



*A Joint Initiative of The John D. and Catherine T. MacArthur Foundation,
The McKnight Foundation, The Joyce Mertz-Gilmore Foundation,
The David and Lucile Packard Foundation, The Pew Charitable Trusts
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The Energy Foundation is now ten years old. Our founding premise was that a focused, concerted effort to change the nation's energy policy could lead to a vastly cleaner energy supply system and much more efficient use of that energy. The foundation was built on technological optimism: it was clear in 1991 that energy waste could be cut at least by half in virtually every application and that renewable energy technologies could become competitive. Technology developments since then have made the case all the stronger.

The foundations creating the Energy Foundation had their own strongly held theories about change: we would aim our work at changing policies, which could lever grants dollars a thousand-fold. And we would work through existing networks of nongovernmental organizations, supplementing their efforts where necessary but maintaining a great faith in the capabilities of organizations close to the venues they intended to influence.

The Energy Foundation was created by three foundations: the Rockefeller Foundation, the John D. and Catherine T. MacArthur Foundation, and the Pew Charitable Trusts. They felt that a joint effort was necessary to affect the enormous energy sector. In the years since, the Joyce Mertz-Gilmore Foundation, the McKnight Foundation, and the David and Lucile Packard Foundation have joined our forces. The combined support, long-term outlook, and broad mandate of these foundations have given us extraordinary leverage in the energy debate.

This essay revisits our founders' premises, considers our progress so far, and then discusses the potential for success in the coming years.

The Business of Philanthropy

Philanthropy is an immature business. It relies on vague—and at times nonexistent—measures of progress. It does not yet have a strong sense of historical success or failure, and there is precious little sharing of best practices.

Although one can find stellar—even world-changing—examples of philanthropy, they are outnumbered by good-hearted but relatively ineffectual gestures. The lack of clear measures allows the field to drift along with little discernment between the great and the merely good. It is crucial to understand what makes that difference.

As in any other endeavor, one needs a strong sense of what works in philanthropy to build an effective program and to avoid waste. Such a sense, refreshed with new experience, is good for the donor and good for society, and it is in keeping with the public trust imbued in tax-sheltered foundations.

One type of philanthropy has been especially effective: focused, or “special purpose” philanthropy. Focused philanthropy has a rich history. It has, over the last century, played a principal role in building university science, eradicating yellow fever, doubling global agricultural production, building civil rights laws, developing contraceptive technologies, and charting a path toward nuclear disarmament. This list is by no means complete, but even in such an abbreviated form, it conveys the potential power of philanthropy.

Those successes, together with the characteristics of our energy dilemma, helped inspire the creation of the Energy Foundation.

The Nature of the Energy Dilemma

The energy crises of the late 1970s and early 1980s unleashed innovations in technology and energy policy. Some of those efforts were hugely successful; others failed spectacularly. When we did the original research that led to the establishment of the Energy Foundation, we interviewed more than a hundred veterans of energy crises; they included people from industry, science, government, and the nonprofit world. We found a near consensus on several issues, and those formed the logic underlying the Energy Foundation:

- Off-the-shelf technologies can cut energy use in industry, buildings, and transportation by half, two-thirds, or more, and save money at the same time.
- The market fails to take advantage of these potential savings because of a dozen structural barriers. A classic example is the “renter’s dilemma.” Owners of apartments rarely pay energy bills, and thus have no incentive to purchase energy-saving equipment, but renters cannot make capital investments in their space.
- Policies that set clear standards but let the market choose the technology to meet them have been highly successful. California building codes have reduced energy needs by 75 percent. U.S. fuel economy standards have saved 800 billion gallons of gasoline and some \$400 billion.
- Renewable energy technologies have been dropping in price; sustained investments would make them competitive in the foreseeable future.

Thus, we believed that a concerted effort to promote energy efficiency and renewable energy through changes in policy would have enormous impact. This became the mission of the Energy Foundation.

The Energy Foundation Approach to Philanthropy

With a clear mission, we had to develop a grantmaking structure that could produce large-scale results. We began with a metric: to get the maximum carbon reductions per philanthropic dollar. This naturally led to a sector-by-sector analysis of the U.S. (and later Chinese) energy economy. For example, electric utilities are responsible for about a third of all U.S. carbon emissions. There are terrific energy-saving technologies for electricity, and promising renewable energy technologies to produce electricity with no carbon. Perhaps most important, electric utilities are regulated through public utilities commissions, so there is a natural entry point for nonprofit groups. Those factors made the electric sector an obvious target for philanthropy; we are delighted that the choice has borne fruit.

One of our earliest discoveries was that some of the most rewarding strategies came from relatively obscure and uncharismatic fields. Building codes cannot compete with oil spills or dolphins in attracting the attention of the public or of environmentalists, but few venues are more powerful in terms of reducing pollution and waste. Building a strategy based on quantitative analysis has enabled us to find incredible leverage in the energy field.

In selecting our sectors and strategies, we made extensive use of peer reviews. We began our work with more than a hundred interviews, and we continue that practice today. The Energy Foundation staff regularly hosts workshops on different issues, bringing together experts from across the spectrum. We have tried to make our choices and the underlying rationale in each sector explicit. This has helped us determine failure and success more quickly, since we can map results against explicit assumptions.

A Strategy for Change We receive perhaps a thousand proposals per year. Every one is saturated with good intentions. Most of them do a fine job of describing a problem. Many have a vision of a better system. But relatively few make a credible case that they can deliver change. Those that do, naturally, form the real competition for grants.

A good strategy for change has several elements:

1. Know who must change, and consider their motives Reforming any policy requires insight into institutional dynamics, status quo interests, political momentum and inertia, marketing, and sometimes most importantly, the ancillary concerns of different actors.

At the outset of the Energy Foundation, we asked why the market did not pick up technologies to reduce energy even when they were cost-effective. It turned out that the buildings industry, for example, was rife with market failures, and we could not develop a decent strategy without understanding that.

Consider: Architects are neither rewarded nor penalized by the energy performance of their buildings. Developers rarely own the buildings and consequently care little about life-cycle costs. Building purchasers—be they commercial or residential—generally find it impossible to measure a building's energy performance, and even when those figures are available, such features (or demerits) are generally swamped by concerns over price, location, and amenity. The tenants of most buildings are renters, not owners. As mentioned above, renters generally cannot make capital investments in energy-saving devices, and landlords rarely pay energy bills. And finally, no one in the building sector—architects, developers, builders, owners, or renters—likes to take risks over mundane items like air conditioners. This brew of motivations results in a veritable collapse in rational energy decision-making, with vastly wasteful practices as a result.

That is actually an abbreviated list of problems, but it nonetheless illustrates the complexity of building a good strategy for change. If we fail to appreciate the motivations of each of the building sector's principal actors, our strategy will fail.¹

2. Understand other efforts Many efforts to transform the building sector have failed. The Energy Foundation staff who studied the history of the building industry found that demonstration buildings set new marks for what was possible, but steered only a small percent of developers to better practices. Fannie Mae promoted energy-efficient mortgages, with a lackluster response. Energy rating systems have failed to generate a significant market signal. And so on. Each of those ideas reflected some theory of change. All were valuable, but none could make a significant change with limited philanthropic dollars.

We decided to support the development and promulgation of advanced building codes. This strategy has met with great success and will in time help to transform the character of the building industry. And the broad consultation leading to the strategy has been part of its success, since the ultimate strategy reflects the priority, and therefore gathers the support, of many of the interested parties.

3. Ensure that every step is credible The great Indian energy thinker, Amulya Reddy, said that a strategy for social change must be like a stairway, with a well-understood starting point, a clearly articulated goal, and each step in between explicitly mapped. He added that if any step along the way was weak or impossible, the whole strategy was similarly weak or impossible. Defining each step before setting a strategy is necessary to avoid missing any step.

At the Energy Foundation, we use these tests in evaluating grant proposals: Has the applicant identified, by name or position, those who must change? Can he or she identify their motivations for changing, or for not changing? What pieces must fall into place for the strategy to succeed? Can each piece be so coaxed?

4. Make sure that the scale of your grants relates to the scale of the problem Focused philanthropy requires a careful matching of dollars to problems. Real progress in any significant issue requires serious money. Energy is a \$500 billion per year business in the United States, so a few million dollars is a relative pittance. Still, by focusing resources on key venues, such as public utilities commission hearings—or, in the transportation sector, air pollution authorities—foundation dollars can make a difference. We have decided not to take on a problem or an issue unless we can spend enough money to have a substantial presence in the key forums for that issue.

5. Make a long-term commitment Significant change is rarely speedy. Institutions, cultural patterns, laws, and values all change slowly. Society's dampened responses no doubt save us from the perils of a thousand zealots and crazy schemes, but they also slow the acceptance of much needed reforms. The most successful foundation programs in history took decades to realize their potential. Several modern endeavors in philanthropy that seemed quixotic in their early years are now proving their worth, but only because they have had time to unfold.

Few programs will succeed if they do not have staying power. Energy Foundation grantees cannot successfully pursue clean energy plans in public utility commission hearings unless those groups can survive the initial skepticism, overcome the roadblocks dropped by utilities, build sound economic arguments, and muster political support. It would make no sense, then, for the Energy Foundation to support utility reform unless we were prepared to stay the course for many years.

Energy as a Nexus Environmental Issue

6. Follow through on strategies The parallel requirement to long-term support is follow-through. This requirement comes squarely up against the notion that foundations can forever seed new programs and then jump on to a new subject, leaving old ones behind. Seeding new programs is indeed exciting, but unless someone is around to water the seedlings, weed them, harvest the grain, and bake the bread, seeding itself is useless.

The most successful groups we support at the Energy Foundation have made it clear that they will follow policy reform from conception to practical realization. That often means working on an issue for years after groundbreaking legislation has been passed, following the chain of reform all the way to detailed implementing regulations and practical adoption—and perhaps then to some course correction.

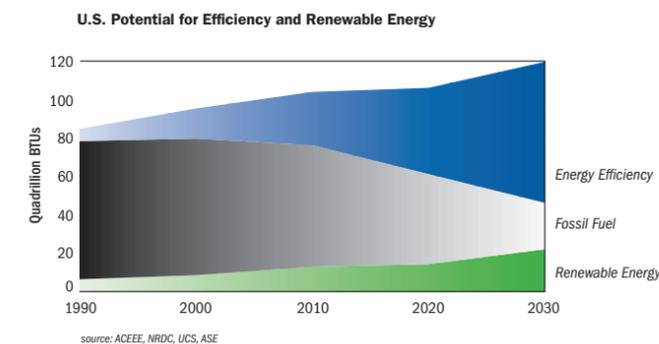
Those six elements, together, form the basis of our approach to grantmaking. They give us explicit standards for our work: as staff, we revisit them every year to see how we are doing.

But just as important as this structure are the substantive issues. The remainder of this essay looks at each of the principal energy sectors, considers what has been successful so far, and outlines what is especially promising for future investments.

Energy is at the center of the earth's most pressing environmental problems. Fossil energy—coal and oil—has fueled tremendous economic growth over the last century, but at a substantial, and growing, environmental cost. Wasteful energy use is the leading cause of greenhouse gas emissions, smog, acid rain, airborne toxins, oil spills, and nuclear waste. None of those problems can be solved without new energy trajectories. Conversely, all would be drastically reduced with a sharp commitment to clean energy technologies.

The United States is the world's largest carbon emitter, but other nations are growing quickly. China, for example, is expected to surpass Western Europe's carbon emissions before 2005 and will surpass the United States to become the world's largest carbon emitter by 2015. Brazil and India are on similar high fossil-energy growth trajectories. The challenge we face is to bring about a shift from an economy based on fossil fuels toward one based on energy efficiency and new low—or zero—carbon energy sources, including renewable energy technologies.

The graph below, built from a vast, detailed model of the economy, shows how fast the United States can reduce carbon emissions at a nominal cost. It shows that the combination of energy efficiency and renewable energy can keep this country on a prosperous path with dramatically reduced environmental damage. This is our guiding vision.



The Electric Power Sector

As America's largest polluters, electric utilities are responsible for two-thirds of the country's acid rain emissions (sulfur dioxide), more than one-third of global-warming emissions (carbon dioxide), and more than one-third of smog-causing nitrogen oxides. Utilities are also among the largest sources of mercury and small particulates, both health threats to children and the elderly. The deregulation trend sweeping the utility industry is bringing tremendous change—and opportunity.

Recent Progress Over the last decade, the Energy Foundation has helped build a network of utility advocates, composed of a dozen key groups covering over 30 states. These grantees have been critical in creating and protecting policies for clean energy in dozens of states. Utility energy efficiency programs, spurred by the Utility Network, totaled \$15 billion between 1992 and 1998. Those programs saved 360 billion kilowatt-hours of electricity—equivalent to two years of consumption by California—and 177,000 megawatts of capacity—equivalent to 350 large coal-fired power plants.

Now, in the electric restructuring debates, foundation-supported advocates have won more than \$750 million per year for energy efficiency in 19 states, as well as \$3.6 billion of public investment in renewable energy over the next decade from 13 states. In addition, 12 states have adopted renewable energy standards. To date, state policy gains for renewables should add at minimum 8,400 megawatts of new capacity by 2012 and should support 7,800 megawatts already in place. For example:

- In Texas, a 2,000-megawatt wind mandate—equaling \$2 billion in new investment—could push that state ahead of California in wind production.
- The California legislature recently renewed the state's fund for renewable energy and energy efficiency, adding some \$5.5 billion over the next ten years.
- By 2002, 425 megawatts of wind and 125 megawatts of biomass will be operating in Minnesota. The state utility commission is expected to order utilities to build another 400 megawatts of wind capacity.
- Advocates in Illinois steered \$225 million from a coal power plant sale into a Clean Energy Community Trust Fund, the first major commitment to clean energy in that nuclear-dominated state.

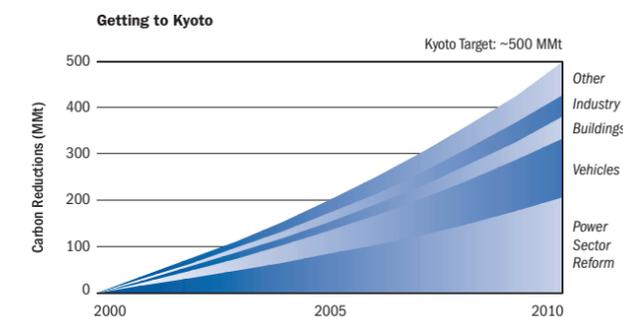
Prospects Utility deregulation means that clean energy sources will need to be compatible with competition. To ensure that competition reflects the strong public desire for a clean environment, advocates are trying to remove unfair barriers to renewable energy. But customer choice will not be enough. A transition to a clean energy system requires strong state and federal policies such as a renewable portfolio standard, which requires marketers to include a minimum percentage of renewable power in their mix, and a public benefits fund, which supports energy efficiency and research. Advocates have made great strides in getting those policies adopted in several states, but much more work is needed.

Clean energy funds: Boosting public funds for clean energy is essential in states that already have them, and creating such funds is necessary in states that do not. In New York, for example, a token two-year public benefits fund is up for renewal now, and advocates are hoping to raise it to \$250 million per year for efficiency and renewables. Massachusetts, Minnesota, and Iowa will also consider such funds in the next two years.

Clean distributed generators: Power reliability problems are creating opportunities for new, smaller generation technologies. Fuel cells and microturbines, which are just around the corner, offer the potential for high efficiency and low emissions. But dirty diesel generators are here today, and they are being sold by the thousands, creating a new public health threat. We need policies to encourage the cleanest sources and prevent the dirtiest.

Prairie winds: The wind energy potential of the Upper Midwest is enormous. Enough, in fact, to power the entire country while creating a cutting-edge industry for ailing rural areas. Policies could spur billions of dollars of new investments in Iowa, Minnesota, and the Dakotas.

Federal action: Federal action on utility deregulation appears inevitable. We must be ready to ensure that clean energy policies are not neglected. A national renewable portfolio standard, as endorsed by the Clinton Administration and as adopted by former governor George W. Bush in Texas, could have an enormous effect on U.S. carbon emissions.



Transportation

The transportation sector accounts for nearly 30 percent of the total U.S. energy consumption. Gasoline and diesel vehicles produce about 30 percent of the nation's greenhouse gases and 50 percent of the pollutants that create urban smog. Recent studies show that vehicles may be responsible for as much as 70 percent of the toxic compounds in urban air.

The Energy Foundation's transportation strategy aims to:

- Reduce fuel use and emissions through improvements to conventional vehicle technology
- Transform the vehicle fleet to dramatically more clean and efficient technologies such as battery-electric, hybrid-electric, and fuel cell vehicles

Recent Progress Energy Foundation grantees have worked with decision-makers to achieve important gains on both fronts. Foremost among these gains are:

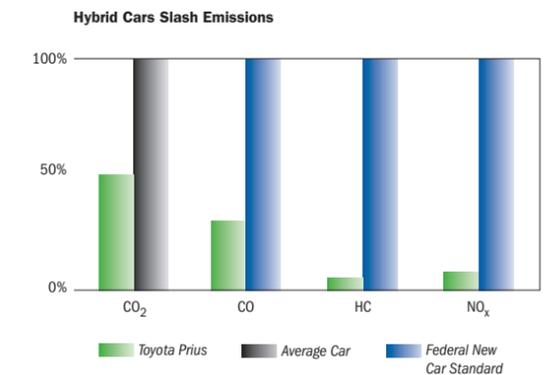
- Upholding the California zero-emission vehicle (ZEV) program, the only regulation worldwide that is driving advanced technology vehicles toward commercial reality. The new Toyota and Honda gasoline-electric hybrid cars, which get more than 50 miles per gallon, are one result.
- Replicating the California vehicle program in four Northeast states.
- Adopting federal "Tier 2" emissions standards for cars and light trucks, greatly reducing emissions for the next two decades and preventing more than 4,000 premature deaths and 400,000 incidences of asthma and respiratory illness in children each year.
- Fostering an aggressive federal proposal to reduce emissions from heavy trucks and buses by more than 90 percent.
- Creating state and local programs requiring transit bus fleets and other heavy vehicles to use advanced technologies and nonpetroleum fuels.

Prospects Air-quality regulations of the past decade have cut vehicle emissions dramatically. These aggressive programs have also created advanced technologies that can transform our national fleet, slashing both emissions and fuel consumption. Vehicle fuel economy, however, has worsened since 1987, as corporate average fuel economy (CAFE) requirements stagnated in the face of formidable industry opposition, and the cheap oil of the 1990s fueled unprecedented sales of inefficient sport utility vehicles and minivans. Although air-quality programs continue to present important policy opportunities, they cannot transform the U.S. fleet alone. Progress on fuel economy standards is the next crucial step.

The Sierra Club estimates that revised CAFE standards of 45 mpg for cars and 34 mpg for light trucks, when fully implemented, would save Americans more than 3 million barrels of oil per day (making drilling in the Arctic National Wildlife Refuge irrelevant) and would reduce CO₂ pollution by 140 million metric tons—about one third of the carbon reductions needed to reach Kyoto goals. This could be achieved even without advanced electric-drive technologies; automakers have many options for improving the efficiency of standard gasoline vehicles at reasonable cost.

Advanced vehicles promise even greater reductions in fuel consumption. In the near term, the 55-mpg and greater fuel economy of hybrid-electric vehicles, such as the Toyota Prius and Honda Insight, should add weight to the arguments for tighter CAFE standards.

Our challenge in the coming years is to work through both energy and air-quality programs to overcome the barriers of politics, cost, and technology and realize the promise of technological advances.



Buildings

Appliance efficiency standards are among the most effective means to save consumer dollars and reduce energy use and carbon emissions. The American Council for an Energy-Efficient Economy (ACEEE) estimates that new and existing appliance standards can save 78 million metric tons of carbon (MMTC) per year in 2010, the output of 90 power plants. The Department of Energy has the authority to set new efficiency standards for a list of residential and commercial appliances, but is years behind in adopting them. Our strategy in the buildings sector focuses narrowly on appliance and equipment standards and on building codes to maximize energy savings.

Recent Progress Recently enacted standards will bring enormous savings to the nation. For example:

Fluorescent lighting ballast

- Businesses will save more than \$1.2 billion annually by 2020.
- The country will save 227 billion kWh of energy by 2030.
- The equivalent energy will supply 12 million U.S. homes for one year.

Clothes washers

- Consumers will save \$5.3 billion per year by 2020.
- The country will save 77.5 MMTC cumulatively by 2030.
- We will save about 11 trillions gallons of water by 2030.
- The energy savings will be equivalent to the annual energy use of about 21 million households.

Water heaters

- Consumers will save \$23 billion cumulatively by 2020.
- The country will save 4 MMTC per year and 36 MMTC by 2020.
- The savings in MMTC will be equivalent to pulling 28 million cars off the road.

Central air conditioners and heat pumps

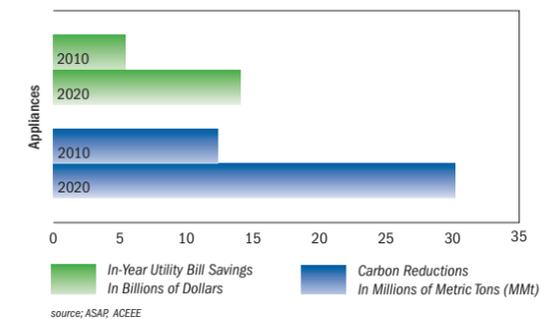
- Consumers will save over \$3.9 billion annually by 2020.
- The energy savings will be equivalent to building 53 new power plants.

Prospects Appliance standards: The Department of Energy has the authority but has yet to set standards on distribution transformers, commercial air conditioners and heat pumps, furnaces, dishwashers, and other appliances, which would result in additional annual savings of 8.7 million metric tons of carbon in 2020.

Building codes: Few policy venues are as obscure or unromantic as the development of national building energy codes. ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers) takes seven years to produce a new version of its commercial building code, but once it has, the energy ramifications are huge: 39 states and the federal government adopt ASHRAE standards. Nations such as Thailand, Indonesia, Malaysia, and the Philippines base their building performance standards on ASHRAE technology. For residential construction, 34 states use the International Energy Code (IEC) to set the bar or design their own code based on it. In the years ahead, advocates will need to continue their successful push for higher efficiency levels in ASHRAE and IEC forums.

Simultaneously, we need to accelerate the adoption of new codes state by state. Only a handful of states require an automatic upgrading to new national standards as they emerge.

Savings From Stronger Appliance Standards



The U.S. Clean Energy Program

While climate science is making extraordinary progress—and reaching often frightening conclusions—the U.S. political machinery is frozen over how to address climate change. The government is loath to act as long as the costs of reducing carbon emissions are assumed to be high and as long as the business sector is opposed to action.

Fortunately, some leading businesses have recognized that it is in their interest to become more energy and carbon efficient—not only because some form of carbon regulation is likely, but also because they can save money. Voluntary corporate commitments to reduce CO₂ emissions are an antidote to political paralysis: they demonstrate the real-world advantages of CO₂ abatement strategies, and they make it politically acceptable for governments to address carbon emissions.

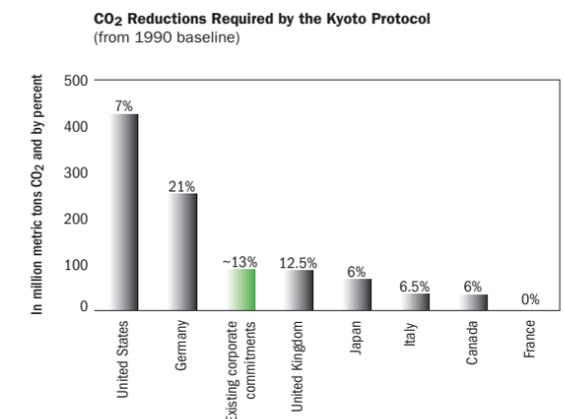
Seeing this opportunity to move business and government toward clean energy, the Energy Foundation, with support from the David and Lucile Packard Foundation, launched the U.S. Clean Energy Program in March 1999. The program's mission is to build support in the business sector for a shift toward a low-carbon energy future. The program has three funding priorities:

- Secure business commitments to greenhouse gas reductions
- Build business constituencies for clean energy
- Develop policies and measures for achieving a low-carbon energy future

Recent Progress A few months after the Kyoto Protocol was negotiated, Sir John Browne of BP stunned the corporate and political worlds by announcing that, by 2010, BP would voluntarily reduce its greenhouse gas emissions by 10 percent from 1990 levels. Since then, Shell, DuPont, IBM, Johnson & Johnson, and at least nine others have made similar commitments. Combined, these corporate commitments will save over 100 million metric tons of CO₂—as much as Great Britain would save under Kyoto.

In addition to these commitments, eleven companies have committed to purchasing 1,000 megawatts of new renewable energy. Business-environmental coalitions are expanding in number and size. States are creating policies to measure and manage their own emissions. Work under this program has generated a great deal of media attention, including stories in the *Wall Street Journal*, *Business Week*, the *New York Times*, the *Washington Post*, *The Economist*, and other major publications.

Prospects The political debate over climate change is no longer over whether it exists, but over what to do. In the new political era, business actions will become even more important as leading-edge efforts in the struggle to avert global warming. We expect to secure additional business commitments to CO₂ reductions and low-carbon policy, and we will focus media and policymaker attention on these commitments.



The China Sustainable Energy Program

China is the most populous and most coal-dependent country on earth. If China's economic growth continues to be based on current technology, it will threaten the earth's climate. Energy efficiency and renewable energy development can directly offset China's demand for new coal-fired electricity plants and could dramatically reduce carbon emissions. The David and Lucile Packard Foundation joined the Energy Foundation in 1998 to fund the China Sustainable Energy Program (CSEP); the program aims to assist China's transition to a sustainable energy future by promoting energy efficiency and renewable energy. CSEP supports capacity-building, linking Chinese grantees with "best practices" expertise from around the world.

To carry out this work, we opened a Beijing office in 1999. Staffed by Chinese nationals, it serves as an arm of the Energy Foundation and, when necessary, as an energy policy NGO providing outreach to China's government and policy research institutions.

Buildings: The China Green Lights program is improving the efficiency of compact fluorescent and other lighting products. It could cut China's carbon emissions by 80 million metric tons by 2010. The China Energy Conservation Association (CECA) is drafting air conditioner efficiency standards that will decrease the energy use of an average air conditioner by 22 percent. This standard alone will displace the need for ten large (500 megawatt) coal-fired power plants over ten years.

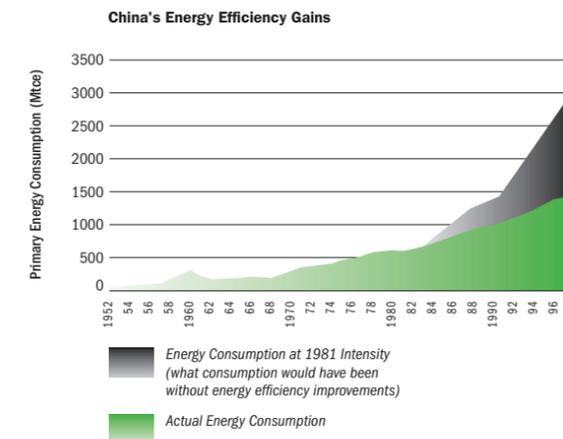
Industry: 71 percent of China's primary energy is consumed by the industrial sector. Our Key Energy-Consumptive Enterprises project teams the Lawrence Berkeley National Laboratory with CECA to develop new industrial efficiency policies conducive to competitive markets.

Electric utilities: The State Development Planning Commission, the State Council Development Research Center, and the State Power Corporation's Power Economic Research Center are receiving training by international experts on approaches to energy efficiency and renewable energy policy under competitive utility markets.

Renewable energy: Grantees have launched a comprehensive policy plan for developing China's renewable energy sector, including a proposed national renewable portfolio standard and the development of renewable energy microgrids for rural electrification. China's tenth Five-Year Plan recommends a national renewable portfolio standard that will require 5.5 percent of all electricity to come from renewable energy. Twelve U.S. states have adopted a renewable portfolio standard; to win one in China will be a huge victory for clean energy. Much work is needed to implement projects on the ground, starting with two pilot provinces.

Transportation: CSEP's vehicle technology consultants are assisting China's State Environmental Protection Agency, the Ministry of Science and Technology, and Tsinghua University to develop advanced vehicle technologies (hybrid-electric and zero-emission vehicles) and cleaner, more efficient conventional cars and trucks through a combination of air quality, fuel efficiency, and technology policies.

Low-carbon development paths: The Lawrence Berkeley National Laboratory and the Beijing Energy Efficiency Center are creating countrywide, multiyear carbon scenarios that model China's long-term options for energy policy. The Harvard School of Public Health and Tsinghua University are conducting a national analysis of fossil combustion health impacts.



Conclusion

One of the principal questions humanity faces is whether we can reconcile our vast population and material appetites with a sustainable environment. We cannot hope to succeed if we do not master our energy use—the world's largest source of pollution and the dominant agent in climate change.

Although the impact of our energy use is enormous, the energy problem is uniquely susceptible to a technological solution. In every sector, there are, or will soon be, cost-effective ways of slashing carbon and pollution emissions. Detailed studies from many quarters show that we can build a sustainable energy system at a modest cost.

If we do not rise to this challenge, the earth will face an accelerating cycle of climate disruption, habitat loss, and species extinction. Humanity will face scarcity and a degradation of health and quality of life.

The Energy Foundation is committed to reform in China and the United States. Our progress so far is heartening, but the challenges are great. We will redouble our efforts in the coming years to build that sustainable energy future.

¹ For an insightful, detailed look at the dysfunction in building energy decision-making, see Amory Lovins' essay, "Energy Efficient Buildings: Institutional Barriers and Opportunities," available from E-Source, Boulder, Colorado, December 1992

Programs and Grants

The Energy Foundation awards grants and takes direct initiatives in utilities, buildings, transportation, renewable energy and integrated issues. It has recently launched, in partnership with the Packard Foundation, the U.S. Clean Energy program, designed to engage business in reducing energy waste, and the China Sustainable Energy Program. The foundations's geographic focus is the U.S. and China.

In this section we describe our programs and illustrate them with the grants given in 1998, 1999, and 2000. In these three years, a total of 380 grants worth \$36,724,794 have been made.