RESEARCH BRIEF

The Global Policy Landscape for Biobased Chemicals

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LUX TAKE

Clients along the biobased chemicals value chain should use policy as a commercialization filter, not just a signal of government interest in the bioeconomy. Prioritize markets where incentives, procurement, infrastructure, feedstock access, or strategic offtake directly reduce adoption and scale-up risk, especially where biomanufacturing is tied to industrial competitiveness, defense readiness, supply-chain resilience, and domestic manufacturing.

Biobased chemicals remain strategically important for companies pursuing decarbonization, circularity, and products perceived as safer or more sustainable, but the sector has struggled to translate sustainability value into broad commercial adoption. High production costs and scale-up challenges continue to limit competitiveness against fossil-derived incumbents, especially for drop-in alternatives that must compete largely on price. Government support has helped advance technology development, but funding alone has not created durable market pull.

This analysis examines how global policy is shaping the next phase of growth in biobased chemicals, identifying where regulations, incentives, procurement programs, and funding allocation are beginning to improve commercial conditions — and where policy gaps still leave adoption dependent on voluntary corporate commitments rather than a compelling stand-alone business case. Understanding regional differences is critical to identifying which markets, applications, and policy environments offer the clearest path from corporate ambition to commercial adoption. North America and Europe will remain important for research funding, startup activity, ecosystem partnerships, and pilot-scale validation, but many APAC markets offer stronger conditions for first commercial assets as policy support shifts toward manufacturing capacity, biofoundries, scale-up infrastructure, and industrial deployment.

Biobased chemicals policy in North America

In the U.S., direct policy incentives for biobased chemicals remain limited, but federal support has grown through broader bioeconomy, biomanufacturing, supply-chain resilience, and national security initiatives.

The Biden administration's 2022 Executive Order 14081 elevated biotechnology and biomanufacturing as strategic priorities and mobilized more than USD 2 billion across federal agencies, but the Trump administration revoked the order in March 2025. Even so, parts of the biomanufacturing agenda have continued where they align with domestic manufacturing, defense readiness, and reduced dependence on foreign supply chains. As such, the Department of Defense is one of the most important federal drivers of biomanufacturing through programs like BioMADE, the Tri-Service Biotechnology for a Resilient Supply Chain program, and the Distributed Bioindustrial Manufacturing Program, which frame biomanufacturing as a tool for securing domestic access to defense-relevant fuels, polymers, resins, composites, critical materials, and other strategic inputs. BioMADE's pilot plant network is particularly important because it targets one of the sector's most persistent scale-up barriers: the shortage of domestic pilot- and demonstration-scale infrastructure. However, the long-term impact of these programs will depend on whether planned facilities and pilot activity translate into reliable manufacturing capacity, sustained procurement, and repeatable scale-up pathways.

Demand-side federal bioeconomy support in the U.S. has historically focused more on fuels than on chemicals. Policies like the Renewable Fuel Standard create clearer market-pull mechanisms for biofuels than currently exist for renewable chemicals. USDA's BioPreferred Program provides a more targeted procurement and labeling mechanism for biobased products, and recent updates have tied the program more explicitly to domestic supply-chain resilience and national security by excluding entities and products from foreign-adversary countries. However, BioPreferred does not create the same level of demand certainty as mandates, production credits, or long-term offtake mechanisms.

The U.S. still lacks an enacted federal incentive specifically targeting renewable chemicals production, but pending legislation points to growing congressional interest. The Renewable Chemicals Act of 2026 would create a targeted tax credit for qualifying renewable chemicals or an investment tax credit for renewable chemical production facilities, while the Biobased Materials Investment and Production Act would create tax incentives for broader biobased chemicals and materials production. Related legislation like the Agricultural Biorefinery Innovation and Opportunity Act would expand support for pilot- and demonstration-scale biobased manufacturing projects, but it would function primarily as scale-up support rather than a dedicated market-pull mechanism for renewable chemicals. As a result, state-level programs in Iowa, Maine, and Minnesota remain among the few active mechanisms directly supporting domestic renewable chemicals production, while Kentucky's program has expired and Nebraska's has paused new approvals for 2026 through 2029.

Similarly, Canada continues to support bioeconomy development through national and provincial initiatives that leverage its abundant biomass and forestry resources, outlined in the country's industry-led national bioeconomy strategy. Over the years, the government has allocated funding to organizations and programs like Sustainable Development Technology Canada, Bioindustrial Innovation Canada (BIC), Natural Products Canada, and the Forest Innovation Program to foster innovation and technology development. Provinces like Alberta and Ontario also support bioeconomy innovation through regional agencies and funding programs like Alberta Innovates. However, Canada's policy framework remains fragmented, and industry groups are calling for stronger coordination, clearer commercialization targets, and a more deliberate scale-up strategy.

In 2025, BIC urged the federal government to attract major investments in large-scale biorefineries and biomanufacturing facilities capable of anchoring new value chains around Canadian biomass resources. Canada has begun to make targeted scale-up investments, but these remain project specific rather than part of a broad market-creation policy for biobased chemicals. As in the U.S., the key gap is not the absence of research capability or biomass availability; it is the lack of coordinated demand-pull mechanisms, commercialization financing, and large-scale industrial infrastructure needed to translate Canada's resource base and innovation ecosystem into durable domestic manufacturing capacity.

> **Key Takeaway: North America remains a strong innovation engine for biobased chemicals but is not yet a strong commercialization environment. The clearest opportunities are emerging where policy support aligns with national security, supply-chain resilience, and domestic manufacturing rather than broad, climate-driven bioeconomy deployment. Clients should not assume that North American policy will broadly de-risk biobased chemicals scale-up; instead, they should prioritize products with defense, critical materials, domestic supply chain, or procurement relevance and stay flexible on facility siting where state, provincial, or international incentives offer a clearer path to first commercial deployment.**

Biobased chemicals policy in Europe

The EU has no shortage of bioeconomy ambition, funding, or regulatory activity through its Bioeconomy Strategy and programs like Horizon Europe and the Circular Bio-based Europe Joint Undertaking (CBE JU), but its policy framework still does more to support biobased chemicals innovation than to create durable commercial demand. The region is increasingly aware of this gap and is actively addressing the sector's core commercialization bottlenecks. In March 2024, the European Commission introduced Building the Future with Nature to identify adoption barriers, improve regulatory clarity, strengthen demand for biobased products, and inform the next phase of EU bioeconomy policy. The Commission followed up with the EU Biotech and Biomanufacturing Hub in January 2025, providing biotechnology and biomanufacturing startups and small to medium-size enterprises with a centralized resource for navigating regulations, funding, scale-up support, and market-entry requirements.

In terms of chemicals, the EU's Bioeconomy Strategy was one of the first major policy frameworks to explicitly recognize biobased chemicals as part of the broader transition away from fossil-derived materials. Recent updates acknowledge persistent commercialization challenges, including fragmented regulatory definitions, uneven approval pathways, financing gaps, and underdeveloped downstream markets. However, the strategy remains primarily a coordination-and-competitiveness framework rather than a direct mechanism for market creation. Meanwhile, CBE JU continues to serve as the EU's primary recurring funding mechanism for applied circular and biobased innovation, with annual calls typically allocating more than EUR 100 million to areas like biobased specialty ingredients, residual biomass valorization, biorefinery integration, and biobased materials; its 2026 call allocates EUR 170.7 million across 13 topics. The EU's next major policy signal will be Biotech Act II, the Commission's planned initiative for industrial biotechnology and biomanufacturing. The initiative is expected to complement the first European Biotech Act, which focuses primarily on health biotechnology, by broadening the agenda to industrial biotechnology, biomanufacturing, and cross-sector applications in chemicals, agriculture, food and feed, consumer products, and industrial manufacturing. For biobased chemicals, the key question is whether Biotech Act II will move beyond regulatory streamlining and ecosystem coordination to create stronger conditions for the deployment of industrial biomanufacturing.

Beyond dedicated bioeconomy policy, the European Green Deal continues to shape EU sustainability initiatives through related strategies like the EU Forest Strategy for 2030, the Circular Economy Action Plan, and the Sustainable Blue Economy. These frameworks reinforce the long-term direction of travel toward renewable carbon, circular materials, and lower-fossil production pathways. However, the EU still lacks targeted, federal-level tax incentives, production credits, procurement mandates, or other durable demand-pull mechanisms for biobased chemicals. As a result, the sector remains more strongly supported by R&D and demonstration funding than by policies that materially improve the stand-alone business case for commercial adoption.

The U.K. continues to position bioengineering as a strategic growth sector, but it still struggles to convert its strong biotechnology research base beyond lab or pilot stage. BB-Reg-Net reported that more than GBP 450 million in UK Research and Innovation funding supported biobased research and demonstration projects between 2018 and 2024, yet less than 10% of funded innovations reached commercial production in the U.K.; more than half of the 45 companies it interviewed were considering scaling production in the EU or North America to access more stable regulatory and fiscal frameworks. The government has already begun responding to this commercialization gap by elevating bioengineering as a strategic priority. In December 2023, it launched the National Vision for Engineering Biology, committing GBP 2 billion over 10 years to support applications across health, agriculture, chemicals, manufacturing, fuels, and environmental solutions, among other sectors. Building on this vision, the U.K. listed bioengineering as one of six frontier technologies in its 2025 Industrial Strategy's Digital and Technologies Sector Plan and committed GBP 380 million between 2026 and 2030 to infrastructure and innovation programs that support domestic scale-up. However, the policy response remains focused mainly on infrastructure, coordination, and early commercialization support; the U.K. has not yet created the demand-pull mechanisms needed to make domestic production of biobased chemicals and materials broadly attractive.

> **Key Takeaway: Europe and the U.K. risk becoming net exporters of biobased innovation if policymakers continue to prioritize research funding, coordination, and pilot-scale support over commercial deployment. For now, clients should view the region primarily as sources of technology, talent, development funding, and early scale validation rather than a default location for first-of-a-kind manufacturing assets. Clients evaluating startups in these markets should prioritize technologies with credible scale-up pathways, use regional funding to advance technology readiness, and pressure-test whether commercial deployment would be better suited to regions with stronger demand-pull incentives, cheaper feedstocks, clearer offtake structures, or more supportive industrial policy.**

Biobased chemicals policy in APAC

In China, policy emphasis has shifted from broad bioeconomy promotion toward a more implementation-oriented biomanufacturing strategy. As the country transitions into its 15th Five-Year Plan (2026–2030), policymakers have introduced measures to accelerate the commercialization and scale-up of biobased chemicals and industrial biotechnology. These include a 5% additional value-added-tax deduction for qualifying advanced manufacturing firms through 2027, a national program supporting the commercialization of nonfood biobased materials, and a biomanufacturing pilot platform initiative targeting more than 20 pilot-scale facilities, 200 supported enterprises, and 400 incubated products by 2027. The pilot-platform program explicitly supports applications in chemicals, enzymes, biomass conversion, and alternative feedstocks, reflecting a growing focus on industrial deployment rather than upstream R&D alone. Implementation is increasingly driven by regional initiatives, with municipalities like Shenzhen and Shanghai and provinces including Guangdong supporting biomanufacturing infrastructure, pilot-scale facilities, and commercialization programs. Notably, the National Development and Reform Commission approved the National Innovation Center for Biomanufacturing in Shenzhen to support scale-up activities through shared infrastructure and industry collaboration. Collectively, these measures signal a transition from research-led bioeconomy development under the 14th Five-Year Plan toward a commercially focused policy framework centered on pilot infrastructure, manufacturing capacity, and technology deployment.

In 2024, **India** approved the Biotechnology for Economy, Environment, and Employment (BioE3) Policy to expand its bioeconomy across priority areas, including high-value biobased chemicals, biopolymers, and industrial enzymes. Unlike earlier biotechnology initiatives focused primarily on R&D and startup support, BioE3 places a stronger emphasis on commercialization and industrial scale-up through biofoundries, Biomanufacturing and Bio-AI hubs, and shared pilot-scale infrastructure designed to reduce scale-up barriers for startups and industry. Implementation accelerated throughout 2025 and into 2026 through the Department of Biotechnology and Biotechnology Industry Research Assistance Council-led proposal calls, BioE3 Challenge initiatives, and infrastructure programs under the Bio-RIDE scheme, which includes a reported INR 1,500 crore (~USD 180 million) allocation for biomanufacturing and biofoundry development. In September 2025, India further advanced this strategy by planning a network of 21 biofoundry facilities equipped with shared pilot- and commercial-scale fermentation infrastructure to support strain engineering, process optimization, and scale-up across sectors including biobased chemicals, functional proteins, and pharmaceutical intermediates.

Japan introduced its Bioeconomy Strategy in 2019 and updated it in 2024, aiming to realize a bioeconomy market worth approximately JPY 100 trillion by 2030. The strategy positions biotechnology as a driver of industrial competitiveness, decarbonization, and resource security, with biomanufacturing and bioderived products identified as a core market area. For biobased chemicals, Japan's policy emphasis is centered on biomass utilization, biofoundational tools, AI-enabled strain and process optimization, and industrial bioproduction for chemicals, materials, textiles, fuels, and other manufacturing applications. To address commercialization and scale-up challenges, Japan has expanded support for regional biocommunities, including the Greater Tokyo Biocommunity and BiocK in Kansai, which are intended to strengthen collaboration among companies, universities, investors, and government agencies. Japan has also linked biomanufacturing to its broader green transformation agenda through programs like New Energy and Industrial Technology Development Organization (NEDO)'s Green Innovation Fund project on carbon recycling using CO_2 as a direct raw material for biomanufacturing.

However, Japan's tax incentives remain broader carbon-neutrality investment tools rather than targeted incentives for biobased chemicals specifically. Since 2022, the government has further accelerated investment in industrial biotechnology through large-scale national biomanufacturing programs, with total public support for biomanufacturing and related areas, as described by the Cabinet Office, on the order of JPY 1 trillion. The most important example is NEDO's FY 2023–FY 2032 biomanufacturing initiative, which has a total budget of approximately JPY 300 billion and targets industrial-scale bioproduction across sectors, including chemicals, materials, textiles, and fuels. These programs give Japan one of the more substantial public funding backbones for biomanufacturing in APAC, but the policy framework remains more focused on technology development, infrastructure, and industrial capability building than on creating direct demand-pull for biobased chemicals.

In 2022, South Korea launched the National Synthetic Biology Initiative to strengthen synthetic biology capabilities and accelerate biomanufacturing innovation. The initiative set goals to raise Korea's synbio capabilities to 90% of the global leading level, transition 30% of the manufacturing industry toward biobased production within 10 years, and establish a top-tier national biofoundry industry. It also supported the Korea Synthetic Biology Association as a private-led coordination body across industry, academia, and research centers. Building on this foundation, South Korea passed the Synthetic Biology Promotion Act in April 2025, with implementation scheduled for 2026 after a one-year grace period. The act requires the Ministry of Science and Information and Communication Technologies to prepare a five-year Synthetic Biology Promotion Basic Plan, creates legal grounds for a Synthetic Biology Development Council, supports designation of R&D hub institutions, and allows the government to establish and operate core infrastructure like public biofoundries. It also provides a basis for standardizing synthetic biology, supporting research data use, facilitating commercialization, developing talent, fostering international cooperation, and managing safety. Together, these measures mark a shift from early stage synthetic biology promotion toward a more structured commercialization- and infrastructure-driven bioeconomy framework.

Thailand established its Bio-Circular-Green Economy Model (BCG) as the umbrella framework for expanding its local bioeconomy, including biochemicals, bioplastics, bioenergy, and other value-added uses of agricultural and biological resources. Thailand's cabinet endorsed BCG as a national agenda in 2021 and formulated the BCG Action Plan 2021–2027 to coordinate public-private activity across priority sectors. For biobased chemicals and materials, the most important support comes through investment-promotion mechanisms rather than dedicated demand-pull policy. Thailand's Board of Investment offers incentives for BCG-aligned and advanced manufacturing projects, including corporate income tax exemptions, import-duty reductions or exemptions, and other investment privileges, while additional location-based benefits may be available in the Eastern Economic Corridor across Chachoengsao, Chonburi, and Rayong. These tools strengthen Thailand's position as a regional production base, especially for bioplastics and biobased materials, but they don't fully address domestic demand limitations. Thailand's Plastic Waste Management Roadmap and related circular-economy measures encourage reducing and replacing single-use plastics with environmentally friendly alternatives, but the country still lacks strong demand-pull mechanisms, such as mandatory biobased-content requirements or broad procurement mandates. As a result, Thailand remains commercially attractive as a feedstock- and incentive-supported manufacturing hub, but much of the business case for biobased chemicals still depends on export markets, corporate sustainability commitments, and the evolution of carbon-credit or plastic-waste policy.

Singapore does not have a dedicated bioeconomy policy but instead supports biotechnology and bioindustrial development through its Research, Innovation and Enterprise (RIE) plans, the country's five-year national strategy for directing public R&D investment and innovation priorities. Under the recently launched RIE2030 plan, Singapore committed SGD 37 billion (2026–2030) to research, innovation, and enterprise activities and explicitly identified the bioeconomy as an emerging area where the country can leverage its existing chemicals, energy, and biotechnology capabilities to develop sustainable products, alternative feedstocks, and new industrial activities. Singapore continues to rely on direct public R&D investment rather than dedicated bioeconomy regulations or sector-specific incentives, but the inclusion of bioeconomy within a flagship national innovation strategy signals growing government support for industrial biotechnology and biomanufacturing. The strategy also highlights bioprocess development and stronger industry–research collaboration to accelerate commercialization of biobased technologies and products.

> **Key Takeaway:** APAC is separating itself from the U.S. and Europe by treating biomanufacturing as an industrial competitiveness issue rather than solely an innovation challenge. Clients should evaluate the region not only as a feedstock and manufacturing base but also as a potential destination for first commercial facilities where policy support, infrastructure access, feedstock economics, and industrial partners align. However, APAC shouldn't be treated as a single market: China, India, Japan, and South Korea are prioritizing biomanufacturing scale-up and industrial infrastructure, Thailand offers feedstock and manufacturing advantages, and Singapore is better positioned as a regional hub for corporate innovation, technology translation, and market access.

Outlook

Over the next three to five years, biobased chemicals policy will become more supportive but is not likely to be broadly transformative. Governments will continue expanding R&D funding, pilot infrastructure, biofoundries, biomanufacturing hubs, and ecosystem-development programs. Resource-rich countries may also use bioresource utilization strategies, targeted tax incentives, and biorefinery support to convert biomass advantages into domestic manufacturing capacity. But most markets will still stop short of the broad procurement mandates, production credits, or durable demand-side mechanisms needed to make biobased chemicals cost competitive with incumbent fossil-based products across large-volume applications. This will force companies to separate where they develop technology from where they scale production. North America and Europe will remain important centers for innovation, startup formation, partnerships, applied funding, and technical validation, while APAC will become more important for first commercial deployment as China, India, Japan, and South Korea build scale-up infrastructure and frame biomanufacturing as a matter of industrial competitiveness.

Clients should evaluate policy support as part of their commercialization strategy, using it to determine where to pilot, site first commercial facilities, secure offtake, and scale production — not just as a source of nondilutive R&D funding. Companies that succeed will combine policy support with feedstock access, downstream regulatory tailwinds, credible customer demand, and a realistic path to cost-competitive production. As governments increasingly link biomanufacturing to national security, supply-chain resilience, and industrial strategy, clients should prioritize technologies and applications that align with these priorities while preserving flexibility to deploy manufacturing capacity in regions where infrastructure, incentives, offtake, and feedstock economics create the strongest business case.

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