

Delaware Science & Technology Ecosystem Assessment

Prepared for: Delaware Prosperity Partnership
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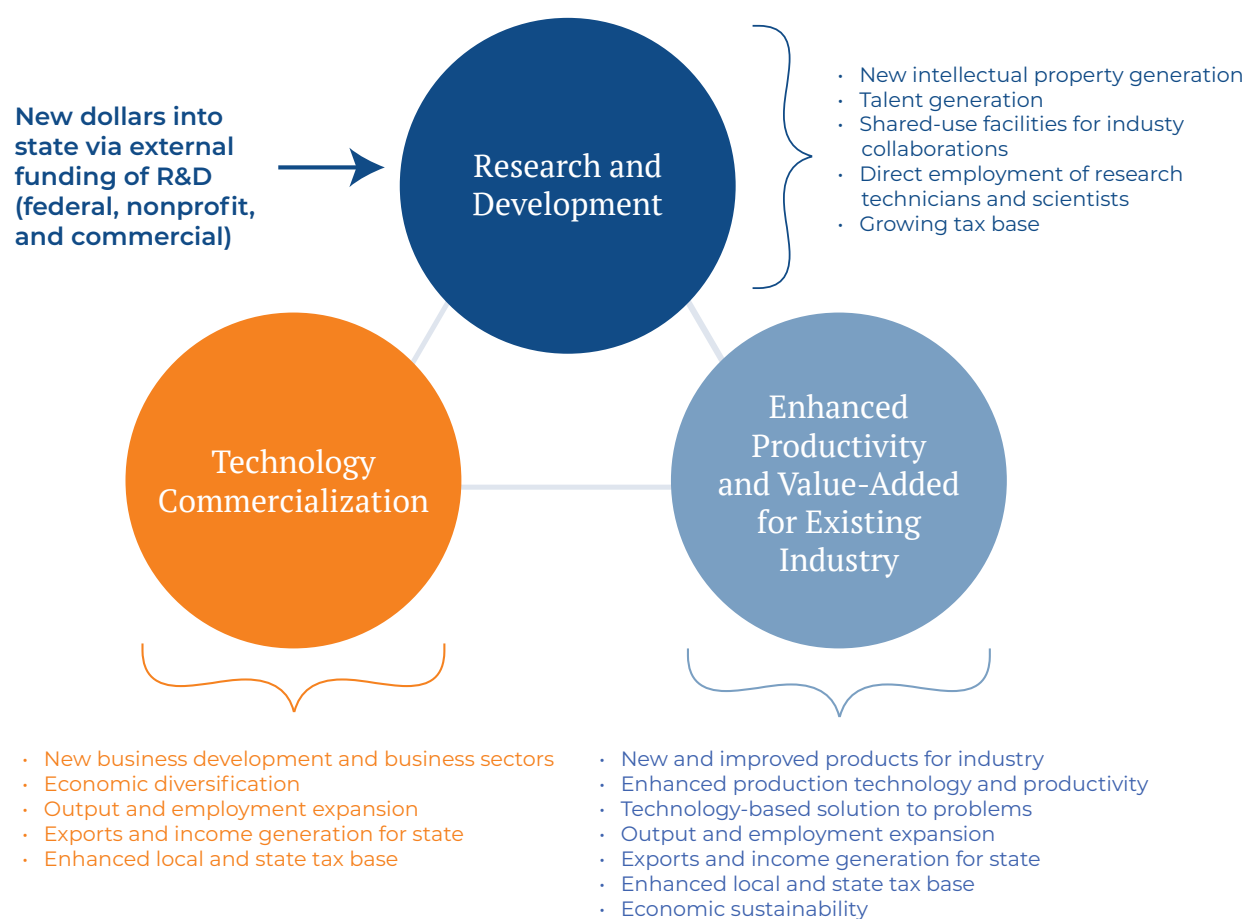
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Executive Summary

The State of Delaware's economic growth has been driven for more than 200 years by scientific innovation, led by industry giants such as DuPont. Today, innovation continues to be a driving force of Delaware's growth and prosperity.

As illustrated in Figure ES-1, innovation-led development is a key driver of economic growth, high-quality jobs, and rising standards of living.

Figure ES-1. Innovation-Led Development is a Key Driver of Economic Growth



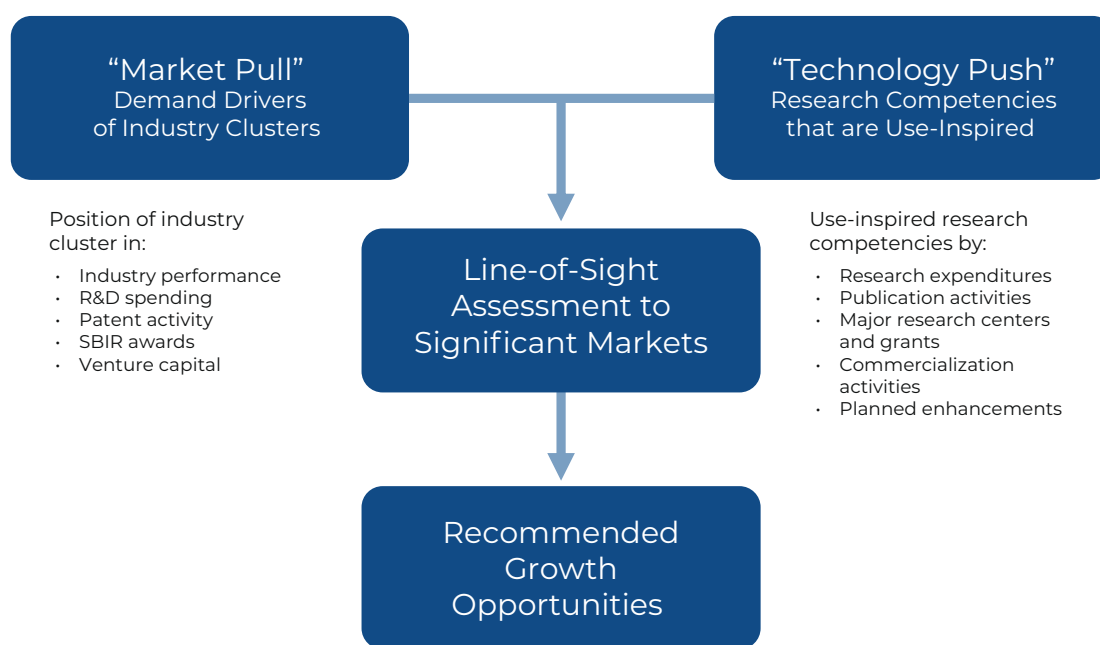
Source: TEconomy Partners, LLC.

Through the efforts of the Delaware Prosperity Partnership (DPP), the nonprofit public/private organization that leads Delaware's statewide economic development efforts, ensuring a robust innovation ecosystem continues to be a top priority. To this end, DPP commissioned a study to identify Delaware's innovation strengths and assess where the state can enhance the support ecosystem to more fully capture the economic potential of its science and technology (S&T) growth sectors.

Delaware's S&T Growth Opportunities

To identify Delaware's S&T growth opportunity areas, a rigorous, data-driven approach was undertaken to evaluate the state's competitive position. A line-of-sight assessment considered the "market pull" of industry innovation drivers found within established and emerging S&T industry clusters and how they aligned with the "technology push" of research capabilities found across the state's research institutions (Figure ES-2).

Figure ES-2. "Line of Sight" Approach for Identifying Strategic S&T-Driven Industry Opportunities



Source: TEconomy Partners, LLC.

The intersection of where the state excels in the "market pull" of industrial innovation activities and the "technology push" of industry-facing core competencies represent the greatest opportunities for future economic growth. Taken together, they can offer a line-of-sight to innovation-led market opportunities that can help sustain the vibrancy of Delaware's leading existing industry clusters as well as position the state to respond to emerging market opportunities.



Ultimately, five existing S&T growth opportunity areas were identified for Delaware through the line-of-sight assessment. These five areas are those in which Delaware is best positioned to compete in innovation-led market opportunities that can help grow the state's leading industry clusters.

FinTech and Emerging Business Services Platforms

FinTech encompasses the digital and financial infrastructure that enables digital payments and online banking, but it also extends to applications and systems that enable the seamless integration of financial technology into every aspect of business and consumer life. Companies are no longer simply offering standalone financial products; instead, they are embedding financial services into software and services across end markets in e-commerce, logistics, and healthcare systems.

Next Generation Specialty Chemical Products

Next generation specialty chemical products represent a broad and growing market applications area that provides critical materials and formulations as a part of the upstream supply chain for a number of high-growth industries including semiconductors, healthcare, automotive, and energy technologies. These chemical compounds and chemically-derived materials enable higher performance, sustainability, and enhanced functionality across multiple applications, making this area a cross-cutting strength that supports multiple end-market applications.

Sustainable and High-Performance Materials

Next-generation sustainable and high-performance materials encompass a wide spectrum of advanced material classes engineered for superior performance and sustainability. These include innovative polymers and composites, nanoscale materials, and bio-derived substances that outperform traditional materials in strength, weight, durability, or functionality while also reducing environmental impact. Several key application verticals that this opportunity area spans include advanced polymers and plastics, high-performance composites, nanomaterials and photonic materials, biomaterials and soft matter, and hybrid and responsive materials.



Clean Energy Systems

Clean energy systems encompass a suite of technologies and processes designed to produce, store, and distribute energy with minimal environmental impact. These systems prioritize the use of renewable resources and aim to reduce greenhouse gas emissions, mitigate climate change, and promote sustainability. Key types of clean energy systems with the potential to be deployed on a commercial scale include fuel cells and hydrogen energy systems, solar photovoltaic systems, and wind energy systems.

Biopharmaceutical Manufacturing and Discovery

The rapid pace of biopharmaceutical research advances combined with the growth of fields such as cell and molecular biology, genomics, computational chemistry, and chemical biology is reshaping the way we discover, develop, and manufacture therapeutics, as well as diagnose and treat diseases and medical conditions. Biopharmaceutical research and manufacturing advances are not only at the forefront of creativity and innovation, but represent a convergence point for engineering, information technology, and physical sciences, such as chemistry and materials.

In addition, three emerging S&T growth opportunity areas were identified for Delaware through the line-of-sight assessment that can position the state to respond to emerging market opportunities:

- **BlueTech Innovation**, encompassing marine science, ocean technology, offshore wind, aquaculture, and coastal resilience.
- **Integrated Agriculture and Sustainable Food Production**, a sustainable approach to food production that combines different farming enterprises to create a self-sustaining, resource-efficient, and environmentally friendly system.
- **Rehabilitative and Performance Enhancement Technologies**, encompassing treatments that represent a broad spectrum of interventions focused on restoring function, reducing pain, and improving a patient's quality of life. These existing and emerging S&T growth opportunities represent a unique portfolio of Delaware's technology strengths and provide a potential playbook for the state's innovation-led future.

Delaware's Innovation Ecosystem

In order to successfully leverage the identified S&T growth opportunities, Delaware must have a robust innovation ecosystem that helps increase the likelihood of impactful technologies, products, and services making it to the market. A holistic, objective, data-driven assessment of the capacities, gaps, and opportunities for the state's innovation ecosystem was undertaken. Delaware's performance was compared against six benchmark states and the national average, and the analysis can be summarized through seven key findings:

1. Delaware is a powerhouse in research and development (R&D) and patent activity, with growth rates far outpacing the U.S.
2. Delaware's research universities are seeing substantial growth in R&D funding and have made significant investments in their infrastructure to encourage innovation and entrepreneurship.
3. Despite growth in R&D, Delaware's universities are not commercializing research at a pace fast enough to promote broad-based economic vitality.
4. Delaware is home to a continuum of ecosystem support services to encourage innovation and entrepreneurship.
5. Delaware is seeing overall growth in risk capital and venture development, but increases are modest and starting from a low base of activity.
6. Delaware is lagging benchmark states and the nation in the growth of both STEM-related degrees and STEM employment share.
7. Although Delaware is seeing sustained startup activity in high-tech sectors, this has not translated into wide-spread advanced industry establishment or employment growth.

Overall, Delaware is home to some of the elements of a robust innovation ecosystem with the ability to impact economic vitality. However, the system is not functioning at maximum capacity, and, as a result, Delaware's innovation ecosystem needs to be further strengthened in order to strategically grow its innovation economy. Moving forward, the state must be strategic to ensure it continues to build positive momentum while also addressing the challenges facing its innovative firms.

Conclusion

The S&T growth opportunities represent a unique portfolio of Delaware's technology strengths and a potential playbook for the state's innovation-led future. By identifying those areas that have significant potential for moving research to market and strengthening the support ecosystem, DPP and its partners can develop targeted economic strategies and programs focused on growing high-impact businesses and increasing the competitive advantage of the state's key industry sectors.

Successfully seizing these opportunities will require intentional connections, investments, and a collaborative culture. As DPP looks to the future, these opportunity areas can serve as a guide to catalyze strategic partnerships, inform future investments, serve as a foundation for statewide innovation initiatives, build awareness of the state's unique strengths, and recruit and retain world-class innovators in Delaware.