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Before the
House Committee on Foreign Affairs
Field Hearing
on
The Impact of U.S. Export Controls on National Security, Science and Technological Leadership

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Mr. Chairman and members of the Committee, I am Karen Murphy, senior director for trade for Applied Materials, Inc. I thank you for holding this hearing on export controls and for offering me the opportunity to testify before you today.

Applied Materials, Inc., (Nasdaq: AMAT) is the global leader in nanomanufacturing technology solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass. Founded in 1967, Applied Materials creates and commercializes the technology that helps produce virtually every semiconductor chip and flat panel display in the world. Our service products improve yield enhancement and increase productivity. Today, our expertise is also being used in solar photovoltaic (PV) panels that turn abundant sunlight into clean electricity.

Applied Materials employs approximately 12,600 people throughout the world. In fiscal year 2009, Applied Materials recorded revenues of approximately US$5.0 billion. With more than 80 percent of our revenues coming from sales outside the United States, export controls are an important issue for us.

We Need a 21st Century Export Controls Regime

We have been operating under a system of export controls that has changed relatively little for more than 30 years – since the Export Administration Act of 1979. On top of this obsolescence is a lack of specific statutory authority and instead a reliance on the International Economic Emergency Powers Act (IEEPA) as a legal basis. The fact that our current system is outmoded and in dire need of sweeping change is no longer questioned, as a variety of studies have pointed out over the years (most recently the National Academies' *Beyond 'Fortress America': National Security Controls on Science and Technology in a Globalized World*). More importantly, both legislative and executive branch policymakers appear to recognize the need for action.

As mentioned by other panelists, the United States is not the only supplier of technology. A look inside one of the most advanced chip manufacturing facilities in the world, for example, would reveal that there are no U.S. etch systems installed. (Etch systems are the tools that create the nano-scale electronic circuitry on the chip.) Among the foreign competitors in this technology is a Chinese company that is proving very technically competent. Moreover, because it is not subject to export controls of any kind, can move much more quickly in the marketplace. While this competitor has only confirmed 2-3 installed systems, in the

semiconductor equipment market this is a big deal. In a "copy exact" manufacturing environment, one tool is one too many as U.S. tools are replaced on customers' factory floors around the world.

Clearly, we need to modernize. We need change.

Accordingly, I would like to offer the Committee some basic principles that should guide the development of a 21st century export controls system. Many of these ideas will be familiar, as we have participated in the industry working groups that have developed these consensus principles over the past few years. These principles, which many good people have thought long and hard on, are –

- *Both U.S. national security and economic competitiveness depend on a strong, technologically advanced industrial base*
- *R&D and technological innovation are now global in nature*
- *Control mechanisms must be cognizant of and keep pace with advances in technologies*
- *Control regimes should be premised on a cooperative effort between government and industry*
- *Export controls should be multilateral*
- *The export controls process should be clear and simple, from its policy foundations to its execution and review*

I would like to discuss these principles – and our hopes that we really *can* enact fundamental changes – in the context of how Applied Materials operates. Specifically, (1) how we develop technology and conduct R&D; (2) how we operate in an age of a globalized supply chain; and (3) how we ship products and service them.

Research, Development and Technology

As is true for probably every high-tech company today, our technology development process is very different than it was in the past and depends on non-"home grown" talent (testimony from the other witnesses will talk to this new reality in greater detail). More than ever before, we need the flexibility to hire the best and brightest from a global pool of students to work both in the United States and abroad. In addition, we need to be able to partner with suppliers and customers to develop new and innovative products customers will buy. Students studying in the United States, but who are not U.S. citizens, are prejudiced in our evaluations due to the cost and administrative burden to bring them on board. Many of these students would like to remain in the United States and we should encourage this. We realize that jurisdiction on this issue resides in another committee, but we need a policy change that will help turn these people into Americans, not into competitors.

The need for flexibility in attracting and keeping talent is not limited to students – it is true for scientific and engineering talent throughout their careers. The business segments we operate in are all characterized by rapid change, whether in the technology itself, its application or its manufacturability. Our ability to respond effectively depends on our access to people who can develop the solutions to our customers' problems.

Globalized Supply Chains

Just as we seek our scientific and engineering talent from around the world, so do we seek suppliers from around the world. Current controls on technology sharing reduce our choices in suppliers. As an example, suppliers located in countries not party to the Wassenaar Arrangement require more compliance considerations than those in the regime. This is true even when the non-regime country has export controls that are similar to the United States. Singapore is a good example of this. To be effective, multilateral control regimes should be inclusive and not closed clubs.

Suppliers are becoming more sophisticated in their ability to deliver customer-ready components. These suppliers are more than a third party to Applied Materials; they are our manufacturing partner. The recent proposal for a license exception between related companies (ICT) should be expanded to allow for these relationships. Many of our suppliers are required to obtain a license from their local government as well as a U.S. re-export approval. This administrative burden causes delays in our ability to react to customer demand.

How Our Business is Affected

Approximately 30 percent of Applied Materials' tools and spare parts (based upon dollar value) are subject to export controls. U.S. exporters of semiconductor equipment and parts understand the importance of being able to ship and service in a timely fashion. Our competitors – both those party to export control regimes and those outside – are not subject to the cumbersome multi-agency review process and conditions of approval that U.S. exporters

are. U.S. Export Licenses are approved with more than 11 conditions and require reporting and verification visits. Foreign licenses carry only a condition around non-proliferation and have no reporting or audit requirements by their governments. In several cases, customers are now pushing back on these conditions.

It is not uncommon for some of our customers to have identical tools with identical capabilities next to one another on the factory floor, but with different license conditions. Similarly, while we have not had a license denied, when a customer shipment is delayed during the license process it can all too easily become a *de facto* denial because the customer selects another tool it can receive faster and without conditions. This situation has occurred in at least three instances at Applied Materials. One event was featured in a 2002 GAO report highlighting China and the semiconductor industry. These types of situations disadvantage not only Applied Materials as a reliable supplier, but all American companies. Buying from non-U.S. suppliers largely obviates these types of complications, which add needless cost and complexity to our customers.

Moving Forward

We are encouraged by the current appetite for change among all stakeholders. The stars are aligned as never before among the Congress, the executive branch, academia and industry. We hope and urge that this concurrence can produce an export controls system that serves the interests of all its stakeholders.

As the committee moves ahead with this important task, we stand ready to assist. In partnership, we can create fewer but more effective regulations so we control what we really can control. We should look to the rest of the world and keep foreign practices in mind as we re-desing our own system. This should not be a U.S.-only silo. And we should examine the structure and makeup of current multilateral regimes to make them work more effectively. It is time to bring in those countries that are implementing export controls based on dual-use lists and non-proliferation principles. A system that is more transparent and accountable is in everyone's interests.

In closing, I urge you to move forward and enact legislation that protects the national security of the United States and, at the same time, enables our global competitiveness.

Thank you. I welcome your questions and the discussion.