# Florida TaxWatch BRIEFING

May 2015

## Could Florida Be The Next High-Tech Hub?

New Consortium Provides Opportunities To Lead

## **INTRODUCTION**

The International Consortium for Advanced Manufacturing Research (ICAMR) is a public/private partnership that brings the high-tech manufacturing industry together with local and state government partners and state universities to establish Florida as a leading advanced manufacturing hub.

The consortium, organized as a not-for-profit entity, uses a public/private partnership model to maximize the impact of multiple funding streams, providing the ideal environment for the development of high-tech, high-wage jobs and innovative products. The ICAMR is the consortium responsible for building and operating the Florida Advanced Manufacturing Research Center (FAMRC), which is envisioned as a 100,000 square foot, state-of-the-art manufacturing research and incubation facility in central Florida, focused on the research of advanced manufacturing techniques for emerging technologies, particularly smart sensors.

### Diversifying Florida's Manufacturing Sector

The ICAMR project is a promising opportunity for the Florida economy because it has the potential to add significant value while further diversifying the manufacturing sector in Florida. Currently, Florida is home to more than 18,200 manufacturers and 317,000 manufacturing workers.<sup>1</sup> Four of the top five manufacturing segments in Florida (based on employment data) can be easily identified as advanced manufacturing or high-tech industries: aerospace products and parts, medical equipment and supplies, semiconductors and electronic components, and electronic instruments.<sup>2</sup>

Advanced manufacturing leads to the production of high-value, big-ticket goods and results in higher wages and salaries, making it a worthwhile target for Florida's economic development efforts. Advanced manufacturing utilizes sensitive, high-tech equipment, brings capital investment to the state, requires highly skilled, highly trained professionals, and is based on unique knowledge and strong intellectual property rights.<sup>3</sup>

2 Ibid.

<sup>3</sup> Area Development website. Advanced Industries Article by Brad Lindquist. 2014. Available at: http://www.areadevelopment.com/advancedmanufacturing/Advanced-Industries-2014/role-of-labor-advanced-manufacturing-29228276.shtml Accessed on April 21, 2015.



<sup>1</sup> Enterprise Florida website, Industry Overview: Manufacturing. Available at: http://www.enterpriseflorida.com/industries/manufacturing/ Accessed on April 21, 2015.

ICAMR can provide a boost to the state's existing manufacturing industry, as locally-sourced smart sensor technology can lead to opportunities for high-tech clustering, which further enhances economic growth. Additionally, smart sensor innovations may be able to breathe new life into traditional manufacturing through innovations that create new capabilities for established processes, equipment, and products.

Whether it is advanced or traditional, manufacturing is very important to Florida. Previous research from Florida TaxWatch demonstrates how average annual wages in Florida manufacturing grew each year from 2001-2010, maintaining a significant lead over the statewide average annual wage over the same period.<sup>4</sup> The same Florida TaxWatch study cited the manufacturing sector as having the highest multiplier effect of all economic sectors in Florida.<sup>5</sup>

Data for labor sector growth since 2010 from the Florida Department of Economic Opportunity (DEO) shows manufacturing trailing only financial activities in terms of

#### ADVANCED MANUFACTURING

Advanced manufacturing can be defined as:

"a family of activities that (a) depend on the use and coordination of information, automation, computation, software, sensing, and networking, and/or (b) make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences, for example nanotechnology, chemistry, and biology. This involves both new ways to manufacture existing products, and especially the manufacture of new products emerging from new advanced technologies."

Source: President's Council of Advisors on Science and Technology Report to the President on Ensuring American Leadership in Advanced Manufacturing. June 2011

average annual wage (\$54,087 and \$63,006, respectively), and since 2010, the manufacturing sector has paid an average annual wage that exceeds the statewide average (\$54,087 and \$43,822, respectively).<sup>6</sup>

#### **ICAMR Background Information**

The International Consortium for Advanced Manufacturing Research (ICAMR) is the world's first industry-led consortium for the research, development, and commercialization of smart sensor technology. The ICAMR is to be housed in, and will be responsible for managing, the Florida Advanced Manufacturing Research Center (FAMRC). Through the ICAMR, the FAMRC will provide unique, industry-led research and manufacturing operations that are not solely guided by academic and/or governmental authorities, allowing the focus on commercial application to be maintained so that economic gains and taxpayer return-on-investment are fully realized.<sup>7</sup>

ICAMR currently includes the following partners: University of Central Florida, University of Florida, University of South Florida, Florida International University, Osceola County, the Florida High Tech Corridor Council, the State University System of Florida, the Orlando Economic Development Commission, Enterprise Florida, the Mist Center, and Novati Technologies, Inc.<sup>8</sup>

<sup>4</sup> Florida TaxWatch. "Manufacturing: An Economic Driver for Jobs and Florida's Future." August, 2011. Figure 2, page 4.

<sup>5</sup> Florida TaxWatch. "Manufacturing: An Economic Driver for Jobs and Florida's Future." August, 2011. Page 14.

<sup>6</sup> Florida Department of Economic Opportunity. 2013-2014 Annual Report. October 2014. Table 1, pg. 5.

<sup>7</sup> Florida Senate website. Don Fisher (Osceola County Manager) testimony to the Appropriations Subcommittee on Transportation, Tourism and Economic Development on March 11, 2015.

<sup>8</sup> ICAMR website. Available at: http://www.icamr.net/about.html Accessed on: April 21, 2015.

During the first phase of the FAMRC project, a 100,000-square-foot building with be built in the initial 20-acre site, which is located close to the Orlando International Airport,<sup>9</sup> and phase one tool installation is scheduled to begin in 2016 and the facility will be fully operational in 2017. The design and construction cost for the building is \$75 million, tool acquisition and installation is \$11 million, and there is an additional \$9 million budgeted for construction, tools, or other expenses that may be incurred.

The initial 20-acre site and 250 high-tech jobs will serve as the foundation for what could eventually become a 300-acre campus and thousands of additional high-wage jobs in the years to follow.<sup>10</sup> So far, Osceola County has donated land and committed nearly \$138 million toward construction and equipment for FAMRC. The University of Central Florida has agreed to operate FAMRC for 30 years and contribute \$10 million toward the construction and another \$7 million for faculty hires.<sup>11</sup> ICAMR has requested \$25 million a year for five years in infrastructure funding from the Florida Legislature for the purchase and operation of specialized equpiment for the FAMRC facility.<sup>12</sup> It is expected that after five years, the fees charged to partner companies would allow the consortium to be self-sufficient going forward.<sup>13</sup>

Private advanced manufacturing firms needing to overcome high-tech obstacles are expected to locate at FAMRC and partner with ICAMR to take advantage of its research and development opportunities. Through the FAMRC, the ICAMR will "provide Florida with a platform for manufacturing that will bridge the gap between advanced research at Florida's universities and the cost-competitive manufacturing that will get these discoveries to market quicker and more affordably."<sup>14</sup> As the number of partner firms increases, the operations of ICAMR will become more commercially focused and the need for public sector support will diminish.<sup>15</sup>

ICAMR is structured in a way that portends success in this very specialized field, as its leadership team has members with previous experience working for SEMATECH, a high-tech, nonprofit consortium that successfully partnered with organizations in Austin, Texas and Albany, New York in the fields of semiconductor manufacturing and nanotechnology. Other members on the ICAMR leadership team hail from academia and other private high-tech firms.

<sup>9</sup> UCF website. Article by Gene Kruckemyer. March 26, 2015. Available at: http://today.ucf.edu/ucf-consortiums-future-smart-sensors-will-sense-things-cant-measure-today/ Accessed on April 22, 2015.

<sup>10</sup> Ibid.

<sup>11</sup> *Ibid.* 

<sup>12</sup> Osceola News-Gazette. "Osceola sensor facility gets additional \$5 million in funding." March 25, 2015.

Florida Senate website. Don Fisher (Osceola County Manager) testimony to the Appropriations Subcommittee on Transportation, Tourism and Economic Development on March 11, 2015.

<sup>14</sup> Tampa Tribune Op-Ed. J. Charles Gray. In Central Florida, a game-changing intiative. April 24, 2015.

<sup>15</sup> *Ibid.* 

#### **Smart Sensors**

Smart sensors represent the next generation of electronic sensors, possessing enhanced functionality and providing new capabilities. By combining a sensor with microprocessor technology, smart sensors can create enhanced accuracy and greater information connectivity so that better decisions can be made and tasks performed more quickly. Essentially, smart sensors are smaller, faster, more affordable, and more capable than their traditional counterparts.

Applications abound in health care, safety, industrial equipment, automobiles, aircraft, telecommunications, and connected cities and homes.<sup>16</sup> It is estimated that by the year 2020, some 50 billion devices (objects, buildings, and infrastructure) will be connected by smart technology sensors.<sup>17</sup> According to July 2014 estimates, the global market for sensors was valued at \$79.5 billion in 2013 and is expected to increase to \$86.3 billion in 2014, \$95.3 billion in 2015, and to nearly \$154.4 billion by 2020, a compound annual growth rate of 10.1% from 2015 through 2020.<sup>18</sup>

## QUANTIFYING THE BENEFITS OF ICAMR AND THE FAMRC TO THE STATE OF FLORIDA

The manufacturing sector has proved to be highly beneficial to the state of Florida. According to a 2011 Florida TaxWatch report,<sup>19</sup> manufacturing provides high-wage, high-value-added jobs to the state. The sector has the lowest personal income volatility and biggest multiplier of all other sectors of the

Florida economy, as each dollar of manufactured goods creates another \$1.33 of activity in other sectors. Moreover, the sector is key to economic diversification, and accounts for 85 to 90 percent of Florida exports.



<sup>16</sup> Bloomberg Business website. Article by Olga Kharif. August 5, 2013. Available at: http://www.bloomberg.com/news/ articles/2013-08-05/trillions-of-smart-sensors-will-change-life-as-apps-have Accessed on April 21, 2015.

<sup>17</sup> ICAMR website. Available at: http://www.icamr.net/about.html Accessed on: April 21, 2015.

<sup>18</sup> BCC Research LLC. Research Report. "Global Markets and Technologies for Sensors." Report Code: IAS006F. July 2014. Report Highlights available at: http://www.bccresearch.com/market-research/instrumentation-and-sensors/sensors-ias006f.html Accessed on: April 22, 2015.

<sup>19</sup> Florida TaxWatch. "Manufacturing: An Economic Driver for Jobs and Florida's Future." August 2011.

The establishment of the ICAMR and the development of the FAMRC will support a number of industries, including several target industries,<sup>20</sup> increase talent retention, and provide the opportunity to create a high-tech cluster.

#### High Skills, High Wages

Manufactured goods fall within two major categories: durable and non-durable goods. The production of advanced sensors, photonics, optics, and similar devices proposed by ICAMR fall within the durable goods category. The manufacturing of durable goods provides an average earning of \$21.66 per hour to its employees, a much higher average earning than that offered to non-durable goods employees, at \$16.63 per hour.<sup>21</sup> Wage differences are significantly higher when compared to the average annual wages of other private industries. Average annual wages in specific manufacturing subsectors (see table below) associated with ICAMR can be more than twice (228 percent) as much as those of the average private sector job in Florida.<sup>22</sup> Higher wages are associated with higher consumption (a major driver of the gross state product), and with higher tax receipts.

SUBSECTOR	AVERAGE ANNUAL PAY 2013	PERCENT OF AVERAGE WAGE OF ALL PRIVATE INDUSTRIES
Communications Equipment Manufacturing	\$98,001	228%
Semiconductor and Electronic Component Manufacturing	\$81,444	190%
Computer and Electronic Product Manufacturing	\$79,220	185%
Electronic Instrument Manufacturing	\$73,655	172%
Florida, All Private Industries	\$42,901	100%

#### Table 1: Average Annual Wages of Manufacturing Subsectors Associated with ICAMR

Source: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages

#### **Steady Income Stream**

Personal income in the durable goods industry has a smaller coefficient of variation<sup>23</sup> (a statistic that shows the predictability of a series over time) than every other major sector<sup>24</sup> except for non-durable goods manufacturing. A lower coefficient of variation means that the series is more predictable, which means that durable goods manufacturing can be expected to provide steady income to Floridians and a consistent tax revenue source, hence providing stability to the state economy.<sup>25</sup>

<sup>20</sup> A group of industries identified by Enterprise Florida as high value-added for the state of Florida. They include: Cleantech, Life Sciences, Infotech, Aviation & Aerospace, Homeland Security & Defense, Financial/Professional Services, and Manufacturing.

<sup>21</sup> U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages.

<sup>22</sup> Ibid.

<sup>23</sup> A statistic that was determined by dividing the standard deviation of personal income by the mean of the series.

<sup>24</sup> The sectors used in this comparison were selected using the North American Industry Classification System (NAICS) codes. The following sectors were used: nondurable goods (part of manufacturing); utilities; forestry, fishing, and related activities; farm income including farm proprietors' income; military, mining; retail trade, transportation and warehousing; federal and civilian government; state and local government; other services, except public administration; wholesale trade; information; health care and social assistance; accommodation and food services; finance and insurance; arts, entertainment, and recreation; administrative and waste services; construction; management of companies and enterprises; and educational services.

<sup>25</sup> Florida TaxWatch. "Manufacturing: An Economic Driver for Jobs and Florida's Future." August 2011.

#### **Economic Diversification for State and Local Governments**

Investing in manufacturing has been shown to diversify the economy away from sectors that tend to suffer the most during economic downturns, particularly retail trade and construction, two of Florida's largest sectors. Large unemployment in these and other related sectors have decreased state and local tax collections, and increased social assistance expenditures. Manufacturing's reliable personal income stream is a good investment for a government that wishes to safeguard its revenue streams in order to continue to provide essential services to its citizens during economic downturns.

#### **Export Opportunities**

Advanced manufacturing also provides an export growth opportunity for Florida. Over the past two years, Florida has been experiencing a decline in export value, and was surpassed in 2013 by Louisiana in the national rankings, falling to the seventh largest exporter in the nation.<sup>26</sup> Advanced manufacturing provides an opportunity to boost Florida's export share, as it produces higher-value goods, and is an opportunity to fill the containers that arrive to Florida loaded and leave empty (or less than fully loaded), an imbalance pointed out by the Florida Chamber Foundation's "Florida: Made for Trade" report.<sup>27</sup>

#### Support of Other Florida Industries

In addition to high-tech manufacturing, the ICAMR and the FAMRC will provide technologies to support other high-skill, high-wage targeted industries, including Aviation and Aerospace, Homeland Security and Defense, Life Sciences, Infotech, and Cleantech.<sup>28</sup>

#### High Job Creation Opportunities and Talent Retention

The ICAMR has been modeled after SEMATECH, a successful public-private semiconductor consortium in Austin, TX and Albany, NY that created \$25 billion in economic activity and more than 36,000 jobs, according to 2007 data.<sup>29</sup> In addition, the initiative positioned Austin as America's hub for information technology and innovation manufacturing.

The ICAMR and the FAMRC provide an opportunity for Florida to recover a significant number of the more than 65,000 manufacturing jobs that were lost during the Great Recession.<sup>30</sup> If Florida can replicate the benefits of the Albany, NY cluster, approximately 19,800 jobs would be created over 10 years, including 4,605 high-tech jobs. If, however, Florida were able to replicate benefits similar to those associated with the Austin, TX cluster, approximately 83,180 jobs would be created over the same time period, including 19,344 high-tech jobs.<sup>31</sup>

<sup>26</sup> Ranking determined using U.S. Census Bureau Foreign Trade Data. Available at: https://www.census.gov/foreign-trade/statistics/ state/data/index.html

<sup>27</sup> Florida Chamber Foundation. "Florida: Made for Trade." Available at: http://www.flchamber.com/wp-content/uploads/ MadeForTrade-FINAL-Single-1.pdf

<sup>28</sup> ICAMR Infographic. Available at: http://www.orlandoedc.com/MetroOrlando/media/Metro-Orlando/Industries/Advanced-Technologies/ICAMR-FAMRCInfographic.pdf?ext=.pdf

<sup>29</sup> Ibid.

<sup>30</sup> Job loss estimation shown in Florida TaxWatch's "Investing in Tourism: Analyzing the Economic Impact of Expanding Florida Tourism." January 2013.

<sup>31</sup> Arduin Associates. "Economic Impact from a Potential Advanced Technology Manufacturing Cluster in Florida." January 2015.

### **CONCLUSION**

The importance of manufacturing to the livelihood of Florida citizens is very clear, and undertaking private/public sector manufacturing initiatives that enhance value-added capabilities and promote diversification is a worthwhile endeavor.

Manufacturing high-tech goods provides several benefits to the state of Florida, including:

- creating high wage jobs that could pay, on average, twice as much as the average Florida job;
- providing a steady income stream to Floridians and a consistent tax revenue source;
- allowing for economic diversification away from sectors most significantly affected by economic downturns;
- providing an opportunity to increase Florida's high-value exports;
- supporting other Florida industries, including other target industries such as Aviation and Aerospace, Life Sciences, and Cleantech; and
- potentially creating thousands of jobs and helping Florida recover some of the manufacturing jobs lost during the Great Recession.

The proposed investment in ICAMR, through FAMRC, could generate a significant number of highwage jobs that would be very beneficial for Florida, and would create employment opportunities for graduates of Florida's high-tech programs, provide jobs for skilled workers already in the area, and attract talented individuals to Florida to take advantage of the industry and academic developments brought on by the high-tech cluster.

Based on these identified benefits, the Legislature should invest in ICAMR as an industry infrastructure project that will create the necessary foundation to support continued economic development efforts to grow Florida's advanced manufacturing sector. For all economic development incentives, there should be appropriate mechanisms linking the taxpayers' investment to successful performance. However, it must be noted that the state's investment will be in an infrastructure project rather than a traditional incentive and will need to be treated accordingly for return on investment analyses. Likewise, it should also be noted that estimates of the return on the taxpayer investment will likely need to include not only the direct, indirect, and induced benefits of ICAMR, but also the related infrastructure and development around the facility, and the economic impact of private enterprise directly and indirectly related to the establishment of the facility.

Creating this sector in Florida could be a transformative moment in Florida's economy, pushing the state to be a critical hub for the next generation of technological advancement in our increasingly interconnected world.

This TaxWatch *Briefing* by **Jennifer Linares**, **MS**, Economist & Research Analyst, and **Steven T. Petty, Ph.D.**, Chief Economist.

Robert Weissert, Sr. VP for Research & General Counsel Steven T. Petty, Ph.D., Chief Economist Chris Barry, Director of Publications

Michelle A. Robinson, Chairman of the Board of Trustees, Florida TaxWatch

Dominic M. Calabro, President & CEO

Florida TaxWatch Research Institute, Inc. www.floridataxwatch.org

Copyright © Florida TaxWatch, May 2015

