Greetings!

As we discussed the content for this month's EDAB e-news, some impactful stories surfaced about the power and potential of additive manufacturing. One story summarized how additive manufacturing allowed the Army to create a replacement part for vehicles in Afghanistan and have it reproduced in-hand and on site in just four days. Another told of a heart surgeon who used 3D printing to create a replica of a young patient's damaged heart so that he could determine the best way to successfully repair it before entering the operating room. The possibilities are endless. And with the recent State legislation that established an additive manufacturing authority in Maryland, those possibilities can happen right here at home.

These are only the tip of the iceberg for applications of additive manufacturing. We will be watching for many successes and more news. In the meantime, what can YOU make with plastic, resin, metal or nano-materials? Don't miss the Business Spotlight profile on Chesapeake Manufacturing, and learn more about the extremely advanced business of additive manufacturing in Fast Facts.

For more information, or to get involved in the efforts of the Economic Development Advisory Board to advocate for positive growth in the County, visit www.harfordbusiness.org.

Sincerely,

Eric McLauchlin
Chairman, EDAB

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**Manufacturing Adds New Dimension to Economy**

The innovative concept of 3D printing has been quietly rising to the forefront of today's manufacturing technology. While somewhat science-fiction-like in its process, the results are exciting. Supplement that technology with additive manufacturing, and we have a valuable resource for economic growth just waiting to launch.

It's a fact that the resources necessary to allow additive manufacturing to thrive reside right in our backyard. As a revolutionary form of manufacturing that holds great promise for the region and the nation, additive manufacturing has been at the epicenter of technology used by the Army for military support. The Federal Government has invested more than $25 million at APG to make that happen. The equipment, software and manpower are located at the Edgewood Chemical and Biological Center (ECBC). The workforce that has access to those assets boasts over 50 years of additive manufacturing experience, with competencies in printing with plastics, ceramics, metals and nano-particle resins. This workforce has interacted with over 100 government, academic and private business clients, is certified by the Society of Manufacturing Engineers, and has even been a co-recipient of a Nobel Prize for its work.

These are the assets to leverage to grow a manufacturing base. Approximately 12 percent of the nation's gross domestic product comes from manufacturing, and that sector is responsible for 70 percent of domestic industry research and development. Manufacturing also accounts for 70 percent of patents awarded to U.S.
In an effort to strengthen the nation's core manufacturing infrastructure, President Obama has initiated national investments in education, infrastructure, and innovative, advanced technology. The Obama Administration has allocated federal funds of $1 billion for a network of 15 regional Institutes for Manufacturing Innovation, modeled after a pilot institute launched in Youngstown, Ohio. This National Additive Manufacturing Innovation Institute (NAMII) attracted 76 members and co-funded seven collaborative projects in its first year. Virginia has its Commonwealth Center for Advanced Manufacturing, and Pennsylvania has its partnership in the NAMII through its Center for Innovative Materials Processing. These institutes will provide leadership and collaboration for manufacturing technologies. Maryland is next.

In Maryland, we have the potential for an even more impressive entity with unlimited growth opportunities. We have the key assets for success: an infrastructure of education, a strong, experienced workforce and the nation's premiere additive manufacturing facility. Recent legislation gave Maryland the Northeastern Maryland Additive Manufacturing Innovation Authority (NMAMIA) to "position the State as a leader in additive manufacturing." Maryland can continue to build economic resources and new industry around the assets in our region. The legislation creates a vessel to capture the Federal funding. Through NMAMIA, Maryland can expand the single-solution concept of 3D printing, which is often equated to additive manufacturing, to a full manufacturing solution - from concept through research and development, manufacturing, training, education and distribution.

The manufacturing supply chain requires knowledgeable workers of all skill levels. From data experts and R&D specialists to manufacturing line workers and upper management, the additive manufacturing process will open the door to opportunities for all levels of education and experience. Ideally, these workers will be trained and educated in northern Maryland. Harford County's existing infrastructure of STEM-focused programs at both the high school and college levels, as well as technology programs at Harford Community College and the affiliated Towson University, are valuable assets to the emergence of additive manufacturing. In addition, the programs for four-year, Master's and PhD education at the University Center will support current workforce advancement.

The NMAMIA is being implemented through a non-profit organization that will work with APG and viable businesses that can benefit from additive manufacturing. Through a Cooperative Research and Development Agreement (CRADA) with APG, industries can access the equipment and knowledge base of additive manufacturing at APG. The NMAMIA will be the conduit to a sustainable, high-performing, high-technology manufacturing center that will foster the economic development of the region and the State.

The NMAMIA will be guided by a Board of Directors that include stakeholders from the education entities of Harford and Cecil Counties, the respective Offices of Economic Development, ECBC, DBED, and notable companies such as SURVICE Engineering, Chesapeake Testing and ATK that are already working with APG on additive manufacturing programs. It is an exciting time for the region, and announcements are pending for the coming summer months.

While the potential is clear and the benefits are up to the imagination, several things are certain: additive manufacturing is faster, greener, and more economical and makes things lighter and stronger. The technology is successful. The foundation exists. The region is prepared to help the State. Most certainly, the time is now. We are poised to unlock a new dimension for our local and national economy. Harford County promises to be the center.

Business Spotlight: Chesapeake Testing

Chesapeake Testing provides ballistic and non-destructive testing services to support government programs and commercial customers that produce protective body armor and ballistic-resistant materials. The company was established in 2006 by the efforts of Jim Martin and Craig Thomas after being tasked to create a ballistic armor and personal body armor testing division by SURVICE Engineering founder Jim Foulk. Chesapeake Testing tripled its indoor firing ranges and employees within the first four years and built a new technology center that included additional indoor firing ranges, and non-ballistic test laboratories. This new facility opened in 2010 in Belcamp, three years ahead of schedule.

Chesapeake Testing is approved by the National Institute of Justice to perform personal body armor testing and is accredited through the NVLAP and A2LA accreditation programs. Other notable services include material performance, mechanical/environmental testing and a 450kV/250kV micro-focus 3D X-Ray walk-in CT scanner (one of only three in the world). XCT scanning obtains detailed 3D images of the internal dynamics of materials and products, allowing for precision analysis, inspection and reverse engineering.

Named the 2012 Small Business of the Year by the Maryland Chamber of Commerce, Chesapeake Testing offers world-class testing services to both domestic and international customers. For more information, visit www.chesapeake-testing.com.

Source: Chesapeake Testing website www.chesapeake-testing.com

Fast Facts

- In just 10 years, the application of additive manufacturing to the total global product and service
revenues has gone from zero to 28 percent of its global product and service revenues.

- Additive manufacturing does not begin at the printing machine. In fact, the early stages of product development are a substantial part of the process, including reverse engineering, 3D design, simulation, process and materials selections, modeling, testing and evaluation.

- Local companies like Quicksilver, Alcore, Smith’s Detection, Automated Coatings, Independent Can, Automated Motion and Harford Systems have a long history of manufacturing in Harford County and employ over 1,500 skilled workers. Additive manufacturing will further leverage these skills and manufacturing capabilities.

- Harford County Public Library has a 3D printer, as do Harford County Public Schools.

- The existing STEM (Science, Technology, Engineering and Math) programs will continue to be the basis for additive manufacturing education, along with the addition of the fifth component - Art - creating the STEAM program.

- Regionally, a public-private partnership, or P3, will help to develop the additive manufacturing base with academic, government, and local economic development resources, state resources, federal government facilities, equipment and subject matter experts and local commercial facilities, equipment and subject matter experts.

- The Institutes for Manufacturing Innovation (IMIs) will be collaboratively funded and cooperatively staffed to help in the complete manufacturing cycle, insuring that inventions and discoveries in the U.S. are manufactured here and reap the economic and national security benefits the U.S. offers.

Sources: Northeastern Maryland Additive Manufacturing Innovation Authority White Paper; Testimony to Senate Finance Committee, MD State Senate.

David R. Craig, Harford County Executive

The Harford County Economic Development Advisory Board consists of a number of subcommittees - including technology, workforce development, finance, tourism, and land use - dedicated to the positive growth and Economic Development of Harford County.