

# New Hampshire's Innovation-Led Growth Opportunities are Found in Advanced Manufacturing, Information Systems and Biosciences

The “line-of-sight” analysis identified six niche areas of industry innovation in New Hampshire that fall within three broad industry clusters:

Below is a brief overview of each of the specific innovation niches falling within these broad industry clusters. A profile of each these innovation niches areas is provided in Appendix A to provide a fuller explanation of the industry innovation context, the industry connections, the university research alignment and the growth potential.

## Advanced Manufacturing

**Sensor, optics, communications and electronic systems** – New Hampshire is active in patent areas involving optical interface devices, manufacturing and treatment of semiconductor devices, magnetic field sensors, vehicle navigation control systems, and aerial antennae systems. This reflects New Hampshire's specialization in defense-related industries involving search, detection and navigation, as well as those involved in the electronic systems supply chain such as optical instruments, printed circuit assembly and electronic component manufacturing, communication and energy wire manufacturing and engineering services. These companies employ more than 16,000 workers in New Hampshire.

- **Industry presence:** Many large companies with operations in New Hampshire fall into this category, including BAE, GE Aerospace, Fujifilm Dimatix and Taiwan Semiconductor. However, most are small and mid-sized companies, who serve as suppliers to larger organizations. A notable, mid-sized company is Create, which is highly successful in federal small business innovation research (SBIR) grant funding and received 59% of New Hampshire's 537 SBIR awards from 2009 to 2015 and created multiple spin-out companies.
- **Growth outlook:** While the employment base is not growing in New Hampshire nor across the U.S. in these industries – as emerging advanced manufacturing process technologies are being installed – they are still viewed as having solid future growth trends, with the global markets for image sensors, integrated remote sensing and advanced electronics projected to grow at close to 10% or higher annually.
- **Research capacity:** Universities in New Hampshire have a strong concentration of publications in optics, remote sensing, imaging science and spectroscopy though often applied through environmental sciences. Leading research centers include the University of New Hampshire's Center for Coastal and Ocean Mapping, the joint UNH-NOAA Hydrographic Center and Dartmouth's Advanced Imaging Center.

**Photonics and Plasma Technologies** – New Hampshire is a national leader in this area with very high specializations in patents for charged particle beam systems, projected and filtered light display devices, generating and handling plasma and laser systems.

- **Industry presence:** While a highly specialized, but smaller industry with nearly 2,700 jobs in New Hampshire, it is led by one of the most successful home-grown New Hampshire companies, Hypertherm. Other companies found in this innovation area include Laser Light Engines, Osram Sylvania, Solid State Scientific, QmagiQ LLC and Active Spectrum.
- **Growth outlook:** The market for laser technologies in the U.S. has overall modest growth prospects in the 5% annual growth range, but high growth of over 10% annually is projected in the specific markets for photonic detectors and sensors. SBIR funding for high performance metals machining and inspection is an active area in New Hampshire.
- **Research capacity:** There is a specialized focus on plasma physics as a publication field among universities in New Hampshire and an overlap with strengths found in optics. The UNH Space Science Center is a major research center aligned with this area of innovation focus.