Statement of Dan W. Reicher
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to the Senate Committee on Energy and Natural Resources
Hearing on Legislation to Improve the
Availability of Financing for the Deployment of Clean Energy
and Energy Efficiency Technologies
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Mr. Chairman and members of the committee, my name is Dan Reicher and I am pleased to share my perspective on legislation to improve the availability of financing for the deployment of clean energy and energy efficiency technologies. I serve as Director of Climate Change and Energy Initiatives for Google.org, a unit of Google which has been capitalized with more than $1 billion of Google stock to make investments and advance policy and technology in the areas of climate change and energy, global poverty and global health.

At Google we have been working to lower the cost and increase the deployment of renewable energy through our Renewable Electricity Cheaper than Coal (RE<C) Initiative and also to accelerate the deployment of plug-in vehicles through our RechargeIT Initiative. We have also recently announced the development of a product called Google PowerMeter which will facilitate near real time monitoring of home energy use. Google engineers have been working for nearly a decade to optimize the efficiency of our data centers. We're also focused on increasing the sustainability of our offices in both the U.S. and other countries as well as using on-site renewable energy when possible. Recently, I served on President Obama's transition team where I was involved with the development of the stimulus package for clean energy.

Prior to my position with Google, I was President and Co-Founder of New Energy Capital, a private equity firm funded by Vantage Point Venture Partners and the California State Teachers Retirement System to invest in clean energy projects. New Energy Capital has made equity investments and secured debt financing for ethanol and biodiesel projects, cogeneration facilities, and a biomass power plant. Prior to this position, I was Executive Vice President of Northern Power Systems, one of the nation's oldest renewable energy companies. Northern Power has built almost one thousand energy projects around the world and also developed path-breaking energy technology.

Prior to my roles in the private sector, I served in the Clinton Administration as Assistant Secretary of Energy for Energy Efficiency and Renewable Energy, the Acting Assistant Secretary of Energy for Policy, and Department of Energy Chief of Staff and Deputy Chief of Staff.

1. The Compelling Need for Clean Energy Project Finance

As I testified last summer at a hearing in this committee, there is an established pathway for investment in clean energy:

- It often starts with government investment in early stage high risk technology research;
- It moves to corporate and venture capital funding of technology development;
- It then proceeds to actual deployment of technologies through project finance and other mechanisms.

The bill being reviewed today – the 21st Century Energy Technology Deployment Act - is focused on the final stage of this continuum – the deployment of clean energy technologies at a scale significant enough to actually address our energy-related challenges like climate change, energy security, economic competitiveness, and job creation. However, the bill has an even more particular and critical focus: the point at which an energy technology is ready for scale-up from a pilot project to a full-scale plant. This problematic moment is often when many promising energy technologies falter – and a significant number die. In the clean energy technology industry it is known as the "Valley of Death". Helping cutting-edge technologies survive this difficult phase is an element of our RE<C (Renewable Electricity Cheaper than Coal) initiative at Google.

The Valley of Death looms large. Failing to bridge it has cost us serious progress on many clean energy technologies from wind, solar, and geothermal, to biofuels and efficiency. In some cases investors from other countries have stepped into the breach and the technology has advanced but we have lost the tax and employment benefits of a company based in the U.S.

The good news is that there is a broad array of clean energy technologies that have been developed with government and private sector investment that could address our many energy-related challenges. The not so good news is that investment in the actual deployment of these technologies – "steel in the ground" as they say in the project investment world – is inadequate. And the Valley of Death will be a particular challenge for scale-up of promising technologies including, for example, Concentrating Solar Power (CSP), Enhanced Geothermal Systems (EGS), various on-shore and off-shore wind technologies, advanced batteries, and biomass power and fuels.

Aggressive federal policy can drive private sector investment – measured in the trillions of dollars – that will be required to move the nation and the globe toward a more sustainable energy future. There are several critical steps the federal government must take:

- First, we must significantly increase public funding of research and development of advanced energy technologies.

- Second, the federal government must put a price on greenhouse gas emissions in order to internalize the costs of climate change and move energy investments toward lower carbon and more efficient technologies.

- Third, we must remove barriers to cleaner and more efficient technologies and establish rigorous standards to move these technologies to market.

- And fourth, the federal government must, in partnership with the private sector, help increase the capital available to move immature and often higher risk technologies to commercial scale.

Mr. Chairman, this fourth role is illustrated by the bill you and Senator Murkowski have recently introduced, the 21st Century Energy Technology Deployment Act. The bill, if enacted, would increase the capital available for clean energy projects, thereby helping to mature the underlying technologies and move them to scale. We welcome your bill and its innovative and attractive approach to improving clean energy project finance. In this testimony we provide our thoughts on some of the bill's important elements and how the legislation might be further strengthened.

2. The 21st Century Energy Technology Deployment Act

There are typically two elements of energy project finance: equity and debt. Federal tax credits have stimulated equity investment in wind, solar, geothermal and other clean energy projects. Securing loans for projects has been more problematic, especially for higher risk projects. Bankers are generally reluctant to provide a loan for a project involving a technology that has not been proven at commercial scale. A common refrain from the bankers is: "We'd be delighted to finance your third or fourth project. Come see us after you've built the first couple of full-scale plants and you've got solid operating data proving that your technology works."

Bank financing plays a critical role because a commercial-scale energy project can often cost hundreds of millions or billions of dollars, generally beyond the capacity of venture capital investors who have often advanced the technology through pilot scale. The projects also generally have rates of returns well below what the venture community expects. There are other sources of private equity beyond venture capital but these players generally require the lower cost debt provided by the banks to be part of the project finance deal in order to meet their return thresholds.

Let me provide a bit of perspective on the scale of energy project transactions and expected rates of return. Over the last five years venture capital investment in wind, solar, biofuels, biomass, geothermal, small hydro and marine energy companies was roughly $12 billion worldwide. In contrast, investment in projects deploying these technologies was more than twenty times this, at about $275 billion. And in very rough terms, venture investors expect average returns on a per transaction basis to be 35-40% in

a basket of deals ranging from "home runs" to total losses. In contrast, returns for equity investors on individual energy projects are roughly in the 8-12% range and 6-8% for the banks providing debt, with the expectation that most energy projects will perform as promised – and none will be outright failures.

The key point is that the Valley of Death projects sit precariously between the venture capital and project finance worlds. They are generally too big in terms of required capital and too small in terms of returns for the venture capital community. And they are often too risky for the project finance players, especially for the banks which typically provide the great majority of a project investment. Mr. Chairman, this is why the CEDA is so critical.

Mr. Chairman, the bill you introduced last year, S. 3233 was designed to increase the willingness of banks to make loans for clean energy projects by providing a secondary market for their loans through the 21st Century Energy Deployment Corporation. I concluded last year that if implemented well this secondary market should increase the capital available for the scale-up of clean energy technologies with lower risk profiles. The question I raised, however, was whether the Corporation in its operation would also purchase loans from higher risk Valley of Death projects. I was concerned that the bill as drafted last year would fail to address precisely the kind of higher risk Valley of Death projects - as part of a larger portfolio of projects - that most need a smart push from the government.

I was also concerned that last year's bill did not include critical tools, including loan guarantees, letters of credit, direct loans and related mechanisms, which could directly address higher risk projects. Loan guarantees, for example, help borrowers obtain access to credit with more favorable terms than they might otherwise obtain in private lending markets because the federal government guarantees to pay lenders if the borrowers default. By doing so we could help leverage the vast amounts of private sector capital that is so critical to taking clean energy technologies to scale.

The new bill, the 21st Century Energy Technology Deployment Act, deals precisely with these issues in several respects and includes a number of important provisions to ensure effective and efficient financing of clean energy projects. The legislation would incorporate the existing DOE loan guarantee program into a new Clean Energy Investment Fund. Importantly, it would also create a new financing entity called the Clean Energy Deployment Administration (CEDA) housed within DOE but with a degree of independence like the Federal Energy Regulatory Commission enjoys. The Clean Energy Investment Fund would become the seed fund for CEDA.

The bill is an improvement over last year's approach for several reasons:

- First, there is specific focus in the bill on "breakthrough technology", i.e. technology with significant potential to advance critical national energy goals but that "has generally not been considered a commercially ready technology as a result of high perceived technology risk or other similar factors". It is this

breakthrough technology, with its significant risk profile, that faces difficulties raising capital for the first few commercial-scale plants.

- Second, CEDA will have a board of directors and an advisory council that will have the background and skills to help ensure that the financial and technical risks of the agency's clean energy project investments are adequately considered.

- Third, the bill provides a broad array of tools to CEDA to accelerate deployment of clean energy technology including direct loans, loan guarantees, letters of credit, and other credit enhancements. The CEDA may also issue bonds, notes, debentures or other obligations or securities. In addition CEDA can use alternative fee arrangements such as "profit participation" to increase the upside in a transaction and offset the risk.

- Fourth, the CEDA would use a portfolio investment approach to mitigate risk and diversify investments across technologies.

3. Areas for Improvement

Overall, the 21st Century Energy Technology Deployment Act takes the right approach to moving critical technologies across the Valley of Death but there are some areas where it might be further improved. At the core of these improvements is ensuring that CEDA ends up successfully funding the right set of projects that will move breakthrough technologies through the Valley of Death to full scale commercialization.

We can think about the universe of possible CEDA projects as a three-layer cake. The top layer, the most financeable projects, will get financed by private investors. The bottom layer involves projects that are far too risky and should not be financed at all. The layer in the middle has projects that don't quite meet the bar of private lenders but have promising technologies and should be financed by CEDA. The challenge that CEDA has is figuring out which projects are in the middle layer and where the layer starts and ends.

In meeting this challenge CEDA has three related tasks.

1. Select the projects that it will fund;
2. Structure the transactions to mitigate risk and be compensated for residual risk;
3. Set the loan loss reserve to cover potential losses.

The bill has mechanisms addressing all these tasks but there is little focus on the most obvious mechanism which is to engage private financiers in some way. There are several reasons to do so:

- They may have already reviewed the transaction, know the participants, and can identify the risks and issues.

- They will be financing the projects after projects one or two so they can provide the performance criteria required in order to finance subsequent plants.
- Their degree of interest in participation in future projects will be an indicator of future success.

Engaging the private financiers can be as simple as encouraging CEDA to adopt a practice of actively reaching out to private financiers on every transaction. CEDA might also run an annual finance conference with the private sector to solicit feedback.

CEDA might also work to pre-arrange financing for the 3rd or 4th plant in partnership with private financiers conditional on the initial plants meeting certain performance criteria. Alternatively, CEDA could reserve a senior position in the capital structure of the first project for private lenders. This should be an option rather than a requirement since even if the private financiers did not participate in the first deal, CEDA would have gained a second opinion on the risk.

Coupled with CEDA's own assessment, this process would leave CEDA better informed on whether to fund a particular project, how to structure it and what reserve level to set. It would also provide the private investors early exposure to the project so that they could track its progress, making it more likely that they would finance later projects.

Once a project has been selected, the next task is structuring the deal and determining the degree to which CEDA can benefit from upside that comes from a successful project. The bill allows for "profit participation" under the Alternative Fee Arrangements section. This is critical to the success of the program because it allows CEDA to be compensated for risk with upside in successful companies. This will help meet the critical goal of making the Clean Energy Investment Fund, which undergirds CEDA, self-sustaining.

This provision could be further improved if CEDA were allowed to take equity positions through purchase of warrants in the technology companies. CEDA would then benefit from the rising value of companies that successfully transitioned to commercial products. CEDA could do this either directly or through a fund in partnership with private investors. CEDA might also acquire rights to invest in additional future projects on favorable terms.

The third task CEDA faces involves setting the loan loss reserve, which is the percentage of capital the agency should keep as a buffer against potential losses. Since the loan loss reserve depends both on the quality of the deals selected and the structure of the transactions, progress on the first two tasks above should make it easier to set a reasonable loan loss reserve. This is important because the lower the loan loss reserve the more loans CEDA can make for the same amount of appropriation. For example, the current figures of $10 billion in appropriations with a 10% reserve – the initial assumption of a loan loss reserve in the bill - would provide about $100 billion in loans. If the reserve percentage was reduced to 5% then about $200 billion in loans could be provide for the same $10 billion.

Some might argue that CEDA should simply charge higher fees for riskier projects but that would not mitigate the risk. In fact it might increase the risk because it would place additional burden on the borrower. This can be problematic when riskier borrowers are charged more interest and fees, making them more likely to default.

A final issue involves collateral sharing: The previous loan guarantee program did not share collateral fairly between the commercial lender and the DOE. The DOE was first in line for the collateral so if the project went bad the commercial banks may have limited claim on the assets. This would be roughly equivalent to having a first and second mortgage on a house but in the event of a foreclosure only the DOE would get the house leaving the commercial bank with insufficient recourse. Congress needs to ensure that if CEDA is created there is a fair sharing of collateral.

4. Conclusion

Mr. Chairman and Senator Murkowski, the legislation you are jointly advancing obviously comes in the midst of an economic crisis. But it is precisely at this moment - when clean energy projects so vital to our economy, environment and security are facing increasing difficulty getting financed - that the mechanism you propose is so important. This is especially the case for projects involving innovative technologies with higher associated risk – the very technologies that may well hold the keys to addressing the climate crisis, our oil dependence, a deteriorating electric grid and also provide a major stimulus to the faltering economy. And when the economy improves, these Valley of Death projects will continue to need the critical financial support that this bill provides. At Google we stand ready to help you advance this important legislation.