

SECTION 2 · CHAPTER 2

Lead in clean and efficient energy

Steve Royall, senior plant manager of Pacific Gas & Electric's Colusa Generating Station, climbs the stairs on one of the facilities Heat Recovery Steam Generator, near Maxwell, California, Nov. 15, 2011.

AP PHOTO/RICH PEDRONCELLI

Capturing the energy opportunity by ensuring we have reliable sources of energy that are both sufficient and sustainable is a critical element of our strategy to grow the U.S. economy. We stand at a crossroads that will define our competitiveness—as well as our national security—for generations.

Do we invest in infrastructure and technology that will see the continued expansion of green jobs and manufacturing, or do we allow this race to be won by China and Europe? Do we continue an unsustainable trade deficit fueled by foreign oil imports, or do we become more self-sufficient? Do we stand as helpless bystanders to the devastating effects of climate change, or do we shape the future and protect our people by creating a low-carbon economy?

If our 300 million engines of growth live in a country that is failing to compete in the biggest growth industry of the 21st century; if they live in a country that is increasingly vulnerable to

volatile energy prices and has no plan for the coming years of rising long-term energy costs; and if they live in a country where the health and climate costs of fossil-fuel pollution continue to take an incalculable toll, then we will fall short of our economic potential.

It is likely that clean energy is the only possible energy of the future. The continued acceleration of climate change and the continued disappearance of finite fossil-fuel resources, which will likely be felt in the economy not as scarcity but as price increases, together will cause the world to switch to a clean energy economy. The policies outlined in this report to get us to a clean energy future are needed, notwithstand-

ing the growth in natural gas. After all, the problem is not only the finite nature of fossil-fuel reserves but also that we must constrain their use to avoid climate catastrophe and we must prepare and encourage the clean energy revolution that will bring new technologies and jobs. We need to plan for the transition to a clean energy economy or risk falling behind the rest of the world in these technologies.

than any other country in the world.² But the rest of the world is not complacently sitting on the sidelines. It is catching up rapidly and, in some cases, has begun to pass us by. To maintain our leading position and take advantage of this tremendous opportunity, we need to build on what's gotten us this far. Fundamentally, we need a policy environment that encourages investment in clean energy.



With stronger demand drivers, more large-scale financing, and a continued commitment to the necessary infrastructure, we can be on a path for getting 35 percent of our electricity from renewables by 2035.

This switch will be one of the greatest economic opportunities of our lifetimes. That's why Germany, China, Saudi Arabia, India, South Korea, Japan, Spain, France, and other countries around the world are positioning themselves to capture this opportunity.¹

The United States is currently a leader in this field. In 2011 we invested more in clean energy

There are three pieces to this policy environment: demand, financing, and infrastructure. The Center for American Progress first laid out this three-pronged approach in its 2009 report, "The Clean Energy Investment Agenda."³ Recent years have validated this approach. Demand (primarily through state-level renewable energy standards) paired with financing (through tax credits and tools such as the Department of Energy's Loan Guarantee Program) and infrastructure (such as new transmission lines to carry wind energy and workers trained for clean energy jobs) can rapidly move clean energy forward.

Now is the time to take the next step in the transition to a clean energy future. With stronger demand drivers, more large-scale financing, and a continued commitment to the necessary infrastructure, we can be on a path for getting 35 percent of our electricity from renewables by 2035.

At the same time that we make new investments in our electricity sector, we can take similar steps and cut our oil imports in half by 2020. Doing this will keep more American money at home, rather than send-

Energy

Problem: The United States is currently dependent on imported foreign oil, faces volatile energy prices, and is starting to face the high costs of climate change—all of which drag on our economy and present high direct and indirect costs to America’s 300 million engines of growth.

Solution: Capture the multitrillion-dollar opportunity of clean energy by stimulating demand, ensuring effective financing, building efficient transmission infrastructure, and prioritizing efficiency.

Key policy ideas:

- Institute a \$25/ton carbon tax on large power plants to allow businesses to price carbon and invest accordingly to limit pollution.
- Launch a comprehensive clean energy investment program that includes direct support of \$9 billion per year for research and development in both the public and private sector, the extension of the wind energy production tax credit, the launch of a green bank that would provide a range of financing tools to enable clean energy deployment, and public market-financing tools.
- Launch three specific programs to eliminate waste: Home Star (\$6 billion rebate plan for homeowners to upgrade with energy efficiency), Building Star (\$6 billion in incentives for businesses to retrofit commercial and multifamily residential buildings), and Rural Star (\$4.9 billion loan authority for rural electric cooperatives).

Other policies we propose include eliminating \$4 billion in annual tax breaks for oil and gas companies and creating a future oil reduction technology fund to invest in research, development, and demonstration for clean vehicles. The fund would be fully supported by one cent of every dollar of profits from the big five oil companies.

Outcomes: The United States will have clean, sustainable, and economical energy sources that fuel economic growth. We will receive 12 percent of power from renewables by 2020 and cut oil imports by half. ■



Central Maine Power technician Gary Sturgis installs one of the first "smart" meters Sept. 28, 2010 at an apartment building in Portland, Maine.
AP PHOTO/JOEL PAGE

ing it abroad in exchange for a fossil fuel. Of course, this policy of reducing oil imports will only reap environmental benefits if it's paired with tools to reduce overall demand and doesn't simply increase drilling in the United States.

Our plan for sustainable energy will put people to work, put money in people's pockets, and put our country on a path that avoids the most catastrophic effects of climate change.

We propose policies to:

- Quadruple our share of renewable electricity by 2020

- Use efficiency to put money back in people's pockets
- Slash our oil imports in half

Policies to quadruple our share of renewable electricity by 2020

The amount of renewable energy used for electricity in the United States doubled from 2008 to 2012.⁴ We can do this again by 2020. This would move us to 12 percent of power from renewables by 2020, quadrupling since 2008, and putting us on course to 35 percent by 2035, a goal the Center for American

Progress called for in “Helping America Win the Clean Energy Race.”⁵

The way to quadruple U.S. renewable energy is focusing on demand, financing, and infrastructure.

Demand for renewable energy

The entrenched status quo in the energy world is strong. People who own coal-fired power plants would be happy to keep running them with as few controls on the pollution that they emit as possible. We need policy tools that build on our current momentum and hasten the shift away from the power sources that emit the most pollution that causes climate change.

There are multiple ways to do this. We could implement a clean energy standard. We could start a cap-and-trade program. We could have the Environmental Protection Agency regulate carbon dioxide. Each of these would be valuable, and any tool that puts a price on carbon—either a real price (through something akin to cap and trade) or a shadow price (through something similar to direct regulation) would get the job done.

We believe that the policy most likely to drive significant economic growth in the short term while also tackling the climate change problem is a tax on carbon emissions, starting in the electric-utility sector and slowly expanding to other parts of the economy. Setting a carbon tax will directly relate to our plans for eco-

nomical growth by encouraging private-sector investment in new power plants and reducing industrial carbon pollution to avoid the most catastrophic effects of climate change that would devastate our economy.

We therefore propose a tax of \$25 per ton on carbon pollution from large power plants—the largest uncontrolled emissions source, accounting for roughly one-third of our total greenhouse gas pollution.⁶ This tax should be introduced over several years, starting at \$6.25 in 2013 and ramping up to \$25 by 2015, then increasing at 5 percent each year thereafter. For more on this policy idea, see the Center for American Progress issue brief, “A Progressive Carbon Tax Will Fight Climate Change and Stimulate the Economy.”⁷

We estimate that such a carbon tax will raise approximately \$500 billion in revenue over the next 10 years. Of that, we propose to invest \$200 billion in research and development of advanced clean energy technologies, deployment incentives for such technologies, and international climate and energy commitments. In addition, it is important that revenue be allocated to ameliorating any effects of the tax on middle- and low-income Americans through a broader tax-reform initiative and other mechanisms.

A tax on carbon as we propose would price in some of the climate-change-related externalities of fossil fuels currently borne by society at large such as costs of damage associated with extreme-weather events, severe storms, more frequent hurricanes

and tornadoes, among others—particularly by more vulnerable Americans who are less able to protect themselves. The marketplace would adapt to this more accurate pricing, as power companies shift to cleaner sources of power and energy efficiency. We estimate that the effect of such a tax will be that power-plant emissions will fall approximately 20 percent in 10 years.

Addressing emissions from the power plants of the electric-utility sector is just one of the steps that must be taken. In the case of the quarter of emissions that come from the transportation sector, fuel efficiency and carbon-pollution tailpipe standards are currently projected to slash emissions by billions of tons.⁸ The remaining emissions are from industrial facilities, agriculture, and commercial and residential buildings.⁹ We must reduce pollution from these sources as well, eventually applying a carbon tax to these sectors as the next step to be taken after the utility sector.

Financing for renewable energy

The second thing we need is effective financing for large amounts of clean energy.

The private sector invests in energy in ways that lead to suboptimal outcomes. Companies underinvest in research and development, are unwilling to bear risks related to deployment of new technologies, and do not have to include the cost of externalities in investment decisions. These factors lead to fewer investments in new energy

technologies and a continued reliance on dirty, inefficient technologies.

The government can play a role in balancing energy investments by creating incentives for clean-tech investments and by funding advanced high-risk, high-reward research that companies are unwilling to undertake. There is a history of successful government investments in energy, from rural electrification to drilling techniques that make possible the current increases in “tight” oil (that is, oil that is trapped in underground rock formations) and shale-gas production.

There are three primary ways that the government invests in clean energy: direct spending, tax incentives, and credit support through loans and loan guarantees. Public market financing provides a fourth means. A comprehensive clean energy investment program will utilize all four tools, recognizing that each one meets specific needs. By instituting a carbon tax, we will raise significant funds to be invested in new energy technologies.

These tools are:

- **Direct spending:** The government should provide direct support of \$9 billion per year for research and development in both the public and private sector. In the public sector, this should be continued mainly through the Department of Energy and its affiliated labs. The Advanced Research Projects Agency–Energy, or ARPA-E, program, which invests in private-sector research, should be strengthened by doubling the funding



North America's first floating wind turbine is lowered into the Penobscot River at the Cianbro Corp., May 31, 2013, in Brewer, Maine.
AP PHOTO/ROBERT F. BUKATY

for it: \$9 billion dollars would get us back to the peak level of government investment in energy R&D in the late 1970s.

- **Tax incentives:** The production tax credit for wind energy has been a huge driver for deploying clean energy at scale¹⁰ by leveraging at least \$10 in private investment for every \$1 in tax credits. Thanks to this investment incentive, the United States now produces enough wind energy to power more than 13 million homes. This credit—set to expire at the end of 2013—should be extended for several years, and improved by making new technologies such as offshore wind eligible for

different tax-credit structures that better suit their risk profile.¹¹

- **Credit programs:** The Department of Energy Loan Guarantee Program should be improved upon with a new Clean Energy Deployment Administration¹² or Green Bank, which would provide a range of financing tools to enable clean energy deployment. In addition, the Rural Utilities Service should be utilized to the maximum extent possible, allowing for rural areas to reap the benefits of clean energy.
- **Public market-financing tools:** Ultimately, we need to finance clean

energy the same way that we finance traditional energy: through public equities and corporate debt. There are multiple ways to encourage this, but the most likely is to adapt master limited partnerships and real estate investment trusts to meet the needs of clean energy technologies.

Infrastructure for renewable energy

Finally, we need to make sure we have ways of getting clean power from where it's generated to where it's used and ways to make sure the power is available when it's needed. This will require transmission, energy storage, and smart-grid technologies.

Transmission is primarily a challenge of planning, permitting, and paying for it. Thankfully, there are already systems in place to begin addressing these challenges, and they need to be allowed to work. The Federal Energy Regulatory Commission is dealing with planning and paying for transmission through its implementation of FERC Order 1000, which required public policy considerations to be factored into transmission planning.¹³ The Council on Environmental Quality should continue to lead the Rapid Response Team for Transmission, which is coordinating permitting efforts across the government.¹⁴

Energy storage and the smart grid are more complicated. To begin with, government needs to make research, development, and demonstration investments in critical promising technologies such as batteries that operate at the necessary scale. The federal

government can also move the smart grid forward by building on the lessons of the internet revolution, as described in CAP's report, "The Networked Energy Web."¹⁵

Policies that use efficiency to put money back in people's pockets

In addition to generating cleaner electricity and employing alternative transportation fuels, we must use energy more efficiently. McKinsey & Company estimated that the United States wastes \$130 billion in energy per year.¹⁶ This is a misallocation of resources on a colossal scale, and eliminating this waste will cut our oil imports, reduce our carbon-pollution footprint, and save scarce financial resources that can be redeployed into other areas of the economy.

Three specific programs that can reduce this waste are:

- Home Star, which would launch a \$6 billion rebate plan, offering homeowners incentives to upgrade to more efficient appliances, insulation, windows, and other off-the-shelf products and technologies
- Building Star, which would allocate \$6 billion to provide incentives for businesses to retrofit commercial and multifamily residential buildings by leveraging \$3 to \$4 in private funds for every \$1 in public money spent
- Rural Star, also known as the Rural Energy Savings Program, which would set up a \$4.9 billion loan authority to allow rural

electric cooperatives to lend money to their customers to pay for energy-saving building improvements

The effect of these three programs in terms of carbon pollution would be “the equivalent to taking 4.6 million cars off the road,” and would create 250,000 jobs in the process.¹⁷

Policies to slash our oil imports in half

The purchase of foreign oil is a significant part of our trade deficit. As prices rise, families and businesses pay more at the pump, and a large portion of these additional funds

go overseas. Reducing consumption of foreign oil will keep more dollars at home to be invested in other goods and services here. The policies we have outlined above will decrease our reliance on foreign oil and allow us to slash our oil imports in half by 2020.

The new modern fuel economy standards that took effect for model year 2012 vehicles have already begun to reduce oil use.¹⁸ These savings will accelerate as the standards become more effective, culminating in doubling fuel economy by 2025.

In addition to cars going further on a gallon of gasoline, we propose to invest heavily in alternative, non-petroleum-based transporta-

Green jobs

According to a 2012 Bureau of Labor Statistics analysis, green jobs and services accounted for 3.1 million jobs in the United States.²⁰ The vast majority of those jobs (2.3 million) were in the private sector, and they pay well. In fact, a Brookings Institution analysis found that green jobs pay 13 percent higher than other industry jobs.²¹

Moreover, from 2008 to 2010 green jobs outperformed the job growth of the overall economy by two to one.²² And in 2010, 25 percent of all new construction undertakings were green-building jobs.²³

The truly exciting trend is that green jobs are being created all across different industries—from recycling and waste reduction to the transportation sector. Green jobs are transforming our economy, making it more efficient, less polluting, and more competitive in new technologies and global industries. Our nation has always been on the cutting edge of innovation, and we are already seeing investments in the clean economy pay dividends. By enacting strong progressive policies, this trend will continue and accelerate.



Bobby Bailey stretches to tighten a screw that holds a corner of a solar panel at the O2 Energies solar power farm in Newland, North Carolina, Aug. 4, 2011.

AP PHOTO/BOB LEVERONE

tion options so that drivers are less reliant on gasoline or diesel fuel, and less vulnerable to petroleum-fuel price spikes. This plan includes investing in electric vehicles and public transportation and the infrastructure to support these alternatives.

We propose raising the revenue for these investments through the following measures:

- Eliminating \$4 billion in annual tax breaks for oil and gas companies¹⁹
- Creating a future oil reduction technology fund to invest in research, development, and demonstration for clean vehicles, paid for by dedicating one cent of every dollar of profits from the big five oil companies ■

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