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STATEMENT OF RICHARD L. KAUFFMAN,

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and

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HEARING on

CLEAN ENERGY FINANCING

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Chairman Wyden, Ranking Member Murkowski, and Members of the Committee, thank you for the opportunity to speak today on clean energy financing. My name is Richard Kauffman and I am the Chairman of Energy and Finance for New York State as well as the Chairman of the New York State Energy Research and Development Authority. Prior to my appointment in New York, I was Senior Advisor to Energy Secretary Chu on clean energy finance. Most of my finance and energy career has been in the private sector.

Clean energy hardware costs have fallen dramatically. As one example, solar panel prices have come down more than 50% in the last three years. Costs of batteries, wind turbines and fuel cells have also declined. Clean energy is the only source of energy that gets cheaper the more of it that is made.

However, as little as a third of the total cost of a residential solar system are the panels themselves. The rest are so-called soft costs—these include installation, permitting, and financing costs. Deployment at scale is the way to reduce soft costs (as well as to continue to reduce hardware costs). Through continued policies to deploy clean energy, costs will decline and the industry will achieve parity with conventional sources of energy. In 2013, solar, without subsidy, is competitive with about 5% of total electricity in the U.S.; in New York State that number is projected to be 50% by 2020. R&D is not enough to reduce clean energy costs—we need deployment to achieve economies of scale.

In spite of nearly record low interest rates, financing costs for the clean energy sector remain high—not for the largest, utility scale projects—but for smaller projects, including small business and residential. Since the ongoing costs of clean energy are very low as wind and sunlight are free, the key to reducing clean energy costs is reducing the upfront costs. And costs are costs—whether they are hardware costs or financing costs.

The key reason of why financing costs are high for clean energy is that the industry is financed in an old-fashioned, anachronistic way. We may be deploying 21st century technology, but the financing structures used are out of date. Discussions about clean energy finance often raise the role of venture capital equity, but by far the biggest source of capital needed for the sector is debt. Clean energy projects are principally financed using debt or debt-like instruments; true risk equity is around 10 percent of the project. In sum, there are three principal market gaps or failures in financing markets:

1. Reliance upon tax equity. Since many projects are financed on a non-recourse project finance basis by entities that do not have large taxable incomes, the industry relies on a small number of tax equity partners that in spite of the term "equity," offer debt like

financing in exchange for tax benefits. Today, there are fewer than 20 providers of tax equity. Not only does the limited number of providers mean that tax equity can be expensive, but also that it is primarily rationed to the largest projects and developers. The other problem with tax equity is that the deals are typically structured so that the bulk of the cash flow from projects over the first few years goes to repay the tax equity provider. While investors everywhere are looking for current yield investment opportunities of all kinds—after all there's only the choice between low interest rates and a volatile stock market—the current tax equity structure makes it difficult to tap general investor demand for current yield opportunities since renewable energy projects offer little current yield.

2. Bank capital rules and insurance company regulations. After the financial crisis, it is understandable that banks and insurance companies need to be more prudent. In practice, the amount of capital that banks need to reserve against smaller loans, loans that are barely investment grade or below, or loans that have long tenors mean that smaller renewable energy projects simply cannot get loans from large financial institutions at any cost. This is one of the reasons you seldom see solar installations on all those flat warehouse and factory rooftops when you are landing at airports. To be clear, I am not talking about loans to finance the manufacturing of renewable energy equipment; I am talking about loans to renewable energy generation projects using proven technology.
3. Little use of stock or bond markets. In most sectors of the U.S. economy, companies use stock and bond markets to raise billions of dollars of capital. Stock and bond markets typically offer cheaper and deeper pools of capital than private markets.

However, in the clean energy sector, stock and bond markets are scarcely used, except for bonds for the largest of projects. Stock market investors can buy shares in REITs or MLPs that have yield characteristics of renewable energy projects; however MLP or REIT treatment is not available for renewable energy assets. Bonds are a different story. To create renewable energy bonds requires standardization of contracts to aggregate small loans into larger bonds and sufficient data to allow bond ratings.

What do these market failures mean? With limitations on availability of bank debt, little use of stock and bond markets and continued reliance upon tax equity, the clean energy industry relies upon private sources of capital where the U.S. has a competitive disadvantage relative to certain other countries and does not take advantage of the competitive strengths of its capital markets. Simply put, costs of financing remain too high. In addition to financing costs, customer choice is also limited. Consider getting a new car: you can buy it using cash or borrowed money, or, you can lease it. The same is true for most large capital expenditures customers make. The solar lease has revolutionized the residential solar market; given that energy is an ongoing operating expense, it is not surprising that customers would want to substitute one operating expense—their electric bill—for another—the lease payment. Unfortunately, in the clean energy space, the solar lease is the exception rather than the rule. You want a solar hot water system, an energy efficiency upgrade or a ground source heat pump? More likely than not, you will need to put a mortgage on your house or pay cash.

All of these market gaps in financing limit economies of scale. Rather than a virtuous cycle where filling financing gaps helps achieve greater scale that in turn reduces costs which increases scale that further lowers costs, we are constraining scale.

These market gaps justify government involvement. This Committee, on a bipartisan basis, voted in 2009 to support a Clean Energy Deployment Administration. Absent federal government action, several states have since set up or announced the formation of state green banks. In his State of the State address in January, Governor Cuomo announced that New York is setting up a $1 billion green bank to help address some of these failures in clean energy finance. New York's green bank strategy has several operating principles:

1. New York's green bank will provide credit support to clean energy generation and energy efficiency projects. Until it can earn a meaningful surplus, it will not offer loans to manufacturers.
2. It will work where government activity can catalyze private market activity. This was DOE's loan program at its best—where government loans to large solar projects led the way to private sector banks subsequently lending to other projects without government involvement.
3. The bank will find intermediaries in the market—project developers, service companies, or private sector financial institutions who are making progress in the market but where their progress is constrained more by the lack of availability in financing than cost. While it is easy to give away money for free, a green bank should not fall prey to using artificially low cost financing as the sole means of generating demand. It will use up its money quickly and not engage in market transformation. Market transformation requires partnership with the private sector which means that the bank and its partners must earn a rate of return. What are some examples of activities the green bank intends to support—in conjunction with private sector intermediaries? Loans to smaller clean energy projects such as commercial and

industrial solar projects, which could be standardized, aggregated and sold to the capital markets. Or credit enhancement for energy efficiency loans, where data on project energy performance and/or customer credit performance is immature. Through risk sharing, a green bank can help a private bank lend more than it would otherwise feel comfortable doing on its own. The same logic can be applied to partnerships with insurance companies that are considering insurance products to help in financing clean energy projects. Another example is to offer financing to equipment providers that want to offer new clean energy products to customers through a leasing structure or vendor financing. Smaller scale combined heat and power units that use natural gas might be an example.

4. New York's green bank will work in partnership with private sector finance institutions to offer financing not only to leverage private sector capital, but to benefit from the origination and underwriting capabilities of the banks. We do not want to be in the direct lending business ourselves.
5. The bank will facilitate development of bond markets. In exchange for providing financing, the bank intends to help in standardization of contracts and can provide warehouse facilities to act as an aggregator of smaller loans. In addition, the bank can help collect data to help rating agencies with their work. Through credit enhancement, perhaps in conjunction with an insurance company, the green bank could also help clean energy bonds achieve investment grade ratings, thereby further lowering the cost of capital.
6. By focusing on areas where there are gaps in the financing value chain rather than strictly on the costs of financing, the bank will not be in the subsidy business per se.

> Instead, the bank will operate at the near frontier, where financial institutions aren't quite operating, and use its resources to reduce risk for the private sector. Once the market sees that specific opportunities are attractive, we can step out of the way, leaving the private sector to take over and the green bank to move on to the next frontier.

State green banks can help solve clean energy financing gaps. After all, it makes sense for states to play a role in clean energy finance: projects are local, building codes are local, and a substantial part of utility regulation is also done at the state level. However, while states can address some of the financing gaps, they cannot address them all: we need federal leadership.

You can see the outline of how federal government policy might address the remainder of the market gaps. While state green banks can try to expand the market for tax equity by finding local banks or other tax equity buyers, only the federal government can solve the industry's reliance upon it. Permitting refundability or transferability of tax benefits would reduce the overreliance upon tax equity and remove a barrier to tapping investor demand for current yield instruments. Because the current structure increases financing costs, it actually increases the industry's need for government support. Second, green banks can do little to help create stock market instruments for clean energy projects: only federal policy can do so. Giving MLP or REIT status to renewable energy would level the playing field. And to be clear here, the benefit in the cost of capital is less about the tax benefits of MLPs and REITs and more about the fact that the cost of equity is less in the stock market than in private equity. Expanding eligibility to renewable projects on a revenue neutral basis would barely change the cost of capital for those incumbent industries that currently enjoy MLP or REIT treatment. Third, while state green banks can work to accelerate the creation of debt markets, it would be better for the federal

government to help standardize contracts and collect data rather than have 50 states work on the problem. We could imagine using the remaining DOE loan guarantee authority to offer a modest credit subsidy in exchange for standardizing contracts and creating data for bond ratings. Fourth, the federal government could help capitalize state green banks. New York State has identified likely funding sources for its bank, but other states may not have such resources. Since state green banks can focus on areas where there are market gaps and can therefore earn a rate of return, this support could be repaid to the federal government. We also know from Eximbank or OPIC that governments can offer guarantee programs that offer low cost financing and can earn a surplus from guarantee fees.

None of these steps would involve undertaking a major new federal commitment to subsidies to support the industry. The steps involve repurposing existing programs, expanding others on a revenue neutral basis, or providing financial support for which the government can earn a rate of return. Together with state initiatives, these proposed federal actions would lower costs of clean energy financing by leveraging private sector capital and by accelerating the transition to using stock and bond markets. Leaders in the clean energy industry look forward to the end of subsidies and the arrival of cost parity, since at that point the industry faces virtually unlimited demand for its products. The quickest way for the industry to achieve cost parity is through economies of scale, and lowering financing costs is one of the most cost effective ways to achieve scale.