CLEAN ENERGY, BRIGHT FUTURE

REBUILDING AMERICA THROUGH GREEN INFRASTRUCTURE

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Clean Energy, Bright Future

Rebuilding America through Green Infrastructure

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Clean Energy, Bright Future:

Rebuilding America through Green Infrastructure

EXECUTIVE SUMMARY

Our reliance on dirty energy is fueling global warming, harming our health, threatening our security and stalling our economy. Burning coal, oil and gas for energy and transportation is responsible for 80 percent of U.S. global warming pollution and most of our smog and soot pollution.

We can protect our environment and strengthen our economy by investing in clean energy and green infrastructure. A green economic recovery plan would mean less global warming pollution, fewer asthma attacks from air pollution, more clean lakes and rivers for drinking water, swimming and fishing, more secure energy in the long term, and more jobs than investing in the dirty energy technologies of the past.

President-elect Barack Obama has pledged to make clean energy and green infrastructure a cornerstone of America's economic recovery. In his first radio address of 2009, the president-elect said "to put people back to work today and reduce our dependence on foreign oil tomorrow, we will double renewable energy production and renovate public buildings to make them more energy efficient."

This report provides specific recommendations in support of the president-elect's efforts to ensure a green economic recovery and estimates the environmental benefits of those recommendations.

These proposals, when fully implemented over the next decade, would reduce annual global warming pollution by nearly 10 percent below current levels and reduce oil consumption equivalent to taking one million cars off the road each year. These proposals would begin to transition America to a clean energy economy and put more than three million people to work quickly in ready-to-go projects. This is nearly as many jobs as Obama has called for creating with the entire stimulus package.

The following measures represent initiatives that will have the most significant impact in promoting cleaner energy and creating quality jobs:

RENEWABLE ENERGY

- Ensure effective incentives for clean, renewable energy
- Expand the Clean Renewable Energy Bonds
- Fund the Green Jobs Act

ENERGY EFFICIENCY

- Fund energy efficiency and conservation block grants
- Expand the home weatherization program
- Create a home and commercial building retrofit program

CLEANER TRANSPORTATION

- Fully fund New Starts transit capital projects
- Transit modernization and rehabilitation
- Increase transit operations and energy assistance grants

These and other recommended clean energy and green infrastructure initiatives totaling $150 billion dollars in federal investment would have significant environmental and economic impacts:

- Reduce carbon dioxide emissions by nearly 670 million tons per year when fully implemented over the next decade, which represents a reduction of nearly 10 percent of America's current annual global warming pollution.[1] This represents a significant step towards reducing the nation's global warming pollution to what scientists say is necessary to avert the worst impacts of global warming.

- Replace the power equivalent of 170 coal-fired power plants with renewable energy and energy efficiency. Our proposals to extend the renewable energy Production Tax Credit and invest in renewable energy on federal property, among others, would reduce significant global warming pollution and create hundreds of thousands of new, clean energy jobs.

- Reduce oil consumption by more than 25 million barrels annually by meeting growing demand for mass transit and cleaner alternatives to driving. This would be equivalent to taking nearly one million cars off the road each year. These benefits would increase substantially over time as our transportation system becomes more and more efficient, rather than more polluting and congested.

In crafting a green economic recovery package, our leaders have an unprecedented opportunity on three fronts:

- Putting the nation on a path to avert a global warming crisis;
- Providing a massive stimulus to the economy and putting millions of workers to work in quality jobs;
- Invigorating America as we lead the world to a clean energy future.

An economic recovery package with smart clean energy and green infrastructure investments can put America on course to save our environment by rebuilding our economy through creating quality jobs and developing new industries and technologies.

This report provides a comprehensive set of recommendations on how to best accomplish a green recovery based on research and analysis from throughout the environmental community, to include public, private and non-profit entities. Environmental, employment and fiscal impacts are assessed within each proposal based on previously conducted studies, in addition to primary and secondary research.

Renewable Energy

Investment and long-term commitment to renewable energy such as wind and solar will play a crucial role in repowering America with clean, homegrown energy. We recommend at least $62.3 billion in investments in growing renewable energy sources, installing renewable energy systems in schools and other government buildings, green job training, and innovative technologies. These investments will help us face the greatest environmental challenges of our time, and in addition create or sustain more than 833,000 jobs.[2]

Electricity generation contributes more than one-third of U.S. global warming pollution.[3] We have the potential to power the entire country many times over with clean sources such as wind and solar.

By making smart investments now, expanding incentives for renewable energy, shifting our own government toward renewable energy, and funding advanced research and development of new renewable energy technologies, we can set a course to repower America with 100 percent clean electricity.

Our recommended investments would reduce global warming emissions in the electricity sector by at least 424.5 million tons a year by 2020,[4] equivalent to global warming pollution of 158 typical coal-fired power plants.[5]

We propose the following economic recovery investments:

- Amend renewable energy production and investment tax credits
- Develop renewable energy on government property
- Increase capacity of Clean Renewable Energy Bonds
- Extend the renewable energy production tax credit
- Fund the Green Jobs Act
- Expand federal Power Purchase Agreements
- Create Energy SmartPARKS
- Adopt a Solar Schools initiative

- Research and development of advanced batteries
- Expand Manufacturing Extension Partnership

Additional investments and policies, such as a renewable electricity standard, a renewable energy manufacturing tax credit, and solar rebate could add nearly a million new jobs and help America repower with clean, homegrown energy.

Funding the Green Jobs Act, for instance, would expand and improve existing worker training programs as well as replicate them all across the country. For example, Cincinnati State Technical and Community College has created a Renewable Energy major. As part of the program, students earn $10-$14 an hour working for renewable energy companies. The major prepares students for jobs such as electronic technicians, product test specialists and electro-mechanics, which pay a starting salary of $30,000-$42,000.[6] Demand for these jobs is high right now and is expected to grow. Cincinnati State would like to expand enrollment in the major and invest in on-site training facilities, and the program can easily be reproduced at community colleges and technical schools all across the country.

These investments and policies and their associated environmental and economic benefits are addressed in more detail in the following narrative and in the appendix attached to this report.

Specific Renewable Energy Investment Recommendations:

Amend the renewable energy production and investment tax credits, and accelerated depreciation, by making them refundable. Due to the current economic recession, these tax credits have become unusable because many companies that would use them are making no profit and have diminished tax liability. The renewable energy production tax credit should be refundable for the duration of the credit for projects placed in service in 2008 and 2009, and the investment tax credit should be made refundable for the next three years.

This simple fix would cost no more than already authorized and would create or sustain 254,000 quality jobs in engineering, installation, construction and maintenance.[7] Additionally, the monetary cap for solar thermal power should be removed. Resulting renewable power installations would provide immediate reductions in global warming pollution by replacing or preventing new peak-load and base-load fossil fuel plants.

In the first three quarters of 2008, thanks in part to the production tax credit, the amount of new wind generation capacity exceeded that of new coal generation by five to one.[8] New installations planned for the end of 2008 and beginning of 2009 will prevent 17.8 million tons of global warming pollution per year.[9]

Invest in renewable energy on government property. The federal government can create hundreds of thousands of jobs by installing renewable energy systems on government property, including 4,000 megawatts (MW) of solar energy systems.

A $10 billion investment resulting in 4,000 MW of solar power would drive more than 350,000 jobs and prevent nearly 4.9 million tons of global warming emissions per year.[10]

Adopt a solar manufacturing credit. This program would level the international solar manufacturing playing field by offering accelerated depreciation and a 30 percent refundable tax credit for the purchase of solar manufacturing equipment.

This investment could create 315,000 good-paying jobs.[11] This credit will help drive down the cost of solar technologies. Upon reaching 5,000 MW of manufacturing capacity America would be constructing enough solar facilities each year to offset 6 million tons of carbon dioxide annually.

Increase Clean Renewable Energy Bonds (CREB) funding for state and local governments and consumer-owned utilities to jump-start renewable energy projects.

A $5 billion investment would create 28,000 jobs in engineering, manufacturing, construction, installation and management. This investment will mean that state and local governments and co-ops can reduce their carbon footprint by financing innovative renewable energy projects despite the recession.[12]

Extend the renewable energy production tax credit (PTC) for five years. The PTC is currently 2.1 cents per kilowatt hour of large renewable energy. Extending this incentive would increase long term planning as well as construction of larger-scale projects.

A $30 billion investment over 10 years would create at least 70,000 jobs and $70 billion in private investment.[13] This would also ensure the continued rapid growth of the largest renewable energy industries. A 2007 report from the American Solar Energy Society estimates that, with the support of the PTC, wind power could grow to more than 200 gigawatts of capacity by 2020. This would offset greenhouse gas emissions by more than 400 million tons a year.[14]

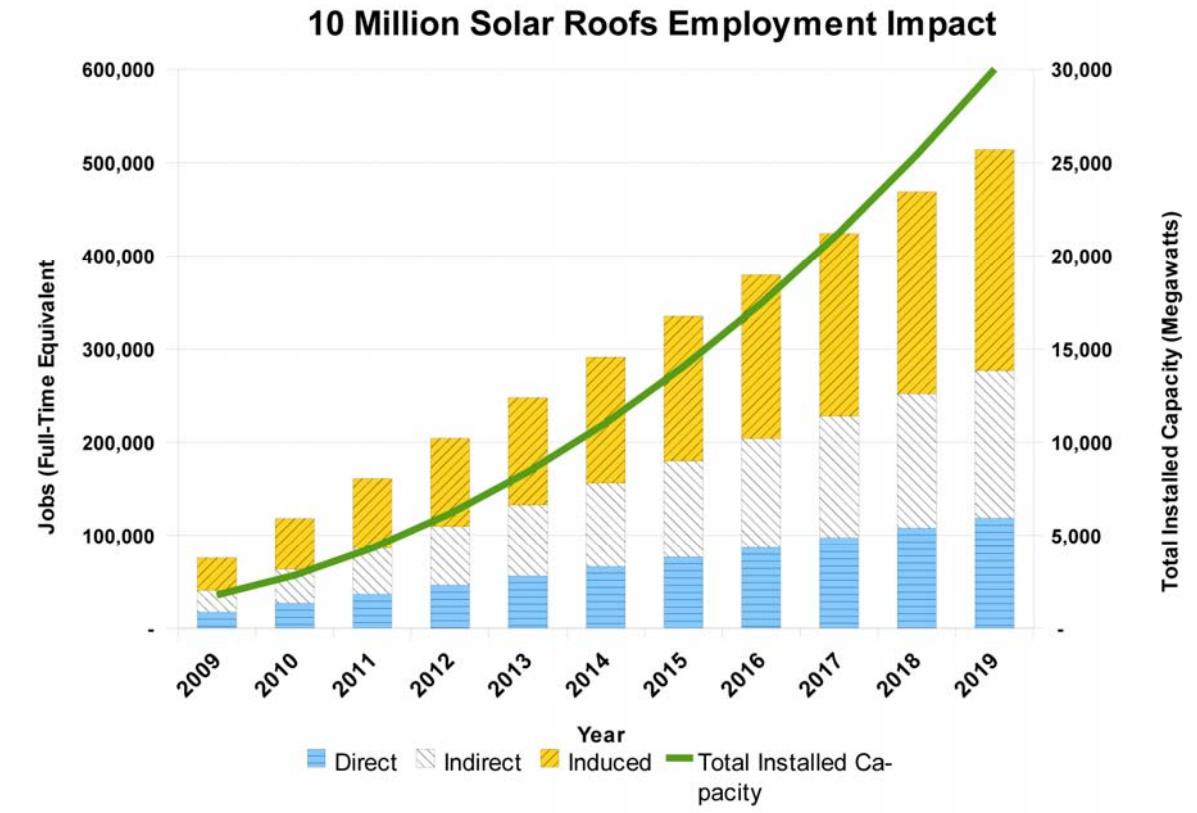
Fund the Green Jobs Act. This program gives grants to national and state training programs (including community colleges and union apprenticeship programs) to prepare skilled workers for green-collar jobs. Some portion of these funds must be dedicated specifically to providing pathways out of poverty for low-income workers.

A $500 million investment over two years in green jobs training for 70,000 workers will ensure that the American workforce, our most renewable resource, is trained and ready to fill the millions of jobs being created and sustained by clean energy industries. These programs will help to wean our country off of dirty fossil fuels such as coal and oil.

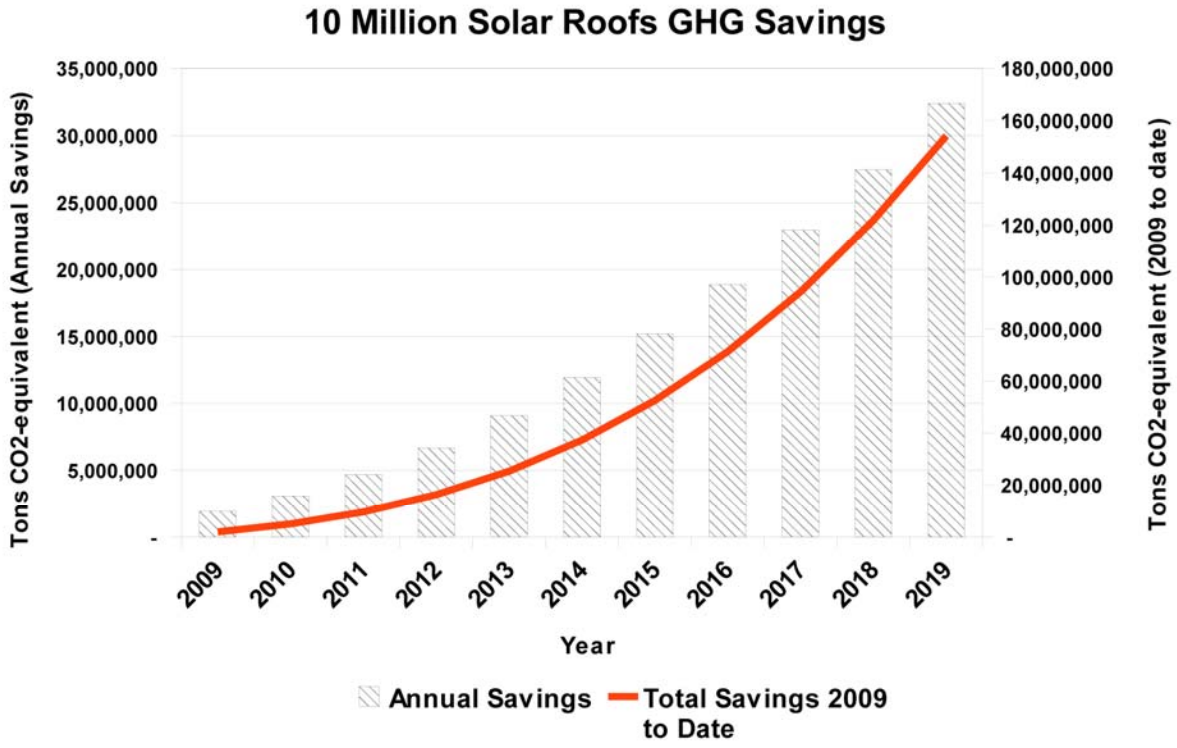
Create a national renewable electricity standard (RES) calling for at least 25 percent of the nation's electricity to come from renewable energy by 2025, with a near term target of 10 percent renewable contribution by 2010, and regular increases mandated every two years thereafter.

An RES would create at least 185,000 jobs, spur more than $300 billion in investment in renewable energy development, and avoid 223 million metric tons of global warming emissions a year by 2020.[15]

Put solar panels on 10 million roofs. The federal government should establish a goal of installing solar energy systems on 10 million roofs in the United States by 2019, totaling 30 gigawatts of capacity. A program administered by the Department of Treasury would provide a per watt rebate for both residential and commercial systems up to five megawatts in size.



Source: Solar Energy Industries Association



Source: Solar Energy Industries Association

While likely a large investment, cost estimates are not available at this time. This program could create more than 500,000 jobs and avoid emissions of more than 36.4 million tons of global warming pollution a year by 2020 equivalent to building more than 13 new coal-fired power plants.[16]

Invest in other renewable energy programs. Many innovative programs can start making real impacts within two years. These programs include funding for advanced battery research, putting solar panels on public schools, installing renewable energy and efficiency technologies in national parks, increasing funding for commercialization of new technologies, and extending federal power purchase agreements to 25 years.

A $16.8 billion investment for these programs would create over 130,000 jobs, provide educational opportunities for our children, and cut global warming pollution emissions.[17]

Energy Efficiency

The centerpiece of any green recovery package must be energy efficiency. Energy efficiency is the cheapest, quickest and cleanest way to reduce global warming pollution. We recommend at least $21 billion in investment in energy efficiency.

Energy efficiency is also one of the best ways that we can invest in American jobs. According to analysis by the Earth Policy Institute, investing $1 billion in retrofitting buildings would create 6.6 times more jobs than the same investment in nuclear power and 7.8 times more jobs than the same investment in coal power.[18] According to the same analysis just $6 billion in residential and commercial building retrofit efficiency investments will, over the next two years, create more than 55,000 new jobs.[19]

There are huge environmental, security and economic benefits from using energy more efficiently. Almost half of the energy we use in America, which is almost 10 percent of the world's energy use, is used in America's buildings.[20] We have the tools and know-how to make these buildings much more efficient. For example, the federal weatherization program weatherizes homes of low-income families and reduces net fuel consumption by an average of 23 percent per home.[21] The program delivers $2.72 in economic benefits for every dollar invested.[22] Since the program's inception it has weatherized 6.2 million homes. This year the program will reach more than 100,000 homes per year, a fraction of the homes that qualify.[23]

Our recommended investments would reduce yearly global warming pollution by nearly 204 million tons and save 16 million megawatt hours of electricity a year. These benefits would accrue over time as we rebuild our efficiency infrastructure.[24] (24)

Buildings are a great opportunity to reduce our energy usage while putting people to work. California has long been a leader in energy efficient buildings. It was the first state to adopt energy standards for home appliances, has the nation's most stringent building energy codes, and has long had well-funded, aggressive programs for promoting energy efficiency. In California, residential energy use declined by more than 40 percent per capita between

mid-1970's and 2002. If the United States had achieved the same per-capita percentage of reduction in residential use between 1975 and 2002 as California did, the nation would have consumed at least 3 quadrillion Btu less energy in 2002, equivalent to 51 million barrels of oil.

To achieve these important gains, we propose the following economic recovery investments:

- Fund Energy Efficiency and Conservation Block Grants
- Increase funding for the Weatherization Assistance Program
- Fund state energy programs
- Expand the efficient new homes tax credit
- Expand efficient home heating and cooling programs
- Expand the Equipment Tax Credit
- Expand the Efficient Commercial Buildings tax deduction
- Fund the Healthy High Performance Schools Program
- Give energy efficiency grants to colleges, governments and schools
- Increase funding for federal agency efficiency improvements
- Expand the EPA Energy Star program
- Create a public information initiative
- Create a home efficiency retrofit program
- Create a commercial and public buildings retrofit program
- Create window weatherization rebates
- Implement an energy efficiency resource standard
- Create small business hot water heater acquisition assistance
- Fund the Super-Efficient Appliances Deployment (SEAD) program
- Create boiler control purchase and installation assistance
- Create waste heat recovery rebates

These measures and their associated environmental and economic impacts are addressed in more detail in the following narrative and in the appendix charts attached to this report.

Increasing energy efficiency would reduce fossil fuel consumption, global warming pollution and damage to the natural environment. These proposals are just a start for increasing energy efficiency. We will be developing additional recommendations to realize even more of the environmental and economic benefits.

Specific Energy Efficiency Investment Recommendations

Fund energy efficiency and conservation block grants at $6 billion over two years to cities and states for energy efficiency and conservation projects that reduce total energy use, decrease fossil fuel emissions, and improve energy efficiency in the transportation, building, and other sectors.

A $6 billion investment would create an estimated 62,000 direct local jobs and would fund thousands of efficiency and renewable projects.[25]

Expand the weatherization program that weatherizes the homes of low-income families and reduces net fuel consumption by an average of approximately 23 percent per home.

A $1.9 billion investment would achieve President-elect Barack Obama's goal of weatherizing 1 million homes a year and provides $2.72 in economic benefits for every dollar invested. It would also save 6 million megawatt hours of energy per year.[26]

Create a home efficiency retrofit program that gives a rebate to homeowners, or any party obtaining an owner's consent, to undertake an efficiency retrofit of an existing home. The rebate would be performance-based, rewarding higher levels of energy efficiency improvement. The program would be administered by the states with the Environmental Protection Agency serving as the overall administrator and would include support for the training of contractors and home energy auditors/raters who would help implement the program.

A $3 billion investment over two years would create over 140,000 jobs.[27]

Create a commercial and public buildings retrofit program administered by the Environmental Protection Agency that would encourage the near term launch of large scale, deep retrofitting of private and publicly owned commercial buildings.

A $3 billion investment over two years would create 13,000 jobs.

Enact an energy efficiency resource standard requiring utilities to achieve energy savings of 15 percent of electricity sales and 10 percent of natural gas sales by 2020. The American Council for an Energy-Efficient Economy estimates that by 2020 this standard would reduce peak electric demand by over 93,000 megawatts, the equivalent of over 300 coal-fired power plants, and reduce carbon dioxide emissions by approximately 230 million metric tons in 2020 — equivalent to taking 38 million automobiles off the road.[28]

Fund federal agency efficiency administered by the Federal Energy Management Program of the Department of Energy for federal agencies to make energy efficiency improvements and for the installation of clean distributed energy in federal buildings. A $600 million investment over two years would be a step toward President-elect Barack Obama's goal of making our public buildings more efficient.

Extend and increase tax incentives for efficient buildings.

- Increase the Efficient Commercial Buildings Tax Deduction from $1.80 per sq/ft to at least $3 per sq/ft in accordance with the proposal from the American Institute of Architects for buildings that achieve a 50 percent energy savings.

- Expand the Efficient New Homes Tax Credit to provide a $4,000 credit for homes that achieve 50 percent savings for the whole home and extends the tax credit for efficient new homes through 2011.

- Provide $600 million in assistance for purchase and installation of control boilers for homes and businesses to purchase and install intelligent boiler controls that have big energy and global warming gas reductions.

- Extend the "Nonbusiness Energy Property" tax credit that applies to high efficiency heating and cooling equipment through 2011.

- Provide $110 million for hot water heater acquisition assistance to small businesses for upgrading to more efficient hot water heaters.

Other Recommended Energy Proposals:

- Fund the energy sustainability and efficiency grants and loans program to give federal assistance to institutions of higher education, public schools, and local government so they can become models for the changes in energy usage that all sectors of society need to adopt. A $3 billion investment would have a major impact on our nation's energy usage and carbon emissions.

- Fund window weatherization rebates to consumers to purchase energy-efficient windows that will reduce energy use. A $1.5 billion investment would create thousands of U.S. manufacturing, sales and installation jobs, save homeowners up to 20 percent on their heating and cooling costs, and eliminate 526,700 tons of greenhouse gas emissions annually.[29]

- Expand the State Energy Program (SEP) to improve state energy management capabilities and strengthen operational capability. A $125 million investment for the SEP can be rolled out quickly for projects such as efficiency improvements to state office buildings and facilities. An Oak Ridge National Laboratory analysis concluded that for every federal dollar invested, more than $7 in direct energy savings is achieved.[30] (30)

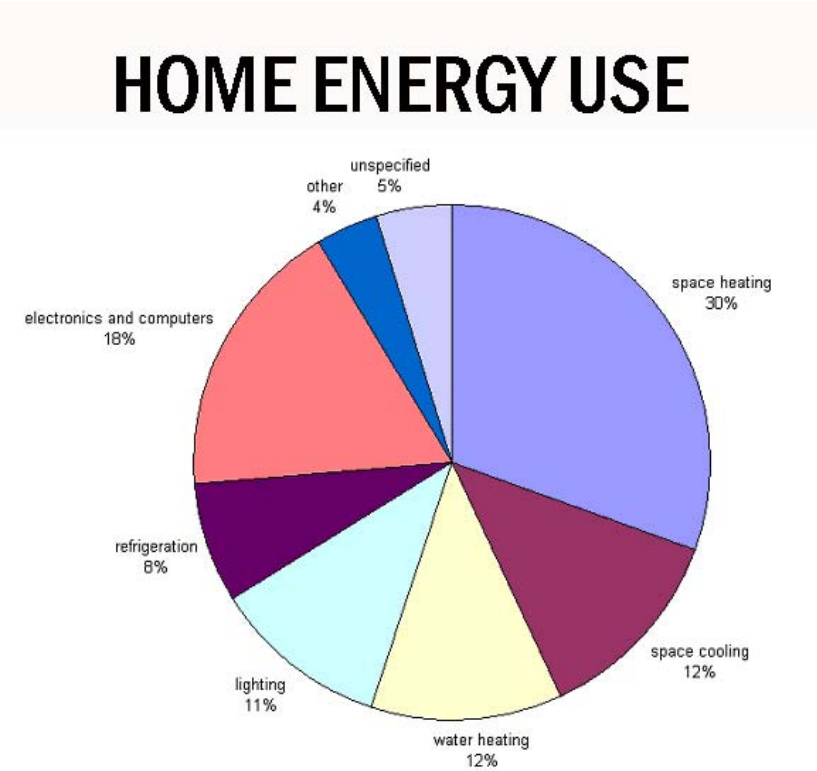
- Fund the Healthy High Performance Schools Program that authorizes grants to state education agencies to facilitate the design, construction, and operation of schools that are energy and resource efficient and contain the amenities necessary for a quality education. A $100 million investment could be used by states to provide information and technical assistance, as well as to help schools monitor and evaluate efforts to create healthy, high performance school buildings.

- Fund waste heat recovery rebates that give incentives to projects that recover waste heat. A $25 million investment would provide large reductions in greenhouse gas emissions, as well as a large potential for jobs in several disciplines.

- Expand the EPA Energy Star program, a voluntary program that promotes energy efficiency in buildings, appliances and equipment. $100 million in additional funding for the Energy Star Program would enable EPA to add products, increase public outreach, work with more businesses and expand state and local programs such as the Home Performance with Energy Star program.

- Fund super-efficient appliances deployment to reward retailers and manufacturers for increasing market penetration of highly efficient products. A $1 billion investment could

be used for employee training, advertising or consumer rebates of highly efficient products.



Source: U.S. Department of Energy

We can significantly reduce energy use in homes through common sense practices such as reducing the amount of heat that escapes from our buildings and by using more efficient appliances and lighting systems.

Cleaner Transportation

Transportation investments are a key component of our nation's economic recovery and any comprehensive energy plan. As a guiding principle, we urge investment in transit and cleaner transportation at a level equal to or higher than highway projects, which only add to global warming pollution and oil consumption.

Specifically, we recommend at least $59 billion in investments in transit, cleaner transportation alternatives, environmental mitigation, road and bridge maintenance, and vehicle and fuel technologies. These transportation investments will, over the next two years, create 1.5 million new jobs, preserve more than 600,000 current jobs, and increase public transportation capacity across many transit systems by 10 percent annually. Furthermore, these investments will create more jobs per dollar than new highways.

Transportation is responsible for one-third of global warming pollution and more than 60 percent of domestic oil consumption. To mitigate this, we need to build a transportation system that uses oil far more efficiently, takes advantage of alternative fuels, and shifts as much of our travel as possible from transportation modes that consume a lot of energy to those that consume little.

Bolstering public transportation should be a primary focus for stimulus investments to reduce global warming pollution and our nation’s dependence on oil. Transit ridership has grown consistently over the past decade and has grown markedly in the recent year, despite falling fuel prices. Yet in 2008, 85 percent of transit systems were experiencing capacity problems and 65 percent lacked the revenue to increase service.[31]

Each year, our recommended investments would reduce oil consumption by nearly 500 million gallons (25 million barrels of oil), reduce global warming pollution by nearly 4 million tons, and prevent the contamination of 16 million cubic meters of fresh water. These benefits would increase significantly over time as we rebuild and grow a sustainable transportation system.

For example, the Blue Line extension of the Charlotte Area Transit System will connect Downtown Charlotte to fast-growing suburbs northeast of the city and the University of North Carolina-Charlotte. If funded, work could begin on the project within four months and the line could be operational within six years.[32]

Fully funding this extension would require a $740 million federal investment and create 34,000 total jobs. The extension is projected to eventually serve 17,500 riders daily, saving 80,000 barrels of oil per year and reducing carbon dioxide emissions by 16,000 tons per year. Overall, this would be the equivalent of taking 2,700 cars off the road annually.

We should not invest economic recovery dollars in new highways that contribute to sprawl and that would only increase oil consumption, global warming pollution, and traffic congestion in the long term. We should invest public dollars instead in places where we can fix existing infrastructure and environmental problems.

These investments put us well on our way to reducing transportation sector global warming pollution by 35 percent from current levels and reducing oil consumption by 3.5 million barrels a day by 2020, and by 2030 cutting our oil consumption in half.

To achieve this, we propose the following economic recovery investments:

- Fully fund New Starts transit capital projects for capacity expansion
- Improve the current system through transit rehabilitation and modernization
- Fund authorized transit emergency service/operations grants
- Expand bicycle/pedestrian infrastructure
- Fund authorized intercity/Amtrak rail improvements
- Employ a ‘fix-it-first’ strategy for maintenance and rehabilitation of roads and bridges
- Expand anti-idling truck technology through rebates
- Prevent water pollution through improved highway stormwater mitigation
- Fund wildlife habitat transit connectivity
- Implement advanced technology vehicles development through loan guarantees

These measures and their associated environmental and economic impacts are addressed in more detail in the following narrative and in the appendix charts attached to this report.

Specific Transportation Investment Recommendations

Fund New Starts transit projects to expand existing and construct new transit capacity. Ready-to-go projects across more than 50 transit systems through the nation will expand capacity and support ridership growth of more than 10 percent annually to meet growing demand.[33]

A $30.7 billion investment over two years would create more than 1.2 million quality jobs, provide immediate benefits to reduce fuel consumption by more than 110 million gallons annually, and decrease global warming emissions more than one million tons annually. These benefits would increase substantially as transit ride share grows and commuters reduce passenger car miles.

Fund transit capital improvements by supplying vehicles and equipment to replace existing transit fleet assets with new, American-made buses and rail cars that incorporate clean energy technology. This would also fund retrofitting of the current fleet with global warming pollution reducing components.

An $8.2 billion investment would create or sustain 300,000 jobs. Compared to the current fleet, improved transit assets would decrease diesel consumption by 200 million gallons and reduce global warming pollution by more than 500,000 tons annually.[34]

Increase transit operating/energy assistance to sustain current and projected growth in ridership, mitigate rate increases and service cuts, and secure access to cleaner alternative fuels.

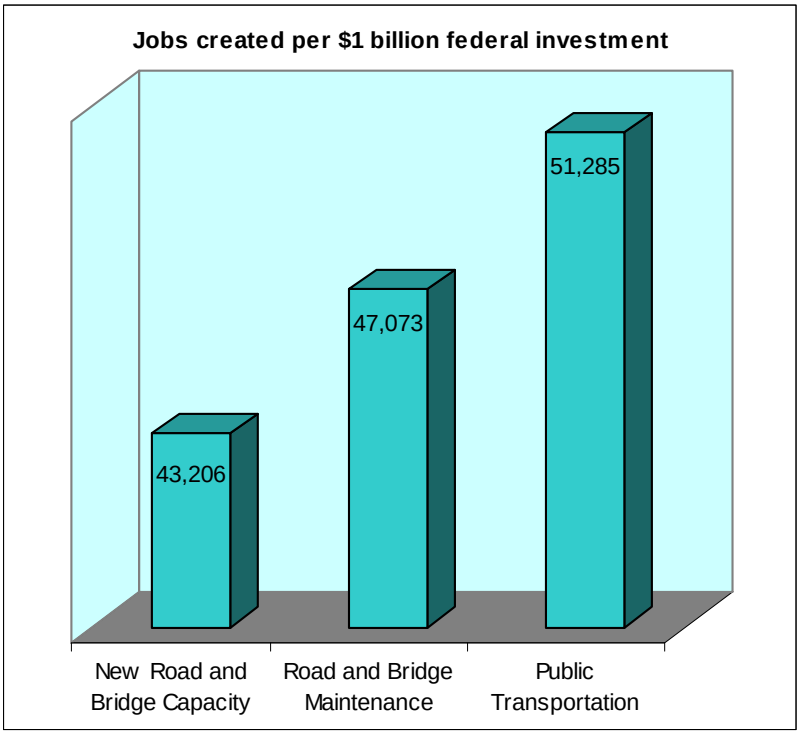
A $4 billion investment would preserve 140,000 current jobs, and sustain the ability of the existing public transportation to annually save 1.4 billion gallons of fuel in direct use, an additional 350 million gallons through reduced congestion, and 37 million tons of global warming emissions.[35]

Improve intercity travel and regional access by funding authorized Amtrak and state intercity rail corridor improvements.

A $1.85 billion investment would preserve 55,000 jobs and ensure access to commuter rail is maintained as an alternative to passenger car travel.[36] (36)

Fund approximately 450 ready-to-go bicycle and pedestrian connectivity projects, as well as support the Complete Streets initiative to enable pedestrians, bicyclists, motorists and bus riders to safely travel the existing road network.

A $1.7 billion investment in bicycle and pedestrian pathways would create an initial benefit of 5.4 million gallons of gasoline saved per year as well as an annual reduction of 53,000 tons global warming pollution.[37]



Source: Surface Transportation Policy Project

Repair and rehabilitate existing roads and bridge infrastructure. Focusing on existing road network discourages sprawl by enhancing existing land use patterns and creates more jobs than new capacity projects.[38] (38)

An $8 billion investment would address critical road and bridge improvements and create or sustain 278,000 infrastructure jobs.

Fund anti-idling truck technology initiatives to provide rebates to truck operators to purchase anti-idling equipment, allowing drivers to power truck cabs without running the truck engine, as well as other equipment to improve energy efficiency.

A $315 million investment would create 1,000 new jobs, for a benefit of 53 million gallons of diesel saved in the first year plus a reduction of 586,000 tons global warming emissions.[39]

Initiate stormwater mitigation projects to create green infrastructure and natural bioretention along roads and highways to reduce stormwater runoff, one of the largest sources of groundwater pollution.

A $232 million investment would create more than 3,000 jobs and prevent the contamination of 16 million cubic meters of fresh water each year.[40]

Promote wildlife transit connectivity to protect and restore landscape connections across transportation infrastructure in wildlife habitats, reducing wildlife vehicle collisions and providing climate change adaptation and resiliency.

A $200 million investment would create or sustain 8,000 jobs, reduce wildlife collisions by 80-100 percent, prevent 160-200 auto fatalities and 23,200-29,000 injuries annually.

Provide loan guarantees for advanced technology vehicles and fuels, creating a domestic market for cellulosic ethanol and renewable hydrogen production, and improving fuel cell and battery technology. A $4 billion investment would create this national infrastructure to supply clean alternative energy.

Getting There

Shifting to green infrastructure is a long term project, but the impacts of global warming are becoming more and more apparent and require action now to avoid a catastrophic outcome.

At the same time, the economy is in the midst of a painful transition, and we need to make a strong course correction to stem further employment loss in the short term and ensure our status as a global leader in productivity, technology and innovation.

Investing in green infrastructure represents an opportunity to weather through these crises and secure our economic and energy future. Implementing these recommendations will reduce our dependence on oil, clean up our air and water, reduce global warming pollution, and create much-needed jobs while making the economy stronger and more efficient in the long run.

Notes

[1] U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, April 15, 2007.

[2] This number does not include the Manufacturing Tax Credit, Renewable Energy Standard or the 10 Million Solar Roofs proposals due to their overlap with other proposals.

[3] EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks

[4] CO_2 equivalent estimates are based on a reduction of .77 tons of CO_2 equivalent per megawatt hour from: Mark S. Mehos and David W. Kearney, American Solar Energy Society (ASES), *Tackling Climate Change in the U.S.,* January 2007. Electric capacity estimates came from policy rules or goals and capacity factors of 33 percent for wind power and 18 percent for solar. This number does not include the Manufacturing Tax Credit, Renewable Energy Standard or the 10 Million Solar Roofs proposals due to their overlap with other proposals.

[5] Number of coal-fired power plants avoided is then based on an average plant capacity of 667 MW and capacity factor of 60 percent.

[6] Cincinnati State Technical and Community College, *Renewable Energy Major: Program Description,* 2004. Available at: www.cincinnatistate.edu/CurrentStudent/Academics/AcademicDivisions/EngineeringTechnologies/Renewable+Energy+Major.htm

[7] This is the sum of two numbers: 89,000 jobs saved in the wind industry and 165,000 jobs realized in the solar industry. From, respectively: Tom Vinson, Environment Legislative Manager, American Wind Association (AWEA), personal communication, December 9, 2008; Solar Energy Industries Association (SEIA), *Solar Energy Fuels Domestic Job Growth* (fact sheet), December 2008.

[8] Resource Media, *$19.2 Billion in U.S. Coal-Fired Power Plants Cancelled in 2008,* December 2008.

[9] AWEA, *Another Record Year for New Wind Installations* (fact sheet), 28 October 2008.

[10] Solar Energy Industries Association (SEIA), *Solar Energy Fuels Domestic Job Growth* (fact sheet), December 2008. This number assumes all solar technologies are manufactured in the U.S.

[11] Ibid.

[12] Renewable Energy Policy Project (REPP), *The Work that Goes into Renewable Energy,* November 2001. According to REPP, for every $1 million spent on wind and/or solar (capital costs and construction), 5.65-5.7 jobs are created. A $5 billion investment in renewable energy through CREBs would therefore create 28,250 jobs in manufacturing, construction, and operations and management.

[13] Gregory Wetstone, Senior Director of Governmental and Public Affairs, personal communication, 25 November 2008. This is the estimated cumulative cost over 10 years.

[14] Michael Milligan, American Solar Energy Society (ASES), *Tackling Climate Change in the U.S.,* January 2007.

[15] Union of Concerned Scientists, *Cashing In on Clean Energy*, July 2007.

[16] Justin Baca, Senior Research Analyst, Solar Energy Industries Association, personal communication, 10 December 2008. This number is based on meeting the policy goals by 2019 with all technologies being manufactured in the U.S.

[17] This is a sum of different job creation numbers for the programs listed. For the Manufacturing Extension Partnership: Susan Helper, Economic Policy Institute, *Renewing U.S. Manufacturing: Promoting a High-Road Strategy,* February 2008; For the Solar Schools Initiative: Jeremy Symons, National Wildlife Federation, *Solar Schools Initiative* (fact sheet), November 2008; For the Advanced Battery Research: American Physical Society, *Science Infrastructure Stimulus Package Proposal* (fact sheet), November 2008.

[18] Earth Policy Institute, Estimated Jobs Created from a $1 Billion Capital Expenditure in Energy and Efficiency, downloaded from www.earth-policy.org/Updates/2008/Update80_data.htm, January 7, 2009.

[19] Ibid.

[20] U.S. Department of Energy, 2007 Buildings Energy Data Book, downloaded from buildingsdatabook.eere.energy.gov January 31, 2008

[21] Weatherization Assistance Program Technical Center, Weatherization Assistance Program Overview, downloaded from www.waptac.org/sp.asp?mc=what_overview_program, January 7, 2009

[22] Ibid.

[23] Ibid.

[24] U.S. Department of Energy, Energy Information Administration, Residential: End-Use Consumption of Electricity 2001, downloaded from: www.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html, October 10, 2006 U.S. Department of Energy, Energy Information Administration, Residential: End-Use Consumption of Electricity 2001, downloaded from www.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html, 10 October 2006 U.S. Department of Energy, Energy Information Administration, Residential: End-Use Consumption of Electricity 2001, downloaded from.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html, October 10, 2006

[25] The jobs number was calculated by summing the total number of jobs for projects proposed by the United States Conference of Mayors using the community block grants program as funding and dividing it by the amount of money that they proposed to spend on the program to come up with an average number of jobs per dollar. The mayor's proposal is available at mayors.org/mainstreeteconomicrecovery/documents/mser-report-20081219.pdf. The number of jobs per dollar was then multiplied that by the $6 billion that we are proposing for the project to create a total number of jobs created from the program. United States Conference of Mayors, *Mainstreet Economic Recovery: Community Development, Green Jobs, Streets/Highways, Airports, Amtrak, Water, Schools, Housing, Public Safety*, December 19, 2008

[26] We are proposing a $500 million increase over current funding in year 1 and $1.4 billion in year 2. The Department of Energy says that there are 52 direct and 23 indirect jobs created for every million dollars that is invested in the Weatherization Assistance Program. http://www.waptac.org/sp.asp?mc=what_overview_program. We divided that number one million to find the number of jobs produced per million. We then multiplied it by the $1.9 billion that we are proposing for the program to determine the overall number of jobs created by the program. We took the $1.9 billion that we are proposing for the Weatherization Assistance Program and divided it by the DOE estimated cost of $2,826 per home weatherized under the Weatherization Assistance Program to determiner that under the proposal an additional 672,328 homes would be weatherized. http://apps1.eere.energy.gov/weatherization/about.cfm. We multiplied the number of homes by the DOE estimate that each weatherized home saves 30.5 Mbtu per year to determine that the program would save 20,506,015 mBtus. We then multiplied by the standard conversion of .0002937107 mBtu per Megawatt Hours to get the number of Megawatt Hours saved by the program. We took the total number of space heaters in the country and determined the percentage of heaters that are electric, natural gas, oil, propane and kerosene using DOE numbers. http://www.eia.doe.gov/emeu/recs/recs2001/ce_pdf/spaceheat/ce2-1c_climate2001.pdf. We assumed that the total gains in efficiency achieved through weatherization would be proportionally the same as the percent of heaters for each technology. We then calculated the carbon emissions reductions for each different type of space heater and then added them up. For natural gas, oil, propane and kerosene we used Environmental Protection Agency data for the coefficient of energy to greenhouse gas emissions. http://www.epa.gov/climatechange/emissions/downloads/08_Annex_2.pdf Because the EPA data did not have a number for electricity we used DOE data for an electricity coefficient. For electricity we used a DOE numbers. http://tonto.eia.doe.gov/ftproot/environment/e-supdoc-u.pdf. We then added the total tons of carbon to get a final figure.

[27] We are recommending $1.1 billion in year 1 and $1.9 billion in year 2. Because the retrofit program can be used for weatherization, we assumed that the energy savings and the job creation would be at least as high as the weatherization program. The Department of Energy says that there are 52 direct and 23 indirect jobs created for every million dollars that is invested in the Weatherization Assistance Program. http://www.waptac.org/sp.asp?mc=what_overview_program. We divided that number one million to find the number of jobs produced per million. We then multiplied it by the $1.9 billion that we are proposing for the program to determine the overall number of jobs created by the program. We took the $1.9 billion that we are proposing for the Weatherization Assistance Program and divided it by the DOE estimated cost of $2,826 per home weatherized under the Weatherization Assistance Program to determiner that under the proposal an additional 672,328 homes would be weatherized. http://apps1.eere.energy.gov/weatherization/about.cfm. We multiplied the number of homes by the DOE estimate that each weatherized home saves 30.5 mBtu per year to determine that the program would save 20,506,015 mBtus. We then multiplied by the standard conversion of .0002937107 mBtu per Megawatt Hours to get the number of megawatt hours saved by the program. We took the total number of space heaters in the country and determined the percentage of heaters that are electric, natural gas, oil, propane and kerosene using DOE numbers. http://www.eia.doe.gov/emeu/recs/recs2001/ce_pdf/spaceheat/ce2-

1c_climate2001.pdf. We assumed that the total gains in efficiency achieved through weatherization would be proportionally the same as the percent of heaters for each technology. We then calculated the carbon emissions reductions for each different type of space heater and then added them up. For natural gas, oil, propane and kerosene we used Environmental Protection Agency data for the coefficient of energy to greenhouse gas emissions. http://www.epa.gov/climatechange/emissions/downloads/08_Annex_2.pdf Because the EPA data did not have a number for electricity we used DOE data for an electricity coefficient. For electricity we used a DOE numbers. http://tonto.eia.doe.gov/ftproot/environment/e-supdoc-u.pdf. We then added the total tons of carbon to get a final figure. The jobs number comes from the Earth Policy Institute.

[28] American Council for an Energy Efficient Economy, Energy Efficiency Resource Standard (EERS) for Retail Electricity & Natural Gas Distributors, downloaded from, www.aceee.org/energy/national/eers0908.htm, January 7, 2009.

[29] [29] Environmental Defense Fund estimates that this program will be the equivalent of taking 92000 cars off the road. EPA estimates that the average passenger car on the road in 2000 emitted 11,450 pounds of carbon dioxide annually. U.S. EPA, Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks, downloaded 08 November 2007, www.epa.gov/otaq/consumer/f00013.htm. To determine the emissions equivalency, we multiplied the estimated carbon car reductions by 11,450 pounds per car and then divided by 2000 to get tons. Environmental Defense Fund, Draft Federal Programs to Create American Jobs (Esp Manufacturing) Quickly and Reduce Energy Use, December 10, 2008

[30] United States Department of Energy, Measuring State Energy Accomplishments, downloaded at http://apps1.eere.energy.gov/state_energy_program/feature_detail_info.cfm/fid=22, January 7, 2009

[31] American Public Transportation Association, *Eighty Five Percent of Public Transit Systems Experience Capacity Problems as Ridership Surges*, September 9, 2008

[32] Charlotte Area Transit System, *LYNX Blue Line Extension Northeast Corridor Light Rail Project Description*, 2008. Surface Transportation Policy Project (STPP), *Setting the Record Straight Transit, Fixing Roads and Bridges Offer Greatest Job Gains,* January 28, 2004. American Public Transportation Association (APTA), *Public Transportation Fact Book/58th Edition*, May 2007. Factors STPP job estimates for transit projects based on construction cost; fuel savings from passenger car vs. transit fuel reduction estimates, APTA Public Transportation Fact Book

[33] Office of Management and Budget, *Detailed Information on the Federal Transit Administration New Starts Assessment*, 2003; 10.3 percent increase in ridership potential per transit system for ready-to-go New Starts projects as a 35 percent proportion of the total national transit network.

[34] U.S. Department of Energy Alternative Fuels and Advanced Vehicles and Data Center, *Natural Gas Vehicle Emissions*, September 2008. Factors 25 percent CO2 emissions reduction between diesel and Compressed Natural Gas buses

[35] American Public Transportation Association, *Public Transportation Fact Book/58th Edition*, May 2007

[36] Transportation Journal - American Society of Transportation & Logistics, *Amtrak revenues, fares, and ridership in the 1990s: trends and passenger revenues forecast errors,* Summer 1997. USA Today, *Amtrak reports record annual ridership*, October 10, 2008. Assumes 11 percent overall annual passenger rail growth consistently achieved will be sustained.

[37] Rails to Trails Foundation*, Role of Bicycling and Walking in Reducing America's Carbon Footprint*, November 21, 2008; Department of Transportation/Federal Highway Administration, *SAFETEA-LU 1808: CMAQ Evaluation and Assessment, Appendix C: CMAQ Project Templates*, October 2008. Factors increased usage of bicycle/pedestrian pathways to supplant passenger car commuting in urban areas.

[38] Surface Transportation Policy Project, *Setting the Record Straight Transit, Fixing Roads and Bridges Offer Greatest Job Gains*, January 28, 2004

[39] Center on Globalization Governance and Competitiveness, *Manufacturing Climate Solutions/Auxiliary Power Units: Reducing Carbon Emissions by Eliminating Idling in Heavy-Duty Trucks*, November 2008. Assumes funding amount enables tax incentive to subsidize purchase of anti-idling components proportionally across national freight truck fleet.

[40] CALTRANS, *Stormwater Quality Handbook*. 2002. Applies reduction of fresh water contamination per lane mile for urban/rural highways.

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

RENEWABLE ENERGY PROPOSALS					
Project	**Project summary**	**Investment (millions)**	**Timeline for job creation**	**Total jobs created/ preserved**	**CO2 reduction (tons/yr)**
Production and Investment Tax Credit	Amending the Renewable Energy Production and Investment Tax Credits, and their accelerated depreciation, to make them fully refundable is necessary for this stimulus to be effective. With the current economic recession, most companies are unable to use the existing tax credits because they do not have tax liability. The monetary cap for solar-thermal should also be removed.	n/a	Immediate	254,000	17,800,000
Renewable Energy on Federal Property	The federal government can drive hundreds of thousands of jobs by installing renewable energy on government property.	$10,000	3 months	350,000	4,900,000
Solar Manufacturing Tax Credit	The Solar Manufacturing Tax Credit would level the international solar manufacturing playing field by offering accelerated depreciation and a 30% refundable tax credit for the purchase of solar manufacturing equipment.	n/a	12 months	315000*	6,000,000*
Clean Renewable Energy Bonds	Clean Renewable Energy Bonds can be used by state and local governments and consumer-owned utilities as funding to jump-start renewable energy projects.	$5,000	12 months	28,000	n/a
Renewable Energy Production Tax Credit	Extending the 2.1 cents per kilowatt hour Production Tax Credit for large scale renewable projects would afford investors the certainty required for long term planning and allow the construction of larger-scale renewable projects.	$30,000	12 months	70,000	400,664,000
Green Jobs Act	The Green Jobs Act gives grants to national and state training programs (including community colleges and union apprenticeship programs) to trail skilled workers for green jobs.	$500	3 months		
National Renewable Electricity Standard	A national renewable electricity standard would require at least 25% of the nation's electricity to come from renewable sources such as wind, solar, biomass and geothermal, by 2020, with a near term target of 10% renewable energy by 2010, and regular increases mandated every two years thereafter.	n/a	3 months	185000*	223,000,000*
Solar on 10 Million Roofs	The federal government should establish a goal of installing solar energy systems on 10 million U.S. roofs by 2019, totaling 30GW, and providing a per watt rebate for both residential and commercial systems up to 5 MW in size in order to achieve it.	n/a	3 months	500000*	36,400,000*
Federal Power Purchase Agreement Contract Expansion	Allowing agencies to enter into power purchase agreement contracts of 25 years for renewable energy will allow producers to secure a long term market for renewable energy, and thus promote new capacity. Power purchase agreements are currently limited to 10, years except for the military.	n/a	3 months	n/a	n/a
Energy SmartPARKS	Energy SmartPARKS is a partnership between the National Park Service, the Department of the Interior and the Department of Energy that seeks to deploy renewable and efficient energy technologies throughout the national park system to showcase sustainable energy best practices and further the National Park Service's environmental leadership mission.	$100	3 months	n/a	n/a
Solar Schools Initiative	The Solar Schools Initiative would install solar roofs on every public high school within 5 years, creating nearly two gigawatts of new solar power for America's 19,000 public high schools.	$16,400	6 months	100,000	1,150,000
Battery Research and Development Program in DOE	Battery research would help promote the commercialization of plug-in hybrid automobiles and other electric vehicles that would help move us away from oil.	$100	6 months	1,000	n/a
Manufacturing Extension Partnership	The manufacturing extension partnership provides critical regional support to manufacturing firms that are struggling to retool and retrain workers so they can take advantage of new clean energy opportunities.	$200	12 months	30,000	n/a
	SUBTOTAL FOR RENEWABLES	**$62,300 (millions)**		**833,000**	**424,514,000**
	TOTALS FOR RENEWABLES, EFFICIENCY, TRANSPORTATION	**$150,322 (millions)**		**3,373,575**	**668,213,772**

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

RENEWABLE ENERGY PROPOSALS					
Fuel savings (gal/yr)	**Oil savings (bbls/yr)**	**Energy Saved (mBtu/year)**	**Energy savings/production (megawatts)**	**Equivalents (coal-fired power plants)**	**Source/methodology**
n/a	n/a	n/a	8,000	7	From, respectively: Tom Vinson, Environment Legislative Manager, American Wind Association (AWEA), personal communication, 9 December 2008; Solar Energy Industries Association (SEIA), Solar Energy Fuels Domestic Job Growth (fact sheet), December 2008, Resource Media, $19.2 Billion in U.S. Coal-Fired Power Plants Cancelled in 2008, December 2008. AWEA, Another Record Year for New Wind Installations (fact sheet), 28 October 2008. This is the sum of two numbers: 89,000 jobs saved in the wind industry and 165,000 jobs realized in the solar industry.
n/a	n/a	n/a	4,000	2	Solar Energy Industries Association (SEIA), Solar Energy Fuels Domestic Job Growth (fact sheet), December 2008
n/a	n/a	n/a	5,000*	2.25*	Ibid.
n/a	n/a	n/a	n/a	n/a	Renewable Energy Policy Project (REPP), The Work that Goes into Renewable Energy, November 2001. According to REPP, for every $1 million spent on wind and/or solar (capital costs and construction), 5.65-5.7 jobs are created. A $5 billion investment in renewable energy through CREBs would therefore create 28,250 jobs in manufacturing, construction, and operations and management.
n/a	n/a	n/a	180,000	148	Gregory Wetstone, Senior Director of Governmental and Public Affairs, personal communication, 25 November 2008. Michael Milligan, American Solar Energy Society (ASES), Tackling Climate Change in the U.S, January 2007. This is the estimated cumulative cost over 10 years.
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	117,000*	73.09*	Union of Concerned Scientists, Cashing In on Clean Energy, July 2007
n/a	n/a	n/a	30,000*	13.49*	Justin Baca, Senior Research Analyst, Solar Energy Industries Association, personal communication, 10 December 2008. This number is based on meeting the policy goals by 2019 with all technologies being manufactured in the U.S.
n/a	n/a	n/a	n/a	n/a	Long-term contracts and cost assurance will make renewable sources more cost-competitive and as such create more generation, but the amount is hard to calculate.
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	1900	0.9	Jeremy Symons, National Wildlife Federation, Solar Schools Initiative (fact sheet), November 2008. This is the cumulative cost over 5 years.
n/a	n/a	n/a	n/a	n/a	American Physical Society, Science Infrastructure Stimulus Package Proposal (fact sheet), November 2008.
n/a	n/a	n/a	n/a	n/a	Susan Helper, Economic Policy Institute, Renewing U.S. Manufacturing: Promoting a High-Road Strategy, February 2008
			193,900		
494,247,003	**25,477,000**	**492,053,639**	**193,900**		

See Energy Efficiency, Cleaner Transportation summaries on pages to follow

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

ENERGY EFFICIENCY PROPOSALS

Project	Project summary	Investment (millions)	Timeline for job creation	Total jobs created/preserved	CO2 reduction (tons/yr)
Energy Efficiency Tax Incentives	Make energy efficiency tax incentives and provisions governing accelerated depreciations fully refundable and alternative minimum tax creditable for two years so that people who wish to use these credits can do so without concern about the credits availability.	$6,000	Rules need to be established	62,945	n/a
Energy Efficiency and Conservation Block Grants	Fund energy efficiency and conservation block grants to cities and states for energy efficiency and conservation projects that reduce total energy use, decrease fossil fuel emissions, and improve energy efficiency in the transportation, building, and other sectors.	$1,900	12 months	142,500	3,673,620
Weatherization Assistance Program	Expand the weatherization program that weatherizes the homes of low-income families and reduces energy consumption for space heating by an average of approximately 25 percent per home.	$125	n/a	n/a	n/a
State Energy Program	Expand the State Energy Program (SEP) to improve state energy management capabilities and strengthen operational capability.	n/a	n/a	n/a	n/a
Efficient New Homes Tax Credit	Expand the Efficient New Homes Tax Credit to provide a $4,000 credit for homes that achieve 50 percent savings for the whole home and extends the tax credit for efficient new homes through 2011	n/a	n/a	n/a	n/a
Efficient Home Heating & Cooling Equipment Tax Credit	Increase the Efficient Commercial Buildings Tax Deduction from $1.80 sq/ft to at least $3 sq/ft.	n/a	6 months	n/a	n/a
Efficient Commercial Buildings Tax Deduction	Extend the Nonbusiness Energy Property tax credit that applies to high efficiency heating and cooling equipment through 2011.	$100	3 months	n/a	n/a
Healthy High Performance Schools Program	Fund the Healthy High Performance Schools Program that authorizes grants to state education agencies to facilitate the design, construction, and operation of schools that are energy and resource efficient and contain the amenities for necessary for a quality education.	$3,000	3 months	n/a	n/a
Energy Efficiency Grants to Colleges, Governments and Schools	Fund the Energy Sustainability and Efficiency Grants and Loans program that gives federal assistance to institutions of higher education, public schools, and local government so they can become models for the changes in energy usage that all sectors of society need to adopt.	$600	n/a	n/a	n/a
Federal Agency Efficiency Improvements	Fund a federal agency efficiency fund administered by the Federal Energy Management Program of DOE for federal agencies to make energy efficiency improvements and for the installation of clean distributed energy in federal buildings	$100	n/a	n/a	n/a
EPA Energy Star Program	Expand the EPA Energy Star Program, a voluntary program that promotes energy efficiency in buildings, appliances and equipment.	$40	n/a	n/a	n/a
Public Information Initiative	Fund the public information initiative, an education program authorized by the Energy Independence and Security Act to help consumers lower their energy bills. The funding would be used for a campaign administered by DOE targeting the general American public and encouraging energy efficiency and conservation actions.	$3,000	no program in place	225,000	5,800,452
Home Efficiency Retrofit Program	Create a Home Efficiency Retrofit Program that gives a rebate to homeowners to undertake an efficiency retrofit of an existing home	$3,000	no program in place	19,500	n/a
Commercial and Public Buildings Retrofit Program	Create a commercial and public buildings retrofit program that would encourage the near term launch of large scale, deep retrofitting of private and publicly owned	$1,500	3 months	n/a	526,700
Window Weatherization Rebates	Fund window weatherization rebates to consumers to purchase energy-efficient windows that will reduce energy use.	NA	NA	n/a	230,000,000
Energy Efficiency Resource Standard	Enact an energy efficiency resource standard requiring utilities to achieve energy savings of 15% of electricity sales and 10% of natural gas sales in 2020.	$110	3 months	n/a	n/a
Small Business Hot Water Heater Acquisition Assistance	Fund hot water heater acquisition assistance to small businesses for upgrading to more efficient hot water heaters.	$1,000	NA	n/a	n/a
Super-Efficient Appliances Deployment (SEAD)	Fund super-efficient appliances deployment which rewards retailers and manufacturers for increasing market penetration of highly efficient products.	$600	3 months	n/a	n/a
Boiler Control Purchase and Installation Assistance	Provide $600 million in assistance for purchase and installation of control boilers for homes and businesses to purchase and install intelligent boiler controls that have big energy and global warming gas reductions.	$25	4 months	n/a	n/a
Waste Heat Recovery Rebates	Fund waste heat recovery rebates that gives incentives to projects that recover waste heat.	$25	4 months	n/a	n/a
	SUBTOTAL FOR EFFICIENCY	**$29,025 (millions)**		**314,500**	**240,000,772**

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

ENERGY EFFICIENCY PROPOSALS

Fuel savings (gal/yr)	Oil consumption savings (bbls/yr)	Energy Saved (mBtu/year)	Electric energy savings/production (megawatts)	Equivalents (coal-fired power plants)	Source/methodology
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	20,507,846	n/a	n/a	The jobs number was calculated by summing the total number of jobs for projects proposed by the mayors using the community block grants program as funding and dividing it by the amount of money that they proposed to spend on the program to come up with an average number of jobs per dollar. http://mayors.org/mainstreeteconomicrecovery/documents/mser-report-20081219.pdf.
n/a	n/a	n/a	n/a	n/a	The Department of Energy says that there are 52 direct and 23 indirect jobs created for every million dollars that is invested in the Weatherization Assistance Program. http://www.waptac.org/sp.asp?mc=what_overview_program http://apps1.eere.energy.gov/weatherization/about.cfm http://www.eia.doe.gov/emeu/recs/recs2001/ce_pdf/spaceheat/ce2-1c_climate2001.pdf http://www.epa.gov/climatechange/emissions/downloads/08_Annex_2.pdf http://tonto.eia.doe.gov/ftproot/environment/e-supdoc-u.pdf
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	323,779,193	n/a	8	
n/a	n/a	n/a	n/a	n/a	Because the retrofit program can be used for weatherization, we assumed that the energy savings would be at least as effective as the weatherization program.
n/a	n/a	n/a	n/a	n/a	The jobs number comes from the Earth Policy Institute.
n/a	n/a	n/a	n/a	92,000 cars off the road	Environmental Defense Fund estimates that this program will be the equivalent of taking 92,000 cars off the road. EPA estimates that the average passenger car on the road in 2000 emitted 11,450 pounds of carbon dioxide annually. U.S. EPA, Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks, 2008 November 2007, www.epa.gov/otaq/consumer/f00013.htm
n/a	n/a	n/a	n/a	n/a	All numbers for the Energy Efficiency Resource Standard are for when it is fully implemented in 2010. Data came from American Consumers for an Energy Efficient Economy. http://www.aceee.org/energy/national/eers0908.htm
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	

344,287,039

See Cleaner Transportation summaries on pages to follow

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

CLEANER TRANSPORTATION PROPOSALS					
Project	**Project summary**	**Investment (millions)**	**Timeline for job creation**	**Total jobs created/ preserved**	**CO2 reduction (tons/yr)**
New Starts transit capital projects	Fund projects to expand existing or construct new transit capacity, as authorized by SAFETEA-LU	$30,700	4 to 18 months	1,250,819	1,096,000
Transit rehabilitation and modernization	Fund capital improvements (new equipment and vehicles) as authorized by SAFETEA-LU to include replacing existing transit fleet with new, American-made buses and rail cars incorporating clean energy technology, and retrofitting current fleet with GHG-reducing components	$8,000	3 months	304,112	528,000
Transit emergency service/operations grants	Increase operating/energy assistance grants as authorized by H.R. 6052 (Saving Energy Through Transportation Act) to sustain current and projected growth in ridership, mitigate rate increases and service cuts, and secure access to cleaner alternative fuels	$4,000	within 3 months	280,000	1,396,000
Bicycle/pedestrian infrastructure	Provide funding for approximately 450 ready-to-go bicycle and pedestrian connectivity projects, as well as funding Complete Streets initiative to enable pedestrians, bicyclists, motorists and bus riders to safely travel the existing road network	$1,700	6 months	45,000	53,000
Intercity/Amtrak rail improvements	Improve intercity travel and regional transit access by funding authorized Amtrak and state intercity rail corridor improvements	$1,850	4 to 6 months	55,000	40,000
Fix-it-first infrastructure maintenance and rehabilitation	Repair and rehabilitate existing roads and bridge infrastructure; focusing on existing road network discourages sprawl by enhancing existing land use patterns, create more jobs than new capacity projects, and creates opportunities to invest in sustainable resurfacing options like permeable concrete to enhance storm water management	$8,000	4 months	278,000	n/a
Anti-idling truck technology	Provide rebates to truck operators to purchase anti-idling equipment, to allow drivers to power truck cabs without running the truck engine, as well as other equipment to improve energy efficiency	$315	2 to 3 months	1,000	586,000
Highway stormwater mitigation	Fund green infrastructure and natural bioretention along roads and highways to mitigate stormwater runoff (one of the largest sources of water pollution)	$232	6 months	3,444	n/a
Wildlife habitat transit connectivity	Protect and restore landscape connections across transportation infrastructure in wildlife habitats, reducing wildlife vehicle collisions and providing climate change adaptation and resiliency	$200	6 to 8 months	8,000	n/a
Advanced technology vehicles/loan guarantees	Provide loan guarantees for advanced technology vehicles and fuels: creating a domestic market for cellulosic ethanol, renewable hydrogen production, improving fuel cell and battery technology	$4,000	R & D within one month, demonstration plant could begin within two years	700	n/a
	SUBTOTAL FOR TRANSPORTATION	**$58,997 (millions)**		**2,226,075**	**3,699,000**

APPENDIX - Proposal Summary, Rebuilding America Through Green Infrastructure

CLEANER TRANSPORTATION PROPOSALS					
Fuel savings (gal/yr)	**Oil consumption savings (bbls/yr)**	**Energy Saved (mBtu/year)**	**Energy savings/production (megawatts)**	**Equivalents (cars off the road/yr)**	**Source/methodology**
113,002,753	5,825,000	33,785,000	n/a	207,172	Office of Management and Budget, Detailed Information on the Federal Transit Administration New Starts Assessment, 2003. Surface Transportation Policy Project (STPP), Setting the Record Straight Transit, Fixing Roads and Bridges Offer Greatest Job Gains, January 28, 2004. American Public Transportation Association (APTA), Public Transportation Fact Book/58th Edition, May 2007. Factors STPP job estimates for transit projects based on construction cost; fuel savings from passenger car vs. transit fuel reduction estimates, APTA Public Transportation Fact Book 10.3% increase in ridership potential per transit system for ready-to-go New Starts projects as a 35% proportion of the total national transit network
192,000,000	9,897,000	57,402,600	n/a	352,000	U.S. Department of Energy Alternative Fuels and Advanced Vehicles and Data Center, Natural Gas Vehicle Emissions, September 2008. Factors 25 percent CO2 emissions reduction between diesel and Compressed Natural Gas buses
126,908,250	6,542,000	37,943,600	n/a	232,665	American Public Transportation Association, Public Transportation Fact Book/58th Edition, May 2007. As of 2007, national public transportation network saves approximately 1.4 billion gallons of fuel through reduced passenger car trips, an additional 350 million gallons through reduced traffic congestion, and 37 million tons of CO2 emissions. Fuel and carbon dioxide impacts factor a potential five percent drop in ridership due to potential service reductions.
5,414,000	279,000	1,618,200	n/a	9,926	Rails to Trails Foundation, Role of Bicycling and Walking in Reducing America's Carbon Footprint, November 21, 2008; Department of Transportation/Federal Highway Administration, SAFETEA-LU 1808: CMAQ Evaluation and Assessment, Appendix C: CMAQ Project Templates, October 2008. Factors increased usage of bicycle/pedestrian pathways to supplant passenger car commuting in urban areas.
3,623,000	187,000	1,084,600	n/a	6,642	Transportation Journal, Amtrak revenues, fares, and ridership in the 1990s: trends and passenger revenues forecast errors, Summer 1997. USA Today, Amtrak reports record annual ridership, October 10, 2008. Assumes 11 percent consistent annual passenger rail growth will be preserved.
n/a	n/a	n/a	n/a	n/a	
53,299,000	2,747,000	15,932,600	n/a	97,715	Center on Globalization Governance and Competitiveness, Manufacturing Climate Solutions/Auxiliary Power Units: Reducing Carbon Emissions by Eliminating Idling in Heavy-Duty Trucks, November 2008. Assumes funding amount enables tax incentive to subsidize purchase of anti-idling components proportionally across national freight truck fleet.
n/a	n/a	n/a	n/a	prevent contamination of 16 million cubic meters of fresh water annually	CALTRANS, Stormwater Quality Handbook. 2002. Applies reduction of fresh water contamination per lane mile for urban/rural highways.
n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	
494,247,003	**25,477,000**	**147,766,600**			