant step towards addressing the need for harmonisation expressed by European cleantech innovators, thereby enabling further progress in technology commercialisation and IP-based finance on a truly European scale.

The full report is available for download at:

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