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Could Renewable Energy be a Key Driver for Economic Recovery from the COVID-19 Shutdown?

Financing the Economic Recovery (Article #3)

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Introduction

This third essay in the series on Energy Policy will focus on portions of the report from the House Select Committee on the Climate Crisis. Commissioned by Speaker Pelosi in January 2019, the bipartisan committee conducted a significant number of interviews and hearings on the topic and published its findings on June 30, 2020, after a brief delay due to the Covid-19 pandemic. (1) Chaired by Representative Kathy Castor (D-FL), the committee's report reflects a Democratic-led response to current polling showing that "70% of voters support legislation targeting a 100% clean economy." (2)

In the report, the majority staff for the Select Committee lays out a framework for comprehensive congressional action to satisfy the scientific imperative to reduce carbon pollution as quickly and aggressively as possible, make communities more resilient to the impacts of climate change, and build a durable and equitable clean energy economy. To succeed, the majority report argues, Congress needs to put people and communities at the center of climate policy so they can see and experience the tangible benefits of climate action for their health and livelihoods. (3) An independent analysis of a subset of the committee's recommendations indicates the U.S. could reach net zero carbon dioxide emissions before 2050 and cut greenhouse gas emissions by 88% from 2010 levels provided key components of the report are implemented. (4)

The Climate Crisis Action Plan establishes a goal of reaching net-zero greenhouse gas emissions economy-wide in the United States by no later than 2050; directs the president to set ambitious interim targets to meet or exceed that goal; and calls for achieving net-negative greenhouse gas emissions during the second half of the century.

The minority members did not publish an ancillary report but did issue a press release on June 30, 2020 recognizing the difficulties in obtaining formal committee markup due to the Covid-19

pandemic. The press release also calls for continued U.S. global leadership in fossil energy policy, recognizing the difficulty in obtaining corresponding gains over foreign competitors, especially China. Finally, the press release reiterates the argument that advances in natural gas production have already led to substantial reductions in emissions in this decade. (5)

The report itself is organized around 12 Pillars as listed below, with specific sub-topics within each pillar and then individual "Building Blocks" providing information gathered on the topic and presenting existing, proposed, or potential legislation that might lead to the anticipated outcomes. The Twelve Pillars are:

Pillar 1: Invest in Infrastructure to Build a Just, Equitable, and Resilient Clean Energy Economy

Pillar 2: Drive Innovation and Deployment of Clean Energy and Deep Decarbonization Technologies

Pillar 3: Transform U.S. Industry and Expand Domestic Manufacturing of Clean Energy and Zero-Emission Technologies

Pillar 4: Break Down Barriers for Clean Energy Technologies

Pillar 5: Invest in America's Workers and Build a Fairer Economy

Pillar 6: Invest in Disproportionately Exposed Communities to Cut Pollution and Advance Environmental Justice

Pillar 7: Improve Public Health and Manage Climate Risks to Health Infrastructure

Pillar 8: Invest in American Agriculture for Climate Solutions

Pillar 9: Make U.S. Communities More Resilient to the Impacts of Climate Change

Pillar 10: Protect and Restore America's Lands, Waters, Ocean, and Wildlife

Pillar 11: Confront Climate Risks to America's National Security and Restore America's Leadership on the International Stage

Pillar 12: Strengthen America's Core Institutions to Facilitate Climate Action

For purposes of this essay, we will focus on Pillars 2 and 3 with a concentrated focus on policies and programs that might have the greatest impact on the industrial states of the Northeast and Midwest portions of the U.S. As the report acknowledges, "Different regions around the country have variable energy supply and demand, requiring different solutions to transition to a clean energy economy. The development and demonstration stages of the innovation process also often occur at the regional level and rely on regional innovation ecosystems to facilitate commercialization." (6) The Covid-19 response in the Northeast, for example, has led to regional collaboration, and the same level of cooperation could be developed for renewable energy deployment. Other existing regional cooperative bodies, such as the NY/NJ Port Authority are also feasible especially for projects and technologies that need a large deployment platform. "The partnerships could help incentivize states, regions, academic institutions, and businesses to organize and address a specific targeted clean energy technology and market

intersection." (7) This approach is well articulated in the bipartisan, bicameral ***Endless Frontier Act***,, Introduced by, U.S. Senator Todd Young (R-Ind.), Senate Democratic Leader Chuck Schumer (D-N.Y.), Congressman Ro Khanna (D-Calif.), and Congressman Mike Gallagher (R-Wis.). This initiative seeks to "solidify the United States' leadership in scientific and technological innovation through increased investments in the discovery, creation, and commercialization of technology fields of the future. The bipartisan legislation further targets support to ensure new research investments translate into new American companies, manufacturing and high-tech jobs, and opportunities for regions across the country to become global centers of emerging technology industries." (8) The Northeast and Midwest area contains a significant number of excellent universities, a 150-year history of manufacturing to scale, a highly trained workforce, and a well-educated consumer population, which puts the region in a great position to benefit from this type of stimulus. Cities like Pittsburgh, Toledo, Rochester, Worcester, and Syracuse, for example, can already serve as models as to how to bring these disparate entities together for positive advances in renewable energy deployment.

Pillar 3: Transform U.S. Industry and Expand Domestic Manufacturing of Clean Energy and Zero-Emission Technologies

In general, the recommendations articulated in the sub-topics of this Pillar are well explained and achievable. Certainly, pursuing the adoption of the recommended "Building Blocks" such as additional funding for ARPA-E, increased utilization of the capabilities and expertise of the National Labs, and increased collaboration with technology incubators and accelerators are excellent objectives. In particular, the suggestion to refocus the mission of the Department of Energy is key in achieving a carbon-free environment is essential. The reports makes little mention, however, of the continued use of the U.S. supply of natural gas as a transition fuel for power production and an increased focus on nuclear energy. Instructions from Congress and the Administration to the Nuclear Regulatory Commission to accelerate approval of technologies used in small and medium reactors (SMRs) is essential. The significant costs of constructing the older style, large nuclear power facilities have become cost prohibitive as is demonstrated by the continued cost increases incurred by the Georgia Power-led Vogtle nuclear project.

One sub-topic of Pillar 2 encourages Congress and the Administration to address the financing tools available for the Deployment aspect of the RDD&D (Research, Development, Demonstration and Deployment) theme emphasized in Pillar 3.

Pillar 2 Sub-topic: Enable and Accelerate Financing for Climate Change Mitigation and Climate-Resilient Infrastructure

This sub-topic recommends "Building Blocks" such as:

- Creating a National Climate Bank or Green Bank,
- Reforming the Department of Energy's Loan Guarantee Program,
- Expanding the ability of Publicly Traded Partnerships to invest in Renewable Energy projects
- Provide similar incentives for Private Activity Bonds, and

- Provide support to municipalities (and we assume states and counties) through cash flow enhancement so they can address local climate change issues.

While all of these building blocks are worth considering, it would also be worthwhile for the Select Committee or related committees in both chambers to address the **deployment objectives** they are endeavoring to support. From this writer's perspective, those objectives are at least:

- Deployment of large scale new or unproven technologies in projects with multi hundreds of megawatt outputs requiring long tenors and project financing structures. This could include nation or regionwide hydrogen delivery systems or a grid of electric charging stations for example. (A Major Project Finance Lender)
- Introduction of smaller projects with outputs of 100 megawatts or less of new or proven technologies and distinct local or regional impact. (A Small and Medium Project Finance Lender)
- Community oriented programs addressing residential and local commercial/industrial sites and providing financing for building energy efficiency retrofits, rooftop solar (or wind where resources allow), appliance replacement and local auto and vehicle recharging stations, etc. (A Network of Green Banks is the classic definition of these entities)
- Manufacturing finance for expansion of existing technologies or start-up financing for new technologies. (A Manufacturing and Technology Lender)

Think of these 4 areas as the respective lending offices of the "energy department" of the Big Government Bank, which also has departments lending to the agriculture, housing, transport and select raw material extraction sectors. Each of these 4 areas would require special skill sets, many of which already exist at the Federal Government or State level and in certain situations at the community level.

<u>Major Project Finance Lender</u>

As the Climate Crisis report correctly points out, the DOE's Loan Guarantee Title XVII program provided Project Finance Loans to the first 5 large scale solar projects, which was followed by another 45 projects financed by the private sector after the DOE proved that these projects could support well structured finance packages. This was accomplished despite several constraints on the program, including:

- The inability to charge a spread over the cost of funding which would have reduced the amount of "subsidy" required under the Federal Credit Reform Act, thus requiring a large upfront payment of monies to the DOE or appropriation of subsidy from Congress to the program.
- A financial environment in which the natural lending partners to the DOE, the large money center banks, were under severe capital constraints due to the fallout from the Great Recession.

- Overly severe credit standards largely imposed on the program by the Office of Management and Budget which often resulted in extremely high fees paid by project developers for technology and process verification.
- Generally weak innovative 1703 (innovative technology) applicants although this was rectified when the American Reinvestment and Recovery Act (ARRA) created Section 1705 to Title XVII in 2009 allowing DOE financing for proven technologies and addressing the appropriation of credit subsidy mentioned above.

Properly reimagined the DOE's Title XVII program could be a "proof of concept" lender for those Large Project Finance Transactions such as technologies important to the Northeast and Great Lakes states, like offshore wind or installation of SMR nuclear facilities (at military bases for starters). Other large-scale projects using both innovative and proven technologies could also be routed through this entity. It has a proven track record in completing financing to these large projects and has established relationships with the large commercial banks that could be co-lending partners, using partial guarantees for example. High expectations of partnering from the commercial banks in the near term might be misplaced in the short term however, as they will likely experience significant losses and necessary increases to their loan loss reserves because of the economic slowdown.

Small and Medium Project Finance Lender

Financing of small and medium renewable energy projects on a regional, state, or local scale requires a different mix of players than large scale project finance. Projects are likely to be smaller scale, although projects up to 100 MW could be included. Examples include 5 to 10 MW, on average, solar farms, smaller onshore wind projects and small methane recapture projects perhaps. While structures, especially loan tenor, will be similar to large scale project finance, these projects will benefit from more local involvement and local lending partners. The "Small and Medium Project Finance Lender" would best be structured as a guarantor rather than a direct lender, and it would delegate loan administration to more local entities, reserving auditing and oversight authority. These local lenders could be regional banks, state sponsored lending entities, or cooperative banks. The need for local involvement is based on the observation that these smaller projects need a more nuanced look at the project, quicker reaction time to addressing problems or the need for adjustments to loan terms as difficulties arise, and similar benefits. The DOE loan program office explored the universe of state and local lending entities and found at least 25 programs that had sufficient experience in lending and well-funded programs that could serve as the lead, or at least fulfill the loan administration function for loans to small and medium size projects. Some examples are the Port Authorities in Ohio which have lending authority and in a few cases were initial lenders to new technologies such as solar panel providers. North Dakota has its own state-owned commercial bank. Most of the states in the Northeast and Midwest have these kinds of programs. Whether the DOE's Loan Guarantee Program should perform an oversight role and co-lender role in working with these state and/or regional entities is a topic for debate, recognizing that the role of direct lender for large projects is different than the role of utilizing delegated authority to provide credit enhancements to small

and medium sized projects.. The alternative is that a new Federal Government entity be established with all the teething problems set up of a new program encounter.

Network of Green Banks

The Green Bank concept focuses on local lending in communities large and small. The committee report states: "Green banks are public or nonprofit finance institutions that deploy clean energy technologies and climate-resilient infrastructure by connecting projects with capital in target markets. They use innovative financing tools and structures to lower the cost of capital and leverage more public and private investment. Furthermore, by enabling more flexible financing for individuals, such as lending based on ability to pay rather than credit scores, green banks help fill a financing gap in underserved communities. As of 2019, 15 state and local green banks operated in the United States, facilitating more than $5 billion of investment from 2011-2019 and leveraging more than $3 of private investment for every $1 of public investment. Green banks are a proven model that could be replicated across the United States to help all communities benefit from the deployment of clean energy technologies and climate-resilient infrastructure."

This is exactly the markets where "Green Banks" should stay focused. As we will be discussing in other sections of this essay, the retrofit of the existing housing stock and the necessity to address energy equality for the most vulnerable residents who occupy a significant percentage of the older housing stock in the country are important energy conservation and social justice goals.

Manufacturing and Technology Lender

Lending to the manufacturing sector is one of the most difficult aspects of commercial lending. All components of a successful manufacturing process must come together, from raw materials and component supply chains, through the manufacturing process itself, introduction of efficiencies and upgrades to the process, and on to sales, distribution and dealing with competition. These types of loans are, in essence, gambles on the ability of management to ensure the process works and that they can do so at a profit, with sufficient cash flow to operate efficiently, expand, provide a return to shareholders, and repay lenders. It takes significant equity and a patient, flexible lending approach, especially for startups. This is particularly true in the renewable energy field, as many of these new manufacturing entities are startups. The solar panel manufacturing field had over 100 firms go bankrupt, close, or become acquired in the period 2009 to 2013, including the infamous Solyndra and Abound Solar, both funded by the DOE's Loan Guarantee Program. Many of these shutdowns were due to price competition from subsidized Chinese firms; and the DOE, for example, had a good case for approaching the WTO citing dumping charges. Some of these technologies are worth looking at again. However, the U.S. has been moving towards more sophisticated and efficient technology recently, such as cadmium telluride (See NE/MWI Senior Fellows blog re Toledo Solar). Today there are 12 U.S. based manufacturing facilities including SunTech, and Toledo Solar in Perrysburg, Ohio as well as SunPower's facility in Oregon acquired from SolarWorld of Germany. The current administration's tariffs on solar panels should

help move more manufacturing to the U.S. The Tesla/Panasonic plant in Buffalo is a good example of the increased production capacity built to, in part, avoid these tariffs.

However, if plans are implemented to significantly increase solar panel production, these manufacturers and new entrants will require significant additional capital, both equity and debt, to achieve the necessary goal of millions of panels for domestic U.S. consumption. Whether the private equity and venture capital sectors will become players in this decade is uncertain given the significant losses they experienced in the previous decade as cited above. This potential reluctance may lead to the necessity for a FUNDCO quasi-equity role for the Federal Government which is discussed below.

The pattern in wind energy is similar although not as dire. The large turbines needed for offshore wind, important for a Northeast or Great Lakes offshore wind strategy, can be produced by GE of Schenectady or Siemens with facilities in Kansas. Other leading large turbine manufacturers tend to be European, and there are numerous smaller turbine manufacturers for supportable onshore projects. Wind turbines can have up to 8,000 components, so development of a robust supply chain manufacturing capability is important in enhancing a U.S. manufacturing base.

The DOE Loan Guarantee Program tried to develop a Manufacturing Lending Partnership Program designed to assist commercial lenders expand their lines of credit and revolver/term loan facilities to existing clients that were seeking to expand their manufacturing capabilities in the renewable energy sector (e.g. inverters, solar racks, wind towers and turbines, etc.). This program never developed as the regional commercial banks, which were the primary potential partners, were cutting commercial exposure at this time due to the Great Recession and significant new capital requirements imposed by the Federal Reserve and regulatory agencies. Whether there will be an appetite for such a partnership going forward is unclear at this point as loan loss reserves, write-offs and commercial failures are likely to accelerate as a result of the current economic slowdown. There is some indication that the private equity business is looking at re-entering this market, given a slowdown in IPOs and technology start-ups. However, it will take some time to assess their willingness to invest going forward. Federal support such as investment tax credits, enhanced tax equity features and grants, and possible federal equity will be important. If a new Manufacturing and Technology Lending Program is created, it should work closely with ARPA-E and the National Labs. It is also suggested that the program be independent from the Project Finance oriented Major and Small and Medium Project Lending programs, as credit standards and loan structures are significantly different for this type of lending than for Project Finance.

There are two additional potential programs or ancillary capabilities that might be addressed as well. These are FINCO and FUNDCO. Both these concepts were explored by the DOE Loan Guarantee Program. FINCO was adopted in part as the program developed, although no projects were funded using this concept.

FINCO

FINCO was focused on distributed energy projects and opportunities. Many of the features were incorporated in a subsequent DOE amendment to the program guidelines that allowed distinct distributed energy projects to be considered for project finance type structures. These could be solar panels for a hotel chain or a major big box retailer, for example. Although the DOE Loan Guarantee Program is tailored for larger distributed projects (Major Project Finance), a FINCO structure that allowed for smaller facilities to small and medium sized developers and installers could have a place in the Small and Medium Project Finance Structure.

FUNDCO

FUNDCO on the other hand recognized that many of the applications for innovative renewable energy technologies, while promising, did not have nor could they readily obtain the development capital needed to construct a working prototype that could demonstrate proof of concept in an operating environment as required by DOE (i.e. 1,000 hrs. run time). The concept was to find a way to allow government funds to complement private equity funds so that promising technologies might be more fully developed and potentially eligible for credit. This would have to be done despite constraints in the Final Rule and from OMB (but not in Title XVII). DOE recognized that a FUNDCO or Equity Supplement Program could not be rolled out immediately and would best be promoted after the "shovel ready" projects and technologies were either funded by the DOE or the renewable energy financing market had matured so that private financing was available (where wind and solar are today) . It was also contemplated that newer technologies, or at least less robustly proven technologies (e.g. waste to energy, energy storage and batteries, and some of the bio-fuels technologies), might be the primary beneficiaries of a FUNDCO type program. It also contemplated working more closely with the Energy Efficiency and Renewable Energy division at DOE, the National Labs, and ultimately ARPA-E, all of which foster more developmental technologies.

FUNDCO was to be modeled after the Overseas Private Investment Corporation's (OPIC, now the U.S International Development Finance Corporation or DFC) and would be directed towards the venture capital market using many of the techniques developed by OPIC to promote the program, although the focus would be on domestic, renewable energy technologies and companies rather than the international focus of OPIC's investment funds. However, common features included the concepts of management loans to newly formed limited partnerships, a managing partner from the venture capital industry with experience in the renewable energy sector, allowing DOE loan proceeds to be combined with equity raised by the managing partner from limited partners, finite investment and loan periods with allowed loan tenor extensions for execution of reasonable exit strategies, use of a "gatekeeper" to evaluate fund manager applicants in specific targeted fund sectors, profit sharing among all partners including the DOE or profits from divestiture or IPO, and other features from the OPIC program. While the FUNDCO program was never implemented at DOE, a variation of the program, which might include direct equity investment authority, could be included in any recasting of the Title XVII program, as a companion program to ARPA-E or on a standalone basis.

Conclusion

It is not the intent of this essay to criticize the findings of the Select Committee on the Climate Crisis in their "Building Block" designed to "Enable and Accelerate Financing for Climate Change Mitigation and Climate-Resilient Infrastructure." Rather, it is to point out that many financing structures and programs already exist and with modest tweaking could be adapted to address Major Project Finance, Small and Medium Project Finance, an effective and not overstretched Green Bank, and robust financing for Technology and Manufacturing Lending. If Congress gets the opportunity to address energy financing structures, it may be well served to consider the different lending approaches needed to achieve success in the different markets and types of renewable energy projects and manufacturers.

The next essay in this series will focus on **Social Equity and Environmental Justice**, themes that pervade the entire report. The essay will look at the report's commitment to achieving environmental justice, particularly in the Northeast Midwest region.

Footnotes**:**

(1) The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America, Majority Report, June 30, 2020
(2) Two Thirds of Americans Think Government Should do More on Climate – Pew Research Center, June 23, 2020, Alec Tyson and Brian Kennedy
(3) The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America, Majority Report, June 30, 2020
(4) Congressional Action Plan Will Decarbonize U.S., Add $8 Trillion in Benefits by 2050, Energy Innovation, June 30, 2020, Megan Marhajan
(5) Republican Climate Crisis – house.gov/news, June 30, 2020
(6) The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America, Majority Report, June 30, 2020
(7) The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America, Majority Report, June 30, 2020
(8) S.3832 - Endless Frontier A**ct,** 116th Congress (2019-2020)
(9) The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America, Majority Report, June 30, 2020
(10) WWW.altenerg.com, Spring 2020 publication