

Business Development

For Virginia to be competitive in the future of nanotech, the development of a comprehensive roadmap for a world-class nano-technology industry in Virginia needs to be established. This plan should consider emerging models for innovation-based economic growth (National Academy of Sciences and the Council on Competitiveness), but also State and regional development plans (i.e. Ben Franklin Technology Partners in Pennsylvania <http://www.benfranklin.org/>), and the Federal policies being developed in legislative proposals in the US Senate and House. Aligning Virginia with these national-level concepts will promote Federal/State partnerships. This approach will also make it easier to establish mutually beneficial relationships with other States and regional innovation initiatives occurring in several places within the US.

In essence, the core of the new innovation-based economic growth models is based upon building an “innovation ecology” – that is, taking a holistic view to developing economic resources and capabilities, since any sector that is a “weak-link” will result in a significant disadvantage in competitiveness in today’s globalizing economy. The policy tools for developing such an ecosystem are, inter alia, public-private partnerships, social and business networking activities, educational and outreach activities, and leveraging of funding and financing from a variety of sources. The technological tools for developing an ecosystem are primarily from information technology, including web, wireless, and visualization tools and new learning and virtual meeting applications. Also, new models for financing and IP transition could be creating distinct advantages for those companies and regions which can develop them. It is expected that the adoption of an innovation-based economic plan will have positive implications for driving and supporting:

- cultural change,
- a state-wide community enthusiastic about technology & innovation,
- attraction of new companies,
- development of human capital, and
- attraction of financial capital in Virginia.

Virginia has a solid entry into the nanoelectronics, nanomaterials, and nanomedicine business arenas with the major investments that companies such as Micron Technology, BAE Systems, and Qimonda have made in their corporate facilities in Virginia. Likewise, Luna Innovations has made significant investment in its Luna nanoWorks facility producing TRIMETASPHERETM carbon nanomaterials which were discovered at Virginia Tech and subsequently licensed by Luna [for applications in medicine](#). Other nanotechnology markets are emerging with small businesses taking the lead, and much of the risks, in developing products. Virginia must work with the existing corporations to insure the continued investments are made so that Virginia stays a leader in the nanoelectronics, [nanomaterial production, and nanomedicine](#).

Furthermore, Virginia should establish a support network to target the establishment and initial expansion stages of the nanotechnology startups [supporting nanotechnology](#)

clusters. The network should develop a set of core expertise to assist in the growth of nanotechnology businesses to build a national reputation as a leader in nanotechnology. This can be accomplished by nurturing nanotechnology companies that complement existing regional areas of technical expertise as well as provide opportunities to support the transfer of new technologies into the marketplace to develop additional nano-related businesses.

In order to develop a nanotechnology-based business community within the Commonwealth, several factors need to be considered. The State's assets must be used to:

- Attract and retain a critical mass of innovative technology firms and potential integrators of nanotechnology;
- Build access to risk capital and stronger paths towards commercialization of technology;
- Attract, retain, and develop skilled human capital and entrepreneurs; and
- Maximize the effectiveness of current institutional alignments in promoting opportunities for strengthening external networking.

The establishment of a centralized *nano-authority* to oversee and guide many of the activities listed within this paper is needed. This body will enable small businesses to make one contact to an organization within the state to obtain information about the available resources within the state. Under this umbrella organization, business groups will coordinate and distribute resources as it best meets the needs of the small businesses and start-ups in its market niche. Resources can include:

Financial Assistance

- **Capital for seed and bridge funding. This funding can include Phase 0 funding to stimulate SBIR/STTR proposal development, matching of angel investments in nanotechnology start-ups, and staged grants to support product development and investments in manufacturing infrastructure.**
- Development of an angel investor network and actively recruitment of venture capital investment.
- Incentives for assist technology transfer from state universities into the marketplace.
- Provide mechanisms for small businesses to access to laboratory facilities for product development to reduce the initial R&D costs.
- Create an SBIR Proposal Development Center that is jointly funded and supported by the Virginia Center for Innovative Technology, and the Virginia Department of Business Assistance.
- **Enact H.B. 935, creating a Commonwealth non-stock corporation that encourages private sector research collaboration with state universities. The legislation is summarized as follows:**

Business Consulting and Services State Council of Higher Education for Virginia; creation of nonstock corporation to support academic research. Requires the State Council of Higher Education for Virginia to establish a nonprofit, nonstock corporation under Chapter 10 (§ 13.1-801 et seq.) of Title 13.1 as a public instrumentality exercising

public and essential governmental functions, to assist the Council in (i) supporting academic research in Virginia; (ii) encouraging research initiatives, with an emphasis on biological systems and nanotechnology, to support Virginia industry; and (iii) conducting or undertaking other activities useful in carrying out the provisions of this section. The Council shall require such corporation to report to it at least annually on its activities. The bill sets out the composition of the board of directors for such corporation.

Business Consulting and Services

- Provide mentoring to small businesses on business finance and management issues. This could potentially be carried out by the Virginia Department of Business Assistance.
- Develop centralized business administration services such as accounting and human resources.
- **Evaluate use of the Virginia Small Business Development Center and Business Incubator networks to address business support services for start-up nanotechnology enterprises. The Virginia General Assembly should request in the 2007 session for a report from the Virginia Department of Business Assistance and the Virginia Center for Innovative Technology on what resources would be needed to accomplish this task.**
- Identify and promote sales and distribution networks.
- Establish networking opportunities, which can include small business forums, the development of a business-to-business and university-business network.

Policy Development

- Provide data to the state legislature on workforce development needs of the nanotechnology companies in the Commonwealth. The Virginia Community College System should be charged with conducting surveys of all existing nanotechnology firms in their respective service area to determine workforce development needs of those firms. In addition, where existing clusters of nanotechnology firms exist, local community colleges should be encouraged to develop certificate and degree programs specifically in nanotechnology support disciplines.
- Work with the Commonwealth to develop policies that stimulate a strong climate for nanotechnology business start-up and growth and relocation of existing businesses to Virginia.
- The 2007 session of the Virginia General Assembly should request via resolution that each state agency be requested to evaluate its own research and development agendas to determine where nanotechnology applications exist. These reports should be provided to the Virginia Center for Innovative Technology and Virginia Department of Business Assistance, to be used as a business development instrument for Virginia's existing nanotechnology enterprises.

Outreach

- Promote Virginia's nanotechnology businesses and products.
- Promote the pro-nanotechnology business environment in Commonwealth of Virginia.
- Get visibility from regional and national associations.

- Task Virginia Economic Development Partnership to aggressively recruit nanotechnology companies to Virginia.

IP/Tech Transfer

- Ideas? Promote technology transfer from Virginia research laboratories and universities by increasing the number of patents obtained by the universities and subsequent licensing.
- Maintain an archive of intellectual property developed at public universities and institutions.
- Provide assistance to small businesses to negotiate licensing agreements with the public universities and institutions.
- Provide mechanisms for small businesses to access to university laboratory facilities for product development to reduce the initial R&D costs including grants to cover hourly fees, fund technical support personnel at universities, and facilitate negotiations with universities to address costs which may include ownership.
- There should be a request to the Commonwealth's Office of the Attorney General to establish a Technology/Nanotechnology Task Force that is charged with evaluating IP issues within the Commonwealth of Virginia, and to determine where state and federal recommendations for policy changes should be facilitated or requested that advance the business interests of Virginia's technology based enterprises.

Recruitment

- Best People? Utilize entrepreneurs located within the State to recruit other nanotechnology businesses to the Commonwealth.
- New Companies? Encourage Virginia universities to recruit leading researchers in the nanotechnology arena.

Business/University Collaborations

- Ideas?

Industrial partnerships and associations

- Ideas? Establish a Virginia centric nanotechnology organization (nano-authority) responsible for the promotion and growth of nanotechnology within the State.
- Survey resources available at the small business incubators at the public institutions and throughout the state. Coordinate efforts to establish additional incubators in undeserved geographical regions within the state.

Virginia Nano Business Accelerator

To address critical needs as outlined, it is proposed to develop a 'Nano-Enterprise' Business Accelerator Range of Services. The Virginia Nano Business Accelerator would provide companies a full range of services to support the development and growth of their nanotechnology businesses:

- Management support: The NanoEnterprise team helps develop nano tech enterprises by providing a wide breadth of executive-level management advice and support. NanoEnterprise supports companies on issues of strategy and market positioning, product development, operations, strategic alliances, financing, and organization development. NanoEnterprise has also developed an extensive

network of management and technical executives and managers that are interested in working with start-up nano tech companies.

- **Clinical Collaborations:** NanoEnterprise enjoys close working relationships with the many world-class clinical and research institutions in Virginia. The NanoEnterprise partners — Virginia based academic centers — are committed to working closely with nano tech service start-ups. NanoEnterprise can help companies access these institutions, facilitating technical validation and development collaborations.
- **Investment Capital and Other Start-up Funding:** NanoEnterprise supports companies looking to raise investment capital and other start-up funding by maintaining relationships with nano tech venture capital firms, private equity groups, and investment banks across the country. NanoEnterprise supports its companies by ensuring that companies are prepared for raising capital. In addition, NanoEnterprise would work closely with several Virginia seed funding sources for start-up funding. Finally, NanoEnterprise helps companies identify grant (federal and state) opportunities to support product and market development.
- **Business Development:** NanoEnterprise brings a network of industry contacts and business development experience to help companies explore and enter strategic relationships. The network includes leading medical technology, computer, and materials companies, as well as strategic advisory firms.
- **Resource Network:** NanoEnterprise would develop a network of regional capabilities and consultants to support the growth of nano tech companies. The capabilities include technical equipment and services, research services, and incubation space, including the NanoEnterprise facility. The consultants span all aspects of commercializing a nano tech technology from basic market research through product and regulatory development to support to marketing and sales support. Finally, NanoEnterprise has also established a set of preferred relationships with professional service firms for business law and intellectual property, accounting and business administration, and regulatory services.