Initial Thoughts: A Clean Energy Investment and Jobs Program

- Objectives include:
  - development and commercialization of clean energy sources
  - reductions in greenhouse gas and other air pollutant emissions
  - creation of immediate and long-term blue and white-collar jobs in the U.S.

- In order to maximize the benefits of each dollar spent in this grant program, these programs should be matched with other incentive tools, such as taxes, fees, loan guarantees, etc. Regulatory changes, such as electricity price decoupling and development of carbon markets, will also greatly improve the efficiency of these grant programs.

- Some would yield immediate results and some would begin yielding substantial results in 5-10 years. Programs that would yield the most immediate job and emissions results include: diesel retrofits, retrofitting buildings for energy efficiency, and some investments in mass transit (e.g. adding additional low-emitting buses to existing mass transit networks).

- Priority should be given to funding projects and mechanisms that encourage significant additional investment by private firms and venture capitalists.

We have broken potential projects into 6 main topic areas:
- Green job training,
- Smart grid
- Transportation
- Energy efficiency and renewables
- Demonstration/development projects
- "Other"

Green Job Training. Without skilled workers, there will be no transition to clean energy. Green jobs include installing clean energy technologies (solar panels, windmills, emission control devices, upgrading the electric grid, insulating homes and offices, etc) and developing new clean energy technologies (nuclear engineers, battery engineers, transportation engineers, smart electricity grid development, etc.)

Develop a Green Job Corps. Like the Peace Corps or the CCC, this corps would train and deploy people to "retrofit the U.S. economy for clean energy." Potential fields include:
- Green Construction & Renovation
- Energy efficiency upgrades & weatherization,
- Alternative energy (on site solar/wind)
- Indoor Air Remediation/Monitoring
- Deconstruction & C&D Recycling
- Building materials reuse centers - Retail

- Green building suppliers - Retail
- Installing Green Building Monitoring Equipment

Expand educational loans**.** While there is a huge amount of interest in environmental problem-solving, many young people choose to go into environmental sciences or policy instead of engineering or other fields whose expertise is required to design clean power plants, car batteries, install boilers, improve the efficiency of oil refineries, etc.

The federal government already offers low-interest educational loans to qualified students. However, we can increase the amount of money offered to students pursuing advanced degrees in mechanical, electrical, environmental engineering; transportation planning, and other desirable fields by increasing loan amounts and providing more favorable loan terms. This could be implemented on an individual basis similar to programs that help doctors and mental health providers who agree to work in pre-determined rural areas for several years after graduation.

Expand education grants. Some individuals are less likely to benefit from better loan terms, either due to age or income, but have skills and experience that are valuable to the energy and environmental fields. Grants could also be targeted to people who live in areas meeting specific levels of unemployment.

Green Building Environmental Education/Job Training Initiative. This would institutionalize green building in high schools and colleges through interactive curriculum and job training program by building on existing green school partnerships. The project could install real-time green building monitoring equipment in public schools (water, energy, indoor air, etc.) and would result in energy and emissions savings, curriculum and expertise development, and hands-on green jobs training.

Complementary policies: investments that spur government and private job creation in the same fields so graduates of training programs have jobs available

2. Smart Grid Development. This is a separate category because the implementation of both energy efficiency measures, clean power technologies, and some transportation projects such as plug-in electric hybrids all require a smart grid.

Fund R&D on necessary technologies. These include electric transmission technologies, grid integration strategies, and grid modernization applications.

Fund transmission construction projects. This includes supporting federal-state efforts to plan for interstate transmission including designation of "renewable energy zones for priority transmission build-out."

Complementary policies: tax policies, appropriate regulations to speed construction, investments that provide confidence products that require this new grid will be available to consumers

3. Transportation. These projects include retrofits for existing diesel fleets, expansion of mass transit, and development of new vehicles, fuels, and related infrastructure.

Expansion of diesel retrofit programs. These are one of the simplest to administer since the technology, program infrastructure, and workforce are all already in place. This would expand current efforts to modernize and upgrade existing diesel engines with modern emission control equipment or to accelerate the replacement of these engines with newer ones. Approximately $50 to $100 billion dollars is necessary to clean up the entire fleet. Even providing a fraction of these funds to facilitate retrofits would result in meaningful environmental improvement and result in jobs in the following sectors: construction and systems installation, manufacturing, equipment dealers and wholesalers and engineering. Program could focus on green ports (reduce truck idling, stationary and off-road diesel engines, and ship engines or otherwise replacing diesel generators); highway diesels, or other off-road diesels.

Expand funding for mass transit. This is both a short-term approach (e.g. adding new buses or bus lines to existing transit programs to increase ridership and reduce vehicle emissions; package of efforts to increase bicycle commuting; etc.) and a longer-term investment into trains, high-speed rail, and other infrastructure-heavy transit projects. California has passed a bond measure to build a high speed rail, but would require significant federal funding to implement the project.

Fund electric car deployment. These programs would serve the dual purpose of guaranteeing a market for electric cars in the US, keeping auto industry jobs, and speeding the market penetration of electric vehicles.

a. *infrastructure development*. An example is the Better Place model developing the infrastructure for battery swap-out and recharging stations. This would allow Detroit auto manufacturers to focus on the electric car development and avoid the "chicken and egg" problem that has hampered efforts to develop new transportation technologies so far. Currently being implemented in several places in Europe; San Francisco and Hawaii are also interested.

b. *subsidize at least a subset of the plug-in electric hybrid cars sold to consumers*. For example, if a Chevy Volt will cost approximately $40,000, and buyers can get subsidies for up to $20,000 of that cost (making them comparable, to say, a Honda Civic or Toyota Prius in price), $15 billion can fund approximately 750,000 Volts (minus some overhead costs for implementation). The subsidy could be implemented through a tax credit (similar to the DC homebuyer tax credit where essentially a rebate is paid out through the IRS), and could be available to

people who do not normally pay taxes (similar to the Earned Income Tax Credit). The amount of the subsidy could vary – larger subsidies for the earliest adopters, gradually declining over time as the industry reaps benefits of experience and mass production to lower costs.

Alternative Fuels. Fund incentives to bring fuel cell and other cleaner, more efficient vehicles to market. Funds could be used to support municipal programs to collect food waste for the conversion to biodiesel and biogas.

Heavy Duty hybrids. Provide funding for rebates for trucking companies to convert vehicles to hybrid technology.

Complementary policies: investments in battery technology, job training, investment incentives for firms to develop all the technical and mechanical components necessary for these technologies to be commercialized, maintained, etc.

4. Energy Efficiency and Renewable Energy Development

Credit Backing for Clean Energy Projects. This is basically what Congress is already talking to the Detroit automakers about, except on a smaller scale. This plan would loosen credit markets for companies that are investing in energy efficiency, emissions reduction from energy generation, or green job creation by backing or otherwise subsidizing these loans. This would protect banks from a substantial amount (but likely not all) of the risks involved in making these investments.

Improve Residential and Commercial Energy efficiency**.** These projects can create jobs, particularly blue collar jobs that cannot be outsourced overseas, immediately. In addition, improving energy efficiency can mitigate the effects on consumers of higher energy prices. There are virtually infinite varieties of these programs; below are a few suggestions – we can collect many additional examples

a. *expand Chicago building insulation program* to other areas of the country. Both reduces emissions substantially, protects homeowners and renters (depending on how program is implemented) from higher electricity costs by reducing electricity use.

b. *expand renewable energy rebates.* The California Solar Initiative provides significant rebates to commercial and residential users to reduce the cost of solar installations. The rebates provide a quick mechanism to infuse cash into the construction sector. Some California cities (e.g., Los Angeles, San Francisco) are adding on their own incentives.

c. *energy saving revolving fund.* This fund would support a series of U.S. business waste reduction and resource efficiency projects to make them more competitive. Companies would pay money back to the fund by

sharing the resulting cost savings. Implementation could include companies signing up for EPA voluntary programs such SmartWay Transportation, Design for the Environment, Water Sense, or others.

d. *sustainable energy financing districts.* The City of Berkeley created a special property tax district to eliminate up front cost barrier of energy efficiency investments for property owners (solar, windows, insulation, energy efficient systems, etc.) by allowing a 20 year payback through a special property tax. Additional funding would encourage other cities, counties and states to provide similar incentives.

e. *green mortgages***.** Provide favorable mortgage terms for buyers and lenders who invest in highly energy efficient construction or renovation. This could be done by resurrecting 1979 Executive Order for low interest/energy efficient mortgages or by working with real estate and lending institution partners to create national green mortgage reforms.

f. *online green building calculator*. Supports green building strategy by updating existing EPA greenhouse gas calculator with additional information and a more user-friendly interface for users who make decisions about building materials. The tool would provide green building stakeholders tools to select building and renovation materials that reduce embodied energy and GHG emissions. The project could be launched quickly using the existing information and materials.

Complementary policies: tools for users to explicitly see the costs of inefficient buildings; tools for users to maximize energy efficiency (e.g. technology to adjust timing and amount of energy load drawn by appliances); technologies and products available to build and retrofit buildings

Renewable energy. These projects contribute to the energy transition, to renewable energy jobs, and transmission line construction jobs.

a. *increase funding for EPA Environmental Technology Verification Program* (ETV) to demonstrate "clean" energy and transportation technologies for both stationary and mobile sources. Verifications allow companies to better market their green products. Technologies include micro-turbines and fuel cells with heat recovery, geothermal energy heavy diesel retrofits for medium to large engines. ETV collaborates with other partners such as states of Texas and New York, the Department of Defense, and nonprofit research institutes such as the Research Triangle Institute and Southern Research Institute, to verify these technologies. The technology developers and vendors themselves also contribute partial to full funding to these verifications.

b. *subsidize installation of renewable energy sources.* This should happen for all sizes of distributed generation, from individual homeowners as well as for businesses of all sizes. Examples include rebates for solar panel installation on house or shopping center roofs.

c. *government purchases of green technology*. The government puts out bids for highly efficient products made by in the US for use by the government. Possible examples: LED lighting, very high mileage cars.

Complementary policies: investment incentives and regulatory drivers need to support creation of technologies from bright idea to commercialization so that there are technologies available to be tested and installed

5. Major Demonstration Projects. These include traditional technology demonstration projects as well as "coordination" demonstrations that align multiple government programs in a single community to arrive at clean energy, buildings, and transportation.

Large-Scale Carbon Capture and Sequestration (CCS) Demonstration Projects. This project would fund deployment of projects that capture, compress, transport, inject and store CO_2 from new and existing large-scale, commercial, coal-fired power generation plants. A meaningful number of projects (e.g., at least ten) should be deployed as soon as possible. Funds would be made available to offset the incremental costs of carbon capture and long term storage. The projects should involve diverse generation and capture technologies, capture and sequester large volumes of CO_2 and be located in different regions of the country. Job generation opportunities would be created in the following sectors: construction and systems installation, manufacturing, equipment dealers and wholesalers, engineering, legal, consulting and government administration.

Construction of Factories to Build Proven Technologies. Grant program that uses a revolving fund or direct funding to create jobs in the US through the construction of a factory in the US to produce an existing technology. Possible Examples: Solar cells, lithium ion batteries.

Green Development Demonstration Projects.

a. *Coordinate* federal small business, community, and other local-scale grant and loan programs to reward companies who create green jobs.
b. *Create 10 high profile demonstration projects* in both urban and rural areas that pool the resources of multiple federal partners (DOE, DOT, HUD, EPA, etc) to implement actions that address the multiple approaches needed to transform to a clean energy community economy.

Tribal Green Building Initiative. Develop tribal green building training and other support for green renovations and new construction with Tribes, HUD, DOE, IHS, and BIA as partners.

6. Other

Government buys carbon reductions. Instead of funding particular efficiency programs, we could hold an auction: we want to buy as much carbon reductions as possible for the amount of funding we have available. Conditions would include: the money must be spent in the US, extra points for projects that result in increased reductions in future years, extra points for each job created by the project. Possible examples: tree planting, weatherizing homes of low income/elderly. This approach could be applied to other pollutants as well, particularly fine particles and ozone and their precursors, and would have the additional benefit of reducing health care costs as exposures go down.

Aid to local/state governments. This involves two funds. The larger is for projects that build or install things – LED traffic lights, solar panels, insulate schools, retrofit transit or school buses. The second, much smaller one, is to pay for the people and support needed to establish new standards or regulations that result in energy savings, such as high efficiency building codes and demand side management.

Public/Internet Access to Utility Data Project. Drive public and private sector green building by making energy, water, and waste data available in a user-friendly interface such as Google Earth by specific building/address. Making the data available would instantly support improved market efficiencies and would allow public and private sector green building, energy/water efficiency, and waste reduction experts to prioritize projects to have the greatest impact. It would also allow identification of our nation's highest performing buildings.