

Review of 21st Century Technology Deployment Act

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- 1) **Summary.** This paper provides an overview of the structure and incentives in proposals to create a very large new federal funding vehicle, the Clean Energy Deployment Administration, or CEDA. At present, it is an extremely large initiative with inadequate controls on spending and poorly structured incentives. Political economy suggests most of the funds will support large scale conventional energy resources; and may crowd out smaller scale innovation.
 - a) **Comments welcome.** This review is a work-in-process. Comments or corrections are welcome (dkoplow@earthtrack.net).
 - b) **CEDA capitalization much larger than other related energy initiatives.** As shown in the chart at the end of this document, if CEDA is funded at levels commensurate with existing commitments to energy loan guarantees, it will control a pool of capital bigger than the portfolios of OPIC and Eximbank combined; roughly 30x the size of DOE's R&D energy budget; and far larger than other federal agencies involved in energy or even export credit support (see chart at end). Proponents appear to be underestimating the market dislocations, control problems, and taxpayer risk exposure from this undertaking.
 - c) **CEDA, at least in initial stages, has NO CAP on funding authority.** So long as the arbitrarily-set 10% default risk premium is met through borrower deposits, guarantees even to high risk ventures will be scored at zero until further information on loan performance becomes available some years out. This means that hundreds of billions of dollars of debt could be guaranteed without any further Congressional oversight. Large scale, high risk ventures have enormous pressure to obtain financing commitments early in the process, before negative data on risks becomes available. **This creates very large financial risks in the short- to mid-term.** OMB risk models will eventually be used to refine loss reserve estimates. However, these models are not available for review or critique, and by the time they come into play the country will be locked into loan losses in the many hundreds of billions of dollars.
 - d) **CEDA is funding high risk ventures, not established debt markets. It does not yet have appropriate control structure, though thankfully the most recent version has given taxpayers some stake in successful ventures.** CEDA has more in common with entrepreneurial finance ventures than with banks. However, its compensation structure and levels, and incentive alignments are inappropriately structured to properly vet and manage the high investment risks it is taking on. Inadequate controls and incentives increase the risk of capital misallocation and project failure. A positive change in the most recent version at

- least gives CEDA the ability to retain "other valuable contingent interest" as compensation for its high risk investment.
- e) **Current language does not ensure adequate diversification.** Authorizing language provides no restrictions on portfolio concentration by deal size, technology, geographic location, or borrower. These types of restrictions are common in venture capital (VC) and private equity funds to protect investors (in this case the taxpayer) against overly concentrated risks. Their absence increases taxpayer risk of loss and the likely market bias from politically-directed funding to a handful of sectors.
 - f) **CEDA is subject to FCRA requirements to fund credit subsidy costs in future years. This requirement will not mitigate financial risks in the short- and mid-term; residual liability will fall on the taxpayer rather than the recipient industry.** CEDA projects are "hard-wired" with a 10% initial default rate for the early funding decisions. While these are to be adjusted experientially, the initial push to obtain guarantees will be immense. Subsequent shortfalls must be made up by Congress.
 - g) **Greatest leverage point to achieve appropriate venture scope and structure is prior to funding.** Regardless of the energy goals supporters of CEDA may have, or the level of authorized initial funding, it is critical to establish a sound structure for the initiative now. That structure does not exist in present forms of the legislation.
 - h) **CEDA risk profile likely to be far more concentrated than conventional banks, increasing potential problems with systemic risks and corruption.** The multi-billion dollar scale of centralized energy technologies suggest the size of the credit commitments for individual projects under CEDA will be far larger than undertaken in other areas of federal credit guarantees. This opens the initiative to higher systemic risks and potential corruption.
 - i) **Focus on technology funding ignores other equally important elements of structural transformation in energy markets.** The organizational structure of CEDA is focused on a technology-as-the solution model. It does not address other key attributes needed for innovation to lead to successful market transformations, such as market structure and business model. A scalable energy innovation requires all three.
 - j) **Market niche of CEDA versus other public and private funding vehicles already in existence is not clearly defined.** Although the authorizing language stipulates CEDA will work in concert with existing financing options, exactly how this would work, what specific gaps CEDA will fill (and why they exist), and whether a large scale, government-run lending enterprise is the best way to fill that gap all remain largely unanswered.

2) How big is the fund to be overseen by the Clean Energy Deployment Administration (CEDA)?

- a) The bill mentions four sources of funding: existing Title XVII authorizations, new authorizations under this statute, subsequent authorizations by future Congresses, and an vaguely defined set of funds that seem to flow to CEDA should it take on deployment and oversight for funding programs in other parts of DOE or other agencies. **However, key staff involved with the bill acknowledge that so long as industry pays in its cost subsidy, there is no cap on the magnitude of guarantees that can be written.**
- b) Title XVII authorizations (Section 8).
 - i) Amount unclear. Is it the \$47b in original authorizations? The additional \$4 billion added in a supplemental CR or Omnibus? Including the \$6b (to fund \$60 billion in LG) added in section 1705 of the stimulus bill, bringing the total to \$111 billion? Consensus seems to be with the largest number.
 - (1) Functions must be transferred within 18 months.
 - (2) There is no discussion whether the original allocations across fuels would hold, though language suggesting original contracts would be honored in any change indicates DOE has control over this feature. Any awards made prior to transfer would carry forward.
 - ii) This level of funding is dramatically bigger than other federal initiatives in energy or credit support.
- c) Additional appropriations per CEDA Act, with initial funding in addition to Title XVII authorizations (sec. 8(a)(6)) set at \$10 billion.
- d) Supplemental appropriations at the discretion of Congress. However, funds needed to carry out the Act, such as to make due on credit shortfalls, do not appear discretionary. Section 8(a)(7) notes that "In addition to funds made available by paragraphs (1) through (6), there are authorized to be appropriated to the Fund such sums as are necessary to carry out this Act."
- e) Secretary of Energy can also authorize CEDA to handle financing for "grant, loan, and other credit enhancement programs authorized under any other provision of law." (Section 7(b)). Assumedly this enables CEDA to handle not only other DOE programs, but programs outside of DOE as well. In any case, it would further increase the funding base of the CEDA.
- f) CEDA runs through January 1, 2029.

3) Cost of operations

- a) Fees capped at 1.5% of revolving fund amount.
 - i) \$1.5 billion/year for a \$100 billion fund? \$750m/year for Title XVII plus Omnibus funding. Is this reasonable a fund this scale? For a provider of debt funding only, with no apparent day-to-day involvement with portfolio companies? What benchmarks have they used to arrive at this figure?
- b) 20 key staff at maximum salaries (see below) of \$227k/year is only \$4.5 million, equivalent to 0.3% of the potentially collected fees.
- c) Flexibility in fee setting is unclear. Despite caps, CEDA (Section 8(c)(1)) is given the authority to collect fees "in accordance with commercial rates."

- (1) What market? Conventional banks making conventional loans? Junk bonds and sub-prime mortgages? If fees are set commensurate with those types of risks, will political pressure force CEDA to reverse course, increasing an already big adverse selection problem?
 - (2) What are appropriate fees if we view CEDA through an entrepreneurial finance rather than a conventional bank framework? 15% average IRR on private equity portfolios is the normal goal, though the targets for each deal (before failures bring down the average) are much higher. If there are no private lenders meeting this niche (the justification for CEDA), how will "commercial rates" fees be set?
 - (3) Note that the fee guidance (Section (c)(3)) focuses not on the risk level of the project or cost of administration, but on the impact of fees on the "development of the technology."
- d) Loss ratios of 10% to start, adjusted annually (Section 7(a)(1)(C)(ii)). Actual loss rates will likely be higher.

4) Who makes the decisions on what to fund?

- a) Bill gives CEDA extremely wide latitude in what to fund, including giving them authority to buy up existing debt instruments from other parties and to add objectives to their mission.
 - i) Normally, these types of arrangements generate allocations that are unfortunately driven more by political power than by economic need. They also result in big shifts of focus as appointees from one administration are replaced by new ones from another.
 - ii) Staff compensation regimes can help push back against these pressures. However, with CEDA managers and staff have no financial interest in deal success and short tenures in their jobs. **This mix seems at great risk of political influence or corruption.**
 - iii) Risks are not limited to potential bias in funding decisions, but to purchase of existing debt and to co-funding partners as well.
- b) How do they hear about deals?
 - i) Borrowers submit applications, which must be reviewed within 180 days if practicable (Section 4(k)).
- c) How do they evaluate them?
 - i) General guidelines on objectives of the program contained in the bill.
 - ii) Reviews assumedly done by staff, but little information in the bill on how this process would work. The Energy Technology Advisory Council will develop and publish evaluative criteria to be used. The Council will also provide opinions on the useful direction of investment.
 - iii) Since all key staff and advisory boards are directly or indirectly appointed by the President, presidential priorities will likely influence the direction of CEDA as well. This influence will be counteracted to some degree by staggered terms that are longer than presidential term of office, resulting in appointees from more than one administration.

5) What is the oversight on those decisions?

- a) No detail provided on internal process for vetting, reviewing, and challenging funding decisions, funding structure or pricing, or funding partners. The program seems at high risk for corruption given the lack of transparency and large sums involved.
- b) Initial loss ratios are set by statute at 10%. This is likely to be too low, but will expose taxpayers to large financial risks during the initial rounds of funding.
- c) Subsequent loss rates will be experientially based using OMB modeling. The assumptions and methods of OMB's approach are not public, despite the very large taxpayer exposure under the program.
- d) CEDA is exempt from FCRA (2 USC 661c(b)). This allows new credit authorizations to be made without any appropriation by Congress or the project sponsor for expected costs of the commitment. This exemption is premised on the basis that the appropriated amount would come from the capitalization funding of CEDA and no appropriation would be needed.
 - i) The approach removes Congressional oversight at the deal-specific level, moving review to CEDA management.
 - ii) If subsequent losses eroded CEDA's capital base, incremental funding for new commitments would require Congressional approval. However, funding to cover higher losses on existing commitments would be mandatory.
- e) CEDA operates as a revolving fund, so does not require ongoing appropriations unless it needs recapitalizations.
- f) CEDA will be run from within the Department of Energy, so does not avoid the conflicts of interest inherent in that Department already.
 - i) It does appear to be under the purview of the Inspector General Act.
 - ii) It is not subject to reorganization by the Secretary of Energy, reducing that venue of potential politicization.
- g) While advisors and staff can be removed, no clear process for challenging decisions is laid out.
- h) Incentive alignment between decision makers for funding and the outcome of the funding decisions is non-existent or poor.**

6) Organizational structure

- a) **Administrator** serving a 5-year term
 - i) Serves as head of CEDA and Chairman of CEDA board.
 - ii) Separate from Secretary of Energy
 - iii) Appointed by the President, though requires Senate approval.
 - iv) Pay scale: level II of Exec. Schedule -- \$177,000 for 2009. Extremely low pay compared to somebody in private sector overseeing deployment and management of \$50 billion or more in assets.
 - v) Responsibilities are all fairly general: do a good job, invest in useful things, be a good fiduciary.
- b) **CEDA board of Directors** - 9 members total

- i) Part-time position, with daily rate of compensation based on level III of Exec Schedule (\$162,900/year in 2009). Daily rate, assuming 10 vacation days/year, would be \$162,900/250, or \$652/day, or roughly \$80/hour. With 4 meetings per year, plus travel, compensation package for serving will be less than \$5,000/year before taxes. The economics will work against getting top talent, unless there are other (perhaps business) interests in the association.
 - ii) Secretary of Energy (or designee) is a voting member (appointed by the President).
 - iii) Administrator (Chairman), also appointed by the President.
 - iv) 7 additional members, **also appointed by the President** (though perhaps with Senate Consent). **This is a political board, not a technocratic one. It is not aligned to the interests of the Administration via financial compensation or equity in the organization either.**
 - v) Skill set: banking or financial services, including development of energy, electricity, transport, or manufacturing sector jobs. **While this may allow for somebody with entrepreneurial finance experience, it is very possible that the board will have no such skills -- pulling instead from larger scale, more conventional project finance areas and banks.**
 - vi) Roles: general oversight of managerial and strategic direction of CEDA.
- c) **CEDA Energy Technology Advisory Board** - 8 members total.
- i) 5 year staggered terms; can be reappointed.
 - ii) Compensation
 - (1) Zero, if a federal employee -- doesn't seem even to allow incremental top-up if job is at a lower pay scale.
 - (2) Part-time position with daily rate of compensation based on Level IV of the Executive Schedule (\$153,200/year in 2009). This amounts to roughly \$612/day or \$77/hour. Again, this will not attract top talent unless they have a strong ideological commitment to the venture, already work for the government and are assigned to go, or have other commercial interests in the business of the Board and CEDA.
 - (3) Board members appear to have no direct financial alignment with the success or failure of the CEDA venture.
 - iii) 5 members appointed by Secretary (who, in turn, serves at the discretion of the President).
 - iv) 3 members selected by the Board of Directors (which was appointed entirely by the President).
 - v) Skill set: scientific and technology research. **There is nobody on this list that has skills related to the other two key factors of successful innovation (per work of Clay Christensen and Innosight): market structure and business model.**
- d) **CEDA Staff**

- i) CEDA administrator has power to hire own staff, subject to standard requirements about hiring on merit rather than other factors. This authority seems to last only for two years. **What happens then?**
 - ii) Key staff can be paid at levels above government guidelines. No more than 20 staff can be paid in such a manner, and terms must be less than 4 years.
 - (1) Maximum pay "may not exceed the highest total compensation payable at the rate determined under USC 104 of title 3," i.e., the salary of the Vice President (\$227,300 for 2009). **Again, this is far less than what people in the private sector involved with these issues earn.** The potential result will be high paid talent arrayed outside of CEDA to influence funding decisions, not inside to vet those decisions and allocate the funding.
 - (2) Assumedly, these pay scales will be public, and create dissension and friction for staff earning them.
 - (3) In standard VC, few deals are expected to mature within the 4 year period noted as the maximum service term for key staff.
 - (a) There will be staff churn.
 - (b) Key staff will by definition have little financial stake in the outcome of their decisions.
 - (c) Because funding and performance periods will not occur under the same staff, reputational effects from bad decisions will be muted as well.
 - iii) No guidance on appropriate staff numbers or ongoing roles subsequent to funding decisions.
- 7) Structure of funding (sec. 7)**
- a) CEDA has authority to issue a variety of **debt instruments only**.
 - b) **Returns to new venture finance usually come through equity, not debt. High risk projects normally have much higher levels of equity, not of debt, to better control cash drains and weather uncertain events. Equity also provides greater incentive alignment with the long-term success of the venture, and allows participation in upside.**
 - i) The CEDA capital structure seems poorly formulated for the mission it plans to serve.
 - ii) However, recent versions of the bill have expanded the ability to participate in more complicated risk sharing approaches including "profit participation, contingent fees, and other valuable contingent interests.." (Section 8(c)(4)).
 - (1) This is a positive change, as it gives the taxpayers a stake in the upside of successful ventures, rather than just repayment of debt.
 - (2) However, additional clarity on appropriate return targets and formats (does "other valuable contingent interests" include equity?) is needed.
 - c) On the positive side, CEDA can participate in a syndicate of other lenders. If structured properly, this can help spread the due diligence responsibility across more parties than just CEDA. CEDA should have senior or at least pari passu positions on defaults.

- d) CEDA sets up a loan loss reserve to offset technology risk. Loss reserves are reviewed annually.
 - i) **Unlike Title XVII, this loss reserve appears (at least initially) to be funded by taxpayers, not project sponsors or beneficiaries. In addition, the loss reserve seems to be a pooled instrument rather than project-specific. If so, this would mask important information on which of the projects are expected to be highest risk.**
 - ii) The initial loss reserve is set at 10%, the "low risk" investments noted by Secretary Chu.
 - (1) Default rates in venture capital are often 30% or above, even with much better incentive alignment.
 - (2) CEDA is being justified on the grounds that VC funding is insufficient to meet the needs they are serving, but that the deals they reject have merit for the country. This likely means these residual deals are also higher risk than the ones the VCs do fund. They would therefore be expected to have higher default rates than VC, not lower.
- e) **Size, mix of funding commitments**
 - i) There are general guidelines that the funding commitments should be mixed across technologies and stipulated end goals of CEDA. (sec. 7(a)(1)(C)(iii)). However, there are no binding structural caps or constraints, as would be common in venture capital and private equity funds to force diversification.
 - ii) A numerical constraint in the House version of the bill (limiting a single technology to no more than 20% of the total pool) was removed in markup. Even a 20% target could still be high relative to normal portfolio risk management objectives.
 - iii) There do not seem to be restrictions on funding foreign operations or firms.
 - iv) There are no guidelines forcing diversification in the expected risk profile of funded projects or their anticipated time until fruition.
 - v) There are no guidelines for the minimum number of technologies or sectors that must be funded.
 - vi) There are no guidelines stipulating maximum commitments allowed within particular geographic areas (including Congressional Districts) or borrowers (to ensure a single firm doesn't have multiple commitments boosting it to a high share of total commitments).
- f) Additional funding requirements.
 - i) *Environmental.* Projects should not duplicate environmental reviews, but do seem to have to conduct some form of environmental impact assessment.
 - ii) *Labor.* CEDA-funded projects must abide by prevailing wage laws on all construction work financed **in whole or part** by CEDA. **This rule, if enforced, will make it extremely difficult for smaller projects, or fragmented work tasks (such as DSM might be) to be funded through CEDA. Getting funding partners may also be more difficult or more expensive, especially if the provision opens funders to litigation risk. One concern is that the constraint will inadvertently bias the projects selected**

towards larger scale generation technologies, likely the exact opposite of what should be done.

8) Interactions with other funders

- a) CEDA is advocated as acting "through partnership with and support of the private capital market."
 - i) The bill further states that funding be directed to projects "for which, as determined by the Administrator, insufficient commercial lending is available to allow for widespread deployment." (Section 3(5)(b)).
 - ii) **Proponents should provide more resolution to support these claims. Information should include more specificity on the gaps in existing instruments and how CEDA will fill gaps rather than conflict with existing structures.**
 - iii) **For market segments determined to contain "insufficient commercial lending," proponents should provide information on whether the problem is linked to deal structure (i.e., you need to use equity finance, not debt); risk (in which case an evaluation on whether alternative energy solutions would better serve the public); or poor public policy (e.g., there are no constraints on carbon, so investments in carbon-reduction strategies are uneconomic).**
- b) **CEDA appears to be in potential conflict with existing financial approaches.**
 - i) CEDA will enter the entrepreneurial finance space with more money, a poorer incentive structure, and cheaper finance instruments than presently exists in venture capital markets. Under some funding scenarios (see chart) the energy lending will be more than 3x the size of US venture capital market (the world's largest) lending to all sectors in a peak year.
 - ii) The competitive advantage of the government-supported fund will be further enhanced by the ability to issue tax-exempt securities to finance this debt. This authority is **apparently exempt from standard limits on private activity bonds**, since there are no limitations noted in the bill, but most recipients will be private activity bond categories, or fully private interest, private activity endeavors.
 - iii) The conflict with banks may be less severe, since CEDA can be a co-funder.
 - iv) However, the interaction with existing equity funders of high risk ventures is not clear. Will they be displaced? Will they provide equity investments in the same deals? Since many VC business plans must be modified mid-course, will the requirements and bureaucracy of CEDA preclude conventional models of venture finance from working on the same deals with a CEDA-funded project?
- c) Given that the federal government has a poor history of properly targeting funding in energy innovation, will large scale but not particularly well-deployed capital actually destroy market niches that could otherwise grow in the private sector? A good example would be heavy funding to large scale centralized generation technologies with low variable costs (such as nuclear). The new capacity could create a supply overhang, especially should capital recovery requirements drive

firms into bankruptcy (after which much of the invested capital would be written off, as happened already in this sector). Competing technologies would be forced to compete on a full cost basis against the variable cost of subsidized baseload power.

9) Incentive structure

a) Compensation of employees

- i) Compensation to all staff appears to come in the form of wages only.
- ii) Terms of some key staff are restricted to a time period shorter than normal venture lifecycles.
- iii) Compensation levels, while somewhat what more flexible than standard civil service pay scales, are well below salaries earned by people in private financial services.
 - (1) This suggests the best talent will be outside of CEDA aiming to influence the direction of its pool of subsidized lending, rather than inside helping to make good energy investments and financial management decisions for the country.
 - (2) It also suggests that the flow of employees from inside CEDA to private parties working with CEDA will be robust, further weakening the ability of CEDA to operate as a prudent, independent fiscal agent of the taxpayer.

b) Alignment of interests of funders with project performance

- i) Advisory boards mostly linked back to the President. Jobs are part-time, and compensation levels below private industry levels for such a large and complicated undertaking. Staffing criteria are technology-focused; less emphasis on the business model, scalability, and deployment side of things.
- ii) CEDA employees appear to see no direct financial impact from either positive or negative fund performance.
- iii) While the fund itself has an option to participate in profits, this option is not well defined and does not seem to provide benefits to the key decision makers on capital deployment.
- iv) Staff tenures of key staff are expected to be shorter than the project gestation life, fragmenting managerial responsibility for bad decisions and credit for good ones. This reduces the ability of reputational risk to constrain poor decision making.
- v) There is no mention of CEDA staff involvement with operational, strategic, or managerial aspects of funded companies. This is a central value provided by conventional venture capital firms.
- vi) There is no mention of CEDA staff involvement on the Boards of funded companies, again a common feature of entrepreneurial finance.
- vii) While the CEDA bill may allow multiple funding tranches to recipient firms, this is not discussed at all. Funding rounds provide opportunities for mid-course corrections, redeployment, and restructuring in conventional venture finance and are an important risk control method for the lender.

- c) Risk sharing and control, downside**
 - i) No information on recourse or hierarchy in the case of bankruptcy is provided.
 - ii) As a debt provider, government claims are ostensibly more senior to external equity providers. However, claims hierarchy for co-funded projects are not specified.
 - iii) Default risk allowances do not seem project-specific and allowances are too low for likely loss ratios. Unlike Title XVII, these allowances appear to be taxpayer-funded, not funded by the project sponsor.
 - iv) Fee charges to borrowers appear constrained by impact on technology viability rather than anticipated project risk.
 - v) Key decision makers on deal flow bear no financial risk (other than possible job loss) from poor decisions or higher-than-expected loss rates.

- d) Risk sharing, upside**
 - i) Some possibility for profit participation at the CEDA level, but no information on how this would work.
 - ii) No ability for equity participation is mentioned.
 - iii) Bulk of support appears to be in the form of debt. While there may be potential upside participation via contingent fees or "other valuable contingent interests," this area of participation needs to be clarified.
 - iv) Whatever upside participation is available at the fund level only, and provides no financial incentives to staff.

- e) Funding form & phases**
 - i) All debt, no tranches noted.

- f) What role of funders in business operations, managerial guidance?**
 - i) None specified.
 - ii) No board seats specified.

Scale of Energy Initiatives are Massive: Replaying Fannie Mae?

