



Top 100 Global Innovators 2022

Higher fidelity

The way ideas are formed, where they are created and how they connect is evolving. So too does the manner in which we measure them.



Contents

02

Foreword

03

Reboot

04

Calculating excellence

04

Innovator informatics

06

Top 100 Global Innovators 2022

09

The macro view of modern innovation

12

The direction of ideas still to come

Foreword



Terrence Curtin
CEO, TE Connectivity

TE Connectivity's purpose is to create a safer, sustainable, productive and connected future. We are a global industrial technology leader in connectivity and sensor solutions that enable advancements in electric vehicles, factory automation, data communications, medical devices and renewable energy. Innovation is one of our company's four core values and is truly at the heart of everything we do.

We are proud of our innovation culture. In 2021, we invested nearly \$700 million in engineering, research and development, and exceeded 15,000 patents granted or pending. Approximately 20% of our \$14.9 billion in sales in FY21 were from new products introduced during the previous three years.

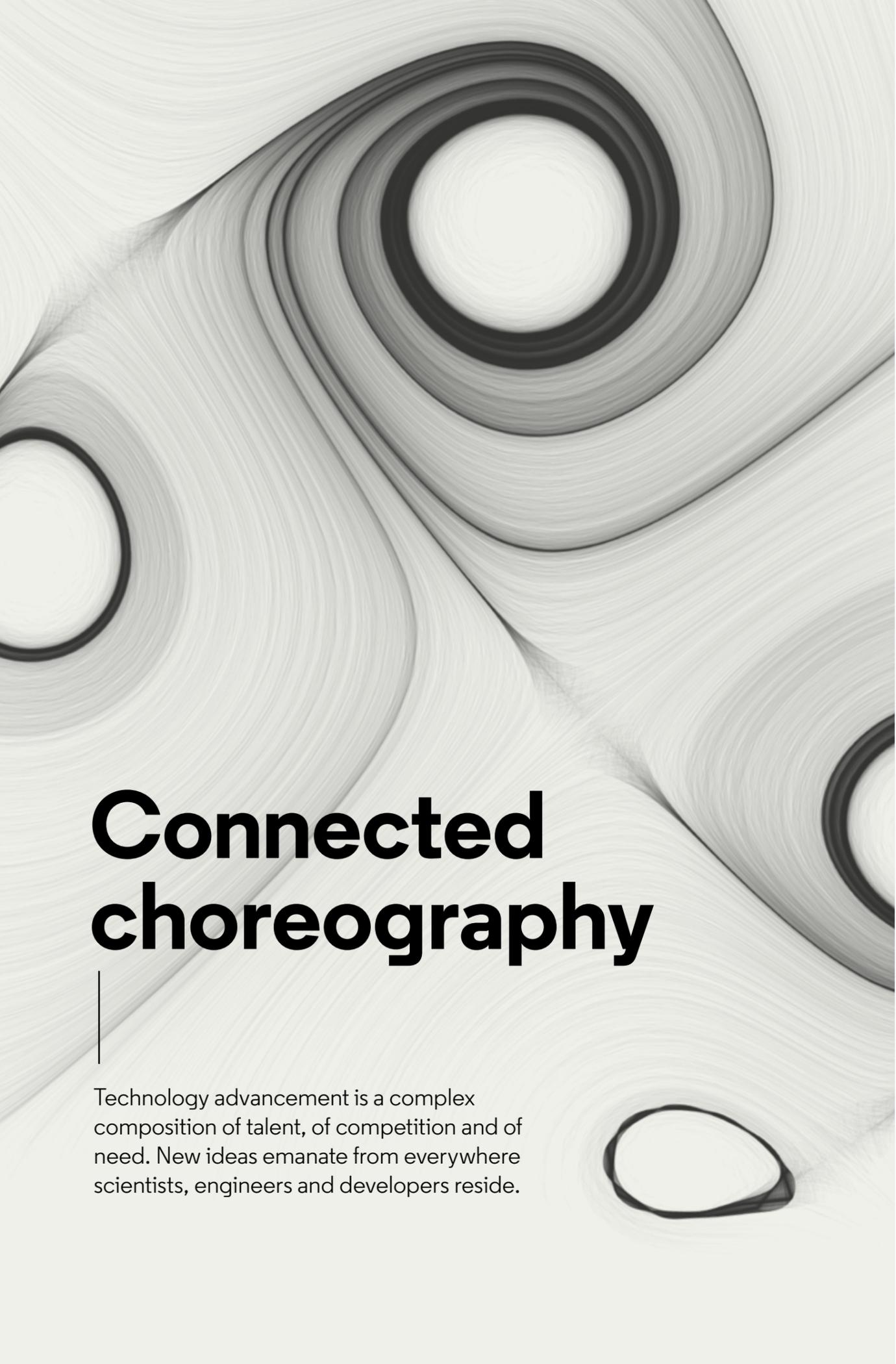
With more than 85,000 global employees, including more than 8,000 engineers, our teams work intimately with our customers around the world to understand and anticipate their needs and develop technology and products that help solve their toughest challenges. Now more than ever, it's critical to us that our innovation advances sustainability — both in the solutions we bring to our customers and by reducing our own carbon footprint through more sustainable manufacturing processes.

Innovation that makes our world better and our planet healthier is something we strongly believe in at TE and I know it is also a focus for many of the companies featured in this report.

We are very proud to be included for the 11th straight year on the list of companies recognized by the Top 100 Global Innovators program. We thank Clarivate™ for this recognition and we congratulate all the honorees. Together, we are solving the problems of today to ensure we are building a better tomorrow.

Consistent outperformance

The Top 100 Global Innovators 2022 demonstrate the capabilities, consistency, incredible creativity and new thinking that solve pressing challenges and establish new value for the world.



Connected choreography

Technology advancement is a complex composition of talent, of competition and of need. New ideas emanate from everywhere scientists, engineers and developers reside.

Reboot

For more than ten years, Clarivate has produced the Top 100 Global Innovators™ list using the same methodology. **This year, it changes.**

As the way ideas are formed, where they are created and how they connect evolves — so too does the manner in which we measure them.

No longer is an idea an island. Technology advancement is a complex choreography of talent, of competition and of need. New ideas emanate from everywhere scientists, engineers and developers reside.

Assessing innovativeness for 2022 (and beyond) switches from a top-down view of companies and institutions to one where every invention, no matter the source, is compared to all others.

Using the core Vision of Clarivate to improve the way the world creates, protects and advances research and ideas, we are going further in the way we compare.

Each idea is measured to typical values, baselined even as what is typical varies from technology to technology and region to region.

Each invention is assessed on its influence, its market footprint, its investment level and for the first time, its rarity.

We co-opt the skills and knowledge of the world's patent examiners, to determine when one idea leans on another, and when that link crosses to others.

We explore the novelty of each idea, and the economic asset footprint it has gathered.

We look to the investment levels planted into each innovation, the international ambition it represents and the confidence in the idea.

We look to the distinctiveness of each invention, and how far beyond the technological norm it pushes.

Innovators become a product of their innovations, built from the ground up, as the outcome of each individual idea they develop is compared to all patented human knowledge.

Using informatic techniques targeting innovator excellence, we compare 50 million ideas, across thousands of baselines, through billions of calculations, so that we can discover the 100 innovators at the very top.

We do this to pinpoint those organizations who are reaching furthest, who through excellence in creativity, talent, planning and thought, lead the way in generating new ideas.

That have the greatest change on the way world works, and who shift the market goalposts the most.

That create not just good ideas, but important inventions — consistently and at scale — that are impactful, tangible and extend the boundary of what is known.

That define modern innovation and set the direction of ideas still to come.

At Clarivate, our Mission is providing guidance and clarity to the world's innovators.

Today we do so with a higher fidelity, on a more even field, using a deeper level of data exploration and comparison.

Here, we introduce the Top 100 Global Innovators from Clarivate, refreshed and rebooted.

Calculating excellence

With more patented ideas created each year than ever before, measuring them — and identifying those organizations and institutions producing them — requires a deep understanding of the patterns woven into global ideation and innovation data. **It requires a mathematical foundation focused on comparison.**

With a refreshed approach, Top 100 Global Innovators switches to a new model of excellence calculation, focused on above the bar consistency and scale in innovativeness, where all ideas compete equally.

The Top 100 Global Innovators 2022 list is based on a twin track approach to evaluation.

Track 1: Qualifying as global

The first track focuses on identifying innovating organizations that pass qualification criteria based on volume of inventive activity: 500 published inventions since 2000, and 100 granted inventions in the 2022 5-year evaluation window.

We then compare innovators based on the proportion and level of international inventions (ideas patented in more than one country or region), creating an international innovator weighting factor.

All applicants



500
published inventions

100
granted inventions

Qualifying long list

= International Innovator Weighting factor

Track 2: Baselineing each idea

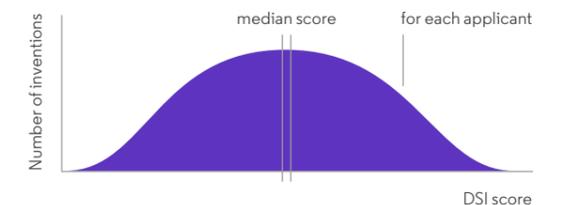
The second track evaluates all inventions in the Derwent World Patents Index™ (DWPI™), and scores them on four factors:

All patented ideas



50M
inventions compared on these factors

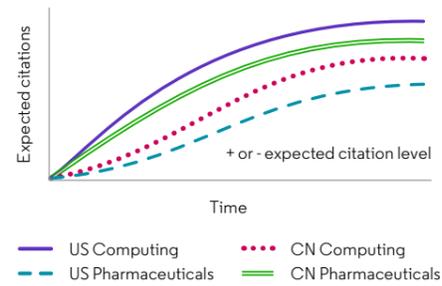
-  Influence
-  Success
-  Globalization
-  Technical distinctiveness



= Derwent Strength Index

Derwent Strength Index Comparison factors overview

Influence



The downstream influence on other innovators of each patented idea, compiled by patent examiners, and normalized for variation by technology sector and differences that occur by geography or language. Every combination of technical theme and geography has an expected level of patent citation over time, and we assess individual inventions in comparison to that influence curve.

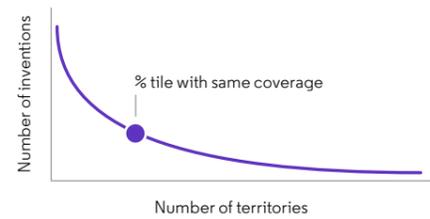
Success



% world economy covered

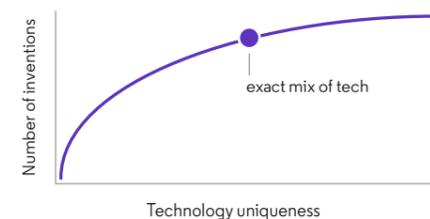
The proportion of the world economy that each patented idea has covered by a granted, issued patent right. This provides a basis from which the rights' owner can use their technology.

Globalization



The dedication to each patented idea, measured by the level of international patent filing committed to by the applicant. The greater the level of geographic breadth attempted, the higher the investment level the idea had lavished upon it.

Technical distinctiveness



The rarity of the combination of technical features and use cases presented within the patented idea, and therefore the level of technical extension the invention supports.

Combining ideas with organizations

Each invention returns a Derwent Strength Index™ score based on these four factors, compared directly to all other patented ideas.

International Innovator Weighting factor



Innovators are ranked based on the Derwent Strength Index of the median average of their activity over the last five years (the invention in the middle, the value separating the top performing half of their inventions from the bottom half), weighted by the global innovator factor.

Derwent Strength Index



Global Innovator Score

Data behind innovation measurement

Derwent World Patents Index™ (DWPI™)

A database built around ideas, DWPI records where and when inventions are patented across 60 patent-issuing states and authorities.

DWPI rewrites these patents into English-language invention summaries and categorizes their intended use, why they are needed and what is novel about them — 3.5 million times a year.

Derwent Patents Citation Index™

A sister database to DWPI, the Derwent Patents Citation Index focuses on inventions that have been referenced by applicants and patent examiners in later, downstream patent applications.

Emulating the DWPI invention-level structure, Derwent Patents Citation Index automatically removes double, triple (or more) counting of citation events between the same patented ideas.



Finding the innovation signal

Innovators the world over need techniques and data that enable inventions to be benchmarked against comparables and formulated to tell real stories, that accurately narrate the ecosystem and its influences.

Top 100 Global Innovators 2022

After almost two years of radical economic and technological change, the pace of innovation is breaching new frontiers of speed and complexity.

As we approach the second quarter of the 21st century, innovation and ideation are reinforced and stimulated by forces of convergence at a degree not seen before. There are examples all around us.

The way automation provides new paradigms in productivity and efficiency.

The remodelling of mobility, evolving how people and goods move.

The underpinning usefulness of data connectivity, creating new industries and changing forever more traditional enterprise.

The great project of human wellbeing, taking longevity and quality of life and culture to new levels.

The existential and foundational imperative of sustainability, transforming how we source and consume energy and resource.

Like ripples on a pond, amplified today to waves on the ocean, these forces intersect, interfere and augment each other.

The need — and the opportunity — for new ideas and fresh thinking has never been greater.

For every technical breakthrough created, the need for context and clarity sits behind. At Clarivate, our task remains the same and our mission stays constant.

With the landscape of technical ideas evolving more rapidly in more directions than any time in history, our Vision remains consistent: to advance the knowledge frontier and provide the benchmark, to help accelerate innovation itself.

Every year since 2012, we have celebrated the world's innovators in all their forms and flavors with analysis, discussion and a list of the 100 corporations and institutions at the very pinnacle of the global innovation ecosystem.

Here are the Top 100 Global Innovators 2022.

Top 100 Global Innovators 2022

Alphabetical list ordering

 11-Year Top 100 Global Innovator

 Innovator to watch

 New entrant

Innovator	Country / region	Industry	Recognition (2012-22)*	Highlights
3M	United States	Chemicals and materials	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
ABB	Switzerland	Industrial systems	2012, 2014, 2015, 2020, 2021, 2022	
AGC	Japan	Chemicals and materials	2014, 2015, 2018, 2019, 2020, 2021, 2022	
Airbus	France	Aerospace and defense	2012, 2013, 2014, 2022	
Alibaba	China, Mainland	Software, media, fintech	2022	 
Alstom	France	Energy and electrical	2016, 2017, 2018, 2019, 2020, 2022	
Ant Group	China, Mainland	Software, media, fintech	2022	
ASML	Netherlands	Semiconductors	2012, 2022	
AU Optronics	Taiwan	Electronics and computing equipment	2022	 
BASF	Germany	Chemicals and materials	2012, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
BOE Technology	China, Mainland	Electronics and computing equipment	2022	
Boeing	United States	Aerospace and defense	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Bosch	Germany	Industrial conglomerate	2015, 2022	
Brother Industries	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2022	
Canon	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2022	
Carl-Zeiss	Germany	Industrial systems	2022	
CEA	France	Government and academic research	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022	
CNH Industrial	United Kingdom	Industrial systems	2022	
CNRS	France	Government and academic research	2012, 2013, 2014, 2015, 2016, 2022	
Continental	Germany	Automotive	2022	
Deere & Co	United States	Industrial systems	2022	
Delta Electronics	Taiwan	Electronics and computing equipment	2022	 
Denso	Japan	Automotive	2012, 2013, 2015, 2022	
Dow	United States	Chemicals and materials	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
DuPont	United States	Chemicals and materials	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022	
Ericsson	Sweden	Telecommunications	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	

Innovator	Country / region	Industry	Recognition (2012-22)*	Highlights
Evonik	Germany	Chemicals and materials	2022	
Fanuc	Japan	Industrial systems	2012, 2013, 2022	
Ford	United States	Automotive	2013, 2014, 2022	
Foxconn	Taiwan	Electronics and computing equipment	2018, 2019, 2020, 2021, 2022	
FujiFilm	Japan	Electronics and computing equipment	2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Fujitsu	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
GE	United States	Industrial conglomerate	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
General Motors	United States	Automotive	2022	 
Halliburton	United States	Energy and electrical	2022	
Hitachi	Japan	Industrial conglomerate	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Honda	Japan	Automotive	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Honeywell	United States	Industrial systems	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
HP	United States	Electronics and computing equipment	2012, 2013, 2014, 2015, 2020, 2021, 2022	
Huawei	China, Mainland	Telecommunications	2015, 2017, 2018, 2019, 2020, 2021, 2022	
Hyundai Motor	South Korea	Automotive	2022	 
Infineon Technologies	Germany	Semiconductors	2014, 2022	
Intel	United States	Semiconductors	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
ITRI	Taiwan	Government and academic research	2015, 2018, 2019, 2020, 2021, 2022	
Johnson & Johnson	United States	Pharmaceuticals	2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Kia Motors	South Korea	Automotive	2022	
Kioxia	Japan	Electronics and computing equipment	2022	
Komatsu	Japan	Industrial systems	2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Konica Minolta	Japan	Electronics and computing equipment	2022	
Kyocera	Japan	Electronics and computing equipment	2015, 2016, 2017, 2018, 2019, 2022	
LG	South Korea	Industrial conglomerate	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
MediaTek	Taiwan	Semiconductors	2015, 2016, 2017, 2022	

Top 100 Global Innovators 2022

Alphabetical list ordering (cont.)

 11-Year Top 100 Global Innovator

 Innovator to watch

 New entrant

Innovator	Country / region	Industry	Recognition (2012-22)*	Highlights
Merck	Germany	Chemicals and materials	2017, 2018, 2020, 2022	
Mitsubishi Heavy Industries	Japan	Industrial systems	2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Michelin	France	Automotive	2012, 2013, 2014, 2022	
Mitsubishi Electric	Japan	Energy and electrical	2012, 2013, 2014, 2015, 2016, 2018, 2019, 2020, 2021, 2022	
Murata Manufacturing	Japan	Electronics and computing equipment	2012, 2022	
NEC	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Nitto Denko	Japan	Chemicals and materials	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2022	
Olympus	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022	
Omron	Japan	Electronics and computing equipment	2014, 2017, 2018, 2019, 2020, 2021, 2022	
Panasonic	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Philip Morris International	United States	Consumer goods and food	2022	 
Philips	Netherlands	Medical and biotechnology	2012, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Procter & Gamble	United States	Consumer goods and food	2012, 2013, 2014, 2022	
Qualcomm	United States	Telecommunications	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Quanta Computer	Taiwan	Electronics and computing equipment	2019, 2020, 2021, 2022	
Raytheon Technologies	United States	Aerospace and defense	2012, 2013, 2019, 2020, 2021, 2022	
Realtek Semiconductor	Taiwan	Semiconductors	2022	
Ricoh	Japan	Electronics and computing equipment	2013, 2015, 2022	
Roche	Switzerland	Pharmaceuticals	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Rolls Royce	United Kingdom	Aerospace and defense	2022	
Safran	France	Aerospace and defense	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2022	
Samsung	South Korea	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Saudi Aramco	Saudi Arabia	Energy and electrical	2022	
Screen Holdings	Japan	Electronics and computing equipment	2022	
Seiko Epson	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2022	
Shimano	Japan	Consumer goods and food	2022	

Innovator	Country / region	Industry	Recognition (2012-22)*	Highlights
Shin-Etsu Chemical	Japan	Chemicals and materials	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Siemens	Germany	Industrial conglomerate	2012, 2013, 2014, 2015, 2019, 2022	
Signify	Netherlands	Energy and electrical	2022	
SK Group	South Korea	Industrial conglomerate	2021, 2022	
Sony	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
STMicroelectronics	Switzerland	Semiconductors	2013, 2014, 2015, 2022	
Sumitomo Chemical	Japan	Chemicals and materials	2022	
Sumitomo Electric	Japan	Energy and electrical	2012, 2014, 2015, 2016, 2017, 2022	
Swatch Group	Switzerland	Consumer goods and food	2022	
TCL Technology	China, Mainland	Electronics and computing equipment	2022	 
TDK	Japan	Electronics and computing equipment	2013, 2014, 2015, 2018, 2019, 2020, 2021, 2022	
TE Connectivity	United States	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Thales	France	Aerospace and defense	2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Tokyo Electron	Japan	Semiconductors	2015, 2022	
Toshiba	Japan	Electronics and computing equipment	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
Toyota	Japan	Automotive	2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	
TSMC	Taiwan	Semiconductors	2014, 2022	
Valeo	France	Automotive	2013, 2014, 2016, 2017, 2022	
Volkswagen	Germany	Automotive	2022	
Wistron	Taiwan	Electronics and computing equipment	2022	 
Yamaha	Japan	Industrial conglomerate	2012, 2015, 2016, 2022	
Yazaki	Japan	Automotive	2016, 2017, 2021, 2022	

* Top 100 Global Innovators inclusion prior to 2022 used a different evaluation methodology.

The macro view of modern innovation

With higher fidelity, and a holistic baseline comparison of individual ideas mapped to organizations, a rebalancing of recipients occurs.

Entry to the list is harder, as performance across the four factors (volume, influence, success, globalization) must occur more consistently within the activity of qualifying entities.

Outperformance of peers and non-peers alike can no longer occur in pockets of research and innovation, in just a selection of inventions; instead it must be across the board.

Comparing the nature of the Top 100 Global Innovators 2022 shows a greater footprint of European and Asian firms.

Companies on the 2022 list also reflect ongoing trends and predicted firsts identified within the last two years of the Top 100 program.

- The regional diversity continues to increase, with the first ever Middle Eastern list entry via energy firm Saudi Aramco.
- The powerful technology development efforts occurring within the industry see a 100% increase in inclusion of automotive firms, including companies predicted in our *Innovators to Watch* reports in 2020 and 2021, for example General Motors and Hyundai. Also entering are Ford, Volkswagen, Kia Motors, joining 11-time Top 100 Global Innovators Honda and Toyota.

- The growth of recognition for electronics manufacturers and semiconductor fabrication firms based in Taiwan, including the entrance of *Innovators to Watch* AU Optronics, Delta Electronics and Wistron, the first time-recognition of Realtek Semiconductors and the return of TSMC and MediaTek.

- The entrance of Mainland Chinese e-commerce powerhouse Alibaba, another company recognized in our *Innovators to Watch 2021* list, alongside affiliate and digital payment giant Ant Group.

- A doubling of the number of aerospace and defense firms, with the addition of Rolls-Royce and return of Safran and Airbus, all European firms.

A large part of the shift the new methodology brings about is a swing of recognition to companies in Japan. This includes five first-time entrants: Screen Holdings (formerly Dainippon Screen), sports-good company Shimano, Sumitomo Chemical, electronic imaging firm Konica Minolta and newly-born memory manufacturer Kioxia — founded just three years ago as a spin-out from Toshiba.

Ideation patterns are changing

The pace of innovation is breaching new frontiers of speed and complexity. Innovation and ideation are reinforced and stimulated by forces of convergence at a degree not seen before.

The wider, top 1,000 view

At a wider, higher level, by extending the view beyond the Top 100, to the deeper Top 1,000 entities, we can visualize the performance of countries, regions and industry sectors.

At this resolution, the power and scale of innovation at the largest conglomerates — companies like GE, LG, Hitachi and Siemens — is very evident.

There is need for fast-paced and breakthrough ideas in transportation, electronics and semiconductor technology. We also see the continued power of diverse but important European innovators, who on average rank highest in the Top 1,000.

The story these deeper measures narrate is one of intersecting need and supply, of collaboration and dissemination of technology:

- That more academic research focused entities perform large-scale development but lean on industry to deploy them into the economy

- The contribution to the global ecosystem provided by more fundamental technologies in telecommunications, materials, industrial systems and energy are enablers

- The surprising underperformance of software-related innovators, that while influential and impactful, protect their ideas more minimally in terms of geography, and whose inventions tend to be less rare technically, limiting their innovator score

With the measures and metrics the Top 100 Global Innovators program has at its disposal, the question becomes: what if we looked ahead? If we took the macro-view, and extend out the trend lines? Can we use excellence in innovation performance to assess the likely future shape of ideation?

Figure 1: Countries and regions, Top 100 Global Innovators 2022



Figure 2: Industry sectors, Top 100 Global Innovators 2022

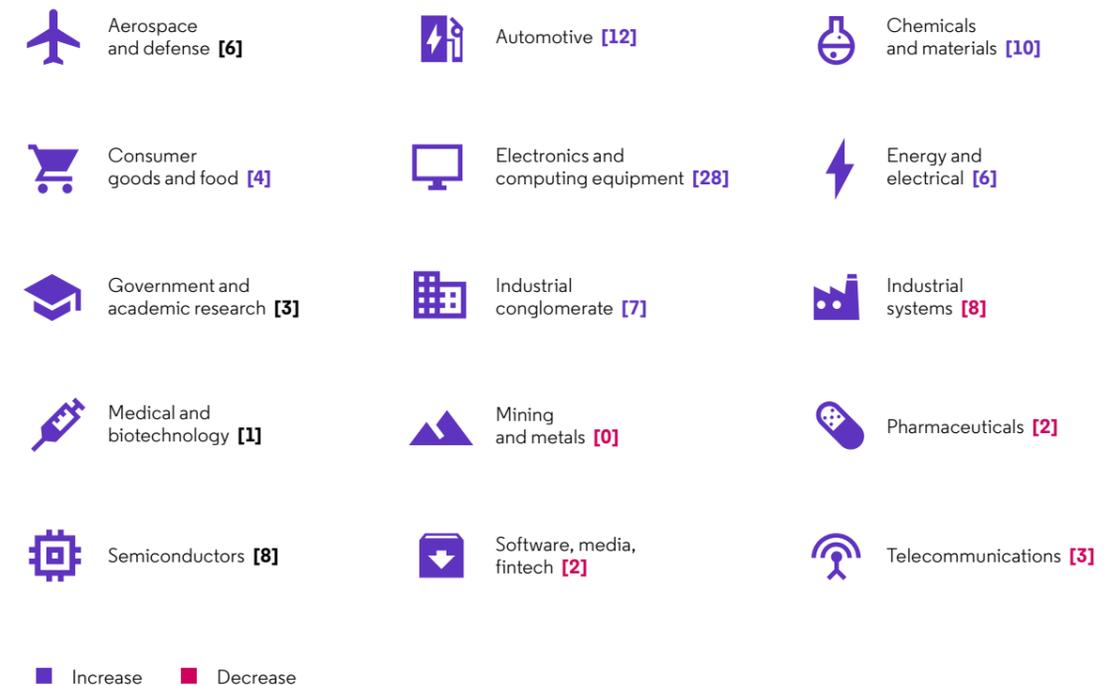


Figure 3: Global innovator ranking by segment.
Average rank of entities, Top 1,000 Global Innovators

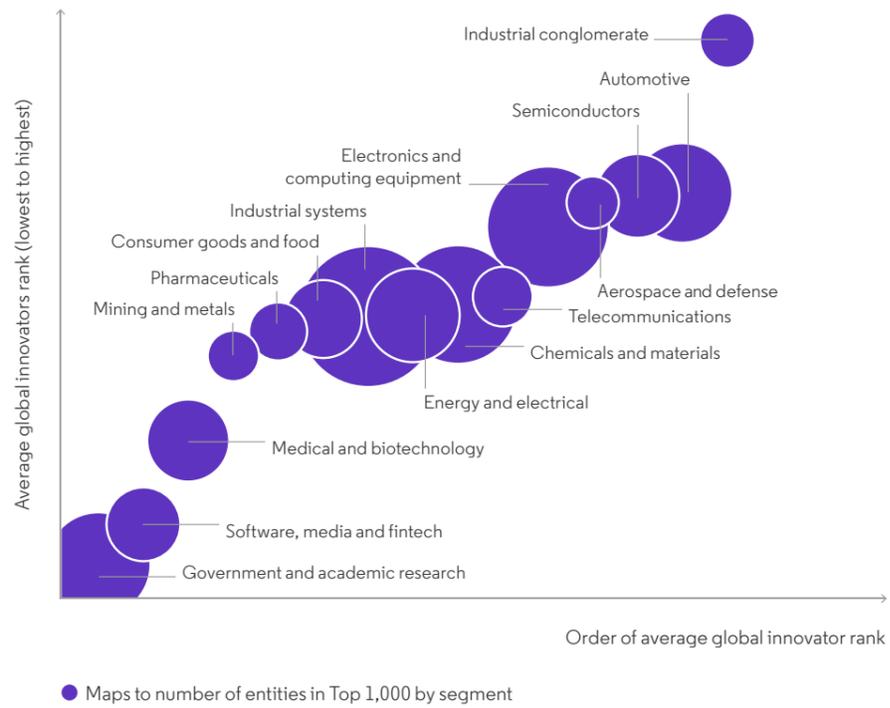
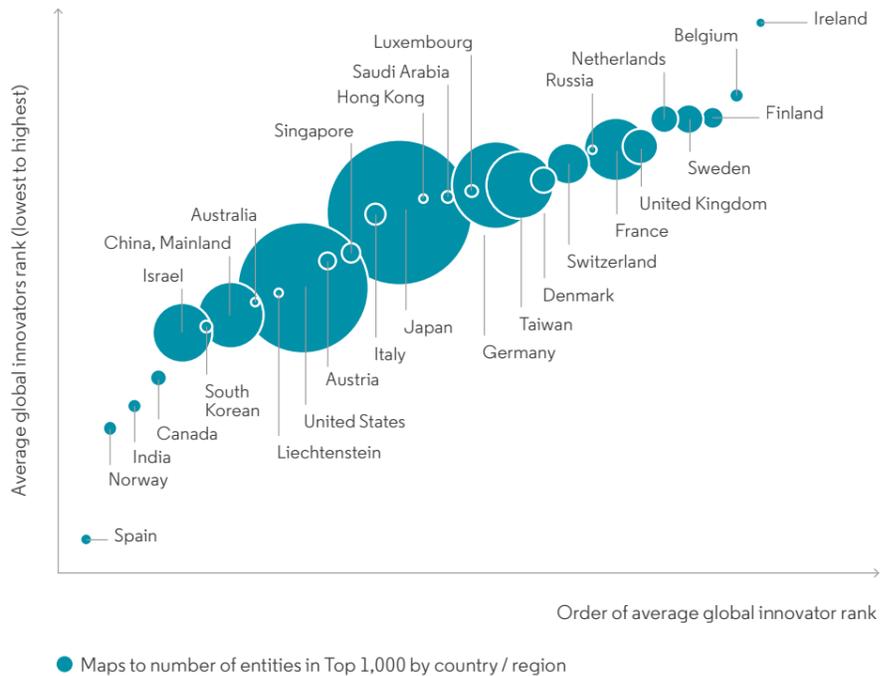


Figure 4: Global innovator ranking by country / region.
Average rank of entities, Top 1,000 Global Innovators



Mathematics of advancement

Using informatic techniques targeting innovation excellence, we compare 50 million ideas, across thousands of baselines, through billions of calculations, to discover the 100 innovators at the very top.

The future shape of ideation

We use the measures and metrics of the Top 100 Global Innovators program, extending out the trend lines and using excellence in innovation performance, to assess the likely shape of future ideation.

The direction of ideas to come

Nine million inventions, four short years

If volume of patent activity is a general indicator of pace in innovation, then the next four years will likely see a profound shift in dynamics.

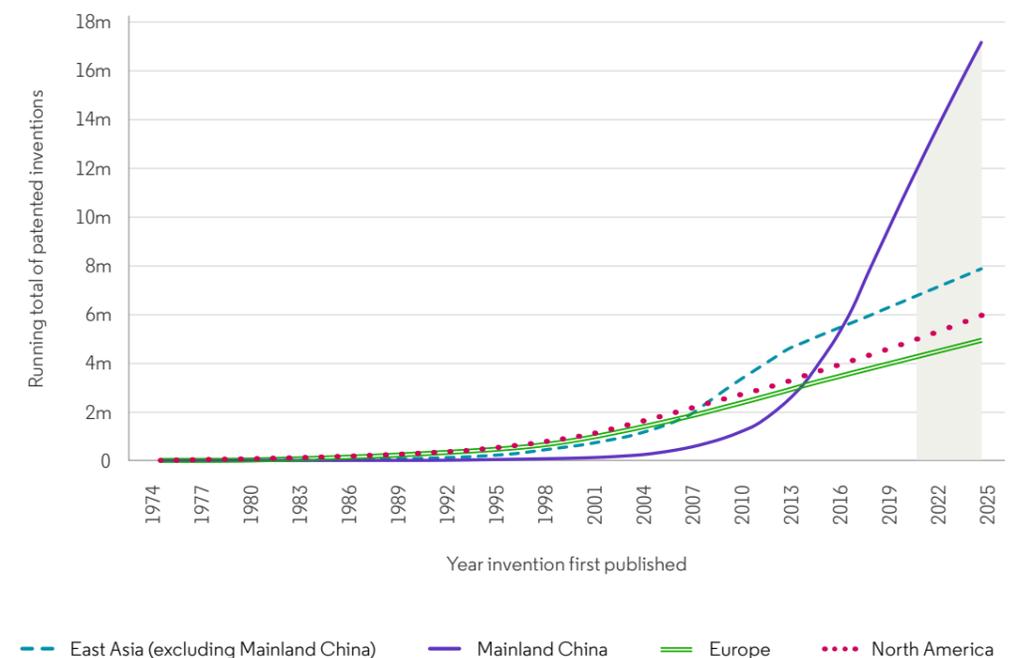
Using existing trends to look ahead, close to one-third of all patented inventions¹, in history, will publish in just the next four years.

Two-thirds of those patented ideas will come from organizations located in Mainland China.

This explosion in engagement with the global intellectual property system raises genuine questions around how that is possible, why it is happening, what a response should look like and even whether a response is required at all.

Is it an avalanche of true innovation, or not?

Figure 5: Number of patented ideas by region. Running total of patented invention (non-utility model) publications, 1974 to 2025 (2021 to 2025 forecast)



¹ These calculations exclude utility models (patents with a shorter term focused on simpler technologies)

Assessing what is real

For many years, intellectual property and research professionals have discussed the tide of patent filing from Mainland China, attempting to understand its drivers and influences, as well as its importance and contribution.

One assumption has been that Chinese patent activity is strongly academic in nature, but a dive into the data tells us that today only a fifth of activity in Mainland China emanates from academic or government institutions. While that is higher than other regions (a similar metric for the United States shows a consistent 5-6% contribution

for several decades), it is down from a quarter of activity ten years ago.

Using the Global Innovators process as a measure, we can see that only 1 in 100 inventions from Mainland Chinese academic institutions are granted in two jurisdictions, versus 1 in 12 in the U.S. However, this hides a deeper finding — the volumes are so high that Chinese academic organizations have 2.5 times the number of patented ideas with the same asset footprint as U.S. academia. Indeed, their Derwent Strength Index average is comparable — within a point of each other.

Taking another track, we can look at the representation within Top 1,000 Global Innovators as a ratio of all activity across regions. Here, Europe and North America have just under 50% of new inventive activity coming from entities in the Top 1,000. For East Asia excluding Mainland China, it is 90% — a strong concentration of innovation in top tier firms. For Mainland China itself, it is 8%, a genuine outlier globally.

Because the Top 100 Global Innovators process requires volumetric qualification for organizations, this represents strong diversity of innovative thinking. Essentially, a wider pool.

Convergence, contribution and complexity

Applying a look ahead to the Global Innovators data itself, we can look to where improvements in ranking are likely to come from, where concentrations of new and innovative ideas are on the rise.

From this data, the technology convergence theme again is evident: with fast and large-scale improvements in average ranking from companies in the telecommunications and industrial systems segments, and from the automotive industry. The likely shape of the global innovation landscape is more reliant on connectivity, particularly in automation and productivity ripe fields, where data sharing is fundamental.

Bringing together these individual data insights, we see a picture of increasing quality, much more diverse innovation pool and global source of technical improvement. And most of all, volume.

But it does make the task of identifying impactful new thinking harder. It means that tools of data science, mathematics and statistics add enormous value to strategies that rely on or are shaped by technological improvement.

It accentuates the need to review historical orthodoxy, that what was believed a decade ago remains true today.

That the intersection of technologies is feeding both opportunity, and the need for partnership.

And it brings into sharp focus the critical need to separate — at scale — signal from noise, insight from data and the important from the background.

To do that, innovators need techniques and data formulated to tell real stories, that narrate accurately the ecosystem and the influences.

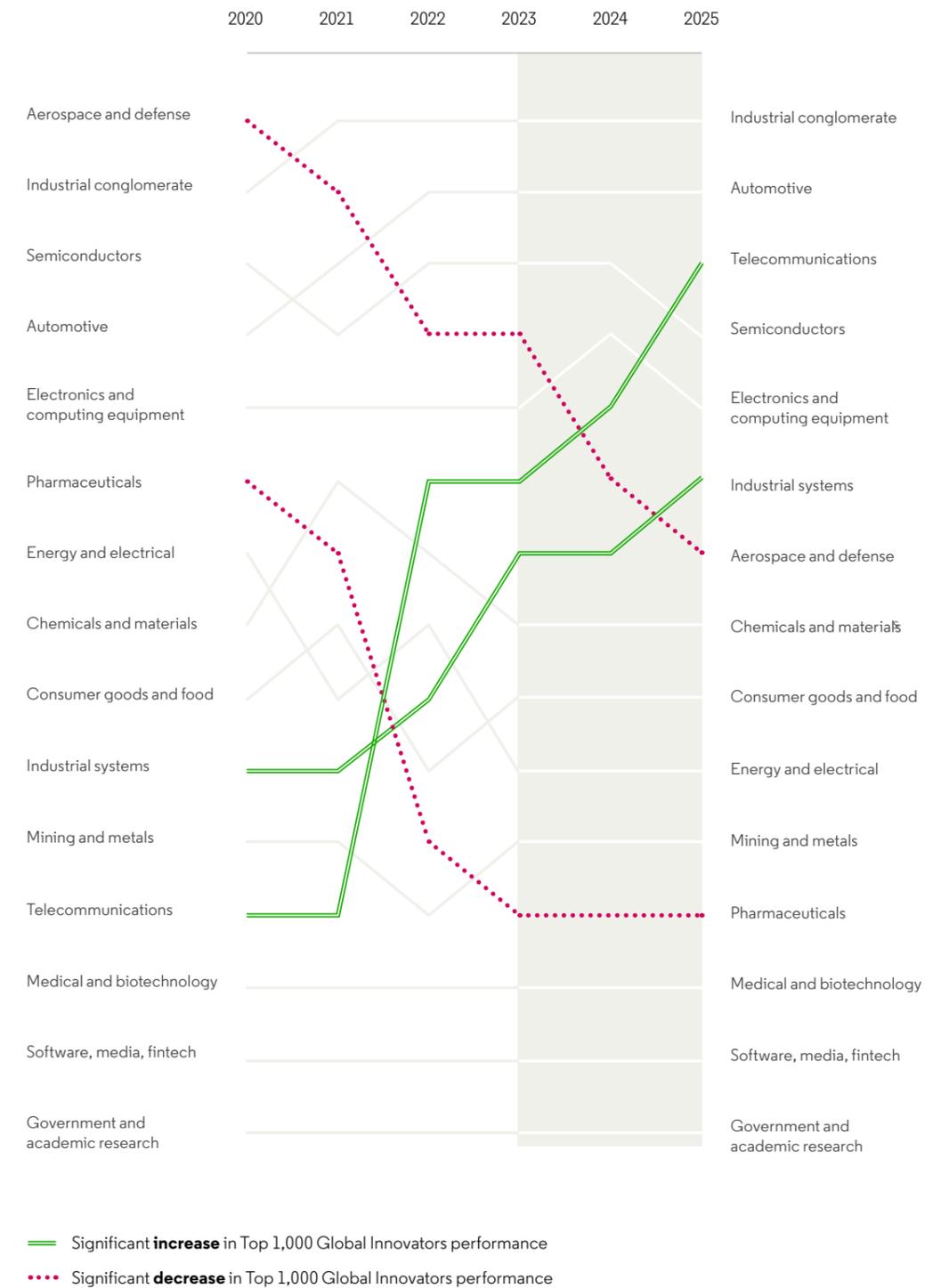
Where information is structured to create fair baselines, so that inventions can be benchmarked against comparables. So that the energy of the avalanche can be harnessed into a strength, and distilled into direction.

For the Top 100 Global Innovators 2022, we congratulate them for demonstrating the capabilities, the consistency and the incredible creativity and new thinking that are establishing new value for the world. That both contribute and thrive in the high pace and high acceleration world of modern innovation.

We also applaud innovators everywhere, whose tireless efforts to solve challenges create permanent improvement. Technical creativity and hard innovation are truly additive and all ideas contribute, whether niche, iterative, ground-breaking or industry-making.

Figure 6: Forecast global innovator ranking by segment.

Average rank of entities, Top 1,000 Global Innovators, displayed as position



About Clarivate

Clarivate™ is a global leader in providing solutions to accelerate the lifecycle of innovation. Our bold Mission is to help customers solve some of the world's most complex problems by providing actionable information and insights that reduce the time from new ideas to life-changing inventions in the areas of science and intellectual property.

We help customers discover, protect and commercialize their inventions using our trusted subscription and technology-based solutions coupled with deep domain expertise. For more information, please visit clarivate.com.

At Clarivate, we aim to provide the guidance and the clarity to understand and take advantage of the complex.

To use the techniques, the information and the expertise behind the Top 100, contact us today:

clarivate.com/top-100-innovators/contact-us
clarivate.com

© 2022 Clarivate. Clarivate and its logo, as well as all other trademarks used herein are trademarks of their respective owners and used under license.

