



## **Invest in New American Energy: Pathway to a Clean and Prosperous American Energy Economy**

### ***POLICY RECOMMENDATIONS***

#### **MAKE CLEAN ENERGY CHEAP, MAKE IT IN AMERICA**

Create a 21<sup>st</sup> Century Energy Technology Deployment Fund to invest \$30 billion annually to accelerate the deployment of promising clean energy technologies, achieve economies of scale to drive down costs, and harness America's vast renewable energy reserves.<sup>1</sup> The primary focus of this strategy should be to drive down real production costs by providing increased and consistent demand for early-stage clean energy technologies that accelerates economies of scale, learning curves, and reductions in the real, unsubsidized costs of each technology. Targeted incentives can make clean energy technology profitable and catalyze American businesses and entrepreneurs.

To qualify for deployment incentives, clean energy technologies should be demonstrated at commercial scale, be currently priced at above-market rates, have technical potential for significant and rapid cost-reductions during deployment, and have relatively good prospects for long-term market penetration once subsidies end. If a technology does not experience consistent price reductions over time or becomes competitive without further support, incentives would terminate. In this manner, these incentives will avoid picking winners and losers *a priori* and will not create permanently subsidized industries. Rather, these investments will provide the fertile ground necessary for winners to emerge in the marketplace, creating opportunity for all promising low-carbon energy technologies to demonstrate progress toward competitive costs while increasing the rate at which early-stage clean energy technologies are commercialized.

Direct federal funding should also be provided to retool the nation's industrial heartland, train a skilled clean energy workforce, and ensure American factories and workers are commercializing and building the clean, cheap energy technologies that will power a prosperous 21<sup>st</sup> century economy. Innovative, advanced manufacturing techniques can drive significant improvements in the price and performance of clean energy technologies, making investments to support cutting-edge U.S. manufacturing a critical component of a strategy to make clean energy cheap.<sup>2</sup>

#### **HARNESS AND SUPPORT AMERICAN INGENUITY**

Increase federal investment in clean energy R&D by \$15 billion annually to spur the development of clean, affordable energy technologies. These new investments should be distributed through a portfolio of federally funded R&D programs organized around the central objective: *making clean energy cheap*.

A portion of this new funding should be used to establish a new National Institutes of Energy (NIE) to create a

nationwide network of regionally based, interdisciplinary, and applications-oriented energy innovation institutes. Like the successful National Institutes of Health, each institute will bring together the best innovators from our nation's high-caliber universities and across the public and private sectors to perform specific and usable energy research. NIE-funded institutes will also spur the creation of jobs in new, high-tech industry clusters that will take the innovations emerging from the institutes to market. The remainder of this increased funding should strengthen and expand basic and applied energy R&D programs at the Department of Energy and to extend programs at other agencies engaged in energy-related research. Full funding should be provided for the newly established Advanced Research Projects Agency for Energy and the Energy Frontier Research Centers program.<sup>3</sup>

Additional investments should accelerate the demonstration of promising new clean energy technologies. Demonstration is necessary to test the viability of new technologies at commercial scale, accelerate learning, identify technical challenges, and bridge the infamous "technology valley of death." Unfortunately, private firms, especially in the energy sector, are reluctant to commit funding for these high-risk, capital-intensive projects. Public support is critical to ensure new clean energy technologies are brought to market at the pace necessary to meet critical national energy priorities.

Finally, the nation must inspire and empower a new generation of scientists, engineers, and entrepreneurs to tackle energy innovation challenges. Investments should be made to strengthen mathematics, science, engineering and technology education, expand access to higher education, create new energy-related research opportunities for students, and fund graduate fellowships in energy innovation fields. These investments will help restore America's technological edge in global markets and strengthen our economic competitiveness.<sup>4</sup>

## **BUILD A 21<sup>ST</sup> CENTURY ENERGY INFRASTRUCTURE**

From railroads and highways to rural electrification and the Internet, public investments in critical infrastructure have consistently laid the foundation of an efficient and prosperous American economy. Today, new investments in a modern energy infrastructure are needed to meet the needs of a 21<sup>st</sup> century economy and to facilitate the widespread deployment and adoption of clean energy technologies.

Public funding to facilitate and support the construction of critical 21<sup>st</sup> century energy infrastructure is needed to accelerate the transition to a clean, prosperous energy economy. A modern, unified national clean energy "smart grid" is necessary to fully tap America's vast renewable energy reserves and facilitate the widespread adoption of plug-in hybrid and electric vehicles.<sup>5</sup> New networks of pipelines to transport advanced biofuels and bring CO<sub>2</sub> to geologic sequestration locations may be necessary. New electrified high-speed rail lines can efficiently link major U.S. cities and strengthen the nation's energy security, while convenient public transit systems can expand individual transportation choices and cut both oil consumption and costly traffic congestion.

Public investments and effective policies are necessary to accelerate and facilitate the construction of this 21<sup>st</sup>

century energy infrastructure. As with historic public investments in critical national infrastructure, these new investments will create hundreds of thousands of American jobs.<sup>6</sup>

## **CAP AND REINVEST – 7 PRINCIPLES FOR EFFECTIVE CLIMATE POLICY**

1. Effective climate policy should raise sufficient revenues to make the critical public investments necessary to make clean energy cheap and build a clean and prosperous 21<sup>st</sup> century energy economy as described above, totaling \$50-60 billion annually.
2. A modest CO<sub>2</sub> price of \$10-15 per ton, rising gradually over time, could generate sufficient revenues to fund critical clean energy investments while avoiding unnecessary dislocation to the U.S. economy.
3. Emissions reduction targets should be consistent with scientific recommendations necessary to avoid potentially catastrophic climate change impacts and include strong mid-term emissions targets.
4. However, to ensure that emissions reduction targets do not outpace the technological capability to achieve them, (a) carbon revenues should be primarily invested in clean energy technology development and deployment and (b) clear, transparent cost containment measures should be implemented to ensure carbon prices do not rise to politically unsustainable levels.
5. A portion of carbon revenues should be dedicated to protecting low-income Americans from the impacts of increased energy prices. Approximately 14% of the revenues of a cap and trade program is sufficient to protect those most vulnerable to price increases.<sup>7</sup>
6. The bulk of carbon revenues should be reinvested proportionately in the states from which they are raised. This will avoid major redistributions of wealth between states and ensure sufficient investment flows to the states most vulnerable to carbon price increase in order to accelerate their transition to a prosperous clean energy economy.
7. International carbon offsets should not be allowed in lieu of emissions allowances. The environmental integrity of international offsets and their ability to effectively drive clean global development have both been repeatedly impugned by independent studies.<sup>8</sup> The central objective of effective climate and clean energy policy should be to transform the American energy economy and to make clean energy cheap enough to power the global economy. International carbon offsets serve no role in achieving these critical objectives.

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### NOTES:

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<sup>1</sup> Cost estimates based on technical estimates of learning curves and economies of scale for a portfolio of potentially cost-effective clean energy technologies. Detailed recommendations on clean energy technology deployment are forthcoming from the Breakthrough Institute in 2009.

<sup>2</sup> For further recommendations on spurring clean energy manufacturing, see “Make it in America: the Apollo Green Manufacturing Action Plan.” Apollo Alliance (April 2009). [URL: [http://apolloalliance.org/wp-content/uploads/2009/03/greenmap\\_proposal031109.pdf](http://apolloalliance.org/wp-content/uploads/2009/03/greenmap_proposal031109.pdf)]

<sup>3</sup> Detailed recommendations on clean energy technology R&D are forthcoming from the Breakthrough Institute and Third Way in June 2009.

<sup>4</sup> For further recommendations on new energy education investments, see “National Energy Education Act.” Breakthrough Institute (July 2008). [URL: <http://thebreakthrough.org/blog/NEEA%20Concept%20Proposal.pdf>]

<sup>5</sup> For further recommendations on the 21<sup>st</sup> century clean energy smart grid, see “Wired for Progress 2.0: Building a National Clean Energy Smart Grid.” Center for American Progress (April 2009). [URL: [http://www.americanprogress.org/issues/2009/02/wired\\_for\\_progress.html](http://www.americanprogress.org/issues/2009/02/wired_for_progress.html)]

<sup>6</sup> Pollin, Robert *et al.* “Green Recovery.” Political Economy Research Institute and Center for American Progress (September 2008). [URL: [http://www.americanprogress.org/issues/2008/09/green\\_recovery.html](http://www.americanprogress.org/issues/2008/09/green_recovery.html)]

<sup>7</sup> “Climate-Change Policies Can Treat Poor Families Fairly and Be Fiscally Responsible.” Center for Budget and Policy Priorities (2008). [URL: <http://www.cbpp.org/archiveSite/climate-brochure.htm>]

<sup>8</sup> Wara, Michael W. and David Victor. “A Realistic Policy on International Carbon Offsets.” Stanford University (April 2008). [URL: [http://iis-db.stanford.edu/pubs/22157/WP74\\_final\\_final.pdf](http://iis-db.stanford.edu/pubs/22157/WP74_final_final.pdf)]; and “International Climate Change Programs: Lessons Learned from the European Union’s Emissions Trading Scheme and the Kyoto Protocol’s Clean Development Mechanism.” U.S. Government Accountability Office (September 2008). [URL: <http://www.gao.gov/products/GAO-09-151>]