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Last month, I had the privilege of traveling to Germany with a delegation of North Carolina leaders, including members of the N.C. General Assembly, representatives of state agencies, local government officials, and delegates from K-12 and higher education. IEI director Anita Brown-Graham described key aspects of the study trip in her September IEI Newsletter, but I was so impressed with the visit that I wanted to say more. Sponsored by IEI, the Global Training Initiative at NC State University, and the Center for International Understanding, the trip was a firsthand opportunity to learn about Germany's advanced manufacturing industries, particularly models of public-private partnership and the dual educational training programs.

Germany is the world's fourth largest economy and the largest in the European Union. What sets Germany apart from other countries economically is its culture of innovation, the type of products that it manufactures, and the training and education the country provides to its youth in support of their road to gainful employment. Germany thrives with this broad approach despite increasing competition from such countries as China and India.

For the group of North Carolina leaders, these lessons became apparent in panel discussions with experts at universities and vocational training schools. Site visits...
to a BMW training facility, Festo, an electric automation company, and Schletter GmbH, a manufacture of solar mountings, were especially instructive.

Culture of Innovation

The German government targets innovation and R&D investment at society's main challenges - sustainability, communication, transportation in large cities, healthcare, green products, and environmental technologies. In the area of renewable energy, for example, Germany is trying to remake its electricity system. Germany has invested more than $140 billion towards renewable energy generation, and future plans include closing the country’s 22 nuclear power stations. German energy companies manufacture mainly highly-engineered, high-value products, such as components for solar panels and machine tools for building parts for solar devices. By leading in green technology, Germany has a competitive edge in the growing green industry.

Education-Industry Partnerships for Manufacturing

Germany embodies national success in innovation and growth despite the fact that the country lacks many natural resources. The most obvious example is the German automobile industry, whose future depends on satisfying both sustainability standards and consumer wants. The University of Stuttgart is working with company engineers on automobile material design, simulation, digital prototyping and production. This kind of partnership with higher education provides industry with new ideas and technologies, and offers a neutral context in which corporate competitors can work side by side. The German government makes this innovation possible through R&D spending of about $96 billion per year, a figure that eclipses R&D spending in other European countries. The network of publicly-financed research institutes include organizations like the Max-Planck-Institute and the Fraunhofer Institute, which work with industry on next-generation products. While some may criticize national industrial policy as an attempt to “pick winners and losers,” the German government understands that innovation requires investment in projects and research that may not be immediately profitable. This is a valuable lesson for the United States.

Work-Based Learning
Germany makes full use of its workforce through its dual education system, where young people who decide against going to the university acquire practical abilities and basic knowledge in a vocational school. This provides the German economy with a reliable stream of skilled workers, and is responsible for the lowest youth unemployment rate in all of Europe (7.8% of 18-24 year olds). Companies provide contracts for their apprentices. German parents are just as proud of a child’s choice of vocational training as they are with a university trajectory. Clearly, manufacturing, education and innovation are woven together in this remarkable country.

Over the past two years, IEI has developed programs to support advanced manufacturing in North Carolina through workforce development and alignment efforts. This year’s Forum, *Innovation Reconstructed*, will highlight how innovation models are changing and adapting to fast-paced global realities. Does North Carolina - like Germany - have the right infrastructure, inputs and supports to lead in our changing climate of innovation?

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What interests you about the natural and built environments in our state? Let us know, and it could be a topic for a future IEI Environments newsletter.