Statement of Energetiq Technology, Inc.

For the

Committee on Small Business
Of The U.S. House of Representatives

On

Large and Small Businesses: How Partnerships Can Promote Job Growth

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Introductory Summary

This testimony describes how Energetiq Technology, a small Massachusetts-based company, and Intel, a large multinational corporation, have found ways to collaborate to their mutual benefit. The resulting partnership has resulted in job creation and financial growth at Energetiq and technical solutions to pressing manufacturing challenges at Intel.

Who is Energetiq?

Energetiq Technology, Inc is a small, high-technology company based in Woburn Massachusetts. We employ 20 people full-time, most of whom are engineers and scientists with advanced degrees. Our workforce is supplemented by a network of local consultants who provide services in the fields of finance, IT management, software development, marketing communications and electronic design. Energetiq's staff focuses on research and development of intellectual property and products, marketing and sales, and the assembly and testing of those products. The manufacturing of the sub-assemblies of Energetiq's products is outsourced to specialized companies, primarily in Massachusetts and New England. These sub-assemblies are integrated into final products in the Energetiq facility and then shipped to Energetiq's customers. Energetiq sells its products all over the world, with particularly high sales in the United States, Japan and Europe. In 2012 we expect the majority of our products to be sold to customers outside the United States.

What are Energetiq's products?

Energetiq specializes in making advanced light sources for scientific and technical applications in the semiconductor, life-science and materials science markets. Our products are based on Energetiq's core competence in plasma physics. These products are critical for a variety of advanced manufacturing processes.

Energetiq manufactures two product lines, based on patented technologies we developed.

The Electrodeless Z-Pinch™ Extreme Ultraviolet (EUV) source product line is an enabling light source technology for next generation lithographic processes in the semiconductor industry. EUV lithography will allow the manufacture of chips with dimensions of 16 nanometers and smaller. The resolution of the lithographic process is driven largely by the wavelength of light used. EUV lithography uses a wavelength of 13.5 nanometers, more than ten times shorter than the 193nm wavelengths used today. To put 16 nanometer chip dimensions in perspective, a human hair has a diameter of around 100,000 nanometers.

The Laser-Driven Light Source (LDLS™) product line is used for advanced measurement and inspection applications in semiconductor chip fabrication, and for a diverse array of applications in the life-sciences and materials-sciences. The LDLS products are used, for example, by a large U.S. medical equipment company for analyzing the pigmentation in skin, and by large U.S. manufacturers of glass products for measuring the properties of glass for displays and for energy-saving windows.

Who are Energetiq's customers and how does Energetiq fit into Intel's supply chain?

We sell our products primarily to large corporations, such as Intel's capital equipment suppliers; to universities, such as SUNY Albany; and to large research institutions such as Sematech, the semiconductor industry research consortium. More than three quarters of our sales are to such customers. Our largest customer is a large U.S. semiconductor capital equipment company – and a major supplier to Intel – that represented about a quarter of our sales in 2011. We have also received research grants from the SBIR programs at the National Institutes for Health and the National Science Foundation, which have lead to successful commercial application of Energetiq's technology in the life-sciences.

Both our EUV and LDLS product lines fit into Intel's supply chain. The EUV light source products are used by a number of companies supporting the introduction of EUV lithography into the manufacturing plants of U.S. and other semiconductor manufacturers, including Intel. We sell EUV sources to the manufacturers of inspection equipment for EUV photo masks, to the companies making photosensitive resist materials for EUV lithography, and to the companies making the complex EUV optical assemblies incorporated in the lithographic printing tools, known as EUV scanners.

Energetiq's LDLS technology and products are used today in the factories of Intel and other U.S and overseas manufacturers for the detection of defects on silicon wafers as they pass through the manufacturing process. We have licensed one of Intel's largest capital equipment suppliers to incorporate the LDLS technology into their inspection and measurement tools.

What is the history of Energetiq and its interactions with Intel?

Prior to the establishment of Energetiq, the founding team worked in high-level marketing and technical roles at a large supplier of process control products to Intel and to other semiconductor companies. In those roles, we were in regular dialogue with Intel scientists, engineers and managers and we were invited to attend Intel's Supplier Days. These Supplier Days included presentations of Intel's manufacturing technology roadmaps, along with discussions of its technical challenges that needed to be met by the supplier community. In addition, Intel's senior lithography staff explained Intel's technical goals with regard to EUV lithography to the wider industry, including through the use of technical conferences and press articles.

We were impressed with Intel's vision for EUV lithography and even more by Intel's well-publicized financial support of that vision through research funding and equity investments in its supplier companies. It was clear from Intel's public statements and actions that there was a clear need for novel sources of EUV light to support the introduction of EUV lithography, and that existing technologies were lacking in performance.

We were planning to start a new enterprise and Intel's public commitment to EUV Lithography guided in large part the choice of our first product. We arranged an amicable departure from our employer and founded Energetiq in early 2004 to address this opportunity.

We spent the first few months of our new company's existence rapidly inventing a new kind of EUV light source, securing the associated intellectual property, building a prototype, and collecting initial data on the prototype's effectiveness. Armed with this early data, by the summer of 2004 we were ready to present the concept and the data to Intel. We were able to meet the leaders of Intel's lithography team in short order and we presented our work. Intel's reaction was very encouraging and equally rapid. The lithography team leaders agreed to fund some research and development work at Energetiq to better prove the performance of the technology. In addition they immediately introduced us to Intel Capital, Intel's venture capital arm. Though we had funded Energetiq with our own savings and received some funding from external investors, we knew that we might well need more substantial funding in the future.

Although Intel did not make a direct investment until later, the early engagement of investment managers from Intel Capital helped us to focus our business plan.

Intel Capital invested in Energetiq in 2006. They invested again in 2008 during our second round of financing. During both financing rounds, the investment managers at Intel Capital provided valuable coaching on the investment process. The financial support from our investors allowed further development of the EUV source technology and the development and introduction of the LDLS technology.

Intel Capital has held an observer seat on our Board of Directors since 2006. Apart from attending our quarterly Board of Directors meetings (one of which is hosted each year by Intel at its headquarters in Santa Clara, CA), our Intel Capital Board Observer has provided significant advice and resources to Energetiq. Based on Intel Capital's wide range of experience with the diverse companies in the Intel Capital portfolio, they recently helped us navigate a legal and intellectual property issue that needed to be resolved.

Our Intel Capital Investment Manager provides business development suggestions to us, and each year we are invited to attend the Intel Capital CEO Summit. That event brings together the CEOs of the Intel Capital portfolio companies with senior executives from large public companies from around the world. We have been able to make many useful connections at that summit.

On the technical side, we have remained connected to the senior lithography staff at Intel. They have monitored our technical progress with our two technologies and guided us toward certain business opportunities involving customer technical challenges. We also have been able to showcase our technologies to Intel's engineers and scientists at events held at Intel's development operations in Portland, OR.

We are regularly invited to attend Intel's Supplier Days, where we can continue to learn the technical needs and challenges of Intel's manufacturing operations. With Intel developing ever more complex microprocessor products every two years, the technical challenges and opportunities to address them do not slow down.

How has Intel benefited from this relationship?

As a result of Intel's technical and investment relationship in a small company, two technologies critical to the manufacture of its present and future-generation semiconductor chips have been developed and commercialized. These particular technologies were not developed by Intel's large capital equipment suppliers, whose focus on making supremely reliable and productive chip manufacturing equipment has, perhaps, made them less nimble with regard to new technology development. Small companies like Energetiq can rapidly develop such technologies if the technical challenge is clearly defined.

Intel Capital invested in Energetiq with two objectives; first, to enable the development of technology critical to chip manufacture; and second, to earn a financial return on its investment. Energetiq has delivered well on the first objective. Intel Capital retains a significant shareholding in Energetiq and it's our goal to ensure that Intel's financial objective is also achieved.

How has Energetiq benefited from this relationship?

Intel provided the inspiration for Energetiq's first product, followed by R&D funding and equity financing. Our relationship with Intel provides us significant credibility with customers, suppliers and investors. We have continued to receive valuable technical and commercial guidance and support from Intel, and Intel's adoption of our EUV and LDLS technologies has helped drive our revenues from product sales.

Summary

The interaction between our small company, Energetiq, and large U.S. companies, notably Intel, has led to significant mutual benefits. We have been able to rapidly develop technologies needed by these large companies. In return, we have received expert technical and commercial guidance and financial support. The result has fueled our growth as a company and helped maintain the technical edge of our large-company partners.