

CHANGE THE RULES, HURRY THE FUTURE

CHALLENGES AND OPPORTUNITIES
ON THE PATH TO A NEW ENERGY FUTURE





The background of the page features a sunset scene with two wind turbines silhouetted against a bright orange and yellow sky. The turbines are positioned on a dark horizon line. The overall aesthetic is clean and modern, with a color palette of teal, orange, and white.

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Energy Future Coalition Steering Committee

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Timothy E. Wirth, President, United Nations Foundation; former U.S. Senator from Colorado; Under Secretary of State for Global Affairs under President Clinton

PREFACE



This report by the Energy Future Coalition looks forward and back, taking credit here and there for progress that has been made on U.S. energy policy since 2003, when we issued our initial report, *Challenge and Opportunity: Charting a New Energy Future*. We make those claims humbly, well aware that credit in Washington must always be shared. For any action of government, there are many players responsible – political figures, of course, and other advocates who have worked alongside us or independently toward the same objective. If we have overstated our role, we gratefully acknowledge that

many cooks have helped to stir the soup, and in any case we have tried to operate without much regard to all that. Both Harry Truman and Ronald Reagan paraphrased Ralph Waldo Emerson: “There is no limit to what can be accomplished if it doesn’t matter who gets the credit.”

Within our ranks, however, it is very clear where credit is due – to the Steering Committee that has guided our actions since the beginning. The “founding fathers” of the Energy Future Coalition were Timothy Wirth, Boyden Gray, John Podesta, and Michael Finley, who came together despite their disparate political views to see if common cause could be made around common ground. Our Steering Committee members have all made significant investments of time through their engagement with the Coalition. Ted Turner merits particular recognition – for serving on the Steering Committee, offering his special vision and leadership, and generously providing much of the funding for the Energy Future Coalition, through the United Nations Foundation, where we are housed, and also through the Turner Foundation, led so ably by Mike Finley. Our other funders deserve our gratitude as well – especially the Rockefeller Brothers Fund and the Energy Foundation, who have seen fit to support our programmatic initiatives early and often, as they say in Chicago. Thanks to all!

A handwritten signature in black ink that reads "Reid Detchon". The signature is fluid and cursive, with a long horizontal stroke at the end.

Reid Detchon

Executive Director, Energy Future Coalition



EXECUTIVE SUMMARY

Energy remains the linchpin of our economic future – in the United States and around the world. National security, climate change, sustainable development, and the fate of the global environment are all affected by energy choices. Much is at stake in getting energy policy right.

Energy systems are big and slow to change, but the world has clearly begun a transition to a low-carbon future – a transition that will involve trillions of dollars of investment and that is highly likely to pick up speed over the coming years. This provides a context for decision makers to evaluate spending and policy options.

In 2003, the Energy Future Coalition urged the United States to chart a new course in clean energy policy so that it might seize this economic opportunity, reduce the emissions that cause global climate change, and curb its dependence on oil. That year, the Coalition released its foundational report, *Challenge and Opportunity: Charting a New Energy Future*, setting out recommendations from stakeholder working groups focused on bioenergy and agriculture, the future of coal, smart grid, transportation, end-use efficiency, and energy access for the global poor. Our central insight was that the nation's energy challenges were also opportunities – for a stronger economy, greater security, and a more stable climate, and also for business development and job creation. The validity of that insight is even clearer today.





The Coalition’s approach has been to work across party and sectoral lines to promote dialogue among business, labor, and environmental stakeholders in support of concrete, actionable ideas. During that time, the Coalition has:

- Sought to “change the conversation” about energy in Washington away from well-worn points of partisan conflict, toward bipartisan acceptance of the theme of economic opportunity.
- Incubated the 25x’25 renewable energy alliance, which has influenced the national conversation about America’s energy future within the agriculture and forestry communities.
- Created strong goals that should guide America’s energy policy – upgrading 40% of its buildings by 2020 to make them more energy efficient and producing 25% of its energy from renewable sources by 2025.
- Advocated for increased use of natural gas and renewables in power generation and of electricity and biofuels in transportation, while promoting environmentally sound practices for production of the sudden abundance of domestic shale gas.
- Promoted the development of a smarter electric power grid and greater access to the transmission system for renewable energy.
- Worked to change state utility efficiency policies to make energy efficiency the first fuel of choice.

Especially at the state and local levels, over the past decade the United States has made a solid start in moving toward cleaner and more efficient use of energy and in changing the rules needed to support that transition. What America can and must do in the coming decade is to drive these changes further and faster. The move to a clean energy future is inevitable, but we need to move with greater speed and scale. We have taken the first steps; now we must accelerate.



Two elements are critical to seize the clean energy opportunity and hurry a clean energy future:

First, **change the rules** – the laws, regulations, subsidies, and tax credits – that govern America’s energy markets. The current energy market rules were designed to support a fossil fuel-based economy and continue to tilt the playing field to make fossil fuels less expensive and more convenient for consumers. But today these energy rules deliver energy outcomes that we do not want and cannot afford – dependence on unstable sources of energy, dangerous levels of emissions, and wavering support for American clean energy technologies. If we want different outcomes – improved national security, lower emissions, and larger markets for clean energy – we must change the rules. We must reflect the full cost of existing technologies and fuels. We must overcome or eliminate market barriers, especially high first costs that slow the adoption of energy efficiency and cleaner fuels, so that America can capture their economic, environmental, and security benefits. And we must enlist the private sector to partner more aggressively with governments to change and streamline regulations, thus opening up opportunities for new entrants and innovations.

Over and over again, market capitalism bounded by smart rules that serve the public interest has delivered the desired result more cheaply, quickly, and easily than anyone thought possible. If we want to change the future, we have to change the rules – to seize the economic opportunities of clean energy, create jobs, lower consumer costs, make America more competitive, reduce emissions, and improve national security.

“Good rules align the interests of individuals and corporations with the public interest, so that business can profit in ways that also make society richer and safer. This is the foundation of sound public policy. When high purpose is combined with the profit motive, the results can be astonishing.”

-Timothy Wirth, Vinod Khosla,
& John Podesta, *Change the
Rules, Change the Future*,
GRIST, May 22, 2007



Second, refocus on energy efficiency – our biggest energy resource. Since the energy crisis of 1973, the United States has met its need for energy by using it more efficiently (reducing demand) to a greater degree than it has by finding and producing more (increasing supply). In the future, making use of the vast supply of energy we waste will provide a more certain and robust path to job creation and financial advantage – one that is cheaper, faster, cleaner, and safer – than conventional supply-side opportunities. It is a win-win-win opportunity for collaboration by business, labor, and environmental groups and by Republicans and Democrats.

But policy makers, the media, and key opinion leaders continue to focus almost all of their attention on the supply side of the energy equation. We must change this conversation. While we cannot and should not ignore the need to increase the supply of clean energy, we must rebalance the debate. The first question that every politician, reporter, business, or environmental leader should ask is: “How can we enable America’s homes, businesses, factories, and vehicles to use energy more productively?”

Going forward, the Coalition will seek to advance these two elements and realize the opportunities of the new energy economy by pursuing the following agenda:

Use less oil in transportation by changing the rules to:

- Continue to increase fuel economy standards for passenger vehicles;
- Prepare the electric power grid for electric hybrid plug-in vehicles;
- Expand the use of natural gas in heavy-duty and centrally fueled fleet vehicles; and
- Accelerate research and development on advanced biofuels and encourage the production of flexible-fuel vehicles and a fuel distribution system that gives consumers a choice at the pump.

Move toward a cleaner, more efficient electric power system by changing the rules to:

- Upgrade 40% of America’s buildings – 50 million homes and businesses – by 2020 to make them more energy efficient;
- Promote new business models for electric utilities so that they and their consumers can co-invest and share in the savings available from energy efficiency;



- Develop new financing mechanisms and other tools to support energy efficiency upgrades in commercial, institutional, and residential buildings;
- Deploy new information and communications technologies that will enable consumers to enjoy more reliable, efficient, secure, and innovative energy services and to sell power to utilities as well as buy it from them;
- Allow consumers to schedule their use of electricity, like any other product, on the basis of its real cost – which can vary by an order of magnitude over a 24-hour period – making the system more efficient and less costly;
- Facilitate the transmission of renewable energy from remote areas to market;
- Remove barriers to and encourage the deployment of distributed energy generation technologies;
- Replace coal in electric power generation with cleaner energy sources and increased energy efficiency by providing clear regulatory direction to utilities;
- Ensure that abundant new reserves of natural gas from shale formations are produced in environmentally sound ways; and
- Continue research on carbon capture and storage for both coal- and gas-fired power plants.

The energy debate in the United States has recently become tangled in an increasingly partisan standoff, reinforced by the massive growth of special-interest campaign expenditures. Economic and political forces designed to protect the status quo have been remarkably successful, particularly in loosening the obvious connection between climate change and energy policy. Over the coming years, the Energy Future Coalition will work to break this political paralysis, facilitate constructive engagement by the private sector, and build on the creativity of state and local governments – using the lessons generated by our federal system. The dysfunction in the federal legislature must be overcome, and new economic and environmental opportunities for a rapidly growing global market must be better articulated if the necessary speed and scale of our energy transition are to be realized.



PROGRESS TOWARD A NEW ENERGY FUTURE: THE ENERGY FUTURE COALITION SINCE 2003

The Energy Future Coalition was created to address three overarching energy challenges for the nation and the world:

- **The political and economic threat posed by the world's dependence on oil.**
- **The risk to the global environment from climate change.**
- **The lack of access by the world's poor to the modern energy services they need for economic advancement.**

These challenges remain unabated today.

Our central insight at the time of our initial report in 2003 was that these challenges were also opportunities – for a stronger economy, greater security, and a more stable climate, and also for business development and job creation. This insight has come to be widely accepted in domestic political discourse over the past eight years – often across party lines – but much more remains to be done to seize what Ted Turner and Bill Clinton have called the greatest economic opportunity of the 21st century.

The Energy Future Coalition's 2003 report, [Challenge and Opportunity: Charting a New Energy Future](#), laid out recommendations from six stakeholder working groups: Bioenergy and Agriculture, Transportation, The Future of Coal, Smart Grid, End-Use Efficiency, and International.¹ This section reviews what has happened since then and the Energy Future Coalition's role in it.

BROAD THEMES

The 2003 report, by its very title and opening line (“Energy is the linchpin of our economic future”), connected the challenge of transforming the world's energy systems to economic opportunity. From the beginning, the Energy Future Coalition sought to “change the conversation” about energy in Washington away from well-worn points of partisan conflict, and the theme of economic opportunity has won broad acceptance, even across party lines.

The Coalition's central vision was laid out in an essay in *Foreign Affairs* in the summer of 2003 by Timothy Wirth, C. Boyden Gray, and John Podesta entitled “[The Future of Energy Policy](#).” “What is needed,” they said, “is a purposeful, strategic energy policy, not a grab bag drawn from interest-group wish lists.”²



In 2007, Wirth, Podesta, and Vinod Khosla further defined this vision in an article in *Grist* entitled “[Change the Rules, Change the Future](#).” They said: “Good rules align the interests of individuals and corporations with the public interest, so that business can profit in ways that also make society richer and safer. . . . We need new rules that will make the best choice for the country also the best choice for consumers.”³

To achieve that change, the Energy Future Coalition has continually emphasized the importance of bringing different constituencies – “strange bedfellows” – together around shared agendas. As the [2003 report](#) put it:

A broad-based, cooperative coalition for change is the missing, indispensable ingredient in transforming a strategic energy vision into reality. Longtime antagonists who are willing to work together and think openly can create a shared vision for a new energy future. . . . The key challenges can be overcome with a blend of carefully targeted policy interventions that build on the power of the market, public-private partnerships in financing and technology development, and, perhaps most important, the development of a political coalition that abandons traditional assumptions and brings together energy interests that have previously engaged mostly in conflict – business, labor, and environmental advocates.⁴

This approach remains just as timely and important in 2011 as it was in 2003.

The Coalition’s work over the past several years, organized around the recommendations of the original six working groups, is discussed below.

Bioenergy and Agriculture

The Bioenergy and Agriculture Working Group began with the question, “Why biomass?” and responded, “Sustainably produced biomass is a highly undervalued and underutilized energy asset in the U.S. and around the world. . . . Accelerated development of industries that convert biomass to liquid fuels, polymers, and chemicals will provide new markets for farmers and stimulate rural economic development.”

The use of biofuels has become more controversial, not less, since the [Coalition's report](#), but the original observations still stand: To be sustainable, large-scale use of biomass to substitute for petroleum must rely on non-food resources, especially cellulose, which constitutes roughly half of all the organic carbon on the planet. Incentives for the use of biomass should take into account “the particular crop, the method of cultivation and harvest, the location, and other factors, as well as the energy conversion and emissions control technologies used.”⁵

Two issues in particular have come to the fore – food security and indirect land use effects. The price of corn has fluctuated wildly over the past few years, and some have named ethanol as the culprit – but these fluctuations have correlated much more closely with the price of oil than they have with the production of ethanol, and other starches not used for biofuels, such as rice, have seen similar price swings. With regard to indirect land use effects, the demand for biofuel crops has been accused of causing the conversion of forests to agriculture, releasing vast volumes of stored carbon to the atmosphere. [One answer](#) is to produce more food on the same amount of land, and U.S. corn yields continue to rise impressively.⁶ The pressure on forests comes from many sources, and the contribution of biofuels is almost impossible to parse – except in clear ecological travesties like the destruction of peatlands and rain forests in Borneo for the production of palm oil. In response to such cases, responsible companies are beginning to adopt sustainability standards such as those developed by the [Roundtable on Sustainable Biofuels](#).⁷

In the 2003 report, the Working Group recommended several initiatives to speed market acceptance of renewable fuels from biomass: a “fly-off” competition of cellulosic biomass conversion technologies to prove and sort out technologies at commercial scale, a tripling of federal funding for bioenergy R&D, incentives to stimulate new markets for biomass, and government policies to increase the use of bio-derived products – e.g., a renewable fuels standard, incentives for flex-fuel vehicles, preferential tax treatment, government procurement policies, a labeling program, and EPA evaluation of the air, water, and health benefits of replacing toxic aromatic compounds in gasoline with alternative fuels. Progress has been made on many of these issues, as described in the following circles:

Measures of Progress

The Energy Policy Act of 2005 contained numerous biofuels provisions, including a collaborative Biomass Research and Development Initiative between the Department of Energy (DOE) and the Department of Agriculture (USDA).

The Energy Independence and Security Act of 2007 included a renewable fuels standard requiring 36 billion gallons of biofuels by 2022, with at least 16 billion of that to come from cellulosic biofuels.

There are now more than 8 million flex-fuel vehicles on the road in the U.S. capable of using 85 percent ethanol blends, increasing steadily from a mere 140,000 in 1998.

The DOE budget for Biomass and Biorefinery Systems R&D nearly tripled from \$85 million in FY 2003 to \$220 million in FY 2010.

In December 2009, \$564 million from the American Recovery and Reinvestment Act (the economic stimulus bill) was awarded to 19 biofuels projects at pilot, demonstration, and full commercial scales and was matched by more than \$700 million in private and non-federal cost-share funds.

The Energy Future Coalition was particularly active in its advocacy for biofuels prior to enactment of the Energy Policy Act of 2005, organizing **letters** to the President and the Senate from retired military officers and other foreign policy leaders calling for “a major new initiative to curtail U.S. consumption through improved efficiency and the rapid development and deployment of advanced biomass, alcohol and other available petroleum fuel alternatives”⁸ to reduce U.S. consumption of foreign oil. The Coalition was among the first to bring retired military leaders into the energy security debate.

As a direct outgrowth of the Bioenergy and Agriculture Working Group, the Energy Future Coalition supported creation of the 25x’25 renewable energy alliance. Leaders from production agriculture and forestry, as well as business, labor, conservation, and religious groups, came together around the **vision** that “by 2025, America’s farms, forests and ranches will provide 25 percent of the total energy consumed in the United States, while continuing to produce safe, abundant, and affordable food, feed and fiber.”⁹ The 25x’25 vision has been **endorsed** by Congress in the Energy Independence and Security Act of 2007, as well as by 9 current governors, 24 former governors, and 15 state legislatures.¹⁰ In addition, the **2007 Defense Authorization Act** set a goal for the Department of Defense to produce or procure at least 25 percent of its electricity from renewable sources in fiscal year 2025.¹¹

25x’25 has influenced the national conversation about America’s energy future, not only through its clear and ambitious vision, but also through its work products – an action plan, white papers, and

reports. In 2006, the alliance published an **economic analysis by the University of Tennessee** finding that the 25x'25 goal could be met while allowing the agricultural sector to reliably produce reasonably priced food, feed, and fiber, and would generate more than \$700 billion in economic activity and 5.1 million jobs, mostly in rural areas.¹² In 2010, **another report** in partnership with the University of Tennessee showed that a 25x'25 renewable electricity standard would generate \$14 billion in cumulative additional revenues for agriculture and forestry and on a national basis would create \$215 billion of additional economic activity and add more than 700,000 jobs and \$84 billion to the nation's GDP.¹³

In 2005 the Energy Future Coalition filed **comments** on the Environmental Protection Agency's proposed rule on mobile source air toxics, calling for replacement of toxic aromatic compounds – benzene, xylene, and toluene – which comprise 25% of the typical gallon of gasoline, with cleaner-burning biofuels.¹⁴ EPA has gradually ratcheted down the percentage of benzene, a known human carcinogen, to a very low level, but the others have remained untouched, even though toluene and xylene can form benzene during the combustion process. Aromatics are harder to burn than other hydrocarbons and thus lead to more fine particulate matter, the single most important air pollution problem in the U.S. today. **EPA said in 2005** that aromatics are considered to be the most significant gaseous precursors of carbon-based fine particulates.¹⁵ Aromatics also adversely affect ozone levels, particularly in urban areas. In August 2010, Boyden Gray and Advisory Council member R. James Woolsey reiterated this theme in a **column in The Washington Times**.¹⁶ Despite what appear to be significant health benefits from reducing aromatics in gasoline, however, EPA has yet to act.

including a cellulosic biofuel producer tax credit, a federal procurement program and voluntary labeling program for bio-based products, a biorefinery assistance program, payments for expanding production of advanced biofuels, and a biomass crop assistance program.

The American Recovery and Reinvestment Act of 2009 provided \$2 billion toward grants for the manufacturing of advanced battery systems and electric vehicle components, as well as a tax credit to encourage investment in advanced energy property manufacturing facilities.

Congress has enacted tax credits for the purchase of fuel cell vehicles, alternative fuel (e.g., natural gas, hydrogen, E85, M85) vehicles, and plug-in hybrid electric vehicles. Tax credits also helped jump-start the market for hybrid electric vehicles.

The Emergency Economic Stabilization Act of 2008 provided an investment tax credit for fuel cell systems, and the American Recovery and Reinvestment Act of 2009 expanded incentives to encourage the installation of fuel cells and hydrogen fueling infrastructure.

The American Recovery and Reinvestment Act of 2009 provided \$8.4 billion for mass transit capital improvements and \$8 billion to improve and deploy high-speed passenger rail.

Transportation

The Transportation Working Group included participants from the three major U.S. automakers, the United Auto Workers, and two leading environmental groups. In the Energy Future Coalition's 2003 report, they recommended incentives for manufacturing and purchasing advanced vehicles (i.e., vehicles meeting performance criteria tied to fuel use and carbon dioxide emissions), a distribution infrastructure for biofuels, accelerated development of fuel cells, and measures to reduce vehicle-miles traveled, including increased availability of mass transit and high-speed inter-city rail. Progress on many of these issues is described in the box at right.

The Transportation Working Group also specifically endorsed the biofuels recommendations of the Bioenergy and Agriculture Working Group, described above.

The Future of Coal (and Natural Gas)

The Future of Coal Working Group – which included representatives of the coal industry, major electric utilities, universities, and environmental groups – identified a common interest in developing and demonstrating technologies that would allow “near-zero” emission use of coal and in deploying those technologies widely in the U.S. and around the world. However, the group was not able to agree on policies to accelerate the development and use of these technologies – such as limits on carbon dioxide emissions.

These political tensions still exist, as demonstrated by the resistance from well-organized coal interests that prevented the Senate from acting on energy and climate legislation in 2010. Progress toward cost-effective technology to capture and store carbon dioxide underground has been slow, and its prospects remain unclear. Meanwhile, the economic and national security context that made coal so important to the United States has been altered by technological advances that have made very large supplies of domestic shale gas economically recoverable, driving down the price of gas to such low levels that they challenge the ability of other energy sources to compete.

The Energy Future Coalition has helped call attention to this shale gas opportunity, its implications for U.S. energy policy, and the need for responsible production practices. In the interest of making available a relatively low-carbon alternative to coal in electric power generation and to diesel in heavy-duty trucks and light-duty centrally fueled fleet vehicles, the Coalition has encouraged efforts to avoid the unnecessary but potentially serious conflicts between natural gas production and environmental protection.

The goal of the Future of Coal Working Group was to reconcile the value of coal as an abundant domestic resource for baseload electricity generation with the need to mitigate its adverse environmental impacts. In effect, the rapid emergence of very large U.S. shale gas reserves has caused the Energy Future Coalition to address this same conundrum for gas. Natural gas has gone from having volatile prices and a dwindling U.S. supply to having abundant supplies with low and probably stable prices for the foreseeable future. It remains a high-value, relatively clean resource at the point of combustion – it produces roughly half as much carbon dioxide per unit of power generated as coal, and it is free of the contaminants in coal that lead to acid rain and mercury poisoning. Moreover, the infrastructure to put that gas to work has already been built – there is more gas-based generating capacity in the United States than coal-based. However, the latter is fully utilized, while gas plants are used less than half the time.

Timothy Wirth, drawing on his experience representing Colorado in the U.S. House and Senate, has spoken out repeatedly about the opportunities for natural gas – one of the earliest public figures in Washington to do so. In 2009 and again in 2010, in **speeches** to the Colorado Oil and Gas Association, he urged the industry to pursue more aggressively the opportunities that could come with moving to a low-carbon economy.¹⁷ Wirth and John Podesta **co-authored a paper** in August 2009 proposing policies that would capture the “unprecedented opportunity to use gas as a bridge fuel to a 21st-century energy economy that relies on efficiency, renewable sources, and low-carbon fossil fuels such as natural gas.”¹⁸



“The time has come for the natural gas industry to get organized, take the gloves off, and get thoroughly engaged in helping our country advance rapidly toward a low-carbon economy. You will help yourselves, leave a legacy for your grandchildren, and play a major role in saving the world.”

- Timothy Wirth, Remarks to the Colorado Oil & Gas Association, July 8, 2009

Because of the potential benefits for public health and greenhouse gas emissions, the Energy Future Coalition developed an **action plan** to increase the use of natural gas and renewables in power generation and transportation, and to ensure that an abundant supply of natural gas would continue to flow through environmentally sound exploration and production practices with wide public acceptance.¹⁹ For example, methane emissions from leakage in gas production and use must be monitored and minimized. Other environmental impacts of gas production can include contamination of water supplies, increased air pollution, and dramatic land use changes. The industry argues that the use of best practices can avoid those impacts, yet has resisted codifying those practices into state or federal regulation. In response, the Energy Future Coalition has encouraged the industry, state regulators, and environmental groups to identify and promote the use of best industry practices. In May 2011 Secretary of Energy Steven Chu **asked** a group of environmental, industry, and state regulatory experts to recommend ways to improve the safety and environmental performance of natural gas hydraulic fracturing.²⁰

The State of Colorado, under former Gov. Bill Ritter, recently demonstrated a balanced approach to this challenge, moving first to impose stronger regulations on gas production – over the industry’s strong objections – and then working with the industry on legislation, the **Clean Air- Clean Jobs Act**, that will cause several old polluting coal-fired power plants to be retired and most likely replaced with natural gas.²¹ The Environmental Protection Agency is also moving forward with a number of long-delayed regulatory actions under the Clean Air Act to reduce power plant emissions, which will force the owners of coal-fired power plants that lack modern pollution controls either to make major new investments in antiquated facilities or to shut them down – and, in all likelihood, switch to gas.

Natural gas also provides an attractive option in the transportation sector through the replacement of diesel fuel in trucks, buses, and centrally fueled urban fleets. In an op-ed in **The Wall Street Journal** in 2009, Ted Turner joined with T. Boone Pickens to argue that the nation’s energy security demands a rapid transition to gas in heavy-duty vehicles.²² **Bipartisan legislation** has been introduced in Congress to provide tax incentives for the production and purchase of such vehicles.²³

Smart Grid

In 2003, when the smart grid (i.e., the integration of modern information and communications technologies into the management and distribution of electricity) was a relatively new concept, the Energy Future Coalition took pains to explain in its report that a smart grid would:

- Respond to system disturbances and mitigate power outages.
- Provide more security from physical and cyber threats.
- Support widespread use of distributed generation.
- Enable consumers to control the energy used in their homes and businesses.
- Achieve greater throughput, thus lowering power costs.

The Smart Grid Working Group recommended three initiatives to hurry deployment and obtain the benefits of a smart grid: a national vision statement and demonstration program for the 21st century grid; national grid performance standards; and federal and state incentives to promote investments in smart grid technologies. Many of these recommendations came to pass, as described in the box at right.

The Energy Future Coalition, in partnership with industry stakeholders, was active in drafting smart grid authorization language, especially for demonstration projects, that was included in the **Energy Independence and Security Act of 2007**.²⁴ The bill authorized only \$100 million per year from 2008 through 2012 but laid the groundwork for investment of more than \$4 billion in grid projects under the American Recovery and Reinvestment Act of 2009.

Going beyond the original agenda of the Smart Grid Working Group and building on work initiated by the Energy Foundation, in 2008 the Energy Future Coalition and the Center for American Progress brought together more than 50 businesses, environmental groups, energy companies, investors, and consumer advocates to produce a **National Clean Energy Smart Grid Vision Statement**.²⁵ The statement called for new national policies to rationalize and expedite

In 2009, the American Recovery and Reinvestment Act modified the EISA 2007 authority for demonstration projects and provided \$4.5 billion for modernizing the grid. That year the Department of Energy also published a smart grid vision statement.

The North American Electric Reliability Corporation has coordinated development of numerous grid-related performance standards, including transmission operations, transmission planning, and interconnection reliability operations and coordination, in addition to producing a report on reliability considerations from smart grid integration. The National Institute of Standards and Technology is working with stakeholders to identify consensus standards for interoperability and security of smart grid devices.

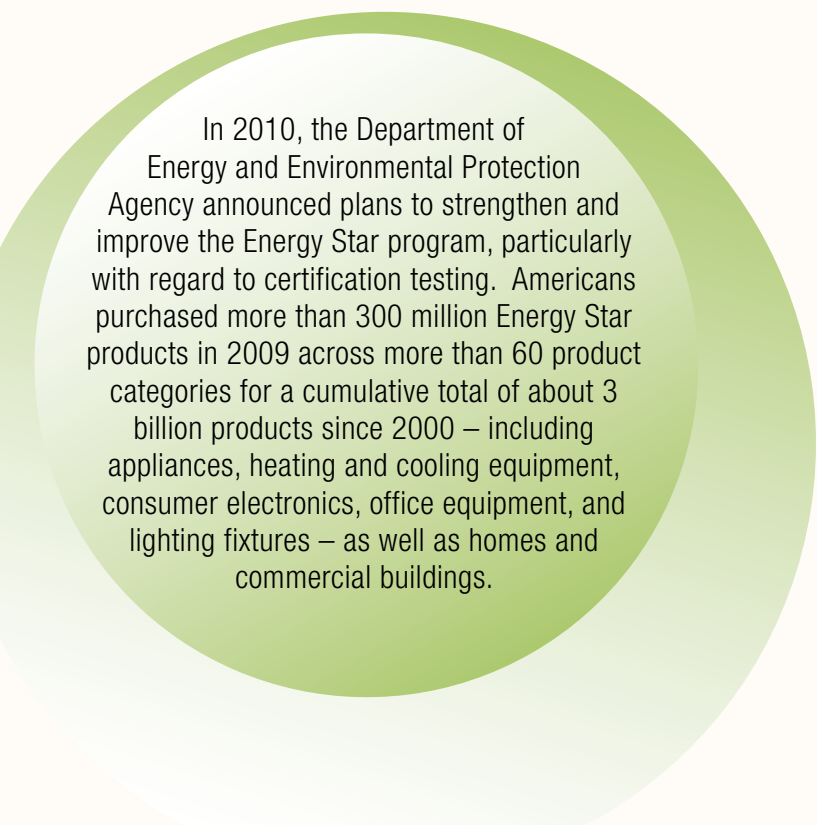
the planning and deployment of new electric transmission resources, to bring the nation's vast reserves of clean and renewable energy from remote areas to population centers.

The Coalition then developed a comprehensive legislative proposal to promote the development of a national clean energy transmission system, and many of its elements were reflected in the American Clean Energy Leadership Act approved by the Senate Committee on Energy and Natural Resources in 2009 (although the legislation never came to a vote in the Senate). Some have since been advanced further by the Department of Energy and the Federal Energy Regulatory Commission. The Coalition's National Clean Energy Transmission Initiative continues its outreach to businesses, energy and environmental groups, utilities, consumer advocates, and others, both at the national and regional levels.

End-Use Efficiency

In its 2003 report, the End-Use Efficiency Working Group noted, "Efficiency can be a powerful tool in any effort to accomplish sweeping changes in the use of fossil fuels, to make industry more profitable, and to tame the emissions challenges of the 21st century." It added, however, that "any number of market flaws and failures conspire to prevent the optimal level of investment."

The Working Group offered three recommendations: federal co-funding to expand state and utility efficiency programs; expansion of the federal Energy Star program to cover more product and building types; and expansion and improvement of energy efficiency training programs.



In 2010, the Department of Energy and Environmental Protection Agency announced plans to strengthen and improve the Energy Star program, particularly with regard to certification testing. Americans purchased more than 300 million Energy Star products in 2009 across more than 60 product categories for a cumulative total of about 3 billion products since 2000 – including appliances, heating and cooling equipment, consumer electronics, office equipment, and lighting fixtures – as well as homes and commercial buildings.

The Energy Future Coalition and its partners advocated for inclusion in the American Recovery and Reinvestment Act (ARRA) of 2009 of \$3.2 billion for the Energy Efficiency and Conservation Block Grant Program, principally to state and local governments, and \$100 million in green jobs training grants. ARRA also appropriated \$3.1 billion to the State Energy Programs and \$5 billion to fund grants to states under the Weatherization Assistance Program.

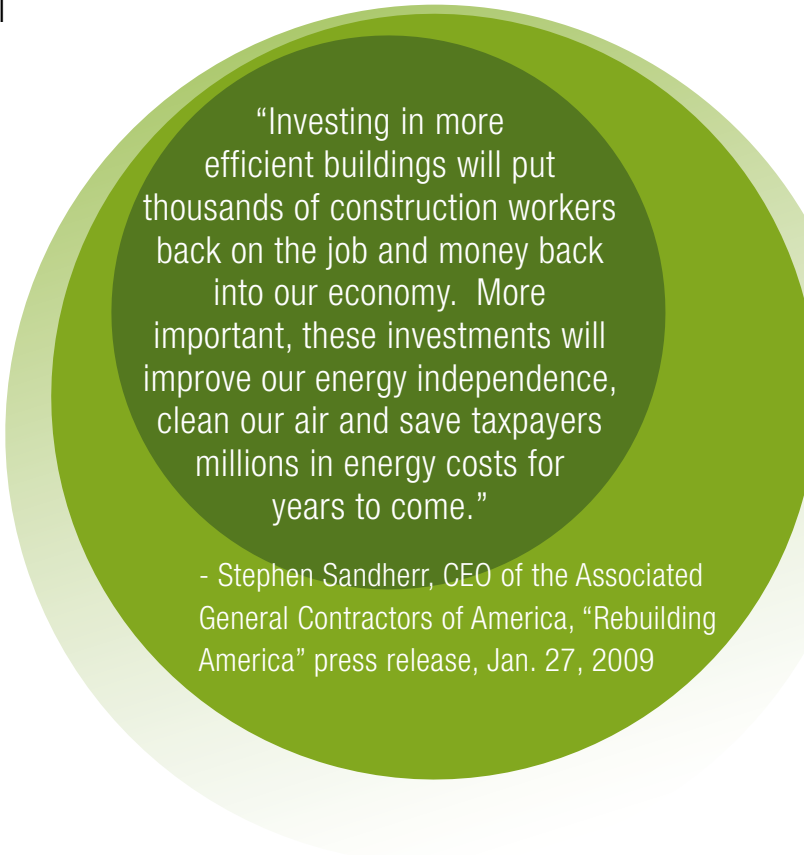
Going beyond the Working Group recommendations, the Energy Future Coalition has sought to "change the rules" and make energy efficiency investments more attractive to utilities by allowing them to "make more

money helping people save energy rather than use energy.”²⁶ The Coalition:

- Worked with partners in 2007 to include a requirement in the **Energy Independence and Security Act** that state regulators and unregulated utilities consider removing disincentives to and providing utility incentives for energy efficiency.²⁷
- Worked with the Maryland Energy Administration, advocacy groups, and businesses to design legislation that requires a 15 percent reduction in per-capita electricity use by 2015, **one of the most ambitious electricity efficiency targets** in the country.²⁸ Enacted in 2008, the EmPOWER Maryland legislation also led to revenue decoupling for electric utilities in the state.
- Worked with partners to include language in the **American Recovery and Reinvestment Act of 2009** requiring state governors to certify that state regulators would seek to implement “a general policy that ensures that utility financial incentives are aligned with helping their customers use energy more efficiently and that provide timely cost recovery and a timely earnings opportunity for utilities associated with cost-effective measurable and verifiable efficiency savings, in a way that sustains or enhances utility customers’ incentives to use energy more efficiently.”²⁹

In 2009, following the near-total collapse of the U.S. construction industry, the Energy Future Coalition and the Center for American Progress launched a new initiative called **Rebuilding America** calling for “a comprehensive national strategy to transform the market and stand up a retrofit industry that can renovate 50 million residential and commercial buildings by 2020 – 40% of the nation’s building stock.” This statement was endorsed by more than 90 partners from the building trades, contractor organizations, businesses, and advocacy groups.

The Rebuilding America coalition supported the Home Star residential retrofit proposal of the Obama Administration and developed the companion **Building Star** package of efficiency incentives and rebates for commercial and multi-family building owners, which was introduced in the Senate by Sen. Jeff Merkley



“Investing in more efficient buildings will put thousands of construction workers back on the job and money back into our economy. More important, these investments will improve our energy independence, clean our air and save taxpayers millions in energy costs for years to come.”

- Stephen Sandherr, CEO of the Associated General Contractors of America, “Rebuilding America” press release, Jan. 27, 2009

and in the House by Rep. Peter Welch in 2010.³⁰ Both Home Star and Building Star fell victim, however, to the political stalemate that developed on energy policy in the Congress.

The Rebuilding America coalition also supported a number of proposed tax incentives for commercial building retrofits that remain viable in 2011. In February 2011, President Obama announced the “**Better Buildings Initiative**,” which seeks to make commercial buildings 20 percent more energy efficient by 2020 and save their owners \$40 billion a year.³¹ The plan includes a proposal to redesign the current tax deduction for commercial building upgrades, transforming it into a tax credit that would triple its impact. This attention to energy efficiency in commercial buildings owes much to the advocacy of Rebuilding America.

International

The recommendations and activities of the five working groups described above respond to the first two of the three energy challenges identified in the 2003 report – the political and economic threat posed by the world’s dependence on oil and the risk to the global environment from climate change. The third of the challenges – the lack of access by the world’s poor to the modern energy services they need for economic advancement – was the responsibility of the International Working Group, which offered five major recommendations:

- Formation of a U.S. Council on Energy and Development to address international poverty and energy security issues;
- Creation of Global Development Bonds to encourage a stronger flow of capital investment to developing countries;
- Development of a Global Rural Energy Best Practices Fund;
- Revision of OECD lending guidelines to provide extended-term financing for low- and no-carbon energy investments; and
- Development of a standardized project financing protocol for end-use efficiency projects.

Of these recommendations, the Energy Future Coalition followed up first on the proposal for **Global Development Bonds**. Working with a small team composed of Michael Eckhart of the American Council on Renewable Energy (ACORE) and John Mullen of GlobalNet Financial Solutions, the Coalition drafted papers and received favorable responses in New York and Washington from officials representing a wide range of commercial and investment banks, rating agencies, insurance companies, law firms, government agencies, non-profit organizations, and others.³² The Wall Street collapse, however, made introduction of a new collateralized debt obligation infeasible.

The balance of the Working Group's recommendations fell more within the purview of the United Nations Foundation, the Energy Future Coalition's host organization and partner. The Foundation has taken up the core issue of increasing private-sector investment in low-carbon energy infrastructure in developing economies, working with the World Economic Forum and the International Finance Corporation (in association with the Institutional Investors Group on Climate Change and the Investor Network on Climate Risk) on the Critical Mass initiative – an effort to develop models of innovative public-private collaborations to pioneer a new wave of bankable and scalable transactions.

Critical Mass brings together institutional investors, asset managers, development banks, donor agencies, infrastructure project developers, and climate finance experts to work through the challenges of low-carbon finance in developing countries, identify how to get real deals done, and scale those deals up.³³ The Foundation has been co-leading the Critical Mass group on energy efficiency, exploring why so little low-carbon investment goes into that area and bringing together potential partners to consider how to finance energy efficiency initiatives for buildings in developing countries. The UN Foundation has also been engaged on the energy access issue more broadly:

- Since 2008, the Foundation has worked with partners to prepare a **Blueprint for Bioenergy, Agriculture, and Rural Development** for eight West African countries and to assist in the development of a sustainable bioenergy plan for all of Africa.³⁴
- With the support of numerous partners and the leadership of Secretary of State Hillary Clinton, in September 2010 the Foundation launched a new **Global Alliance for Clean Cookstoves**, which seeks to save lives, improve livelihoods, empower women, and combat climate change by creating a thriving global market for clean and efficient household cooking solutions.³⁵ Smoke from polluting and inefficient cooking, lighting, and heating devices prematurely kills more than two million people a year, primarily women and young children, and causes a range



“The organizations involved in the Critical Mass initiative believe that a process of practical experimentation and collaboration between the public and private sectors is now critical. By working on live transactions and with national low-carbon programmes, the public and private sectors will be more likely to create win-win arrangements that mobilize the participation of private finance at scale.”

- Scaling Up Low-Carbon Infrastructure Investments in Developing Countries, January 2011

of chronic illnesses and other health conditions. The Alliance has set a goal of enabling 100 million homes to adopt clean and efficient stoves and fuels by 2020, toward a long-term vision of universal adoption of clean and efficient cooking solutions.

- As President of the Foundation, Timothy Wirth served in 2009 and 2010 on the UN Secretary-General's Advisory Group on Energy and Climate Change. This group released a major report in 2010 that called on the United Nations system and its Member States to commit themselves to achieving **two goals** by 2030 – ensuring universal access to modern energy services and reducing global energy intensity by 40 per cent.³⁶ In response, in December 2010, the UN General Assembly designated 2012 as the International Year of Sustainable Energy for All, and the UN Foundation is working with the coordinating group UN-Energy to develop a global campaign for universal energy access.

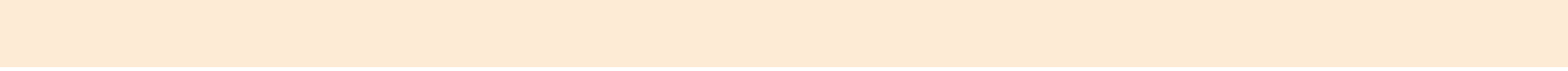
The report of the Advisory Group makes clear what is at stake:

Energy is at the heart of most critical economic, environmental and developmental issues facing the world today. Clean, efficient, affordable and reliable energy services are indispensable for global prosperity. Developing countries in particular need to expand access to reliable and modern energy services if they are to reduce poverty and improve the health of their citizens, while at the same time increasing productivity, enhancing competitiveness and promoting economic growth. ...

Worldwide, approximately 3 billion people rely on traditional biomass for cooking and heating, and about 1.5 billion have no access to electricity. Up to a billion more have access only to unreliable electricity networks. ...

A well-performing energy system that improves efficient access to modern forms of energy would strengthen the opportunities for the poorest few billion people on the planet to escape the worst impacts of poverty.

It is because of such challenges – and such opportunities – that we seek a new energy future, for the United States and the world.





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THE WAY FORWARD

The Energy Future Coalition has not been alone in calling for a new direction for the country and the world on energy. For example:

- In 2004, the National Commission on Energy Policy released a **bipartisan report** focused on enhancing oil security, reducing climate risks, improving energy efficiency, expanding energy supplies, strengthening energy supply infrastructure, and developing better energy technologies.³⁷
- In 2008, the **Energy Security Leadership Council**, a project of Securing America's Future Energy, called for electrification of the transportation sector, enhancing the nation's capacity for electric power generation (including nuclear, carbon capture, renewables, grid, and efficiency), boosting domestic biofuels, and increasing energy R&D.³⁸
- In 2010, the **American Energy Innovation Council** – a group of America's top business leaders, including Bill Gates of Microsoft, Norm Augustine of Lockheed Martin, John Doerr of Kleiner Perkins, Chad Holliday of DuPont and Bank of America, and Jeff Immelt of GE – said that reforming and strengthening U.S. investment in energy innovation is the most critical element to securing America's future.³⁹

And yet, in spite of these calls for change, our energy habits are still stuck in the past:

- Oil imports and carbon dioxide emissions have started to **rise** again, following brief declines caused principally by the recession.⁴⁰
- Even apart from the spike in oil prices to \$145 per barrel in July 2008 (and its subsequent plunge below \$40), the trend in oil prices over the last decade has been **upward** – a trend that was reinforced by the recent unrest in the Middle East.⁴¹
- Petroleum represents an increasing share of the U.S. trade deficit, despite its volatile pricing, accounting for more than half of the total in 2010, rising to **59 percent** in the first five months of 2011.⁴²
- Renewable sources such as solar power, wind, and biofuels provided **just over 8 percent** of America's energy in 2010 – and despite very rapid growth rates in production, their share of the energy market has grown only slightly.⁴³
- The evidence, scale, and impacts of climate change have all increased beyond the



point of credible scientific challenge. The last 10 years included nine of the 10 hottest years on record, extreme weather events are more frequent, and Arctic sea ice (to cite one obvious indicator) is disappearing rapidly. Summer sea ice extent, as of September 2010, is shrinking by an average of **11.5 percent per decade** since the beginning of satellite records in 1979.⁴⁴ The chemical composition of the oceans is changing, as the absorption of carbon dioxide from the atmosphere steadily **makes seawater more acidic**.⁴⁵ Yet our emissions continue to accelerate on a global basis.

These facts underscore the urgency of America's energy challenge. What we must do is hurry our future. We must change the rules that present the largest barriers to our clean energy future and we must refocus our attention on America's most abundant energy resource – energy efficiency.

Some of the barriers that new rules can address include:

- ***Electric utility regulation*** – In **most states**, utilities are rewarded for investing in power plants, for which they earn a rate of return – and not for investing in consumer energy efficiency, for which they may be repaid but not earn an additional return.⁴⁶ When such utilities increase electricity sales, they increase their profit. Increasing energy efficiency – and thereby reducing the need for as much supply – means lower sales and lower profits, so efficiency investments are generally unattractive economically. Customer-owned power systems, such as solar panels, similarly reduce the amount of power that utilities need to generate, along with their profits. Independent renewable power producers face somewhat different barriers. Utilities often make it difficult or expensive for them to gain access to the grid. Fractured and overlapping regulatory jurisdictions impede construction of transmission lines needed to bring renewable energy to market. (If similar systems were in place for America's roads, the interstate highway system would not exist.) And once they reach the grid, renewable energy sources may not receive full credit for the value of their power; because of the intermittent nature of these sources, utilities often give a zero or low price for the “capacity value” of the generation.
- ***Lack of information*** – Energy is a complex technical subject, and consumers – both businesses and individuals – often lack the information they need to make investment



decisions, from the homeowner considering a new air conditioner to the factory owner thinking about a combined heat and power system. Similarly, credit and insurance providers, utilities, and state public service commissions are often unfamiliar with rapidly evolving renewable energy technologies, thereby hindering developer access to financing, increasing capital costs, and reducing the regulatory impetus for change.

- ***Disconnect between decision-makers and bill-payers*** – Many energy investments are made by someone other than the person who ultimately pays the energy bill. Typically, these decision-makers – e.g., homebuilders and landlords – do not make investments in efficiency and renewables that would be cost-effective for the ultimate bill-payer because they cannot be assured of recouping their up-front costs. In the U.S., this issue is estimated to affect almost half of residential space heating, 77% of residential hot water usage, and 90% of leased commercial space energy consumption.
- ***High capital costs*** – Renewable energy and energy efficiency require large capital investments that are recouped over time. These up-front costs can be daunting to those making energy choices – whether a homeowner, a business, or a utility, which can generally pass along higher fuel costs automatically. Decision-makers often have short investment payback horizons and are reluctant to invest in technologies even if they are cost-effective.
- ***Infrastructure*** – Refueling infrastructure is key to widespread market penetration of alternative vehicle technologies. For example, there are now more than **8 million flex-fuel vehicles** (i.e., vehicles capable of operating on either gasoline or a blend of up to 85 percent ethanol) on the road in the U.S., having increased steadily from 140,000 in 1998.⁴⁷ But there are very few pumping stations where drivers of those vehicles can actually have a choice of fuels. Similarly, much of the infrastructure to support electric vehicles in this country is not yet in place. Gasoline and diesel benefit from the advantages of incumbency, brought about by decades of financial and policy support.

The new rules of America's energy future should move toward electricity and transportation systems that are clean, affordable, secure, and sustainable.

An effective energy strategy for the United States must begin by addressing supply and demand options – the production of energy and the use of it – on an equal footing. Energy policy has traditionally focused more on supply than demand, but arguably the latter has **more near-term potential** than the former.⁴⁸ Because of policies enacted after the 1973 oil embargo, the United States was able to decouple energy growth from economic growth. The nation uses roughly half as much energy as was projected 35 years ago, while still achieving the projected level of economic growth. Looking forward, steps to improve energy efficiency appear more cost-effective, less dependent on new technology development, and quicker to implement than new supply options for a cleaner and more reliable energy economy. In all sectors of our energy use – industrial, commercial, residential, and transportation – there is significant untapped efficiency potential.

An effective energy strategy must also address the issues of oil dependence and climate change together. Choices that pit one objective against the other should be avoided. The conversion of domestic coal to liquid fuels, for example, would reduce oil dependence but worsen the threat of climate change. Further improvements in transportation fuel efficiency, on the other hand, would reduce oil consumption by just as much, but at a **fraction of the cost** and with a net positive effect on carbon emissions.⁴⁹

The long-term centerpiece of U.S. energy strategy – for transportation as well as power – must be electricity. Much has been written about the hydrogen economy of the future, but **electricity has all of the virtues of hydrogen** and fewer of the drawbacks.⁵⁰ Like hydrogen, electricity is an energy carrier, not an energy source – it is completely clean at the point of use, in terms of both conventional pollutants and greenhouse gases, but must be produced using energy from another source. Unlike hydrogen, electricity has an **established distribution network** and can be produced inexpensively today. How would an electricity-centered economy address the challenges of oil dependence and climate change, and what would that energy future look like?⁵¹

First, that future would be electricity-centered, not electricity-only. Thus, heavy-duty vehicles and light-duty centrally fueled fleets could be powered by natural gas, while light-duty cars and trucks could run largely (but not solely) on electricity, with plug-in hybrids allowing routine daily travel on electricity but also extended range on a liquid fuel – perhaps a gasoline or diesel substitute derived from biomass. Transitioning the U.S. fleet of light-duty vehicles to plug-in hybrids could have at least two substantial benefits:

- It could reduce gasoline use by 40 to 55 percent by 2050, putting downward pressure on the price of oil and reducing the global flow of revenues to oil-producing countries – even as the trends in exploration are toward resources that are more difficult and costly to extract (e.g., the remaining oil in a tapped reservoir or deepwater resources far off-shore in challenging environments). Use of biofuels for extended-range travel could take cars off petroleum altogether.
- A fleet of hybrid vehicles is also a **fleet of batteries**.⁵² If the cars are plugged in when not in use, a smart electric grid could draw on (or add to) their stored electricity to keep the system in balance – an increasingly challenging task as variable energy resources like wind and solar are added to the grid. Plug-in hybrids could provide thousands of megawatts of **reserve power** to the grid, and in the event of a power outage, a plug-in hybrid could power a house for a time, replacing the need for a backup generator.⁵³ The nation's fleet of vehicles has more generating capacity than the nation's entire fleet of power plants – by various measures, 10 to 35 times as much – although the difference in the usage of automotive engines versus power plants defies a useful direct comparison. If even a small proportion of our vehicles were plug-in electric vehicles, their batteries could potentially provide a significant source to peaking power, voltage regulation, and spinning reserve for the grid. To utilities, the value of this service would be up to **\$3,000 per year** or more per car, helping to offset the increased initial cost of the vehicle to the consumer.⁵⁴

Of course, the environmental benefits of plug-in hybrids depend entirely on how their electricity is produced. The use of energy from conventional coal-fired generation would provide little, if any, benefit, but using excess wind power when it blows the strongest and is needed the least – at night – would be clean and cheap. By thus creating a market for off-peak wind, plug-in hybrids would have the additional benefit of making development of these non-polluting, inexhaustible energy supplies more economically attractive.

None of these benefits will be realized, however, without a smart grid – the integration of modern information and communications technologies (ICT) into the management and distribution of electricity. A smart, ICT-enabled grid would improve the operation of the system from power plant to home appliance and reduce its energy consumption and climate impact at the same time. Ironically, the reliable and pervasive supply of electric power – without which ICT technologies could not exist – is among the last major sectors of the American economy to

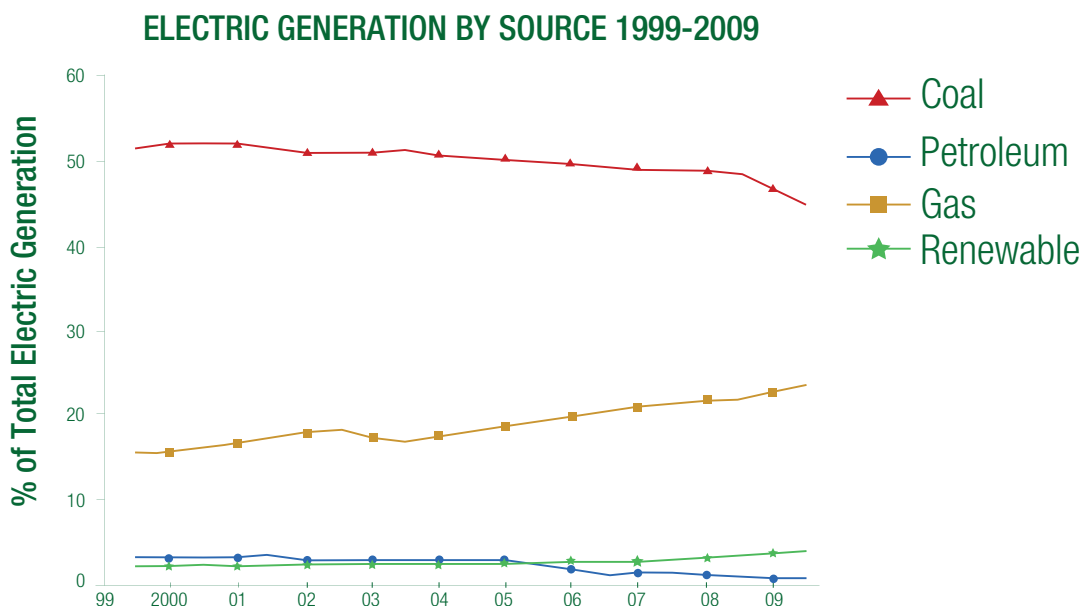
have escaped widespread ICT penetration and transformation. **Greater ICT use**, among other things, would allow utilities to:⁵⁵

- Predict and thus avoid system outages automatically – and when they do occur, limit their scope and respond immediately to repair them.
- Manage the flow of power through transmission lines much more accurately and reduce electricity losses during transmission and distribution.
- Provide information to consumers that will allow them to reduce high-cost peak power demand and cut their electric bills overall.
- Buy and sell power from their customers – from rooftop solar panels, for example – and integrate it into the system seamlessly.
- Use electric vehicle batteries as backup power for the grid, enabling much greater use of intermittent renewable energy sources.
- Create a new platform for innovative household services that can only be imagined today, much as the convergence of the Internet and mobile telephony led to the iPhone, the iPad, and their proliferation of apps.

It remains unclear whether U.S. utilities will be nimble and open enough to take full advantage of these opportunities or whether they will block and slow progress towards them – and possibly get pushed aside by an entrepreneurial culture of third-party vendors who will take their customers away. The key, not surprisingly, is economic. As noted earlier, under most current state regulation, most utilities have little incentive and indeed may be financially penalized if they attempt to benefit their consumers in these ways. The business model of electric utilities today is built around investment and sales. The more electricity utilities sell, the more they profit. This model, which served the industry well for decades, is not as well suited to the opportunities and challenges that utilities now face – especially the end of robust growth in demand for power. If sales were to fall – due to increased efficiency in the use of energy, the spread of distributed generation sources like rooftop solar panels, or the decisions of large industrial customers to generate their own power or acquire it in some other way – then utilities would have to recover the cost of their past investments from a smaller and smaller revenue base. That, in turn, would raise the cost of electricity, making alternatives more attractive, driving customers away, and shrinking sales still further – potentially threatening the utilities' financial integrity. None of that will happen quickly, of course, but the trajectory is undesirable. What is needed is a new business model for utilities – one that puts customer preferences first. Public service commissions

exist to stand between the monopoly provider of electricity and the consumer – to ensure a fair rate of return for the provider at the lowest cost to consumers. Typically this leads to a focus on keeping rates low. What is lost in that transaction, however, is the counterintuitive fact that higher rates can lead to lower costs – if the additional revenue is invested in managing the system more efficiently, reducing peak demand, helping customers to use less energy, and preventing outages. States that have moved in this direction have realized some of these benefits. **California**, for example, has some of the highest rates in the country, but its per-capita energy use is the lowest, and thus its citizens’ electricity bills are also among the lowest.⁵⁶

Other than using less electricity, the most direct way to reduce emissions is to rely on modern, well-controlled power plants and minimize the use of coal (without carbon capture and sequestration) as a fuel. From 1999 to 2009, **gas and renewables** (not including hydro) took almost 10 percent of the electric power generation market away from coal and oil.⁵⁷ This is a trend that should be encouraged and appears likely to continue for the near term, as stronger air pollution regulations will lead to the closure of the oldest, dirtiest coal-fired power plants that lack pollution controls, and as the sudden abundance of low-cost natural gas from domestic shale formations makes it the fuel of choice, particularly for new electric generation. Distributed energy generation will also play an important role; not only is there tremendous production potential, but smaller decentralized systems will also enhance both energy and national security.



The cost of renewable energy continues to drop as deployment increases, but it remains more expensive than gas, and its growth may slow unless policy makers at the state and federal levels continue and strengthen their support through renewable energy standards and/or tax incentives, as well as through regulations to facilitate the construction of long-distance transmission lines to bring wind and solar to market from distant locations in the Great Plains and desert Southwest. Renewable energy remains very popular with the public. More than half the states have adopted renewable electricity standards; several have been strengthened over time, notably in Texas and California; none has been repealed or reduced.

Strong national standards for renewable energy and energy efficiency would provide increased market certainty for technology deployment and would lead to increased private-sector investment, accelerating progress toward a clean energy economy and creating new jobs and businesses. A combined Clean Energy Standard would also be effective if energy efficiency is allowed to compete on an equal footing, if credits are based on greenhouse gas emissions, and if the standard leads to change in the nation's fuel mix over time.

Given these trends and the benefits of moving toward cleaner, more efficient electric generation and transportation systems, the new rules of America's energy future should include:

- Business models for utilities that compensate them for happy customers – for lower bills through increased efficiency, the ability to sell power back to the utility, reduced outages, power quality, and good customer service.
- Additional investment to bring the electric power grid into the 21st century, with increased use of monitors and sensors and the technologies to link them together and make sense of all that data.
- Integration of the smart grid with plug-in hybrid electric vehicles – facilitating recharging when power is cheapest and cleanest and enabling payment to vehicle owners for load balancing.
- Incentives to ensure that an adequate refueling network is available for alternative fuels – giving consumers options other than petroleum.
- Continued support for renewable energy and energy efficiency, with long-term incentives and stable policy frameworks to spur much broader deployment and with increased investment in research and development, focused on innovations that will drive down costs and improve efficiency.
- Rapid substitution of natural gas for coal as part of a systematic program to clean up or shut down power plants that lack up-to-date pollution controls, together with longer-term research

on breakthrough approaches to capture carbon dioxide from power plants (whether coal or gas) and dispose of it permanently.

The results of these interventions would be to reduce U.S. oil consumption substantially through the substitution of electricity, biofuels, and natural gas in the transportation sector and to accelerate the transition of electricity generation to cleaner sources such as natural gas and renewables. Combined with a new emphasis on efficiency in the transmission, distribution, and use of electricity, these steps begin to bring the dynamism of the ICT sector to energy, spurring creative and competitive new approaches to the underpinnings of our modern society, and encouraging innovation in a field where the market for new technologies is immense and truly global. These changes will make the American economy more efficient, productive, and competitive and will create an opening for manufacturing the new products that emerge. The transition to new clean energy systems is the preeminent global economic opportunity of the 21st century, and as a nation, we should provide policies and investments to lead the way forward.



Going forward, the Coalition will seek to realize the opportunities of the new energy economy by pursuing the following agenda:

Use less oil in transportation by changing the rules to:

- Continue to increase fuel economy standards for passenger vehicles;
- Prepare the electric power grid for electric hybrid plug-in vehicles;
- Expand the use of natural gas in heavy-duty and centrally fueled fleet vehicles; and
- Accelerate research and development on advanced biofuels and encourage the production of flexible-fuel vehicles and a fuel distribution system that gives consumers a choice at the pump.

Move toward a cleaner, more efficient electric power system by changing the rules to:

- Upgrade 40% of America's buildings – 50 million homes and businesses – by 2020 to make them more energy efficient;
- Promote new business models for electric utilities so that they and their consumers can co-invest and share in the savings available from energy efficiency;
- Develop new financing mechanisms and other tools to support energy efficiency upgrades in commercial, institutional, and residential buildings;
- Deploy new information and communications technologies that will enable consumers to enjoy more reliable, efficient, secure, and innovative energy services and to sell power to utilities as well as buy it from them;
- Allow consumers to schedule their use of electricity, like any other product, on the basis of its real cost – which can vary by an order of magnitude over a 24-hour period – making the system more efficient and less costly;
- Facilitate the transmission of renewable energy from remote areas to market;

- Remove barriers to and encourage the deployment of distributed energy generation technologies;
- Replace coal in electric power generation with cleaner energy sources and increased energy efficiency by providing clear regulatory direction to utilities;
- Ensure that abundant new reserves of natural gas from shale formations are produced in environmentally sound ways; and
- Continue research on carbon capture and storage for both coal- and gas-fired power plants.

The Energy Future Coalition is a broad-based, nonpartisan alliance that seeks to bridge the differences among business, labor, and environmental groups and identify energy policy options with broad political support. The coalition aims to bring about changes in U.S. energy policy to address the economic, security and environmental challenges related to the production and use of fossil fuels with a compelling new vision of the economic opportunities that will be created by the transition to a new energy economy.

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The Energy Future Coalition is a nonpartisan public policy initiative that seeks to speed the transition to a new energy economy. Combining expertise and advocacy, the Coalition brings together business, labor, and environmental groups to identify new directions in energy policy with broad political support.

The Energy Future Coalition works closely with the United Nations Foundation, with which it is co-located, on energy and climate policy, especially energy efficiency and bioenergy issues. The UN Foundation provides financial and in-kind support to the Coalition.

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