GetFocus

More Liquid Gold Under Your Feet

Breakthrough Direct Lithium Extraction Technologies Oil and Gas Leaders Need to Know About

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The energy industry is entering a redefining era. As global momentum accelerates toward electrification, renewable energy, and sustainable mobility, the demand for lithium, the critical metal that powers batteries, has reached unprecedented levels. Oil and gas companies, once the architects of the fossil fuel era, are now facing mounting pressure to redefine their role in a decarbonizing world.

Long seen as untouchable giants of the energy supply chain, traditional producers now risk being left behind, unless they pivot fast and smart.

Lithium is the new liquid gold, and direct lithium extraction (DLE) offers a rare opportunity for oil and gas leaders to **lead the energy transition, not chase it**.

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Executive Summary

What's Beneath the Brine?

As the energy transition intensifies, demand for lithium is set to outpace supply for years to come. While conventional lithium mining methods struggle with scalability, cost, and environmental impact, Direct Lithium Extraction (DLE) technologies offer a faster, cleaner, and more flexible path forward.

This report explores how oil and gas leaders can turn this disruption into opportunity, with their existing brine extraction infrastructure, fluid handling expertise, and capital strength.

Using GetFocus's AI-driven technology scouting and predictive improvement rate analysis, we evaluated the entire DLE landscape in **just a day**, which would traditionally take experts **months** of work.

Our findings reveal that **Graphene Oxide (GO) Composites** and **Metal-Organic Frameworks (MOFs)** are the overall fastest improving DLE technologies.

This report delivers actionable insights for executives, R&D leaders, and corporate strategists in the oil and gas sector, providing a clear forecast of which DLE technologies are set to lead, and how to position for early, profitable adoption.

Introduction

Beyond the Well: Tapping Into Tomorrow's Energy Resource

Lithium has become the strategic mineral at the heart of the clean energy economy. Battery-grade lithium is now essential for everything from consumer mobility to utility-scale energy storage, creating a **supply-demand gap that legacy mining methods can't close fast enough.**

Traditional lithium extraction, largely reliant on massive evaporation ponds or hard rock mining, is **slow, land-intensive, and environmentally disruptive.**

- In arid regions like Chile's Salar de Atacama, traditional lithium extraction consumes vast amounts of water, **up to 65% of the region's water supply**, leading to severe water scarcity and affecting local communities and ecosystems.
- Hard rock lithium mining requires **over 115 acres of land** per 1,000 metric tons of lithium carbonate equivalent, causing irreversible changes in biodiversity and ecological balance.

These methods struggle to meet modern scalability and sustainability standards. The focus for oil and gas leaders has transitioned from contemplating diversification to strategizing its execution and acceleration.

Direct Lithium Extraction (DLE) promises a faster, cleaner, and more modular way to recover lithium directly from brines, including those already being handled by oilfield infrastructure. For energy companies with decades of experience in subsurface fluid handling, chemical engineering, and large-scale production systems, **DLE isn't just an opportunity, it's a natural evolution**.

In this report, we explore the technologies set to reshape the lithium supply chain, and why oil and gas leaders are uniquely positioned to lead the next phase of growth.

DLE Technologies

Scouted 25 Extraction techniques

Adsorption

- Ion Exchange Resins
- Lithium Aluminum Layered Double Hydroxides
- Lithium Manganese Oxides
- Metal Oxide Adsorbents
- Porous Carbon-Based Adsorbents
- Zeolites

Membranes

- Composite Membranes
- Electrodialysis
- Ion Selective Membranes
- Nanofiltration

Electrochemical

- Capacitive Deionization
- Electrochemical Ion Exchange
- Redox-Mediated Electrochemical Systems

Solvents

- Crown Ethers
- Ionic Liquids
- Organophosphorous Compounds
- Solvent Impregnated Resins

Nanoengineered

- Carbon Nanotubes (Cnts)
- Graphene Oxide (Go) Composites
- Metal-Organic Frameworks (Mofs)
- Nano-Layered Double Hydroxides

Biological & Biomimetic

- Algae-Based Extraction
- Bio-Sorbents
- Microbial Extraction

Upsides and Downsides

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Adsorption

Ion Exchange Resins

- (+) Highly selective, regenerable, and compatible with modular column systems for scalable lithium recovery.
- (−) Performance can degrade in brines with high fouling or extreme Mg^{2+}/Li^{+} ratios, requiring careful pretreatment.

Lithium Aluminum Layered Double Hydroxides

- (+) Offer excellent lithium selectivity even in high-impurity brines due to interlayer ion exchange.
- (−) Stability and reusability can be limited by structural degradation over multiple regeneration cycles.

Metal Oxide Adsorbents

- (+) Provide strong lithium binding and structural robustness in harsh chemical environments.
- (−) Selectivity can be lower than that of engineered materials, and some oxides require energy-intensive synthesis.

Porous Carbon-Based Adsorbents

- (+) Feature high surface area, tunable chemistry, and potential for electrochemical enhancement.
- (−) Require functionalization to achieve lithium selectivity, and their performance varies with brine composition.

Zeolites

- (+) Abundant, low-cost materials with well-defined pore structures for ion exchange.
- (−) Natural zeolites show poor lithium selectivity, and even modified versions are largely experimental for DLE.

Solvent Extraction

Crown Ethers

- (+) Provide exceptional lithium selectivity due to size-specific ion coordination.
- (−) Expensive, moisture-sensitive, and often unstable under real-world brine conditions.

Ionic Liquids

- (+) Highly tunable, low-volatility solvents with strong lithium solvation capabilities and recyclability.
- (−) High cost, potential toxicity, and complex separation processes limit scalability.

Organophosphorous Compounds

- (+) Well-established extractants (e.g., TBP, Cyanex) offering good lithium affinity and scalability in solvent extraction systems.
- (−) Risk of phase separation, degradation, and environmental concerns due to solvent loss.

Solvent Impregnated Resins

- (+) Combine the selectivity of liquid extractants with the mechanical simplicity of solid-phase systems.
- (−) Limited long-term stability due to solvent leaching and resin fouling in aggressive brines.

Membrane

Composite Membranes

- (+) Offer a customizable, high-selectivity solution by combining lithium-specific layers with mechanically robust supports.
- (−) Complex fabrication and fouling sensitivity can limit long-term stability in real brine environments.

Electrodialysis

- (+) Enables continuous, energy-efficient lithium separation using electric fields and ion-exchange membranes.
- (−) Requires precise membrane configuration and control systems; performance can degrade with high scaling or fouling.

Ion Selective Membrane

- (+) Provide precise lithium-ion transport and separation, especially in electrochemical or hybrid DLE systems.
- (−) Custom lithium-selective membranes are still under development and may suffer from low throughput or chemical degradation.

Nanofiltration Membranes

- (+) Effectively remove divalent ions (e.g., Mg^{2+}, Ca^{2+}), enriching lithium concentration in pre-treatment stages.
- (−) Not inherently lithium-selective and require downstream integration for actual lithium recovery.

Electrochemical

Capacitive Deionization

- (+) Offers low-energy separation using porous electrodes and electric fields, particularly suited for low-concentration brines.
- (−) Requires lithium-selective electrode materials, and performance can decline in brines with high ionic strength or fouling agents.

Capacitive Deionization

- (+) Durable, pest-resistant fibre with low environmental impact
- (−) Regulatory restrictions in some regions limit scaling

Electrochemical Ion Exchange

- (+) Enables reversible and selective lithium capture through electrochemically controlled ion-exchange materials.
- (−) Still at early-stage development, with challenges in scalability, electrode lifespan, and regeneration efficiency.

Redox-Mediated Electrochemical Systems

- (+) Provide high lithium selectivity and regeneration efficiency via redox-active materials and membranes, enabling closed-loop operation.
- (−) Complex system architecture and high material cost currently limit commercial deployment.

Nanoengineered

Carbon Nanotubes (CNTs)

- (+) Provide high surface area and conductivity, making them effective as functional supports or electrodes in electrochemical and adsorption platforms.
- (−) Require complex functionalization for lithium selectivity and are relatively costly and difficult to process at scale.

Graphene Oxide (GO) Composites

- (+) Highly tunable 2D nanomaterials with excellent lithium-binding potential and compatibility with membranes, adsorbents, and electrodes.
- (−) Prone to restacking and membrane fouling, with synthesis and long-term performance still under optimization.

Metal-Organic Frameworks (MOFs)

- (+) Ultra-high surface area and highly customizable pore chemistry allow precise lithium selectivity in adsorption and membrane applications.
- (−) Water and thermal stability issues, along with high synthesis costs, limit widespread deployment.

Nano-Layered Double Hydroxides (Nano-Ldhs)

- (+) Offer fast lithium ion exchange kinetics and enhanced surface area due to nanoscale structure, improving adsorption efficiency.
- (−) Mechanical and chemical stability during regeneration cycles remains a key challenge for real-world application.

Biological & Biomimetic

Algae-Based Extraction

- (+) Uses renewable, biodegradable algal biomass to bind lithium ions through natural functional groups, offering an eco-friendly extraction route
- (−) Low lithium selectivity and scalability challenges limit its readiness for commercial deployment.

Bio-Sorbents

- (+) Low-cost, sustainable materials like chitosan, cellulose, or inactivated biomass can be engineered for lithium adsorption with minimal environmental impact.
- (−) Typically have lower selectivity and mechanical durability compared to synthetic adsorbents, especially under harsh brine conditions.

Microbial Extraction

- (+) Leverages live or immobilized microorganisms to actively bind or accumulate lithium, enabling low-energy bio-based separation.
- (−) Still at a proof-of-concept stage with significant barriers in selectivity, recovery control, and scale-up viability.

Protein-Based Lithium Binding

- (+) Offers highly selective lithium capture through engineered or natural metal-binding proteins, enabling precision separation at the molecular level.
- (−) Protein instability, high production cost, and limited reusability currently prevent practical application in large-scale DLE systems.

GetFocus Forecasting Methodology

At GetFocus, we developed a quantitative method inspired by MIT research to **forecast the technological future** based on metrics that can be identified in patent data.

Using the latest advancements in AI technology, we have created a system that can estimate how rapidly any area of technology is improving.

Our method revolves around **3 key steps.**

1

We identify every single patent that relates to an area of technology using AI. The resulting dataset represents the entire developmental history of an area of technology.

2

Once this dataset is created we measure 2 key metrics.

Cycle Time - How many years it takes for a technology to produce a new generation of itself.
The lower the cycle time, the better.

Knowledge Flow - How significant of a step forward a new generation represents.
The higher the knowledge flow, the better.

3

Using the previous metrics, we calculate the **'Technology Improvement Rate'**, which represents the average percentage (%) increase in performance per dollar that can be expected from an area of technology in one year.

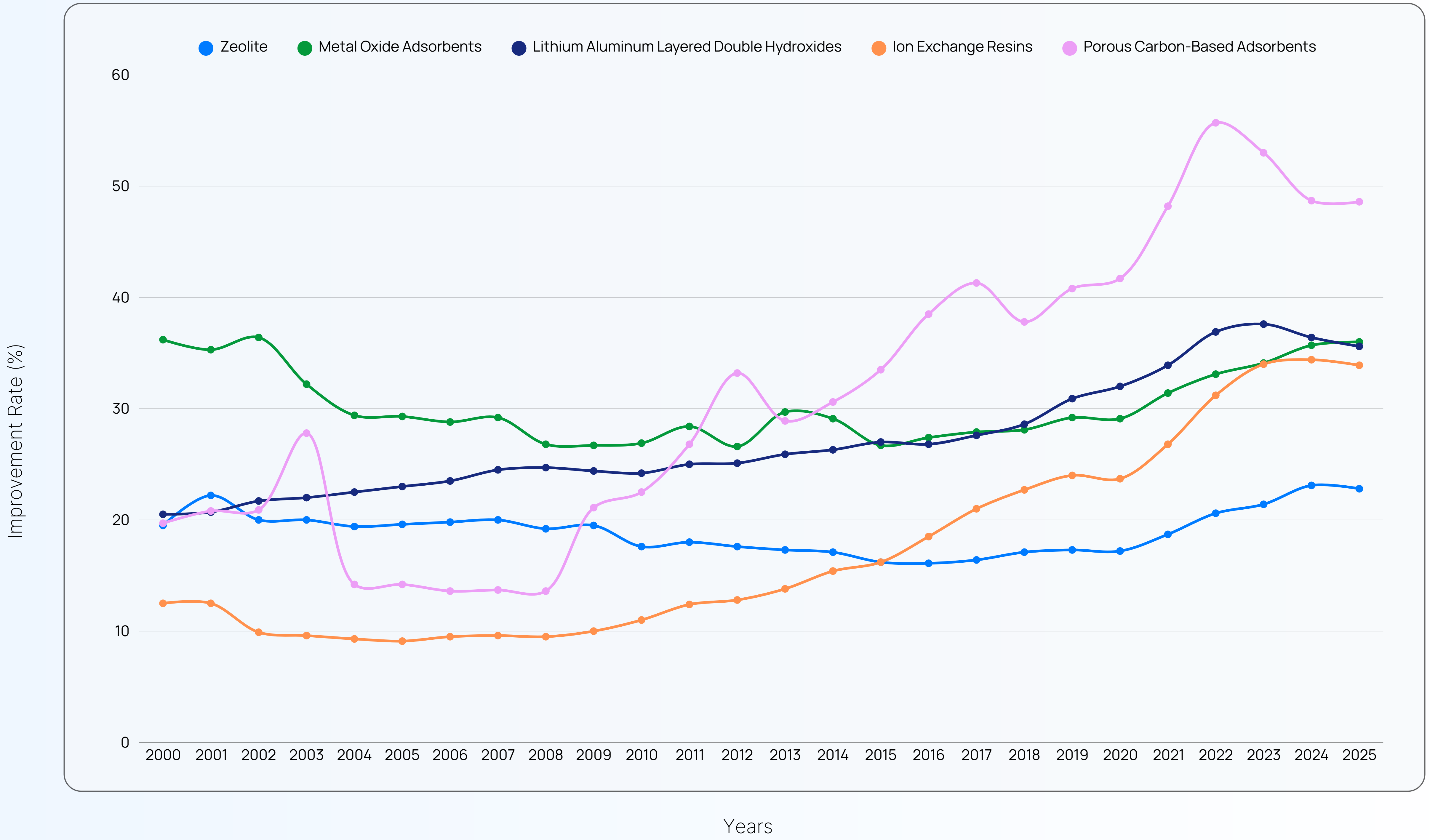
By using the above methodology, technology improvement speeds can be accurately measured, and those speeds can be used to predict technological disruption well ahead of time.

Porous Carbon-Based Adsorbents currently show the highest and most consistent improvement rate among adsorption-based DLE technologies, driven by rapid innovation in material functionalization, structural tuning, and hybridization strategies.

These materials offer **high surface area, excellent conductivity, and chemical versatility**, making them ideal candidates for selective lithium capture when functionalized with suitable binding groups.

They can be tailored for different brine chemistries, incorporated into both passive and electro-assisted systems, and easily regenerated under mild conditions. Their tunable pore structure and fast ion transport properties allow for rapid adsorption kinetics.

Improvement Rates for Adsorption Techniques

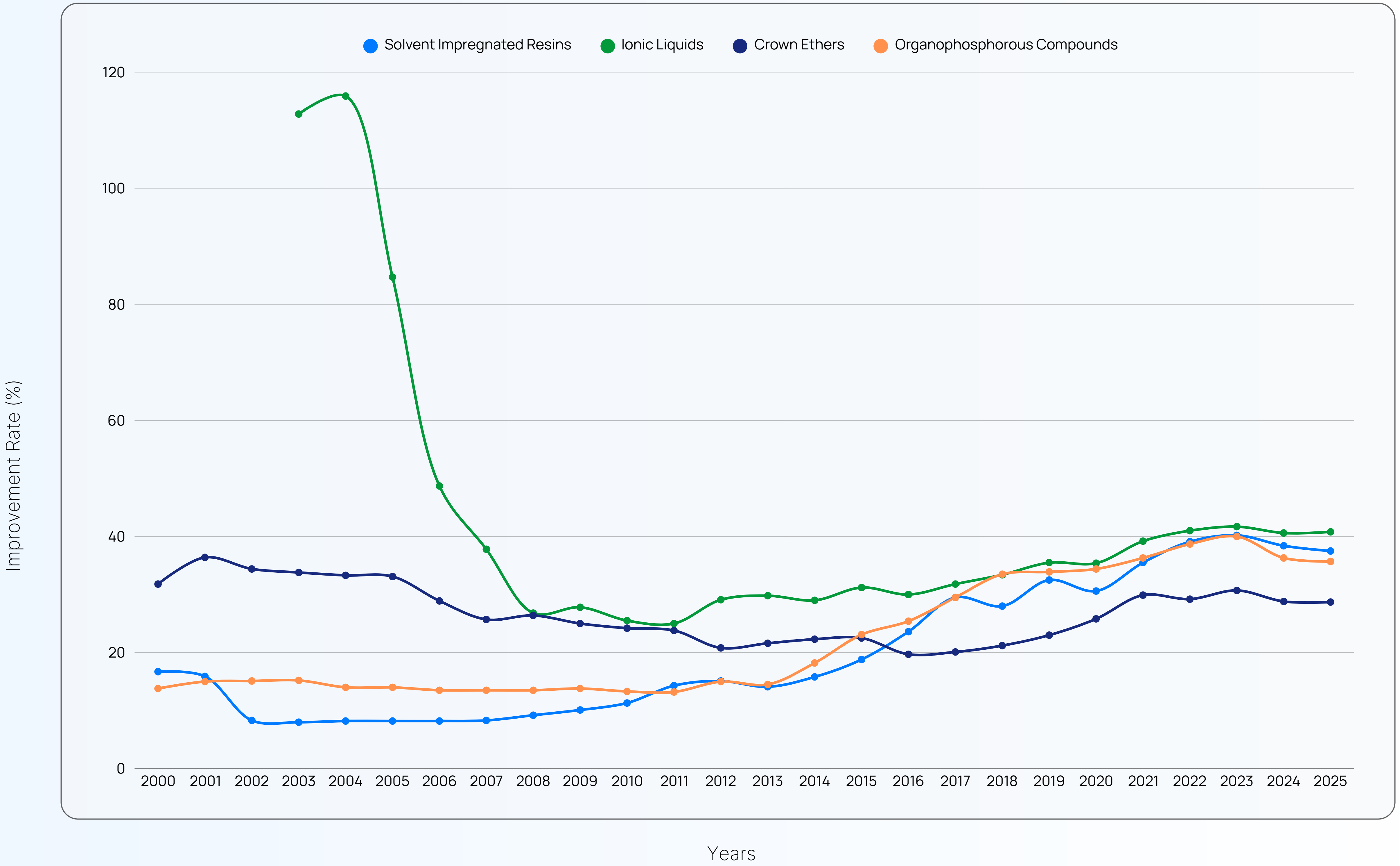


Source: GetFocus Platfrom

Within solvent extraction, **Ionic Liquids** show the highest improvement rate among solvent-based technologies.

The margin between Ionic Liquids and the other solvents extraction technologies, such as solvent impregnated resins, crown ethers, and organophosphorous compounds, is relatively small. This reflects the interconnected nature of solvent extraction innovation, where many of these technologies are not mutually exclusive but are often used in combination and progress in one area often enhances others.

Improvement Rates for Solvent Extraction

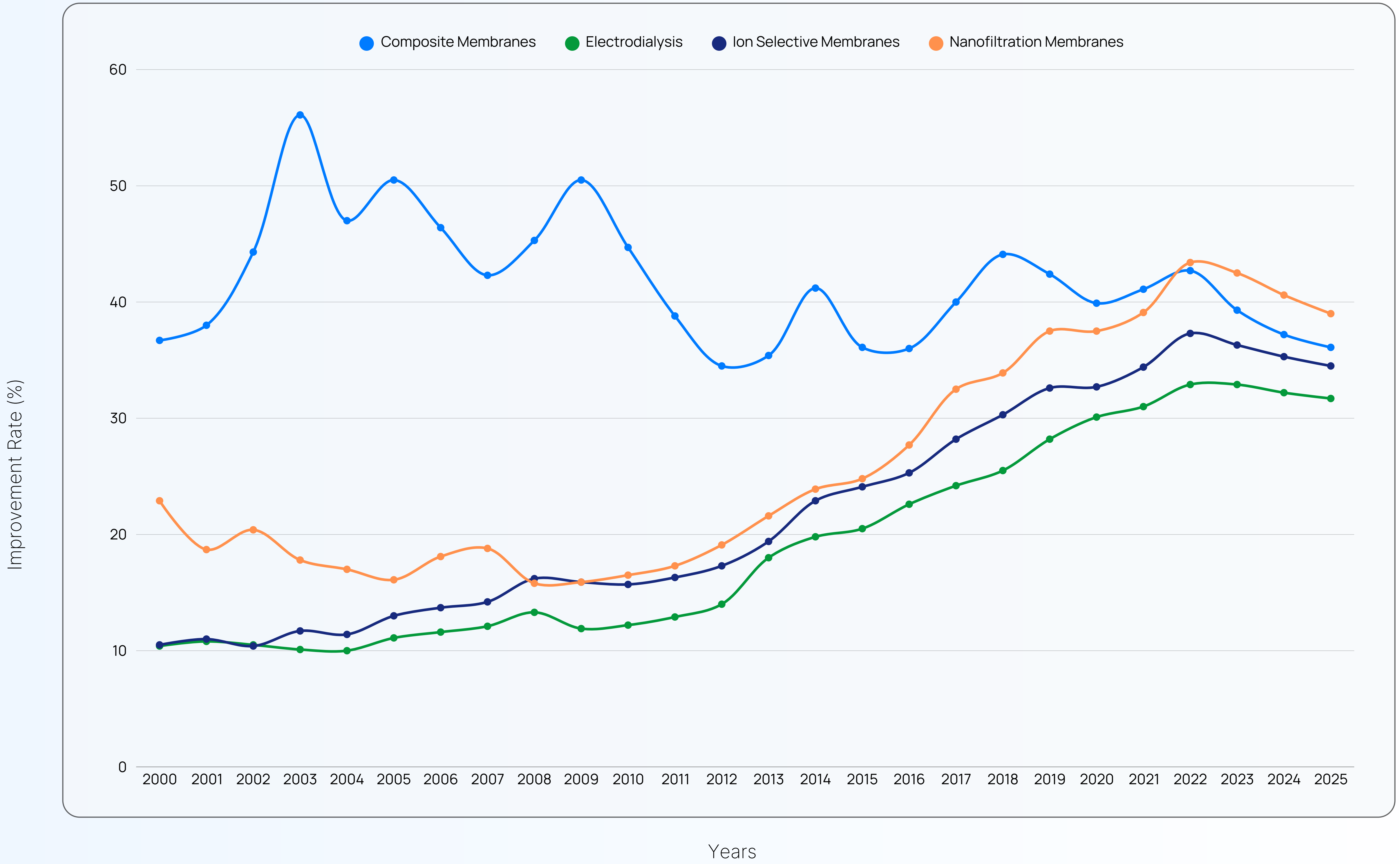


Source: GetFocus Platfrom

Composite Membranes initially led in improvement rate, reflecting their status as the most actively optimized and engineered membrane type, benefiting from advances in both material science (e.g., polymer blends, nanofillers) and fabrication techniques (e.g., interfacial polymerization, surface functionalization).

However, **Nanofiltration Membranes** have recently surpassed composite membranes in improvement rate. Nanofiltration's maturity in adjacent industries (e.g., water treatment) has enabled faster material translation and system integration in DLE. Additionally, recent advances in thin-film fabrication, pore size control, and anti-fouling coatings may be driving this uptick in performance and research attention.

Improvement Rates for Membrane Technologies



Source: GetFocus Platfrom

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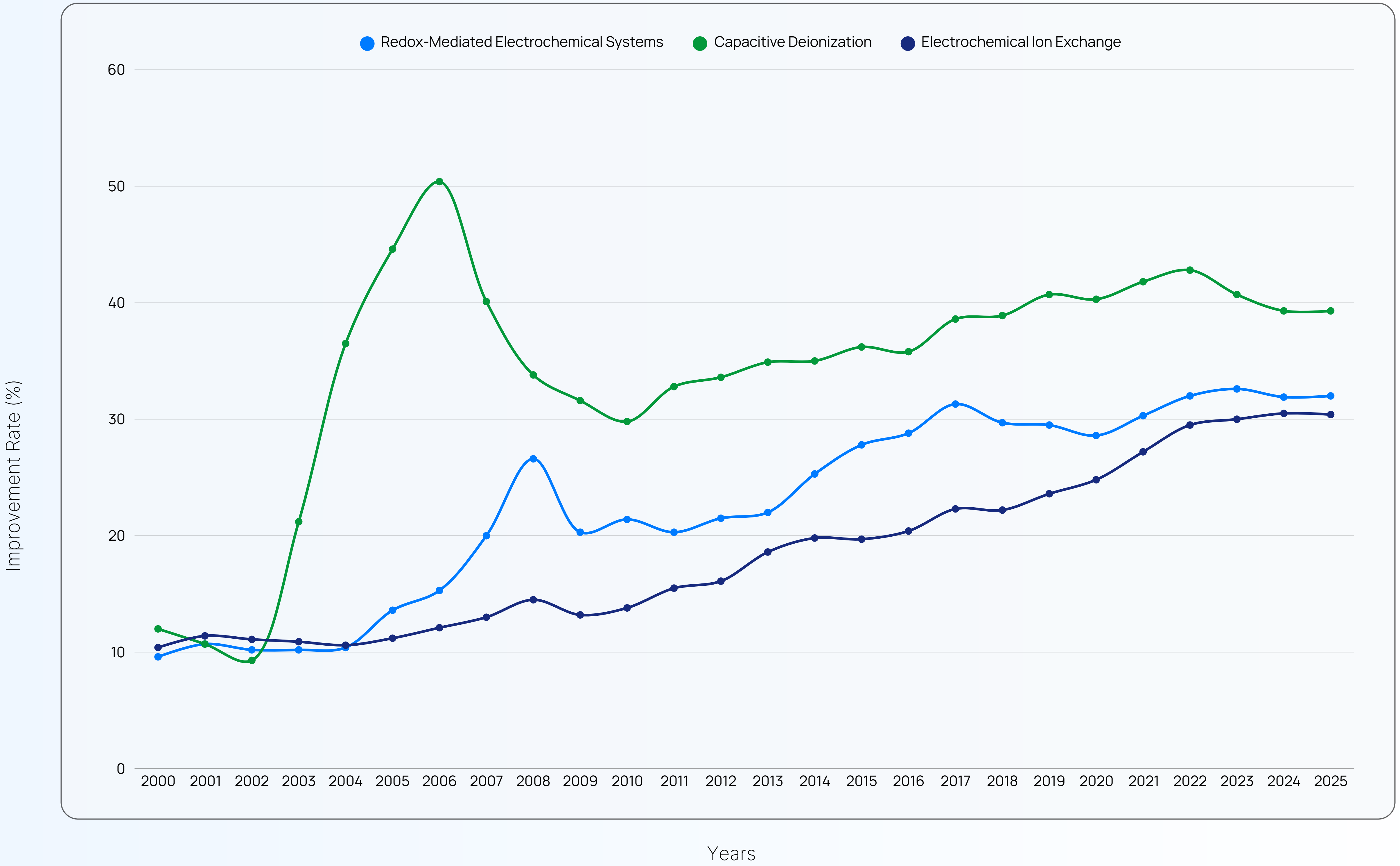
Capacitive Deionization (CDI) outpaces both Redox-mediated systems and Electrochemical Ion Exchange (EIX), likely due to the fact that CDI systems are **mechanically simple** and **easy to modularize**, using pairs of porous electrodes and low-voltage operation. They are **easier to scale and adapt** to different flow rates and brine types compared to more complex architectures

Unlike the solvents previously analyzed, the considered electrochemical DLE techniques are alternative platforms, each based on distinct operating principles, system architectures, and material requirements, making them generally not directly combinable within a single unified system. Thus, the significant margin in improvement rates between Capacitive Deionization Systems and the other techniques further reinforces their position as the **electrochemical approach with the highest potential**

Improvement Rates for Electrochemical Techniques

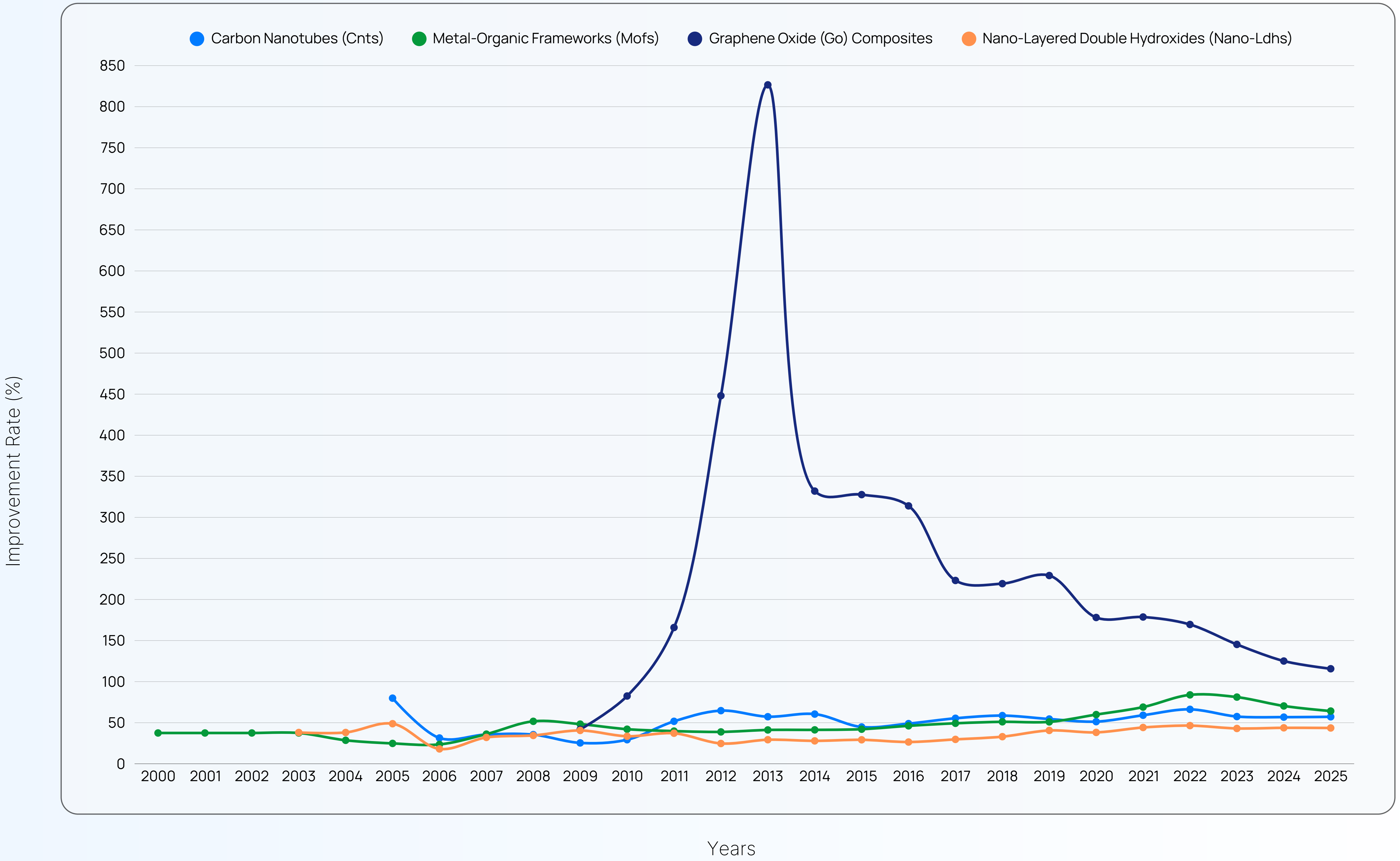


Source: GetFocus Platfrom

Graphene oxide (GO) composites show the highest improvement rate (**~145%**) among nanoengineered materials. The second fastest improving, **metal-organic frameworks (MOFs)** (**~81%**), despite a lower rate, still far outperform **Carbon Nanotubes** (**~57%**) and **Nano-Layered Double Hydroxides** (**~43%**) by a wide margin.

What's particularly noteworthy is that both top performers, graphene oxide and MOFs, are not only high-potential materials individually, but also **compatible and complementary,** representing a powerful convergence opportunity.

Improvement Rates for Nanoengineered Technologies

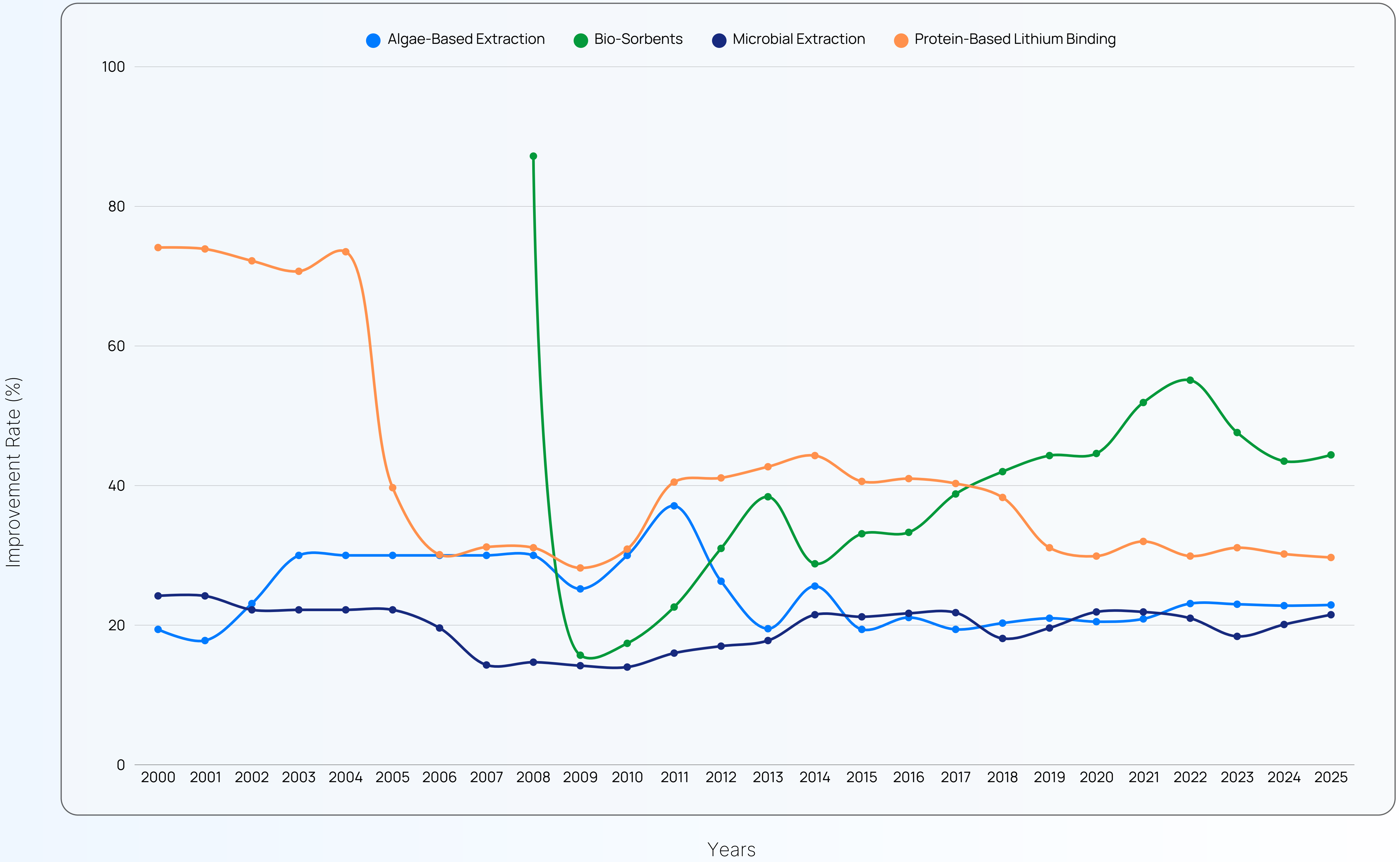


Source: GetFocus Platfrom

Bio-sorbents are currently the fastest-improving biological DLE technology, showing a clear upward trajectory in performance per cost. This reflects growing innovation in functionalizing natural materials such as chitosan, cellulose, and biomass to improve lithium binding, stability, and scalability. These sorbents are particularly appealing for **low-cost**, **low-footprint** extraction systems.

While they still face challenges in selectivity and durability, their improvement rate suggests they may soon evolve from a niche curiosity into a viable solution for **eco-conscious lithium sourcing**.

Improvement Rates for Biological and Biomimetic Technologies



Source: GetFocus Platfrom

Top DLE Technologies
A Cross-Category Comparison

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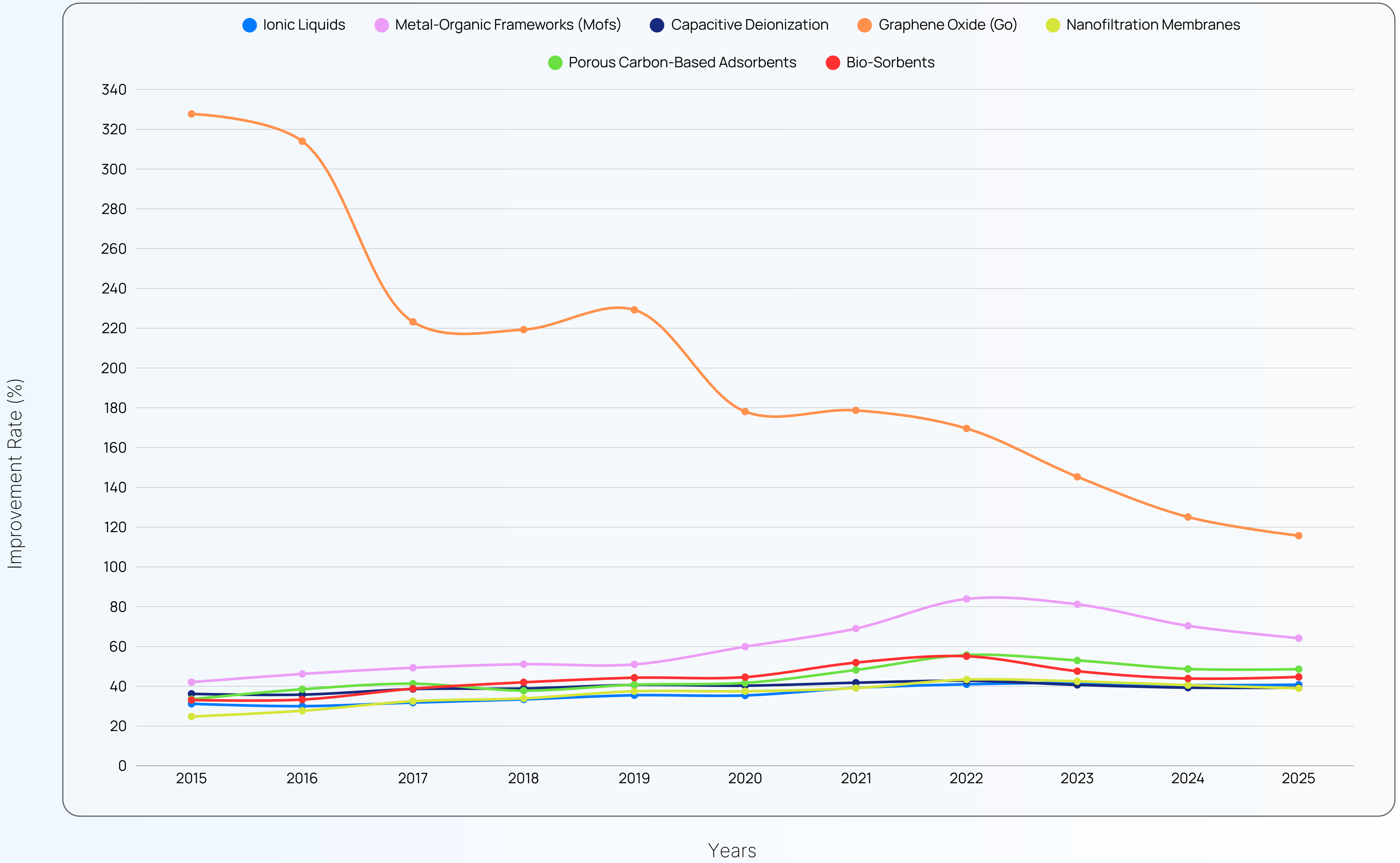
The comparison of the fastest-improving technologies across DLE categories reveals that **Graphene Oxide (GO) Composites** and **Metal-Organic Frameworks (MOFs)** are the two highest-improving technologies overall, with a substantial margin separating them from all other top performers.

What makes this especially significant is that these two materials are not just leading individually but, as mentioned before, they are also **highly compatible**. MOFs can be effectively embedded into GO-based membranes, combining MOFs' highly selective and tunable pore structures with GO's flexibility, mechanical strength, and large surface area.

This synergy enables **hybrid systems** that capitalize on the strengths of both materials, enabling high lithium selectivity, enhanced ion transport, and structural stability in one platform.

Improvement Rates of The Fastest Improving Technologies



Source: GetFocus Platfrom

Nanofiltration membranes, **capacitive deionization** and **bio-sorbents** lead in both improvement rate and TRL within their respective categories.

However, the TRL comparison also reveals that some of the fastest-improving DLE technologies are not yet the most mature.

Porous carbon-based adsorbents (TRL 6) lead the adsorption category in innovation, outperforming more mature systems like ion exchange resins (TRL 8), due to their tunability and fast kinetics.

In solvent extraction, **ionic liquids** (TRL 5) are improving the fastest, though the narrow TRL margin with solvent-impregnated resins (TRL 6) reflects their shared innovation space.

Across all categories, **graphene oxide composites** (TRL 5) and **MOFs** (TRL 4) stand out as the fastest-improving technologies overall. While their TRLs remain relatively low, the rate and trajectory of improvement suggest they are evolving faster than any other material class.

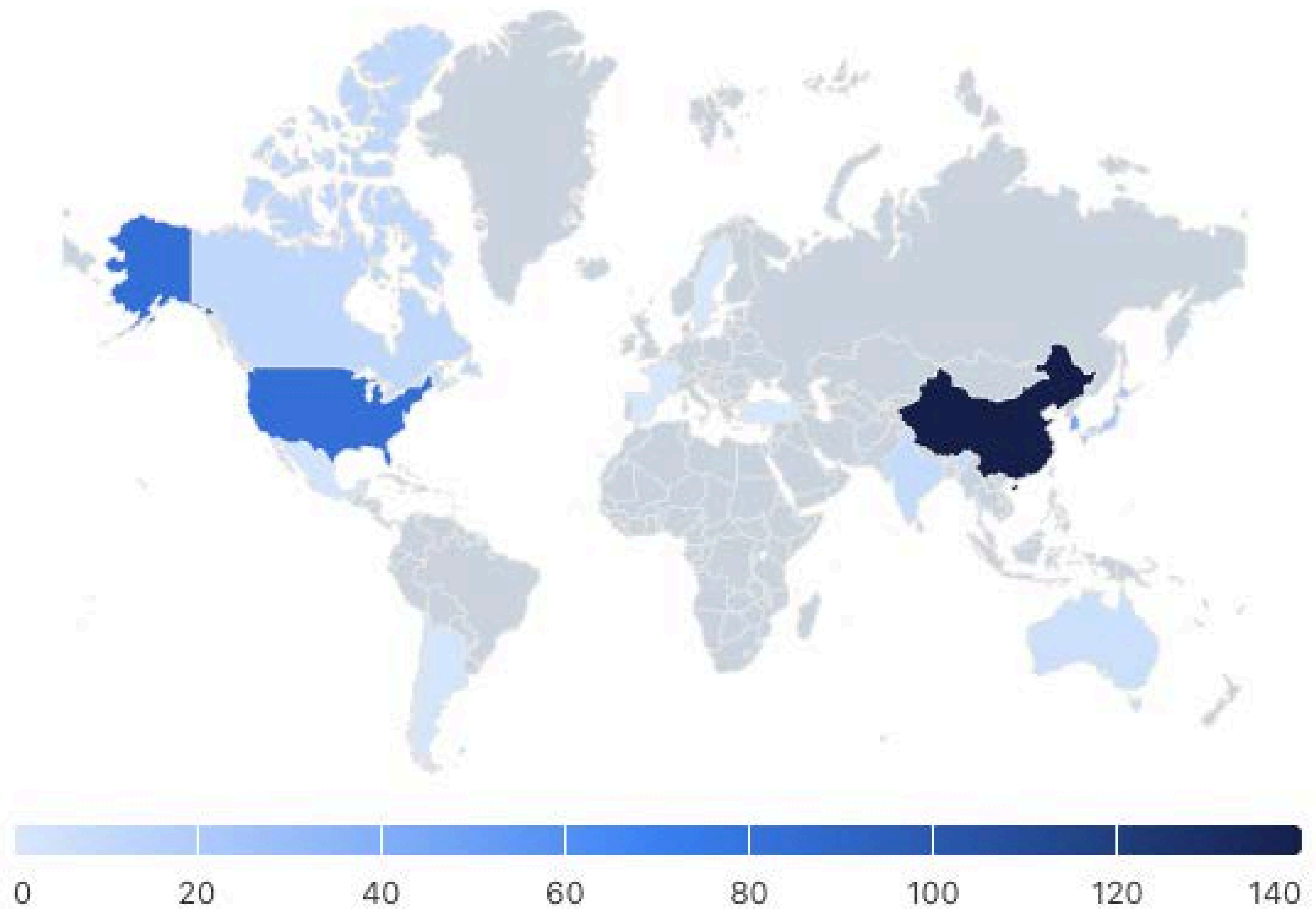
Technology Readiness Level

Category	Technology	Estimated TRL (1–9)
Adsorption	Ion Exchange Resins	8
	Lithium Aluminum Layered Double Hydroxides	5
	Metal Oxide Adsorbents	7
	Porous Carbon-Based Adsorbents	6
	Zeolites	3
Biological & Biomimetic	Algae-Based Extraction	4
	Bio-Sorbents	5
	Microbial Extraction	3
	Protein-Based Lithium Binding	2
Electrochemical	Capacitive Deionization	6
	Electrochemical Ion Exchange	4
	Redox-Mediated Electrochemical Systems	5
Membranes	Composite Membranes	5
	Electrodialysis	7
	Ion Selective Membranes	6
	Nanofiltration Membranes	7
Nanoengineered	Carbon Nanotubes (CNTs)	5
	Graphene Oxide (GO) Composites	5
	Metal-Organic Frameworks (MOFs)	4
	Nano-Layered Double Hydroxides (Nano-LDHs)	4
Solvent Extraction	Crown Ethers	4
	Ionic Liquids	5
	Organophosphorous Compounds	6
	Solvent Impregnated Resins	6

Graphene oxide composites present a significant share of patents concentrated in **China**.

Families, Per Geography Map

Shows the number of patent families per geography, as well as the relative size of the geography its portfolio. It gives insight into where in the world innovation in your technology area is being pursued.



China possesses **substantial reserves of graphite**, the primary raw material used for producing graphene and GO. China is the world's largest producer and exporter of graphite, accounting for approximately 77% of global production in 2023. This abundance supports domestic research and development in these materials.

China is also leading **Metal-Organic Frameworks (Mofs)** innovation.

Families, Per Geography Map

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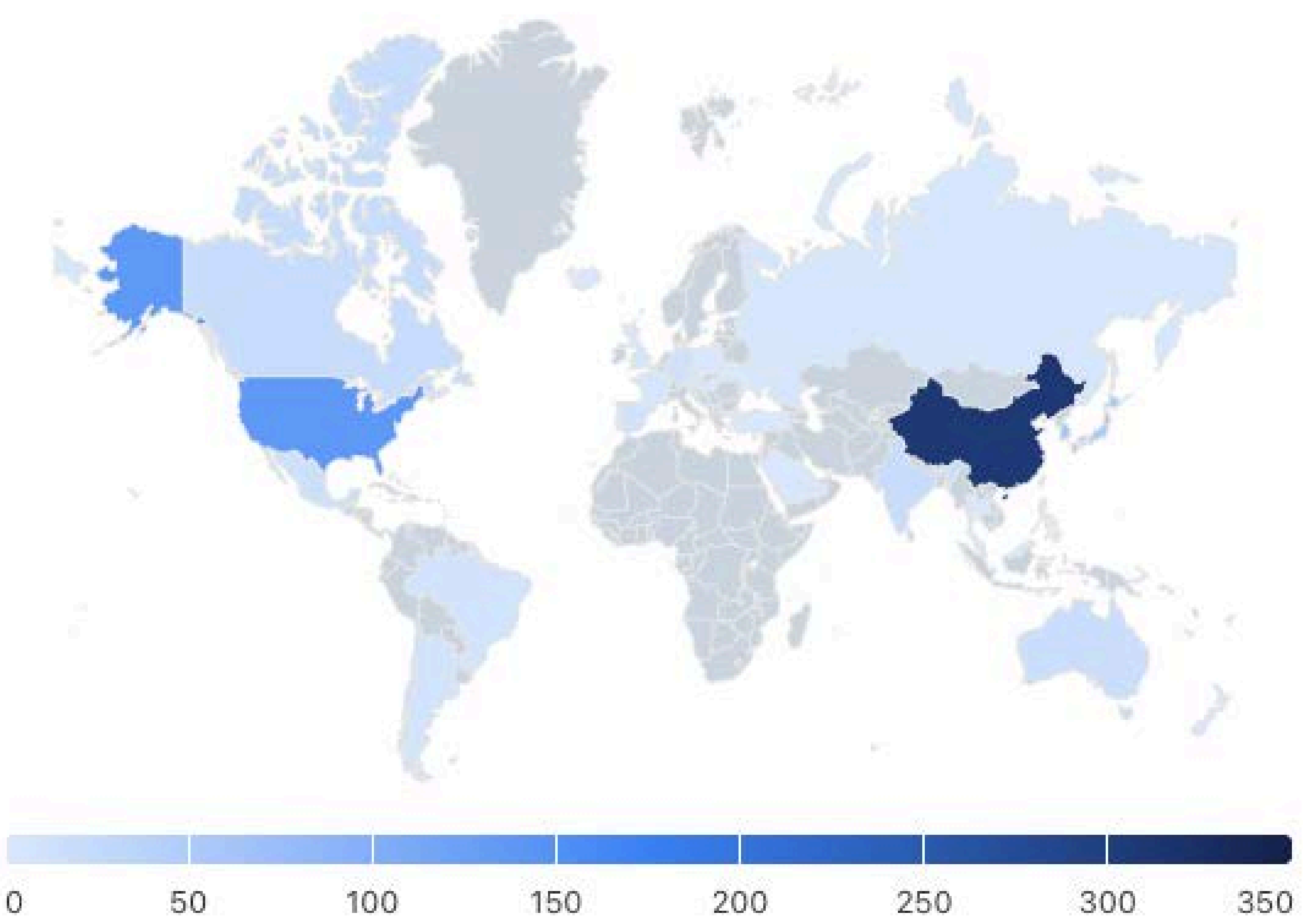


China has established **several research institutions focused on advanced materials**, including MOFs.

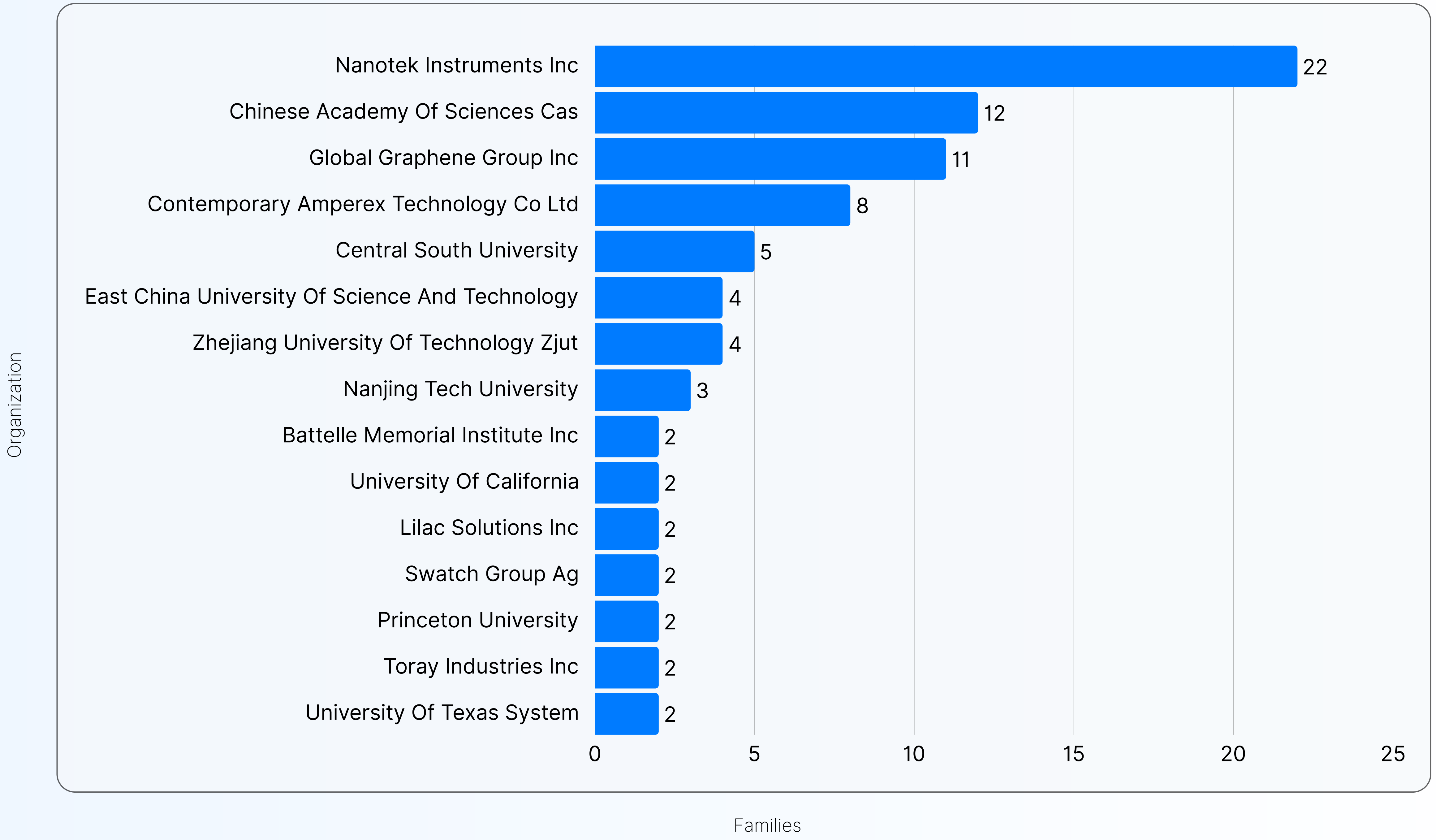
This chart highlights the organizations most actively patenting in **Graphene oxide composites**, offering a clear view of global innovation leadership in this field.

Overall, the chart highlights **China**'s clear leadership in this field. The Chinese Academy of Sciences and multiple top Chinese universities, account for a significant share of the organizations shown.

U.S.-based companies like **Nanotek Instruments** and **Global Graphene Group** rank among the top global holders of patent families, highlighting the role of private sector innovators in advancing GO composite technologies.

Families, Per Organization

Shows the number of patent families per organization. It gives insight into which organizations are most aggressively pursuing innovation in this area.



Source: GetFocus Platfrom

Regulation-Ready: Will DLE Pass the Green Test?

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Direct Lithium Extraction (DLE) has emerged as a suite of technologies capable of recovering lithium from brines with lower environmental footprint, faster cycle times, and greater scalability.

Its advantages align closely with the goals of new and proposed regulatory frameworks in key jurisdictions. For instance, **Chile** now requires DLE adoption for new private-sector partnerships, and the **U.S. Department of Energy** is funding domestic DLE development. Similarly, the **EU's Critical Raw Materials Act** aims to accelerate permitting for technologies like DLE that can deliver both resource security and sustainability.

The role of advanced materials will become critical, particularly those that enable high-selectivity, low-footprint DLE systems. This is where **MOFs** and **Graphene Oxide Composites** stand out. MOFs, with their highly tunable pore structures and exceptional lithium selectivity, offer a level of control and efficiency well-suited for regulatory goals tied to water conservation, waste minimization, and chemical usage. Meanwhile, GO composites bring mechanical flexibility, high surface area, and conductivity, enabling scalable membrane or adsorbent systems that can operate under milder conditions and with greater operational stability.

Moreover, these materials can be combined into hybrid systems, amplifying their benefits; a combination that not only enhances performance but also positions them as strategic enablers of regulation-ready DLE platforms.

Given this alignment between DLE's technical profile and policy priorities, there is a growing likelihood that future environmental and industrial regulations will actively favor DLE technologies, making them not just an innovation frontier, but **a regulatory and strategic imperative**.

Material	Relative Cost	Scalability	TIR	Composite Score	Notes
Ion Exchange Resins	Medium	High	33%	5.7	Mature, widely used in industrial pilot systems.
Lithium Aluminum Layered Double Hydroxides	Medium	Medium	37%	5.1	Selective but structurally sensitive under cycling.
Metal Oxide Adsorbents	Medium	High	33%	5.7	High selectivity and stability; improving rapidly.
Porous Carbon-Based Adsorbents	Low	High	56%	6.9	Fastest-improving adsorption tech; tunable and cost-efficient.
Zeolites	Very Low	High	21%	6.9	Low lithium selectivity; mostly experimental.
Algae-Based Extraction	Low	Medium-Low	23%	5.1	Sustainable, but immature and low selectivity.
Bio-Sorbents	Low	Medium	55%	6.2	Fast-improving, sustainable option for low-concentration sources.
Microbial Extraction	Medium	Low	21%	4.0	R&D phase; complex to scale due to live-cell handling.
Protein-Based Lithium Binding	High	Very Low	30%	2.8	High precision, but costly and unstable at scale.
Capacitive Deionization	Medium	High	43%	5.9	Leading electrochemical tech; modular and energy-efficient.
Electrochemical Ion Exchange	High	Medium-Low	33%	3.9	Low maturity and performance gap vs. CDI.
Redox-Mediated Electrochemical Systems	High	Medium	32%	4.2	Selective and promising but complex and costly.
Composite Membranes	High	Medium	43%	4.5	Highly engineered; catching up in readiness.
Electrodialysis	Medium	High	33%	5.7	Commercializable system; reliant on membrane quality.
Ion Selective Membranes	High	Medium	37%	4.4	Critical component for selective separation systems.
Nanofiltration Membranes	Medium	High	44%	5.9	Rising performer; excellent for pretreatment.
Carbon Nanotubes (CNTs)	Very High	Low	66%	3.5	High potential but still costly and complex.
Graphene Oxide (GO) Composites	High	Medium	169%	7.1	Fastest-improving overall; widely applicable.
Metal-Organic Frameworks (MOFs)	Very High	Medium-Low	84%	4.3	Highly selective and tunable; synergizes with GO.
Nano-Layered Double Hydroxides (Nano-LDHs)	Medium	Medium	46%	5.3	Emerging nanostructured adsorbent.
Crown Ethers	High	Low	29%	3.5	Selective but expensive and chemically sensitive.
Ionic Liquids	High	Medium	41%	4.4	Fast-improving; modular and low-volatility.
Organophosphorous Compounds	Medium	High	39%	5.8	Well-established, scalable extractants.
Solvent Impregnated Resins	Medium	High	39%	5.8	Stable solid-phase solvent platform.

Several low-cost materials still suffer from low scalability, limiting their short-term potential despite affordability: **Algae-based** extraction and **zeolites** are both low cost, but they exhibit a limited improvement rate.

In contrast, **graphene oxide (GO) composites** rank among the top-scoring materials due to their exceptionally high improvement rate and good scalability, but are still held down by high costs. This suggests that cost reduction in GO production and integration could become a strategic priority for future DLE commercialization.

Other mid-range performers, like **MOFs,** demonstrate high potential in selectivity or precision but remain hampered by both cost and limited scalability. Their high improvement rate suggests that these challenges could be addressed in the near future.

Next-Gen Pioneers: Innovators in DLE

Several pioneering companies and research institutions around the world are advancing the next generation of Direct Lithium Extraction by leveraging cutting-edge materials like Graphene Oxide composites and Metal-Organic Frameworks to improve selectivity, efficiency, and scalability.

Graphene Oxide (GO) composites

- **Evove (United Kingdom)**
  has developed advanced membrane technologies incorporating graphene oxide, enhancing lithium extraction efficiency. Their DLE solutions have demonstrated superior performance compared to many traditional approaches.
- **Lyten (United States)**
  specializes in graphene-based materials and has made significant strides in lithium-sulfur battery technology. Their work with graphene composites contributes to advancements in both lithium extraction and storage solutions.

Metal-Organic Frameworks (MOFs)

- **EnergyX (United States)**
  EnergyX's proprietary LiTAS™ technology utilizes MOF nanoparticles to facilitate efficient lithium transport and separation, aiming to revolutionize lithium extraction processes.
- **Texas A&M University & Nankai University (United States & China)**
  Collaborative research between these institutions focuses on designing MOFs with tailored pore structures and functional groups to enhance lithium-ion sieving and capture capabilities.

Conclusion

Direct Lithium Extraction (DLE) stands at the crossroads of technological innovation and strategic necessity. With lithium demand accelerating and environmental standards tightening, the pressure to find cleaner, faster, and more scalable extraction methods has never been greater.

This report shows that technologies like **graphene oxide composites** and **metal-organic frameworks (MOFs)** are improving at striking rates, with GO already outperforming by far all other materials. While some of these high-potential materials still face challenges, especially around cost and scalability, their momentum suggests that barriers are actively being dismantled through innovation.

For oil and gas leaders, the opportunity is clear:

- Pivot early to capitalize on fast-moving DLE innovation and establish first-mover advantage.
- Align with the fastest improving technologies, such as GO and MOFs
- Monitor and respond to regulatory momentum, as governments increasingly favor low-footprint, water-efficient lithium recovery methods.

GETFOCUS INSIGHTS

Join us for our upcoming **webinar**, where we'll go beyond the surface to explore the technologies reshaping lithium extraction, featuring improvement rate forecasting, IP landscape mapping, and strategic insights tailored to the oil and gas sectors.

Hear directly from our analysts and technology scouts as we demonstarte how to apply these insights to prioritize R&D, evaluate emerging materials like GO and MOFs, and position your organization for the next wave of resource innovation.

Looking to move faster? **GetFocus** delivers custom deep-tech scouting powered by our proprietary AI engine, so you can assess complex technologies, benchmark competitors, and act on opportunities in days, not months.

The future isn't at the bottom of a pond: Go direct. Go fast. Go DLE.

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About GetFocus

We are on a mission to **fast-track technological progress worldwide**.
What started with foundations laid by MIT researchers, is now a full blown technology forecasting system. By equipping innovators with **data-driven technological foresight**, we help them make the right investment decisions and innovate faster.

Emerging technologies that turn into winners show clear and measurable signals early on in their development. By giving you access to this data, we help you innovate faster.

Our method has been verified to work on more than **50 technological areas.**

If GetFocus and our method had been around in the past, one could have known that:

- Lithium-ion batteries would eventually become cheaper than combustion engines for vehicles by 1995,
- Digital photography would disrupt film by 1975.
- SSDs would become cheaper than HDDs by the early '80s

If you'd like to see the full data set of this report or discuss a technology you'd like us to analyse, please contact us via :

www.getfocus.eu contact@getfocus.eu

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without the Guesswork

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Spot winners early	**Forecasting** Predict which emerging technologies will dominate and when
Summarized in actionable insight	**Reporting & Monitoring** Competitive intelligence, partnering options, AI patent analysis, landscaping & more

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What customers says about us

Christophe Perthuisot

Head of R&D – Moët Hennessy

"In **one week with GetFocus**, we gained more technology insights than we previously could in 9 months"