

# Rebuild America's crumbling infrastructure

America's infrastructure is in a dire state. Bridges are crumbling, our highways need repair, and our power grids are out of date. Increasing our investments in infrastructure is critical for the short-term and long-term health of our economy and our middle class. In 2009 the American Society of Civil Engineers gave America's infrastructure a grade of "D," while analysis by the Center for American Progress estimates that we need to invest \$129.2 billion more per year over the next 10 years just to meet our country's infrastructure repair and improvement needs.<sup>1</sup>

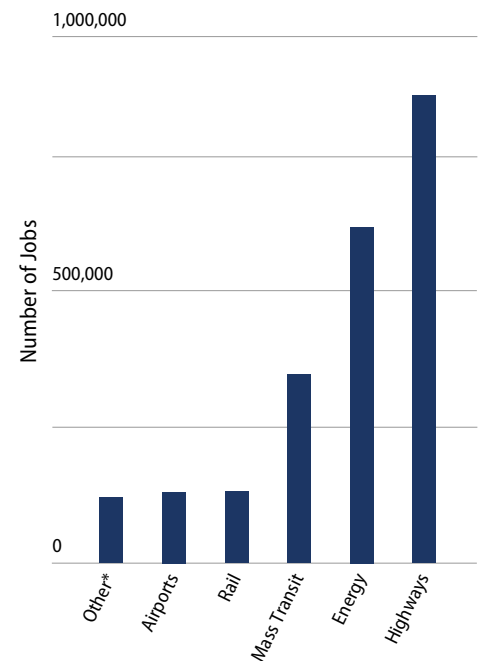
Boosting investments in infrastructure and facilitating the growth of the clean-energy and energy-efficiency industries are very effective ways of boosting economic growth and increasing job growth. In a report on the American Recovery and Reinvestment Act, the Congressional Budget Office wrote that spending on infrastructure created the second-most economic activity for each dollar spent.<sup>2</sup> This power comes from the fact that economic activity is created by the direct hiring of workers to build the infrastructure as well as the boost from the spending of those newly hired workers.

The long-term health of the economy is also helped by strong public infrastructure. Public infrastructure helps boost the productivity of workers and businesses in the private sector.

Well-maintained roads, for example, allow goods and people to move quickly between locations increasing productivity and reducing costs.<sup>3</sup> The increased productivity results in stronger economic growth and rising wages for workers. Over the longer term, the entire economy would be wealthier and the middle class stronger.

**FIGURE 7**  
**The employment power of infrastructure investments**

An estimated 2.4 million jobs created with \$129.2 billion more infrastructure spending, based on 2009 data



Source: Donna Cooper, "Meeting the Infrastructure Imperative: An Affordable Plan to Put Americans Back to Work Rebuilding Our Nation's Infrastructure" (Washington: Center for American Progress, 2012).

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## Rebuild infrastructure to create jobs and spur the economy

### Background

Our nation's infrastructure is crumbling. Aging schools, roads, bridges, and water and sewer systems put the public's health and safety at risk. The problem is well documented and grows more severe with each passing year. Nearly one of every four U.S. bridges is structurally deficient or functionally obsolete;<sup>4</sup> 4,000 of the country's dams are in need of repair;<sup>5</sup> and insufficient freight rail infrastructure results in 39,000 additional truck trips to the Port of Los Angeles alone each day.<sup>6</sup>

Crumbling infrastructure endangers the physical and economic well being of all Americans. In 2007 the I-35W Mississippi River bridge in Minneapolis, which had been categorized as structurally deficient, collapsed, resulting in the death of 13 people and 145 injured.<sup>7</sup> Two years earlier, New Orleans' levees failed to hold back the flood waters of Hurricane Katrina, claiming the lives of more than 1,800 people, and causing at least \$125 billion in economic damage.<sup>8</sup> Both disasters illustrate the cost of neglecting the country's infrastructure.

Moreover, infrastructure investment holds the promise of accelerating the sluggish economic recovery. Infrastructure spending pumps money into local economies by creating work for private-sector companies and good-paying construction jobs.

Mark Zandi, chief economist at Moody's Analytics, found in 2011 that new federal spending for infrastructure improvements to highways and public schools would generate \$1.44 of economic activity for each \$1 spent.<sup>9</sup> In fact, the Congressional Budget Office found that infrastructure investments had one of the strongest economic impacts of all the policies included in the American Reinvestment and Recovery Act.<sup>10</sup>

Rebuilding our crumbling infrastructure is a daunting, but achievable, goal. The nation needs an additional \$129.2 billion per year investment to meet the current backlog of infrastructure repairs and improvements, according to a report by American Progress's Donna Cooper, "Meeting the Infrastructure Imperative: An Affordable Plan to Put Americans Back to Work Rebuilding Our Nation's Infrastructure."<sup>11</sup>

This will require states to raise and spend much more on infrastructure. And although funding is scarce due to the Great Recession and the slow economic recovery,<sup>12</sup> states are using new and creative methods to fund infrastructure projects.

But some states lag behind. On average the federal government provides 20 percent of surface-transportation funding to state projects while state and local spending accounts for 50 percent and 30 percent, respectively.<sup>13</sup> But in 17 states, federal funds were the primary source of transportation dollars, as of 2006.<sup>14</sup>

Even with a heavy reliance of federal dollars in some states and cities, a significant amount of federal money is going unused. Cooper's analysis for American Progress shows that based on the loan-matching requirements established by Congress, at least \$20 billion in private, state, local, or public authority capital could be drawn into U.S. infrastructure projects if the federal loan and loan-guarantee programs were fully tapped.<sup>15</sup>

This is an opportune time for state governments to catch up on our long backlog of infrastructure priorities. Interest rates available to states are historically low and policymakers who act now to finance their infrastructure can lock in inexpensive financing for many years into the future.

## Plan for infrastructure needs

States should formalize their infrastructure planning and financing process and create pathways for public involvement. Moreover, infrastructure plans should identify and seek to achieve specific policy goals—such as increased equity, protection of environmental resources, and increased economic development.

The state of California, for example, through its Infrastructure Planning Act,<sup>16</sup> requires the governor to create a comprehensive, five-year infrastructure-development plan.<sup>17</sup> The plan, along with a proposal for its funding, is submitted to the legislature for review, enabling a public vetting process.<sup>18</sup> Additionally, subsequent legislation required that state infrastructure projects adhere to three planning priorities:<sup>19</sup>

- Promote infill and equity so that infrastructure funds benefit disadvantaged communities and redevelopment of areas previously developed and served by transit, streets, water, sewer, and other essential services.
- Protect environmental and agricultural resources.
- Encourage efficient development patterns.

## Maximize public investment

There are a number of ways states can raise revenue to finance infrastructure projects. States facing severe budget shortfalls but also containing equally important infrastructure-reinvestment needs could maximize public investment by pursuing the following strategies:

**Raise the gas tax and other user fees:** States not raising enough revenue to meet the construction and repair needs for their road and transit systems should increase their gas tax and other user fees to help make up the difference. States raise billions of dollars each year through the gas tax, yet the amount varies widely by state, ranging from 8 cents per gallon in Alaska to 49 cents per gallon in New York.<sup>20</sup> In the United States, a little more than 42 percent of state-level funding for roads comes from user-fee generated revenue. States asking less from those using their roads should increase user fees if they face infrastructure needs.

Massachusetts, for example, receives only 26.8 percent of its state highway funding from user fees<sup>21</sup> and has a backlog of 1,060 structurally deficient or functionally obsolete bridges, more than half of all bridges in the state.<sup>22</sup> With a state gas tax rate less than half the rate of neighboring New York, Massachusetts has ample room to increase its gas tax to help fund the improvement of its bridges.<sup>23</sup> And though only six states have indexed their gas tax to keep pace with inflation, every state should follow that approach.<sup>24</sup> While not every state with high user fees has low bridge-deficiency rates, and vice versa, if states are not raising revenues in other ways to accelerate the repair of their bridges, increasing the gas tax makes sense.

Policymakers should keep in mind that gas taxes—like other sales taxes—are regressive. While we recommend that a significant portion of taxes be reinvested back into infrastructure, legislators could also consider using a portion of funds to for tax-rebate programs for low-income families.

**Use GARVEE bonds:** All states use general obligation bonds to finance their infrastructure, and 33 states plus the District of Columbia and Puerto Rico use Grant Anticipation Revenue Vehicles, or GARVEE, bonds.<sup>25</sup> These bonds allow states to spend future federal highway grants funding now rather than wait when there is an acute need for both the infrastructure and jobs and interest rates are low. States that are not using these bonds should consider doing so.

**Increase tolling and user fees:** States should also consider increasing tolling and other user fees. Most states have some roads or bridges that are viable candidates for new or increased tolls. Doing so would enable states to attract private financing to help fund road and bridge improvements, by dedicating the new tolling revenues to pay off the debt. Credible estimates suggest governments could raise at least \$100 billion by taking advantage of existing tolling opportunities.<sup>26</sup> While the policy implications of increased tolling can be complicated and increase costs on the middle class, increased tolling is a necessary part of the comprehensive approach states should take toward raising essential revenues for infrastructure improvements.<sup>27</sup>

### Explore using pension investments to drive infrastructure improvements

States should look for creative ways to encourage safe investments of their pension funds into state infrastructure improvements. This will provide both added funds to finance infrastructure projects and provide a stable return on investments and broaden the portfolios of pension funds.

On September 29, 2012 California Gov. Jerry Brown (D) signed SB 955, authorizing CalPERS—the \$227 billion California Public Employees’ Retirement System—to prioritize California infrastructure projects with its investment dollars.<sup>28</sup> CalPERS opposed the original draft, which required public-employee pension funds to prioritize California projects, but removed their opposition once the amended bill clarified that the public retirement system boards—and not the legislature—retained investment decision-making powers. CalPERS has already begun to move \$4 billion into the market to finance infrastructure improvements, 20 percent of which will be in California.<sup>29</sup>

Two years earlier the California State Teachers Retirement Systems made the decision to invest in infrastructure improvements and as of October 2012 has committed \$750 million to finance infrastructure projects nationwide.<sup>30</sup> And, finally, the New York City Employee Retirement System also recently passed a board resolution to invest in local infrastructure projects.<sup>31</sup>

### Increase funding for water-system upgrades

The average American family of four uses 400 gallons of water per day.<sup>32</sup> Accessing this water is becoming increasingly costly from both an economic and environmen-

tal standpoint as the aging water systems Americans rely on have reached the end of their useful lives. Every year thousands of aging water pipes burst, costing millions of dollars in repairs and untold economic losses. Every year the United States loses 25 percent of its treated water to leakage and more than 1.7 trillion gallons to 240,000 water main breaks.<sup>33</sup> At the same time, outdated wastewater systems dump billions of gallons of untreated sewage into our rivers, lakes, and streams.<sup>34</sup>

State revolving loan funds are struggling to keep up with the massive demand to repair and improve water infrastructure. One reason revolving loan funds do not have enough assets is due to overly cautious investment practices, according to American Progress's 2012 report, "How to Upgrade and Maintain Our Nation's Wastewater and Drinking-Water Infrastructure." Many of these state entities currently invest unassigned grant funds and repaid loan funds in low-interest-bearing accounts and financial instruments that often yield a return of less than 1 percent a year, which is barely enough to keep pace with inflation.<sup>35</sup> If more funds maintained a balanced portfolio as state pension funds do, they would enjoy a much greater rate of return without taking on irresponsible risk.

New York and Connecticut have begun to take this approach. New York's investment portfolio, for example, consists primarily of highly rated taxable municipal securities, all of which are higher-yield investments. These practices along with a transition to a leveraged-lending model have already enabled New York to increase its loan capacity by an impressive 25 percent.

The Center for American Progress estimates that if these changes were adopted by all state funds in conjunction with transitioning remaining drinking-water and clean-water state loan funds to leveraged models, total funds available for project financing could increase by \$300 million per year.<sup>36</sup>

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## Increase the use of renewable energy to help the middle class

### Background

State governments have a tremendous opportunity to increase the use of renewable energy. After decades of state-level experimentation, state governments now can adopt proven strategies to conserve electricity and to grow their renewable-electricity industry by increasing wind, solar, and geothermal power. By doing so, states not only

reduce carbon pollution, clean their air, and protect public health but they also help grow their economies by creating thousands of reliable, permanent, high-wage jobs.

In large part because of the critical initial investments in renewable energy put in place by the federal government, and by many state and local governments as well, the renewable- and efficient-energy sectors have already become proven job creators.

The Department of Labor's Bureau of Labor Statistics finds that nearly 2 million people work in establishments where all of revenue comes from green goods and services, and more than 6 million additional people work in establishments where some revenue comes from green goods and services.<sup>37</sup> This includes a diverse group of occupations, including software engineers who help design smart-grid technologies, commercial construction workers, and even bus drivers.<sup>38</sup>

And this job growth continues even amid the current sluggish economy. According to Environmental Entrepreneurs (a national organization of business leaders promoting environmental policies), in April, May, and June 2012 alone, 70 U.S. cities, organizations, and companies announced new clean energy projects in public transportation, manufacturing, power generation, and energy efficiency that were predicted to create 37,409 new jobs.<sup>39</sup> And over the past four years, the United States has doubled generation of wind and solar electricity.<sup>40</sup>

Moreover, the future job-creation potential for renewable energy is even more promising. According to one study, Texas could add 123,000 new high-wage jobs to its economy by 2020 by actively moving toward solar power.<sup>41</sup> Similarly, by 2023 Florida could save \$28 billion, offset the state's entire future growth in electric demand, and create more than 14,000 jobs by adopting energy-efficient strategies, according to a 2007 study by the American Council for an Energy-Efficient Economy.<sup>42</sup> And a 2010 University of California, Berkeley study found that a variety of national renewable energy policies would create the equivalent of 4 million jobs by 2030.<sup>43</sup>

Moving to a more sustainable, lower-carbon energy economy helps the middle class in numerous ways beyond job creation. A more diverse electricity sector, incorporating many different kinds of renewable power sources, would move the country away from its current dependence on large, centralized fossil fuel power plants—the kind of plants that are most vulnerable to going down in extreme weather events such as the recent Hurricane Sandy. A less carbon-intensive energy sector would also vastly improve public health, especially in urban areas. And

moving away from fossil fuels will help slow the process of climate change, which is ultimately the most serious economic issue facing the globe.

State governments are adopting a variety of strategies to speed the conversion to renewable energy, protect consumers, and create good jobs. In particular, states are focusing on the three key elements of this conversion:

- Helping create a market for clean energy products and processes
- Helping facilitate private-sector financing of these projects
- Investing in the infrastructure (including the skilled workforce) necessary to move clean electricity and fuels to market.

Below we profile some of the most promising of these strategies, which are detailed in more depth in a 2009 Center for American Progress Report, “The Clean-Energy Investment Agenda: A comprehensive approach to building the low-carbon economy.”<sup>44</sup>

### Establish a state renewable portfolio standard and take steps to meet it

As of April 2012, 29 states and the District of Columbia were helping drive investments in their renewable energy industries by establishing an enforceable renewable portfolio standard, and seven states had adopted voluntary renewable energy goals.<sup>45</sup> Renewable portfolio standard laws require public utilities to increase their use of renewable energy over time. Typically, these laws create a reliable market for renewable energy by requiring that renewable-energy usage be gradually increased until renewables account for a certain percentage of a state’s electricity generation. In addition to reducing pollution, renewable portfolio standard laws diversify a state’s energy mix, reducing the risk to consumers of relying on a single source of energy and decreasing reliance on fossil fuels according to American Progress’ 2012 report, “Renewable Energy Standards Deliver Affordable, Clean Power.”<sup>46</sup> The 21 states without a renewable portfolio standard should strongly consider adopting one.<sup>47</sup> Standards should encourage all forms of renewable energy, including solar photovoltaic, solar thermal, wind, biomass, new hydropower, and geothermal heat and cooling, among others. In some cases where a state has particularly strong resources in one specific area, the state may want to write a standard that favors this particular resource (for example, solar power in Arizona or wind power in South Dakota).



California's model renewable portfolio standard<sup>48</sup> requires the state's electric utilities to draw 33 percent of their retail electricity from renewable energy sources by 2020. The statute also established interim targets of 20 percent by the end of 2013, and 25 percent by the end of 2016.<sup>49</sup> And the aggressive standards have worked. In 2012 California's three large investor-owned utilities collectively generated 20 percent of their retail electricity sales that year with renewable power.<sup>50</sup>

Texas has also achieved positive results by enacting a Renewable Portfolio Standard in 1999 that focuses primarily on wind energy.<sup>51</sup> State wind-power corporations and utilities have invested \$1 billion in wind power, meeting their 10-year generation goals in just six years.<sup>52</sup> And the Union of Concerned Scientists estimates that the state will create nearly 20,000 new jobs and gain an additional \$600 million in the Texas economy if the state meets its 2025 goals.<sup>53</sup>

States should adopt similarly ambitious standards, including interim goals so utilities continue to invest in renewable sources. Steady growth in the renewables market reassures investors and provides predictability for renewable companies so they can manage growth.

### Encourage CLEAN contracts

Across the world, the policy that has helped more than any other to bring more renewable electricity into the market is the Clean Local Energy Accessible Now, or CLEAN, contract, also known as a “feed-in tariff,” according to the 2011 report, “CLEAN Contracts: Making Clean Local Energy Accessible Now,” authored by the Center for American Progress and environmental advocacy groups, Groundswell and the Energy Action Coalition.<sup>54</sup> These policies allow owners of renewable electricity facilities to sell their power to utilities at a predictable, fixed price over a long period of time. Clean-energy growth requires substantial new investment, which requires a predictable market. Yet decades of policies favoring traditional fossil fuels, combined with an uncertain regulatory environment, create anxiety among clean-energy investors who are understandably hesitant about investing in promising technologies. These contract programs confront those challenges by providing clean-energy investors and owners with a stable market for clean energy at a reliable price. It makes it easier for consumers to buy and use clean energy and for business to move projects forward.<sup>55</sup> CLEAN contracts also provide an incentive for investment in nonutility-scale “distributed generation” of renewable energy, such as rooftop solar and community wind projects.

California’s CLEAN contract program,<sup>56</sup> for example, requires utilities with 75,000 or more customers to make a standard feed-in tariff available and allows customer-generators to enter into contracts of up to 20 years with utilities to sell the electricity produced by small renewable-energy systems at time-differentiated, market-based prices.<sup>57</sup> Under the program, utilities pay higher rates, for example, for electricity generated during standard business hours.

In 2009 the city of Gainesville, Florida replaced its existing solar-promotion programs with a feed-in tariff. The program there offers a 20-year contract at a constant rate with the city’s municipal utility, Gainesville Regional Utilities.<sup>58</sup> The plan has been deemed a success as Gainesville now ranks first in the state in renewable energy per capita and the strategic planning engineer for the utility has praised the program for its “impressive results” that have required no new staffers.<sup>59</sup>

States should implement a CLEAN program at their municipally owned and cooperative utilities, and they should engage with the Federal Energy Regulatory Commission to clarify how they would view potential statewide CLEAN contracts.

### Facilitate distributed generation

State governments should also focus on “distributed generation” in order to maximize the amount of renewable electricity they generate. This refers to smaller energy generators, such as homes and small- and medium-sized businesses that may generate renewable electricity via solar or other sources of clean power. CLEAN contracts can help to accomplish this effectively, but other strategies are available to states. This section will briefly describe four policies that states can adopt to further encourage distributed generation:

- Providing incentives to residential users and small businesses to install energy generators
- Adopting net-metering policies to allow small-scale producers to sell their power back to utility companies
- Establishing clear and uniform processes for connecting distributed-generation systems to the grid through comprehensive interconnection rules
- Encouraging broad-based public investment in small-scale projects

First, state governments should adopt programs that provide incentives to residential users and small businesses to install of energy generators. California’s

2006 Go Solar Plan,<sup>60</sup> for example, expanded existing efforts in the state to increase solar photovoltaic installation on homes and businesses. One program, the California Public Utility Commission's California Solar Initiative,<sup>61</sup> is the largest solar rebate program in the world. This program incentivizes the installation of 1,940 megawatts of new solar capacity on existing homes by offering \$2.2 billion in rebates to residential customers of investor-owned utilities between 2007 and 2016. The initiative includes programs that target single-family, low-income homeowners<sup>62</sup> and owners of multifamily affordable residential housing,<sup>63</sup> as well as funding continuing research and development.<sup>64</sup> In addition, the state's New Solar Homes Partnership<sup>65</sup> offers incentives for solar installation on new homes. By 2016 this \$400 million incentive program aims to install 360 megawatts of new solar capacity.

California has been a leader in distributed generation. As of the first quarter of 2012, California had brought on line 2,025 megawatts of solar energy capacity—roughly half of which are from small-scale installations, with the other half coming from utility-scale projects.<sup>66</sup>

Second, states should adopt a net-metering policy to give distributed generation systems the ability to sell power back into the grid from small installations such as residential solar or wind units. More than 40 states now have some form of net-metering policy, and many states have passed recent legislation to improve their policies.<sup>67</sup>

California and Utah have passed legislation to increase the amount of energy provided by net meters.<sup>68</sup> Others have clarified the ability of customers to sell excess capacity back to the utility at full value after the end of a billing period.<sup>69</sup>

Colorado's net-metering policy<sup>70</sup> is considered to be one of the best, according to DSIRE Solar, a database of state incentives for renewables and efficiency funded by the U.S. Department of Energy.<sup>71</sup> The state has no limit on the aggregate net-metering capacity, which means that any size renewable energy system can qualify, and the policy encourages utility customers to produce more energy than they will consume by allowing systems that produce up to 120 percent of a customer's average annual bill to qualify for the program.<sup>72</sup> Also, customers receive credit for the energy they produce on their subsequent bill.

New Jersey's net-metering policy, established in 1999<sup>73</sup> and expanded in 2004<sup>74</sup> and again in 2012,<sup>75</sup> is also regarded by DSIRE Solar as one of the nation's strongest.<sup>76</sup> It has no individual system-capacity limit and no firm limit on aggregate net metering. Any net excess capacity is carried forward to the next bill at the full rate.

Third, state governments should establish clear and uniform processes and technical requirements for connecting distributed-generation systems to the electric utility grid through comprehensive interconnection rules. These rules reduce uncertainty for distributed-generation producers and protect energy end users by ensuring that interconnection costs are uniform throughout the state and commensurate with the size and scope of the project; allowing developers to predict the time and costs involved in connecting to the system; and ensuring that distributed-generation projects meet safety and reliability standards.<sup>77</sup>

The Interstate Renewable Energy Council—a nonprofit organization committed to accelerating the sustainable utilization of renewable energy—has established model interconnection standards which incorporate a number of best practices, including requirements to ensure: all utilities are subject to the policy and all customers should be eligible; there are multiple levels of review to accommodate systems based on capacity, complexity, and level of certification; and application costs are kept to a minimum, especially for smaller systems.<sup>78</sup> To date, more than 30 states have adopted comprehensive interconnection rules that apply to both large- and small-distributed generation systems. States with some of the strongest policies include Virginia, Maine, and Utah.<sup>79</sup>

Finally, one limitation on the broad-based expansion of solar energy is that many people have a hard time participating in its generation. Tenants in multifamily residential units commonly have no rooftops of their own to use to capture solar energy. And a huge number of single-family homeowners do not have rooftops with appropriate sun exposure.

Community-solar facilities—projects where community members pool investments and benefits into renewable energy development—solve this problem and maximize the potential of net metering. Colorado, for example, enacted the Community Solar Gardens Act in 2010, which allows for community solar gardens to be established. These facilities can be owned by a utility or by a for-profit or nonprofit organization with 10 or more subscribers, each of whom receive credits on their utility bills in proportion to the size of their subscription.<sup>80</sup>

### Ensure clean-energy and energy-efficiency jobs are good jobs and go to qualified workers

As state governments drive toward greater efficiency and renewable energy use, they should also focus on job quality. Without any preconditions on the qualifica-

tions of the workers, some utilities or their contractors and subcontractors may attempt to maximize profits by driving down wages or hiring workers without needed training. Some states have created programs to ensure that qualified workers are doing the renewable-energy and energy-efficiency work—including requiring workers to get proper certification, establishing a prequalification list of certified workers, and requiring that contractors hire workers from the list.

After the Center for Working Families and the Center for American Progress released the 2009 report “Green Jobs, Green Homes, New York,”<sup>81</sup> challenging New York state to perform efficiency retrofits to 1 million homes over five years, the legislature passed the Green Jobs/Green New York Act.<sup>82</sup> The program provides funding and support for training for jobs in the renewable-energy and energy-efficiency sectors, including jobs in the operations and maintenance of energy-efficient buildings. The program also helps create a market for this work by providing free and reduced-price energy audits and low-interest loans for residential and small-business owners to energy-efficiency improvements (as discussed in the next section on page 179).<sup>83</sup>

The program requires that training institutions pursue accreditation by applicable independent organizations, such as the Institute for Sustainable Power, the Building Performance Institute, or the North American Board of Certified Energy Practitioners. And it provides for the recognition of existing state-funded training programs to train and place workers with green contractors. The program also conducts needs assessments to ensure that workers will continue to be well trained for existing jobs, especially as new competencies are required.<sup>84</sup>

### Use the state’s public power to leverage private funds for green investment

State legislatures should consider establishing state-level, green-financing instruments, which allow the government to combine scarce public resources with private-sector funding, and leverage these funds to invest in clean-energy projects that would likely otherwise not receive support.<sup>85</sup>

Connecticut, for example, established the Clean Energy Finance and Investment Authority in 2011—making it the first state to create a green bank.<sup>86</sup> The bank combines different funding sources, including its public-benefit fund, to create an initial loan pool that is now being used to attract private-sector investment. Similarly, in 2010 Kentucky established a green bank that used Recovery Act funds to offer a revolving loan fund that finances energy-efficiency improvements of state agency buildings.<sup>87</sup>

Alternatively, in states where setting up a new authority dedicated specifically to funding clean-energy projects is not feasible, legislatures should consider embedding a green-investment function in the state infrastructure bank.<sup>88</sup>

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## Use energy-efficiency improvements to save money and drive job growth

### Background

Americans use huge amounts of energy simply to heat, cool, and light indoor spaces. Buildings account for about 40 percent of total energy consumption in the United States, and about 70 percent of total electricity consumption; they are also responsible for 40 percent of carbon dioxide emissions.<sup>89</sup> For this reason, improving energy efficiency for existing buildings and new construction is critical to moving the United States toward a more sustainable energy economy.

In recent years, advocates for new green construction and existing structure retrofits have enjoyed success in the public and private sectors. High electricity prices have contributed to this, as building owners (especially in the manufacturing sector) struggle to contain costs. In addition, there is considerable interest in both sectors in constructing new buildings that are certified “green” by outside verifiers.

Indeed in the public sector, governments can reap many rewards in addition to reduced carbon emissions by making buildings energy efficient. More energy-efficient buildings would help reduce costs for the government. State and local governments spend more than \$40 billion each year on energy costs.<sup>90</sup> These costs have shot up over 50 percent in the last eight years, posing a growing threat to strained state budgets.<sup>91</sup>

Likewise, private-sector industries are investing in energy efficiency to reduce costs. U.S. manufacturing firms, for example, can significantly reduce costs by incorporating energy-efficiency improvements into their “lean-manufacturing” strategies.<sup>92</sup>

States stand to enjoy huge fiscal savings by improving their energy efficiency through programs to ensure all new state facilities are built “green,” along with retrofitting existing buildings. And in the private sector, reducing energy costs can help significantly reduce costs for U.S. industries thereby increasing global competitiveness and

keeping jobs in the United States. These investments in energy improvements could generate thousands of new, high-wage jobs for workers retrofitting, constructing, and maintaining energy-efficient buildings. The upshot: States should not leave untapped the short-term and long-term benefits of improving energy efficiency.

### Ensure that utility companies participate in the drive toward increasing energy efficiency

Investor-owned utility companies under a traditional payment structure make profits through an approved rate of return built into every unit of electricity they sell. That is to say, the more electricity utility companies sell, the more profits they generate. This creates a financial disincentive for utilities to encourage consumers to reduce energy consumption or invest in efficiency technologies.

State governments should ensure that utility companies participate in the drive toward increasing energy efficiency by enacting laws to decouple utility companies' profits from electricity sales combined with establishing strong Energy Efficiency Resource Standards.

Decoupling laws allow utility companies to raise rates temporarily to recover money it loses when electricity use drops. At least 30 states have approved some form of decoupling.<sup>93</sup>

While decoupling laws neutralize the disincentive for efficiency, they do not create any positive incentive for utilities to invest in efficiency. Energy Efficiency Resource Standards—which have been adopted by at least 21 states<sup>94</sup>—create this incentive by establishing long-term targets for energy savings that utilities must meet through customer energy efficiency programs.<sup>95</sup>

Minnesota's state legislature passed the Next Generation Energy Act in 2007, which included decoupling for public utilities along with establishing Energy Efficiency Resource Standards.<sup>96</sup> The law requires utilities to reduce energy sales 1.5 percent below their "average sales" over three years and invest a portion of their revenues in energy-conservation improvements.<sup>97</sup> It also requires utilities to fund programs targeted at low-income customers, as well as programs to encourage all customers to use efficient lighting.<sup>98</sup>

Under the Minnesota law, each utility must also develop a Conservation Improvement Plan every three years and file it with the Energy Division of the

state's Department of Commerce. They must report actual spending and energy savings on an annual basis. In 2009 and 2010, the most recent years for which data is available from the Minnesota Department of Commerce, utility companies invested more than \$391 million to conserve energy, achieving 1.6 million megawatt-hours of annual electricity savings and approximately 4.5 million thousand cubic feet of natural gas savings. This reduction in electricity use avoids an estimated 1.7 million tons of carbon pollution, according to the report.<sup>99</sup>

Finally, when crafting decoupling language, policymakers should ensure that utility companies can only raise rates when utilization drops due to energy-efficiency improvements—and not for other occurrences that can cause use to drop such as economic downturns or power outages. Maryland's Public Service Commission amended its 2007 decoupling mechanism to disallow utilities from using bill stabilization adjustments following outages in January and October 2012.<sup>100</sup>

### Set high-performance building requirements

States should establish high-performance building requirements on new construction and major rehabilitation projects as well as building maintenance and operation with the broadest possible reach. This would require these projects to incorporate energy efficiency, durability, life-cycle performance, and occupant productivity into their design.<sup>101</sup>

In 2009 Washington's state legislature passed a law requiring that future updates to the state energy code incrementally increase efficiency standards for residential and nonresidential construction, so that the code will achieve a 70 percent reduction in annual net energy consumption by 2031.<sup>102</sup> Washington's energy code largely adopts advanced energy-efficiency standards developed by ASHRAE, formerly the American Society of Heating, Refrigerating, and Air Conditioning Engineers.<sup>103</sup>

Other states have adopted optional energy-efficiency codes. Oregon adopted an optional "Reach Code" for commercial construction—which is a set of optional construction standards designed to increase the energy efficiency of buildings above the mandatory statewide building code.<sup>104</sup> And in 2011 the Maryland legislature approved optional use of the International Green Construction Code for new private and public construction in the state.<sup>105</sup>

In addition, states can begin by adding these requirements to state and local government buildings and other buildings receiving state financing, such as airports, ports,



schools, universities and colleges, medical institutions, and publicly financed college and professional stadiums. This is far from an insignificant place to start—researchers at the Center on Wisconsin Strategy estimate that this sector controls more than 16.5 billion square feet of office space, and uses \$40.7 billion of energy each year.<sup>106</sup>

By using high-performance building standards, states set themselves up to enjoy long-term cost savings on energy usage. Tremendous gains have been made in energy-efficient construction over the last decade. As costs of normal construction have risen, the premium cost of high-performance construction has shrunk, and many estimates showing high-performance construction costs as only 2 percent to 5 percent more than traditional construction.<sup>107</sup> Any modest additional costs in building material will most likely be covered by energy savings in the years after the building goes into use.

In 2008 Maryland passed a requirement that new construction and substantial renovations of state buildings and new schools will meet the U.S. Green Building Council's Leadership in Energy and Environmental Design, or LEED, silver standard or a comparable level of an alternate standard approved by the state.<sup>108</sup> The requirement offered to pay to local governments 50 percent of the local share of any additional costs for achieving that standard. In 2012 the state expanded the requirement to the state's largest water and sewer utility.<sup>109</sup>

In 2012 California Gov. Jerry Brown (D) ordered new and renovated state office buildings to meet the LEED Silver standard and, by 2025, be constructed as zero net energy facilities with an interim target for 50 percent of new facilities designed after 2020 to be zero net energy.<sup>110</sup> State agencies must also try to achieve zero net energy for 50 percent of the square footage of existing state-owned buildings by 2025.<sup>111</sup>

California is also requiring state-occupied buildings to reach set standards for operations and maintenance. The state's Department of General Services is leading efforts to ensure that all state-occupied buildings larger than 50,000 square feet attain LEED for existing buildings—operations and maintenance certification, which addresses building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades.<sup>112</sup> As of 2012, 37 state office buildings have been certified under this standard.<sup>113</sup>

And in 2008 Florida passed a law requiring that new construction and the renovation of buildings owned by state and local governments, as well as state universities and community colleges, follow the guidelines of LEED or other green-building-rating systems, including Green Globes and the Florida Green

Building Coalition standards.<sup>114</sup> The bill further requires that all new leases of state-occupied office space must meet Energy Star energy-conservation standards.

Finally, Oregon's legislature in 2011, unanimously approved their Cool Schools legislation, House Bill 2960, to create a high-performance school pilot program and a fund to help pay for energy-efficiency upgrades through grants and low-interest loans.<sup>115</sup> Funding for the program includes sources such as federal Qualified Energy Conservation Bonds, the State Energy Loan Program, and private funds, and, in order to participate, school districts must hire only Oregon-based contractors.<sup>116</sup> Similarly, Pennsylvania's Department of Education provides additional funding for certified green school construction projects.<sup>117</sup>

### Improve energy efficiency of all K-12 schools

Thousands of older schools are enormously energy inefficient, filled with inefficient lighting along with wasteful appliances and heating and cooling systems. And their energy costs are further exacerbated if faculty and students are not focused on saving energy.

States should encourage local K-12 districts, even those without funding for updated equipment, to adopt Energy Star standards, an energy-conservation and management program developed by the U.S. Environmental Protection Agency and the Department of Energy.

This program uses automation systems as well as educational materials and rewards to teach students, teachers, and staff how to save energy. In St. Tammany Parish, Louisiana, officials began the program to help schools replace appliances and heating and cooling systems following Hurricane Katrina. For a \$300,000 investment, the school district saved more than \$1 million per year.<sup>118</sup> Other elements of the program are aimed at improving indoor and outdoor air quality; enhancing lighting; and expanding recycling.<sup>119</sup> States could improve on this program by adding a requirement for U.S.-manufactured appliances.

### Expand residential energy improvements

States can increase residential energy efficiency by establishing a goal for home-energy retrofits.

In 2009 New York passed the landmark Green Jobs/Green New York Act<sup>120</sup> to establish a program to retrofit 1 million homes over five years, which was estimated to create 14,250 jobs. The statute allocates \$112 million in revenue raised via the auction of greenhouse gas credits through the Regional Greenhouse Gas Initiative, and uses those funds to establish a revolving loan fund aimed at homeowners and businesses who want to make efficiency improvements.

The fund makes loans of up to \$13,000 to homeowners and \$26,000 to businesses, and also provides energy audits and a credit enhancement for critical private-sector capital investments.<sup>121</sup> The homeowner or business owner will pay the full cost of the retrofit over time, but they are estimated to enjoy savings of 30 percent to 40 percent. The program will create thousands of local jobs for contractors and the state estimated the program would save it up to \$1 billion.<sup>122</sup>

In 2011 the New York Assembly complemented the 2009 Green Jobs/Green New York Act with the New York Power Act.<sup>123</sup> The power act, sponsored by State Sen. George Maziarz (R), authorized the nation's first statewide on-bill recovery program, which allows the costs of retrofitting a home or business to be included in a utility bill statement and paid in installments over time.

The law is critical because in New York, as in most states, the majority of residents cannot afford to pay the large upfront costs of retrofitting their homes.<sup>124</sup> This “win-win” program allows manageable payments for homeowners while lenders are reassured by their inclusion on utility bills, which cash-strapped homeowners are more likely to pay than other bills if they have to choose. One especially smart feature is the calibration of monthly payments to the resultant energy savings so that the loan does not increase the ratepayer's monthly bill.<sup>125</sup>

And, as discussed in the previous section on page 173 the law provides funding for programs that train workers in the energy-efficiency sector—including retrofitting and the maintenance and operations of new energy-efficient systems. The program, operated by the New York State Energy Research and Development Authority, allows workers to gain valuable skills and credentials, which will help boost their wages.<sup>126</sup>

Many more states should follow New York's lead. The Center for American Progress has estimated that cutting energy use by 20 percent to 40 percent in just 40 percent of America's building stock would create 625,000 sustained jobs over

a decade and drive half a trillion dollars of new investment into the built environment, while saving ratepayers as much as \$64 billion every year on energy bills.<sup>127</sup>

### Help industries become more competitive by increasing energy efficiency

State governments can help industries become more competitive by incorporating energy-efficiency improvements into their “lean”-production strategies.

Lean-production strategies attempt to eliminate wasteful expenditures of resources that do not create value for the end customer. These strategies are highly focused on waste minimization and can—but do not always—produce environmental improvements.

Washington state is a leader in assisting in-state manufacturers “green” their production processes as they adopt lean production strategies. Industries use about 43 percent of total electricity and 36 percent of natural gas consumed in the state—producing 12.6 million metric tons of carbon dioxide equivalents and requiring companies to pay huge energy costs.<sup>128</sup>

Washington’s Department of Ecology “Lean and Green Project” partners with Impact Washington—a nonprofit organization tasked with supporting in-state manufactures and improving competition—to help manufacturers integrate lean strategies and environmental methods in order to improve productivity, increase process efficiencies, reduce waste, and increase overall competitiveness.<sup>129</sup> The program provides both funding and technical expertise.

A 2008 review of the program pilot found that the three companies initially included saved a collective \$1.6 million in annual operational costs; saved 36,900 gallons of wastewater; reduced the use of hazardous substances by 68,700 pounds; and saved 146,700 therms of natural gas.<sup>130</sup> Additionally, the program helped improved manufacturer competitiveness by cutting production times, increasing flexibility, and allowing the companies to be more responsive to customer demands.<sup>131</sup>

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