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Review Commission
The Challenge of China's Green Technology Policy and Ohio's
Response

Good morning.

I'd like to thank the commission for the opportunity to take part in today's important hearing. Given the critical nature of these topics, I'm pleased and honored to have been invited.

I'm also pleased to be here in Toledo, a city that is proving to be a US hub of clean energy technology development and equipment manufacturing through the presence of important companies such as FirstSolar and others.

Before I begin, a quick word about my firm, Bloomberg New Energy Finance. We are a 150-person unit within Bloomberg, the most trusted source of information for businesses and professionals. The goal of our group is relatively simple: to track financing, technology, and policy trends in the clean energy sector worldwide. We're headquartered in London with teams in New York, San Francisco, Sao Paulo, Sydney, Perth, Cape Town and Delhi. Perhaps most importantly for today's discussion, we have approximately 10 staff based in Beijing, plus a team of five I've had the privilege to lead in Washington for the past five years.

New Energy Finance was founded six years ago as an independent company and was acquired by Bloomberg in December 2009. Today, our clients include most of the largest investors in this sector. This includes the majority of the bulge bracket investment banks, plus major hedge funds, and venture capital funds. It includes energy industry players such as wind turbine makers, solar module producers, project developers, independent power producers, utilities, and oil majors. Finally, we serve governments and non-governmental organizations, including the US Department of Energy, the National Renewable Energy Laboratory, the European Investment Bank, the United Nations, the Pew Center and many others. Our quarterly and

annual figures on dollars invested in clean energy serve as key benchmarks for this industry.

In the past six months, our firm produced two reports which I believe caught the eye of the commission's staff and are likely why I am here today. The first, actually released by the Pew Center but based on data collected by our team, presented country by country investment in clean energy in the G-20 nations. It rather starkly highlighted the large and growing gap between funds invested in China in 2009 and those invested in the US and other G-20 nations.

The second report -- "Joined at the Hip" -- tightened the lens a bit to look exclusively at US-China competitiveness and trade in the wind and solar sectors specifically. Bloomberg New Energy Finance produced this report on its own and released it to the public because we thought it offered important insights on this complex and expanding relationship.

These reports drew on literally thousands of hours of research from my colleagues around the globe. What useful insights I can offer here today are a reflection of their hard work. I have submitted to the commission both of these reports in electronic format for the record. I would also encourage those interested in learning more to go to www.bnef.com.

Given the current economic climate, there may be no two topics in Washington that inspire more hope and fear, respectively, than clean energy and trade with China. The clean energy industry has been touted widely as one of the great economic development opportunities of the 21st century. The Obama Administration, in particular, has made it the centerpiece of its plans to revitalize US manufacturing and exports. Indeed, I understand the President is due to attend the groundbreaking of construction on an advanced battery manufacturing plant in Michigan tomorrow and others in the administration will be visiting clean energy facilities elsewhere around the nation. Those from the other side of the political aisle, particularly Republican governors, have also emphasized that building a clean energy economy is a national imperative.

Conversely, as this commission knows well, fears are growing over China's ascendancy as an economic player on

the international stage. Before the economy dramatically fell into recession in 2008, relatively few public policy leaders loudly voiced concern over the threat China might pose as an international economic competitor. Times have certainly changed. Specific to our sector, in recent months legislation has been introduced on Capitol Hill that would bar Chinese clean energy equipment makers from receiving support from one key federal government stimulus program. I believe that bill has been cosponsored by Ohio's Senator Brown.

With all of that as a preamble, let me say that my remarks today will focus on three key areas. First, I will review the investment figures I touched on just a moment ago and highlight the comparative rates of clean energy growth in China and the US. Second, I will offer some thoughts on the clean energy value chain and how it inevitably has become globalized and inter-connected between the US and China. Finally, I'll offer a few parting thoughts on US clean energy policy and what kinds of changes here might trigger additional investment.

First, the investment totals. Within the past 18 months, China has become the undisputed global leader in attracting new investment dollars in support of clean energy. Last year, \$34.6bn in new private investment went into Chinese companies, technologies, and most importantly new projects. By comparison, the US attracted \$18.6bn. (The United Kingdom received the third highest total with \$11.2bn).

These funds for Chinese firms and projects came from a variety of sources, including Western private equity funds, Chinese development banks, balance sheets of large Chinese state-owned entities, and even small Western investors buying shares of publicly-traded Chinese solar firms. While the cash has been put to use in a variety of ways, it primarily went toward spurring a massive build out of new wind power generating capacity in China and toward expanding photovoltaic equipment manufacturing there. Last year, no less than 14,000MW of new wind projects were built in China. That represented a more 130% jump from the prior year when 6,200MW were installed. To put that in further context, just 1,300MW were installed in 2006 meaning the industry grew more than 10-fold in a period of just four years.

Virtually all of this demand for wind turbines is being met

by Chinese domestic manufacturers led by the three biggest equipment makers -- Sinovel, Goldwind and Donfang. Foreign players, such as Gamesa of Spain, Vestas of Denmark, and GE of the US are active in China but most equipment is being supplied by local companies.

The biggest Chinese equipment makers now very much have their eye on exporting to countries such as Brazil, Turkey, and the US. However, for a variety of mostly market-based reasons, I believe they will find the US market very challenging to crack for at least the next few years.

Much of the rest of the \$38.6bn raised for Chinese firms went toward the expansion of photovoltaic manufacturing in China. As recently as 2006, Japan and Germany were the global leaders in terms of solar modules produced. Today, there is no disputing that China is number one. Last year, manufacturers there had capacity to produce solar cells for use in 4,500MW of solar modules. That represented a bit over 1/3 of the world's overall supply.

This year, Bloomberg New Energy Finance had been projecting China would again meet a bit more than 1/3 of world's demand, this time with 7,100MW produced. However, as of just last week one manufacturer, Yingli Solar of Baoding, secured a massive \$5.3bn loan from the China Development Bank. That loan alone could help to double the world's manufacturing supply of photovoltaic modules in just the next few years.

Unlike with wind, China has seen relatively few megawatts of actual power-generating solar projects installed domestically. However, Chinese firms such as Yingli, Suntech, Trina, and others are enjoying great success exporting, particularly to California.

At first, these equipment makers faced serious questions from installers here about quality. But those concerns have since been largely overcome. As recently as 2008, Chinese equipment accounted for no more than 10-15% of the solar equipment being used in California, according to our research. By the end of last year, two in every five megawatts of new solar installed in California were likely to be from Chinese equipment makers.

The reason is relatively straightforward: price. Photovoltaic modules have become commoditized; developers,

homeowners, and other buyers are simply making their decisions based on price and the Chinese firms are selling for 10-20% less than their competitors.

A quick note about why it is Chinese manufacturers have been under-pricing competitors: it is often the default assumption that China produces cheaper due to lower local labor costs. However, in the case of photovoltaics, this is not the primary reason for the price discrepancy with the West. Rather, Chinese firms are succeeding by building the newest, most advanced manufacturing plants and enjoying the substantial benefits of economies of scale. They are also rapidly integrating vertically up and down the value chain -- buying their suppliers or customers -- to reduce costs.

Most of the figures I've quoted so far have been for 2009, but we have just released newer figures for the first two quarters of 2010. The data suggests that, if anything, the gap between China and other nations may be widening. Financing of new power-generating projects in China continues to be red hot even as it becomes more difficult to secure such funds in Europe. The US project finance market is stabilizing a bit after being hit very hard last year by the credit crisis.

One last note on dollars invested in the two nations before I move on. The one area where the US has proven to be a global leader is in dollars invested by venture capital and private equity players. These funds have gone to support early-stage firms looking to develop the most cutting edge technologies. This suggests that if or when there is a major technology breakthrough in these areas, it is more likely to come in the US than elsewhere.

Next, I'd like to turn my attention to the question of the clean energy value chain and its integrated nature between the US and China. Some have painted the competition between the two nations in overly simplistic terms with China feared or admired as an exports winner and the US criticized or dismissed as a manufacturing loser.

In reality, the clean energy relationship between the nations defies simplistic assumptions defined by economic nationalism. So-called "Chinese" PV modules are often manufactured using US-made capital equipment while you would be hard pressed to find a so-called "US" wind turbine

that does not contain Chinese-made components. In this area as in so many others, China and the US are mutually dependent; each must rely at least in part on the other to achieve its clean energy and carbon reduction objectives.

Finally, a quick word about US policy support for clean energy. In February 2009, President Obama signed into law the \$787bn American Recovery and Reinvestment Act, otherwise known as the stimulus bill. The legislation contained, by our count, \$66bn in support for clean energy development, primarily in the form of grants, loan guarantees, and tax credits.

I would argue that the stimulus bill on its own represents the most important piece of US legislation ever passed in support of clean energy. However, the bill's subsidies all come on the supply-side of the equation. They seek to subsidize the production of new wind turbines, advanced batteries, cellulosic ethanol, solar modules, or other goods by making them cheaper to produce.

But they do nothing to stir additional *demand* for clean megawatt hours, and lack of demand in the marketplace represents the primary conundrum today. Electricity use has remained relatively flat in the past two years due to the recession and natural gas prices have fallen to \$4 per million BTU from over \$10 a few years ago. Current market demand for renewables in the US simply is not very strong.

What could change this dynamic would be a federal policy that sets a clear national target for new megawatt hours of clean energy production. Such a demand-side policy when coupled with the supply-side supports in the stimulus could trigger substantial additional investment in the US. Clean energy projects would be the first to benefit as utilities would be under additional pressure to sign power purchase agreements with them to meet the national goals. Other companies would benefit as well as the pressure to drive down the levelized cost of energy for renewables would grow.

It is just this kind of policy -- a national Renewable Electricity Standard -- that Congress is currently contemplating. Whether it will pass such a bill remains very much to be seen. China already has set such a target.

I would like to thank the commission again for this

opportunity. I look forward to your questions.

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