

**Testimony of Kassia Yanosek
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**Hearing on the Proposal for a Clean Energy Deployment Administration
Before the Senate Energy and Natural Resources Committee**

Tuesday May 3, 2011

Introduction

Thank you Chairman Bingaman, Senator Murkowski, and other members of the Committee for the opportunity to testify today. It is an honor to speak to you on CEDA and the importance of this legislation to the clean energy investment community.

I am Kassia Yanosek, a Founding Principal of Tana Energy Capital, an energy investment and advisory firm. As a principal of Tana, I evaluate and execute investments in energy technologies. Much of my work has been focused on investments in technologies of interest to the electrical utility sector. I work with utilities around the country to understand their perspective on innovative energy technologies and how they expect to diversify their generation portfolios, and improve their transmission systems. Prior to founding Tana Energy Capital, I was a senior investment professional at Hudson Clean Energy Partners, a billion dollar private equity firm focusing on renewable energy. I have also worked at Bechtel and at BP, making investments in both renewable and traditional energy.

The need for programs like CEDA to advance U.S. clean energy innovation leadership

As an investor and advisor to companies seeking capital for clean energy technologies, I see firsthand the critical need for funding to deploy these products and projects at scale. Significant capital is often needed to move technologies from pilot testing to deployment—capital that does not fit the risk/return profiles of venture, private equity, or debt financing. As such, these technologies and projects are stuck in the “Commercialization Gap”. The bill being discussed today--the Clean Energy Deployment Administration (CEDA)--would be an important solution to this funding need which I will describe in further detail.

In my testimony today, I would like to offer my observations on capital flows for clean energy, the funding needs of the Commercialization Gap, and my view on how CEDA would help to solve this challenge and increase U.S. competitiveness. CEDA has a focused purpose to promote affordable financing for clean energy technologies and projects which would not get financing otherwise. CEDA will help to improve U.S. competitiveness in clean energy and reduce the cost of new energy technologies. Support for breakthrough technologies developed and deployed domestically could strengthen U.S. clean technology leadership and lay the groundwork for a competitive U.S. export market.

In this time of fiscal austerity, I see CEDA as a win-win for the American people, legislators, and energy companies alike.

Today I will highlight the following key points:

- The flow of investment in the clean energy sector has strengthened towards emerging markets such as China, and weakened towards Western markets, where flow is slowed by policy uncertainties and low natural gas prices. Recent data for Q1 2010 demonstrate this shift.
- Accelerating our transformation to a cleaner energy economy--and enabling the U.S. to compete abroad--requires the adoption and scale-up of new technologies that have the potential to compete dollar-for-dollar with conventional technologies over the long haul.
- A key impediment for the private sector is funding innovative companies and projects that fall into the “Commercialization Gap”: investments which are too capital-intensive for venture capital, but too risky for private equity, project or corporate debt financing.
- As currently designed, CEDA would provide various types of credit supports to stimulate private sector investment and help bridge the Commercialization Gap.
- In today’s state of fiscal austerity and budgetary concerns, getting taxpayer “bang for the buck” is critical. CEDA’s focus and structure would enable the program to be capitalized only once, yet provide long-lasting benefit.

The current state of clean energy investment globally and in the U.S.

The global clean energy industry has seen tremendous growth in recent years. According to Bloomberg New Energy Finance, 2010 was a record year for invest investments worldwide, totaling \$243 billion. In the past five years, growth rates have topped 25 percent. However, when you unpack the data, it is clear that a new investment pattern is emerging. Much of the recent investment growth has shifted from Western economies to growth economies such as China. Last year, investment in China was up 39% to \$51.1bn, larger than any one country.¹ Furthermore, 2010 investment was kept strong by temporary government stimulus programs, which made up one-fifth of investment in clean energy worldwide.² As these programs phase out and budgetary realities sink in, investors are faced with uncertainty which in turn limits investment in both innovative clean energy technologies--such as energy storage-- as well as conventional clean energy projects such as wind farms and nuclear plants. Early data showing investment trends in the first quarter of 2011 demonstrate how policy uncertainty impacts investment. Q1 2011 saw much weaker investments (\$31bn) which is down 30% from Q4 2010.³ Much of this decline in growth can be attributed to policy uncertainties in Europe, as well as low natural gas prices which have impacted U.S. investments. For example, in 2010, the number of new wind turbine installations in the U.S. fell by almost half.

¹ Bloomberg New Energy Finance; Morgan Stanley.

² Bloomberg New Energy Finance.

³ Ibid.

Accelerating our transformation to a cleaner energy economy requires the adoption and scale-up of new technologies

Whether the fiscal realities will strengthen or weaken the clean energy industry will depend on how policymakers prepare for it. In my view, a root cause of today's investment uncertainty is a boom-bust cycle of short term policies that have encouraged investment in conventional clean energy projects. Nearly seven-eighths of all clean energy investment worldwide has gone to deploying mature clean energy technologies such as wind power. Only a tiny share focuses on innovation. While we need both types of investment, more attention should be placed on accelerating the adoption of innovative technologies that stand a better chance of competing with conventional energy over the long haul.

Accelerating the transfer of energy technology from the lab to commercial deployment is critical for the United States, now more than ever. Impending clean air regulations will require utilities to retrofit or replace a significant number of coal-fired power plants with cleaner options. Energy storage innovations are needed to support intermittent energy sources such as wind and solar power, which only produce power when the wind is blowing or the sun is shining. And grid modernization is critical as "smart-grid" technologies come online and nascent markets such as electric vehicles and customer-driven demand-side management provide new challenges for managing the electrical grid.

A key impediment for the private sector is funding for innovative companies and projects that fall into the "Commercialization Gap"

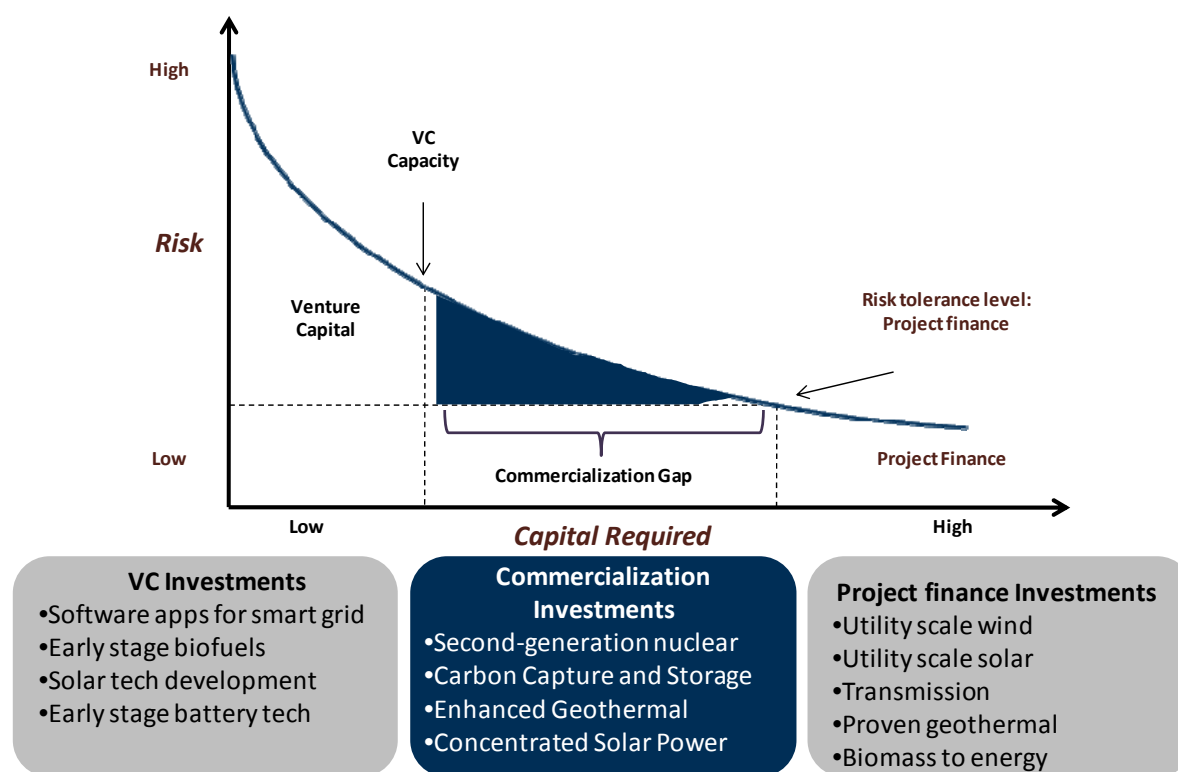
It is vital that we find a solution to accelerate the commercialization of new technologies and the requisite financing needed for their full-scale deployment. Many commercialization investments are stuck in a so-called "Commercialization Gap" (Figure 1). They are plagued by a lack of financing, technology adoption risks, and poor coordination among product manufacturers, financial investors, and the utilities that would deploy these technologies. Significant capital is often needed to move technologies from pilot testing to deployment—capital that most utilities and financial institutions are unable or unwilling to put at risk. Furthermore, technology adoption risks--driven, for example, by uncertainty around technical standards--have held back deployment capital, particularly for investments in grid modernization technologies.

In my day-to-day work as an investor and advisor to energy firms, I see these challenges first hand. For example, I have recently evaluated a second-generation biomass technology in Europe which, if commercialized at scale, has the potential to help utilities supplement their use of coal with a product that is renewable, will significantly reduce their carbon footprint, and do so with a pricing structure for the product that is not too dissimilar to coal's pricing today. This project and many other technologies I evaluate require significant capital expenditures to prove out a first generation facility--capital that is difficult to access without government support prior to proof of commercial viability.

I also see the challenges that utilities face in accelerating new technologies through the Commercialization Gap. In contrast to venture or private equity, utilities enjoy a low cost of capital. However, it is difficult for these companies to justify risky commercialization investments to their

shareholders or ratepayers. For utilities with significant coal portfolios subject to upcoming EPA regulations, there is a concern about the future generation mix and how technological innovation will fit into their investment choices. My experience in working with these corporations is that they too would benefit from policy moving towards technological innovation instead of away from it. Some of these utilities have announced plans to pursue clean coal projects with their Chinese counterparts. These partnerships signal China's intent to develop its capability and competitiveness in clean energy innovation.

Figure 1: Definition of the Commercialization Gap



Graph Source: Tana Energy Capital LLC

CEDA would provide various types of credit supports to stimulate private sector investment and help bridge the Commercialization Gap.

To help close the Commercialization Gap, the U.S. government can lower the financial risks the private sector faces in investing in the deployment of breakthrough technologies. CEDA's credit support products will do just this, improving the risk/return profile for these risky yet capital intensive technologies and enable private sector capital to move off the sidelines. Loan guarantees have already proven essential to promising large-scale solar projects and to firms that test new technologies to burn coal more cleanly. CEDA, as drafted, would incorporate the existing loan guarantee program and improve upon it. Important aspects of CEDA include the following:

- **Emphasis on breakthrough technologies.** CEDA addresses the Commercialization Gap funding challenge and serves to move private capital off the sidelines by improving the risk/return profile of commercialization-stage technologies. CEDA's portfolio approach will pool risk and diversify investments, allowing for losses on some investments to be offset by gains on others.
- **A broad array of tools to accelerate the deployment of clean energy technologies.** Credit support includes loans, loan guarantees, insurance products, and debt instruments that allow CEDA to participate as a co-lender or member of an investor syndicate. CEDA may also provide indirect market support to develop securitized products. These tools enhance and expand the ability for the DOE to provide funding solutions for a range of technologies and projects.
- **A separate administration within the Department of Energy, similar to FERC.** CEDA's separate Administrator and Board of Directors would provide CEDA substantial independence within DOE, much like FERC enjoys. This independence will likely help to reduce lengthy review processes which have challenged DOE's loan guarantee programs.
- **Funding mechanisms which permit CEDA to become self-sustaining.** Profit participation, as defined in the CEDA legislation, will allow CEDA to be compensated for risk with upside in successful companies and/or projects. This is one mechanism by which CEDA could self-fund over time, similar to a mechanism employed by the Overseas Private Investment Corporation (OPIC) Fund Program. OPIC provides loan guarantees to private sector funds in return for a preferred government return. Achieving self-funding status is a significant goal as it would permit CEDA autonomy from the appropriations process.

For my detailed analysis of CEDA in the American Clean Energy & Leadership Act passed by the Senate Energy Committee on 6/29/2009, see the testimony appendix, "The Clean Energy Deployment Administration (CEDA): A comparison of the Senate, House and Green Bank Proposals, April 10, 2010."

In the current state of fiscal austerity and budgetary concerns, getting taxpayer "bang for the buck" is critical. CEDA's focus and structure would enable the program to be capitalized only once, yet provide long-lasting benefit.

In closing, CEDA is a much-needed policy mechanism to provide smarter, more efficient government dollars to work in partnership with the private sector to fund technologies which have a chance to become cost-competitive with conventional energy. The one-time \$10 billion capitalization needed for this evergreen program provides taxpayers a "bang for their buck", particularly when compared to other government programs which have deployed capital for clean energy in the form of grants with no return. As a comparison, the Section 1603 Treasury Grant program is expected to cost approximately \$10 billion through the end of 2011⁴, equal to the one-time capitalization needed by CEDA.

CEDA presents an opportunity for the U.S. government to enact a fiscally responsible, sustainable policy that puts a higher priority on innovating today with an eye towards competitiveness, energy security, and less polluting energy for tomorrow. In this tight budgetary environment, this is an opportunity Congress should not miss.

⁴ The U.S. Partnership for Renewable Energy Finance

APPENDIX

The Clean Energy Deployment Administration (CEDA): A Comparison of the Senate, House and Green Bank Proposals

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A Partnership for Renewable Energy Finance White Paper

The Clean Energy Deployment Administration (CEDA): A Comparison of the Senate, House and Green Bank Proposals

INTRODUCTION

The clean energy industry has been hampered by a range of financing challenges. The expiration-extension cycle of the Production Tax Credit (PTC) and the Investment Tax Credit (ITC) has resulted in a stop-start cycle of investment. Debt capital and tax equity, critical to clean energy deployment at scale, has been scarce due to the dislocations in the credit markets. And breakthrough technologies, necessary for bringing clean energy down the cost curve and maintaining a strong clean energy export market, have lacked sufficient equity capital for scale-up and commercialization. Some of these challenges are being addressed by the American Recovery and Reinvestment Act (ARRA), such as the 1705 Loan Guarantee Program which aims to reduce the cost of debt financing for conventional renewables projects.

However, accelerating the transformation to a cleaner energy economy—over \$30 billion per year will be needed to meet a 15% renewable portfolio standard by 2020⁵—will require a more holistic approach which also addresses more persistent market challenges such as the lack of capital available for the scale up of breakthrough technologies. Congress is currently considering proposals to create a new Clean Energy Deployment Administration (CEDA) within the Executive Branch to provide such financing support. As envisioned, CEDA would administer various types of credit instruments (such as loan guarantees, insurance products, and secondary market supports) with the aim of accelerating private sector investment in the clean energy sector. Versions of CEDA were adopted by the Senate Energy Committee as part of the American Clean Energy and Leadership Act and by the House of Representatives in the American Clean Energy and Security Act (the Waxman-Markey bill.) Similar House legislation, introduced by Rep. Van Hollen, calls for the creation of a Green Bank⁶.

While the pending legislation in both Houses of Congress enjoys bipartisan support, the proposed structure and function of CEDA varies in each proposal. This paper first defines pros and cons of a CEDA focus on conventional technologies versus breakthrough technologies. It then identifies key questions critical to answer in designing CEDA, compares each proposal's approach, and points to additional areas of consideration based on lessons learned from the DOE Loan Guarantee Program.

CEDA Proposals

Bill and Sponsor	House of Congress & Date Adopted	Name	Initial Capitalization	Technology Focus
American Clean Energy & Leadership Act (Bingaman)	Senate Energy Committee 6/29/09	Senate CEDA	\$10 billion	Breakthrough
American Clean Energy and Security Act (Waxman-Markey)	Passed by House 6/19/09	House CEDA	\$7.5 billion	N/A
Green Bank Act (Van Hollen)	Referred to House committee	Green Bank	\$10 billion ⁷	Conventional

⁵ Assumes federal RES legislation passed as part of the Waxman-Markey bill; U.S. PREF white paper, “*Analysis of Project Finance Requirements Implicit in Existing State and Proposed Federal Renewable Energy Mandates.*”

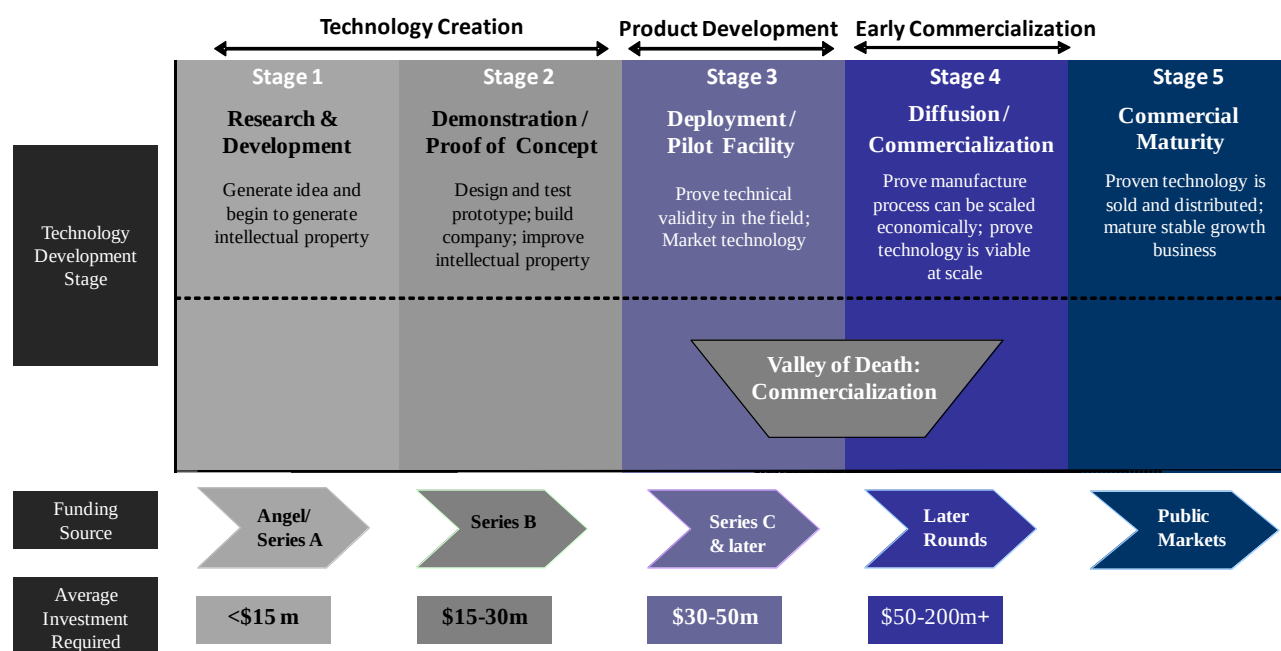
⁶ The Green Bank proposal has been backed by a private sector group called the Coalition for the Green Bank.

⁷ Rep. Van Hollen sent a letter to President Obama January 14, 2010 calling for initial capitalization of \$20 billion.

FUNDAMENTAL CEDA QUESTION: CONVENTIONAL VS. BREAKTHROUGH?

CEDA’s mission is to provide various types of credit supports to stimulate private sector investment in renewable energy. However, the targeted investment stage varies across proposals. For example, the Senate and House CEDA proposals prioritize investments in breakthrough technologies⁸ (stages 3 and 4 in Table 1 below). Many breakthrough technologies fall into a “Commercialization Gap” commonly described as the “valley of death” as they are too capital-intensive for venture capital yet too risky for private equity, project or corporate debt financing. The Coalition for the Green Bank has emphasized a focus on conventional technologies (stage 5 in Table 1 below). Conventional technology projects, such as wind farms, have been plagued by the high cost of capital caused by credit constraints in the debt and tax equity markets.⁹

Table 1: The Clean Energy Technology Development Chain



Adopted from New Energy Finance and Clean Energy Group, “*Clean Energy Investment Trends*,” November 4, 2009

Greater agreement concerning CEDA’s mission is critical to defining the focus, structure and tools of this new government entity. The central debate involves whether the \$10 billion of initial CEDA funding should be allocated to conventional or breakthrough technologies.

⁸ Senate Energy Committee Summary of CEDA: <http://bingaman.senate.gov/policy/ENRBill%20Summary.pdf>

⁹ <http://www.coalitionforthegreenbank.com/>. Liquidity is only part of the financing challenge for conventional technologies. The Coalition for the Green Bank’s vision for CEDA is to provide low-cost debt financing--irrespective of other current supports such as the ITC or PTC—at a rate that would allow renewable energy generation to compete with coal-fired power. The Coalition’s approach would centralize subsidies at the federal level, negating the need for utilities to include the additional cost of renewables into the rate base.

An important nuance to point out is that the debate over technology focus is actually about the allocation of the \$10 billion¹⁰ of CEDA's *initial capitalization*, which is different than the makeup of CEDA's overall investment portfolio. The Senate CEDA, for example, allows CEDA to charge fees for its financing services. This provision is intended to provide CEDA the ability to support conventional technologies outside of the \$10 billion appropriation if such projects "self pay" for access to government-guaranteed financing. These later-stage investments (such as nuclear power plants) could pay for their credit subsidy costs, leaving the majority of the \$10 billion appropriation to support breakthrough technologies.¹¹

While it is unlikely that final CEDA legislation will be "black and white" in terms of its focus on short term versus longer-term financing challenges, it is instructive to understand the pros and cons *if one were to assume CEDA's initial \$10 billion of funding would go towards one approach over the other*. A focus on conventional technologies would address the short-term challenges of the current credit gap¹², accelerate conventional renewables deployment in the near term, and help ensure sufficient depth to the renewable project finance market. Additionally, the lower credit risks for a portfolio of conventional technologies would allow CEDA to maximize leverage and private sector financing on an aggregate level. If successful, a CEDA focus on conventional generation could also create demand "downstream" in the renewable energy supply chain, thereby supporting a long-term market for breakthrough technologies. However, if CEDA's main mission is to address market liquidity, the short-term credit challenge could recede before CEDA is implemented, resulting in a scenario where CEDA financing tools are unwarranted or compete with private capital. Additionally, the implementation of CEDA will require rulemaking and logistics which could take many months, reducing the efficacy of a short-term mission.

A CEDA focused on breakthrough technologies would aid in the commercialization phase of clean energy, an investment stage which lacks sufficient financing in even a robust credit environment. This persistent financing challenge demonstrates a clear need for longer-term federal assistance and provides a justification for the creation of a new and permanent agency. Additionally, a focus on innovative technologies may accelerate the timeline on which renewables reach cost parity with conventional energy. Support for breakthrough technologies could strengthen U.S. clean technology leadership and lay the groundwork for a competitive U.S. export market. However, an emphasis on breakthrough technologies would limit the short-term benefits because less capital could be leveraged against CEDA funding due to higher credit default risks.

These tradeoffs are summarized in Table 2.

¹⁰ \$10 billion is the initial CEDA capitalization in both the Waxman Markey and the Senate CEDA versions. For illustrative purposes, from this point forward the paper assumes a \$10 billion appropriation.

¹¹ Another "self pay" option is to finance the credit subsidy alongside other project costs. In this instance, CEDA would only directly fund the equity portion of a project's credit subsidy cost, allowing leverage to cover the rest. This approach would enable the \$10 million CEDA appropriation to support more investments.

¹² This paper assumes that CEDA would operate alongside of current policy supports (e.g. the ITC or PTC or cash grant) and therefore, emphasizes that the main financing challenge for conventional renewables today is the lack of liquidity.

Table 2: CEDA Funding for Conventional vs. Breakthrough Technologies

This table outlines the pros and cons of allocating \$10 billion of CEDA capital to either conventional or breakthrough technology investments.

Pros: Conventional Technologies	Pros: Breakthrough Technologies
• Impact on jobs, carbon abatement, energy security visible in short-term: More certain ability for conventional tech to increase renewables generation and meet policy goals over the short term compared to breakthrough tech. • Higher leverage of public funds: Lower default risk for conventional tech reduces credit subsidy costs and allows for up to 20:1 leverage of private to public sector investment (\$10bn of CEDA funding would support ~\$200bn of govt. backed financing) for conventional tech investments. • Accelerate development of debt markets: CEDA focus on aiding debt markets will help build depth to the renewable energy project finance market. • Create long-term demand downstream for breakthrough technologies. A successful program creates demand throughout the supply chain, fueling innovation.	• Government role: Clearer need for long-term federal assistance to fill persistent financing gap. • Competitiveness: Aims to strengthen U.S. clean technology leadership over long term and compete with countries heavily supporting domestic clean tech innovation (e.g. China). • Long-term job creation: Helps new companies grow; aims to foster long-term, permanent job growth by supporting development of a robust and competitive technology export market. • Reduce cost of renewables: Focus on breakthrough technologies directly addresses challenge for renewables to achieve cost parity with conventional energy and reduce dependence on subsidies over long-term.
Cons: Conventional Technologies	Cons: Breakthrough Technologies
• Government role: Need for long-term federal assistance less clear. In scenario where debt gap recedes and other supports remain (e.g. ITC/PTC). CEDA financing supports could potentially crowd out/compete with private capital. • CEDA implementation unlikely to be immediate: Creation of a new agency will likely take several months, reducing the efficacy of its mission if CEDA is designed to focus on immediate financing challenges. • Competitiveness: A CEDA emphasis on the conventional tech could be at the expense of U.S. competitiveness over the long term; risk that other countries supplant the U.S. as clean tech leaders.	• Impact on jobs, GHG, energy security visible only in longer-term: Emphasis on breakthrough tech less likely to address significant short-term job growth or acceleration funding for “shovel ready” projects • Lower leverage of public funds: Higher default risk for breakthrough tech increases credit subsidy costs, limiting leverage to ~5:1 (\$10bn of CEDA funding would likely support between \$30-100bn of govt- backed financing). • Higher risks to government: While higher credit subsidy costs for breakthrough tech are intended to cover the associated risks, high-profile write-offs of technology investments could result in political backlash against CEDA.

The following sections describe how each of the three proposals addresses key questions critical to the design of CEDA.

QUESTION #1: CEDA’S SCOPE

CEDA will need a clear mission in order to attract private capital, manage risk, and measure success.

- ✓ ***Which financing challenge(s) should CEDA address?*** The Senate CEDA emphasis is on breakthrough technologies. This proposal would primarily address the longer-term Commercialization Gap challenge, which is present even in a good credit market environment. In contrast, the Green Bank emphasis is on conventional technologies. The Green Bank approach would primarily address the shorter-term credit challenge, assuming existing federal tax-based supports are in place and are sufficient.
- ✓ ***What should CEDA prioritize? Jobs? Innovation and competitiveness? Installed megawatts? Carbon abatement?*** While all versions of CEDA would address these goals broadly, each approach claims different priorities. Proponents of the Senate CEDA argue that prioritizing the scale-up of innovative technologies will help position the U.S. to capture the economic rents of new clean technology globally.¹³ Breakthrough technologies could, over the long term, give the U.S. a competitive advantage vis-à-vis other countries currently investing in clean energy innovation.¹⁴ The Green Bank supporters focus less on specific financing gaps and more on maximizing capital investment and deployment at scale through federal-level, low-cost financing. The House CEDA legislation prioritizes “investments that promote technologies that will achieve the maximum greenhouse gas emission reductions per dollar invested”.¹⁵ Different priorities will require different financing tools and different CEDA staff skill sets.

QUESTION #2: CEDA TECHNOLOGIES AND FINANCING PRODUCTS

CEDA’s technology focus will impact CEDA’s overall credit risk and therefore, the amount of capital CEDA will be able to leverage for its investments. A portfolio of projects focused on breakthrough technologies will mobilize less low-interest rate capital in aggregate than a portfolio of projects representing conventional renewable technologies, as innovative projects have a higher risk exposure and therefore demand higher credit subsidy/government program costs. Under ARRA, the credit subsidy is presumed to be 5% for conventional technologies and 10-30% for innovative technologies.¹⁶ Assuming these credit subsidy rates and an initial CEDA capitalization of \$10 billion, a portfolio of conventional renewables could be expected to raise \$200 billion of low-interest rate capital against CEDA’s \$10 billion, while breakthrough technologies would raise between \$30-100 billion of capital against the

¹³ “Letter to President Obama calling for the Senate CEDA, January 21, 2009. Accessed on Senate Energy Committee website, <http://energy.senate.gov/public/index.cfm>

¹⁴ If other countries (focused on the long-term) invest in breakthrough technologies, while the U.S. (focused on the short term) invests in conventional renewables, over time U.S. competitiveness will be at risk.

¹⁵ ACES, Section 187(c)(3)(D).

¹⁶ The FOA announcement on the Loan Guarantee Program released July 29, 2009 allows for \$2.5 billion in credit subsidies to be applied towards \$8.5 billion in loan guarantees for 1703 projects (innovative technologies) that apply for funding through the 1705 program. The Senate CEDA suggests an initial loan loss reserve of 10%.

CEDA appropriation¹⁷. The higher risk/return of a breakthrough technologies-focused portfolio could, however, result in more upside potential for the government if CEDA were to obtain warrants or royalty stakes in such technologies.

Another question to consider is whether technologies should be limited as a percentage of CEDA's portfolio. On one hand, portfolio limits protect against out-sized representation of one lower-risk, high capital intensity technology (such as a nuclear reactor). On the other hand, funding caps would similarly limit the total CEDA funding available for riskier technologies (such as battery technologies) since higher default risks demand a higher proportion of CEDA financial support.¹⁸

- ✓ ***What should the CEDA portfolio look like?*** The Senate CEDA will use a portfolio investment approach to pool risk and diversify investment across technologies and provide the “maximum practicable percentage of support to promote breakthrough technologies”¹⁹. Such an approach would allow for losses on some investments to be offsets by gains on others. The House CEDA and Green Bank proposals are less specific but call for a broad range of investment types.
- ✓ ***What technologies are eligible?*** The Van Hollen bill provides for financing of all “qualified clean energy or energy efficiency projects”²⁰, which is broadly defined in the legislation. The Coalition for the Green Bank has recently called for the creation of a Green Energy Lending Authority (a new term for Green Bank) which would have a twin mission to finance energy efficiency retrofits and clean energy generation.²¹ The House CEDA limits any one technology to 30% of the total CEDA portfolio. The Senate CEDA does not set a technology limit.
- ✓ ***What financing tools should CEDA provide?*** Each proposal provides for a range of financial products. Credit supports defined in the Senate legislation include loans, loan guarantees, insurance products, and debt instruments including participation as a co-lender or member of an investor syndicate.²² CEDA, under the Senate bill, may also provide indirect secondary market support to develop securitized products. Additionally, the Senate legislation merges CEDA with the Title XVII Loan Guarantee Program by assigning leftover funds allocated to the Title XVII to CEDA's Clean Energy Investment Fund. The other proposals do not address Title XVII vis a vis CEDA.

¹⁷CEDA may be able to leverage more than \$10 billion worth of credit subsidies if CEDA charges fees to cover these costs. The Senate and House legislation allows applicants to “self pay” loan loss reserve requirements. Fees covered by an applicant (such as a conventional nuclear technology project) would be at no cost to CEDA, allowing CEDA to enable government-supported funding beyond the \$30-\$100 million. The CBO estimates that an additional \$100 billion of loans for nuclear projects could be guaranteed. See “CBO cost estimate, S. 1462”, Sept 30 2009.

¹⁸ For example, if both battery technologies and nuclear are limited to 30% of the portfolio, total funding leveraged for batteries would be less than nuclear. Assuming a \$10 billion CEDA fund, batteries would be capitalized with \$6bn of government-supported funding (assuming a 50% credit subsidy) versus \$30bn for nuclear (assuming a 10% credit subsidy).

¹⁹ ACELA, Section 106(a)(1)(C)(iii).

²⁰ Van Hollen bill, Section 9801 (C)(1-2).

²¹ “The Green Energy Lending Authority (GELA), January 14, 2009,

http://www.coalitionforthegreenbank.com/uploads/2/5/3/6/2536821/green_energy_lending_authorityv9.pdf

²² See Appendix A for examples of potential CEDA products.

QUESTION #3: CEDA GOVERNANCE & STAFFING

Where CEDA sits within the federal government is a key difference amongst the proposals. The Senate plan calls for CEDA to be a new administration within Department of Energy (DOE), though it would have own Administrator and Board of Directors. The Senate legislation provides CEDA substantial independence within DOE²³. The House CEDA and Van Hollen proposals depict CEDA as an autonomous, wholly-owned government corporation with no official reporting relationship to the DOE. The tradeoff between these approaches is a structure which leverages existing DOE technical expertise, versus the potential for an agency with greater autonomy, a new culture, more nimble staffing capabilities independent from the DOE, and the potential for a quicker start-up. A key challenge to consider is how CEDA's location within the government will help or hinder its ability to be successful where the Loan Guarantee Program has failed.

- ✓ ***Should CEDA be affiliated with the DOE?*** The Senate CEDA would be created as a separate administration within the Department of Energy similar in structure to that of FERC. In contrast to the Senate CEDA, both House proposals establish CEDA as an independent corporation of the government with no functions, powers, or duties to be transferred to or consolidated with any other agency.²⁴
- ✓ ***How should CEDA compensate CEDA administrators and board members?*** The House CEDA requires “prevailing industry wages” for the Administrator and private-sector board members. Additionally, the House version is explicit in compensating the Board “at the prevailing rate for compensation for similar positions in industry.”²⁵ In contrast, the Senate version pays Board members according to Level III of the Executive Schedule²⁶. In both bills the Advisory Council is compensated at the equivalent of pay prescribed for level IV of the Executive Schedule.
- ✓ ***What should CEDA's Board of Directors look like?*** In all three proposals, a Board of Directors is established to oversee the operations of CEDA. In the Senate version, the Board is comprised of the DOE Secretary, the Administrator, and additional members to be approved by the Senate. In the House version, the Board also includes the Treasury, Interior, and Agriculture Secretaries. The Senate and House versions both establish an Energy Technology Advisory Council consisting of 8 members to advise CEDA on technology.
- ✓ ***What expertise is needed to staff CEDA? At what compensation levels?*** All proposals address the need for private sector expertise within CEDA. The House and Senate versions give the Administrator direct hire authority for critical positions and allow for up to twenty critical staff positions to be paid at a level equivalent to that of the Vice President. The Van Hollen bill calls for the Green Bank to provide compensation to employees “at prevailing rates for compensation

²³ See Report of ACELA, July 16 2009, Senate Committee on Energy and Natural Resources, page 11.

²⁴ ACES, Section 186 (a).

²⁵ ACES, Section 186 (c)(5).

²⁶ Executive Schedule is the highest rank of employee within the U.S. Executive Branch. There are five pay rates within the Executive Schedule, with I being the highest and V being the lowest.

for similar positions in private industry.”²⁷ Additionally, a Senate Energy Committee press release on CEDA suggests technical expertise would be provided by the DOE.²⁸

- ✓ ***How quickly could CEDA be started up?*** The creation and staffing of a new CEDA organization—whether it is an agency of the DOE or a stand-alone corporation—could take several months. The Coalition for the Green Bank proposal emphasizes the importance of setting CEDA up quickly to address immediate debt capital needs and suggests a timeline for the execution²⁹.

QUESTION #4: CEDA FUNDING

All CEDA proposals call for initial seed funding for CEDA to be appropriated by Congress. Additionally, the House and Senate CEDA proposals call for self-sustaining funding mechanisms that would permit CEDA to achieve funding autonomy through fees, new products, and profit participation in CEDA investments or funds. However, funding mechanisms are not detailed in any proposal (beyond the House and Senate versions defining the Clean Energy Investment Fund as a revolving fund for CEDA.) An additional question is whether CEDA will be fully subject to the Federal Credit Reform Act (FCRA). FCRA was enacted in 1990 to improve the measurement of the budgetary costs of federal credit programs. The legislation requires federal credit subsidy costs to be calculated and accounted for on a net present value basis over the life of a loan, as opposed to on a cash basis. Full exemption from FCRA, (if even possible), would mean CEDA would use a cash-based approach to calculate credit subsidy costs.³⁰

Additionally, FCRA requires agencies to participate in the annual appropriations process to cover the estimated cost of loan defaults. Waiving a section of FCRA to eliminate the requirement for new budgetary authority to support loan guarantees (through annual appropriations) would allow for balances in the fund to cover the cost of loan guarantees. Providing CEDA this flexibility could de-politicize the process and provide CEDA more flexibility to manage credit risks at the portfolio level. Critics of FCRA exemptions suggest that reducing congressional oversight might leave taxpayers exposed to risks unforeseen by CEDA officials.³¹

- ✓ ***What funding mechanism(s) will permit CEDA to become self-sustaining?*** The Senate and House CEDA proposals provide for “profit participation” under the Alternative Fee Arrangement Section. Profit participation, which would allow CEDA to be compensated for risk with upside in successful companies and/or projects, is one mechanism by which CEDA could self-fund over

²⁷ Van Hollen Bill, Section 9801(d)(5)(B).

²⁸ “Letter to President Obama calling for the Senate CEDA”, January 21, 2010, Accessed on Senate Energy Committee website, <http://energy.senate.gov/public/index.cfm>

²⁹ Coalition for the Green Bank, “The Green Energy Lending Authority,” Jan 14, 2010 http://www.coalitionforgreencapital.com/uploads/2/5/3/6/2536821/green_energy_lending_authorityv9.pdf

³⁰ The cash-based approach would reward CEDA for projects which never default (and therefore never use credit subsidy allocations). However the cash-based approach cannot take advantage of the leverage afforded by the net present value accounting method which calculates the credit subsidy cost over the life of a loan.

³¹ It is important to note that the Senate CEDA, which waives a section of FCRA, would still be subject to Congressional oversight and regular reporting of credit subsidy costs. The subsidy cost calculation process would include regular re-evaluation by OMB, pursuant to FCRA.

time.³² Achieving self-funding status is a significant goal as it would permit CEDA autonomy from the annual appropriations process.

- ✓ **How should CEDA initially be capitalized?** The House CEDA and Green Bank proposals are capitalized by proceeds from \$7.5 billion and \$10 billion in bond offerings facilitated by Treasury, respectively. A January 15, 2010 letter sent by Rep. Van Hollen to President Obama called for an increase in the initial capitalization to \$20 billion. The Senate CEDA requires a \$10 billion appropriation through the Clean Energy Investment Fund.
- ✓ **Should CEDA be subject to FCRA?** The Senate plan exempts CEDA from Section 504(b) of FCRA, which eliminates the requirement for new budgetary authority to support loan guarantees and instead allowing balances in the Fund to cover the cost of loan guarantees.³³ Exemption from OMB review under FCRA is advocated by the Coalition for the Green Bank. Under the House plan, CEDA is subject to FCRA.

ADDITIONAL DESIGN ISSUES: Learning from the Loan Guarantee Program

The CEDA proposals are designed to help unlock private capital flows to clean energy and promote sustainable growth of the clean energy sector. In order for CEDA to meet this objective, it is critical to design the structure and function of this new agency correctly. Following are design areas that may warrant further consideration for CEDA particularly in light of lessons from the current DOE Loan Guarantee Program.

- ✓ **CEDA's organizational structure and reporting relationships.** The long lead times between application and award of money for DOE loan guarantees have slowed the deployment of capital and impaired investor confidence. Challenges with the DOE program include the lengthy review process which requires a number of approvals and milestones within the executive branch. Lack of clarity around CEDA's perceived independence and relationships with offices and agencies such as OMB and DOE in the current CEDA proposals could lead to similar challenges in program implementation.
- ✓ **Investment framework and credit risk parameters.** Creditworthiness is DOE's most important selection criteria for the Loan Guarantee Program. However, companies with high creditworthiness and secure revenue streams are typically not deploying innovative technologies. This challenge of conflicting goals has resulted in confusion around credit scoring and program methodology. CEDA proposals also do not currently provide a framework for developing CEDA's portfolio construction or a standardized model for credit risk parameters by technology.
- ✓ **Self-funding mechanisms and funding strategy.** The DOE programs have been limited in their ability to support innovative technologies given that 1703 projects have had to self-fund their

³² An example of a profit sharing mechanism is the Overseas Private Investment Corporation (OPIC) Fund program, which (through a competitive process) will match capital raised by a private fund. OPIC provides loan guarantees to private sector funds in return for a preferred government return and a small equity position.

³³ ACELA Report, U.S. Senate Energy Committee, section by section analysis, Section 103, page 10.

credit subsidy costs.³⁴ All legislative proposals aim for CEDA to eventually self-fund. Fees, profit-generating warrants, and the ability for CEDA to finance credit subsidy costs would help to reduce CEDA's dependence on budgetary outlays, allowing the organization to scale independently from budgetary constraints. However the current proposals lack details on how CEDA will approach self-funding using these mechanisms and/or a portfolio approach to balance risk and return.

- ✓ **Public/private participation structures for CEDA investments.** The DOE Financial Institutions Partnership Program (FIPP) is a public/private collaboration between DOE and private lenders to expedite the 1705 Loan Guarantee Program. While the expectation was for DOE to rely heavily on lenders to expedite the diligence process, the program to date has failed to attract many applicants. Current CEDA proposals also reflect an expectation that CEDA will operate in partnership with the private sector. However, absent are details on structures which would enable CEDA to leverage private sector investor expertise while avoiding the failures of the DOE Loan Guarantee Programs.
- ✓ **Interaction with DOE Loan Guarantee Program.** It is unclear how CEDA, if enacted, would interact with the DOE Loan Guarantee Program and its earmarked funds. While the Senate proposal calls for the outstanding funds of the Loan Guarantee Program to be deposited into the Clean Energy Investment Fund (CEDA's revolving fund) the other proposals do not address this procedural challenge.
- ✓ **Hiring and compensation language in the legislation.** The DOE is resource-constrained and has lacked the needed expertise—both financial and technical—to adequately execute its review and approval process for the Loan Guarantee Program. All CEDA proposals attempt to address hiring and compensation for CEDA staff outside typical government processes. However, there still may not be sufficient flexibility around hiring and compensation to adequately address critical staffing and implementation challenges which have plagued the DOE Loan Guarantee Program.

³⁴ DOE's solicitation issued on July 29, 2009 permits 1703 applicants the option to apply through the 1705 program. 1705 applicants are not required to pay the credit subsidy cost of a loan guarantee.

APPENDIX A: Select examples of potential CEDA products

Product	Description	Target tech/ projects	Benefits	Drawbacks/Challenges
CEDA public/private equity fund	✓ Private sector equity funds with market returns underwritten by capped government returns ✓ CEDA awards private funds public capital on a competitive basis	✓ Innovative technologies only	✓ Investors (public and private) invest at the corporate level. Royalties/warranties/equity allow for upside beyond infrastructure returns ✓ Efficient use of private sector know-how and investor expertise	✓ Mission drift: private investors will seek the highest return. This bias could concentrate investments in certain technologies, regions or in later investment stages ✓ Crowd out private equity capital if investments are made in proven technologies ✓ GP reverse selection problem ✓ Cost
CEDA Loan Guarantees/loan fund	✓ Private sector debt funds with market returns underwritten by govt guarantees, 1st loss ✓ CEDA awards projects/companies public sector loans/loan guarantees competitively	✓ Mature technologies ✓ Innovative technologies (some cases)	✓ New CEDA administration without the bureaucratic challenges could streamline process and tailor loan products to specific technology solutions efficiently ✓ CEDA staff with sophisticated finance/technology skill sets will have capabilities to structure and administer appropriate products	✓ Potential for crowding out private debt capital; only would be appropriate when debt capital is scarce/insufficient ✓ Lessons learned from 1703/1705: - o 20% 1st loss unappealing to lenders - o Long lead times for evaluation and approval? (Authority vis a vis OMB?) - o How do you improve the loan guarantee evaluation and decision-making process?
Subordinated loans /loan fund	✓ Provide direct mezzanine loans to projects to fill gap between debt and equity	✓ Innovative technologies (some cases)	✓ Mezzanine debt provides a larger cushion for equity investors; incentivizes equity investment in projects that lack significant senior debt leverage ✓ Lowers the cost of financing	✓ Would need to create specific underwriting standards for specific technologies based on underlying risk of each technology ✓ Provides for substantial equity cushion to mitigate federal government exposure to first loss ✓ Provides additional capital cushion for senior lenders who are exceptionally risk adverse
Efficacy insurance	✓ Targeted risk mitigation: protects against a technology that underperforms; nuclear industry provides model	✓ Innovative technologies	✓ Underwrites private sector commercialization risk, thereby solving the equity gap ✓ Risks could be bundled across technologies/projects and securitized	✓ Hard to scale such a product at this point ✓ Could involve high government cost; fee structure would need priced appropriately in conjunction w/private insurers ✓ Equity may still not invest if other risks viewed as too great

APPENDIX B: Main distinctions of CEDA proposals

Provisions / Issues	21st Century Energy Deployment Act (CEDA) - S.949 Bingaman	Waxman-Markey Clean Energy Deployment Administration (CEDA) (Dingell Amdt)	Green Bank Act H.R. 1698 (Van Hollen Bill)
Summary	Independent administration within DOE tasked with promoting breakthrough energy technologies through a wide range of financing options. Also makes changes to Title XVII to be merged with CEDA under the Clean Energy Investment Fund.	Independent, wholly-owned government corporation tasked with promoting low carbon energy technologies through a wide range of financing options.	Independent, wholly-owned government corporation tasked with stimulating clean energy and efficiency markets with a wide range of financing tools
Sponsors	Jeff Bingaman (NM) Lisa Murkowski	John Dingell (MI) Jay Inslee (WA)	Chris Van Hollen (MD)
Budget Impact	\$10 billion immediate seed investment appropriated from Treasury for establishment of the Clean Energy Investment Fund; expected 10% loss reserve long-term	No immediate (issuance of \$7.5 billion in Green Bonds); expected 10% loss reserve long-term	No immediate (issuance of \$10 billion in Green Bonds); expected \$1-5 billion long term (based on loss reserve)
Sunset	All obligations revert to Secretary of Energy January 1, 2029	Corporation chartered for 20 years from date of enactment	Corporation chartered for 20 years, but existing obligations/functions may continue
Source of Funding	\$10 billion appropriation with supplemental borrowing authority	\$7.5 billion in "Green Bonds" issued by Treasury	\$10 billion in "Green" bonds issued by the Treasury
Technology Focus / Stage Focus	Breakthrough/New Technologies given priority - discretion of Administration via rulemaking	Carbon Reduction technology given priority - discretion of Administration via rulemaking	Any technology for electricity generation, transmission, storage, heating, cooling, industrial process, or manufacturing project as well as any energy efficiency measure with a primary purpose of avoiding, reducing, sequestering greenhouse gases
Structure	Independent administration in DOE, like FERC	Independent, wholly-owned corporation, like the Tennessee Valley Authority	Independent, wholly-owned corporation, like the Tennessee Valley Authority
Governance	Administrator and Board of Directors - subject to Senate confirmation; DOE Secretary, Administrator, and 7 additional members with finance/banking expertise	Board of Directors: 4 appointed by the President and the Secretaries of Energy, Treasury, Interior, and Agriculture	Board of Directors: 4 appointed by the President and the Secretaries of Energy, Treasury, Interior, and Agriculture
Oversight	Comptroller General and independent audits	Comptroller General and independent audits	Self-regulated Board
Federal Credit Reporting Act	Exempt from Section 504(b) of FCRA	Subject to FCRA	
Portfolio Limitations	Based on risk assessment	No more than 30% of funds available for any one technology	At discretion of corporation
Loan Loss Reserve	Suggested target of 10%, subject to administrator	Suggested target of 10%, subject to administrator	At discretion of corporation
Federal Cost Share	Not specified	Limited to 80% of total project cost	At discretion of corporation
Non-Cash Fees	Allowed; Profit sharing, contingent interest	Allowed; Profit sharing, contingent interest	At discretion of corporation
Transparency of Projects	Not specified	Not specified	Required to keep public online database of all financing agreements to inform private markets (except for proprietary info)
Collection of Fees	Deposited in Treasury; Available without further appropriations and across multiple fiscal years	Deposited in Treasury; Available without further appropriations and across multiple fiscal years	Held by Corporation