






NRDC AND ENERGY EFFICIENCY

**BUILDING THE CLEAN
ENERGY FUTURE**





ENERGY EFFICIENCY ACCOUNTS FOR NEARLY

2.2 MILLION                  **U.S. JOBS** **10X** **MORE THAN OIL AND GAS DRILLING** **30X** **MORE THAN COAL MINING**



THANKS TO ENERGY EFFICIENCY, ANNUAL U.S. ENERGY CONSUMPTION IS ABOUT THE SAME NOW AS IT WAS IN 2000, EVEN THOUGH THE GDP HAS GROWN BY 30 PERCENT.



MORE EFFICIENT APPLIANCES SAVE U.S. HOUSEHOLDS AN AVERAGE OF \$500 PER YEAR ON UTILITY BILLS.



OVER THE PAST 40 YEARS, ENERGY EFFICIENCY HAS BECOME AMERICA'S LARGEST SINGLE ENERGY RESOURCE. ITS CUMULATIVE CONTRIBUTIONS TO THE NATION'S ENERGY NEEDS NOW EXCEED ALL COMPETITORS, FROM OIL AND COAL TO NATURAL GAS AND NUCLEAR POWER.



ON AVERAGE, RESIDENTS OF THE 5 LEAST-EFFICIENT STATES HAVE SEEN THEIR ELECTRIC BILLS INCREASE 2X AS MUCH AS THOSE IN THE 5 STATES THAT HAVE LED ON ENERGY EFFICIENCY.

Today's refrigerators run on one-fourth the energy that they required four decades ago. Most light bulbs purchased today will use up to 85 percent less energy than the old ones and last for more than 10 years. And buildings with efficient windows and insulation save money on energy bills and make our homes and businesses more comfortable places to live and work.

Efficiency is the art of getting the same or better performance using less energy—all while cutting utility bills for residential, business, and industrial customers. Taken together, innovations in energy efficiency add up to enormous gains. In the past 40 years, efficiency has done more to meet our growing energy needs than oil, gas, and nuclear combined. And all at a fraction of the cost.

This makes smarter energy use one of the most powerful weapons for combating climate change and ensuring our air is safe to breathe, because the cleanest energy source is the one you don't burn in the first place. And huge opportunities for efficiency remain untapped in every sector of the economy. Seizing them will slash our dependence on fossil fuels and help ensure a clean energy future. It will also create tens of thousands of well-paying local jobs.

Efficiency has a critical role to play in establishing a 21st-century energy system for our nation. It truly is the quickest, cleanest, cheapest solution. It brings cost savings to all communities, helps keep housing affordable, creates tens of thousands of jobs, and shields future generations from destructive climate change. These are the building blocks of the clean energy future. Smarter energy use alone can reduce U.S. energy demand from forecast levels by more than

half. As longtime thought leaders in the energy efficiency arena, NRDC experts help design and secure the policies that will deliver efficiency at the necessary scale at the local, state, federal, and international levels.

NRDC's energy efficiency contributions extend over more than four decades and have helped improve almost everything you use at home and at work. We helped pioneer the first efficiency standards for appliances and the

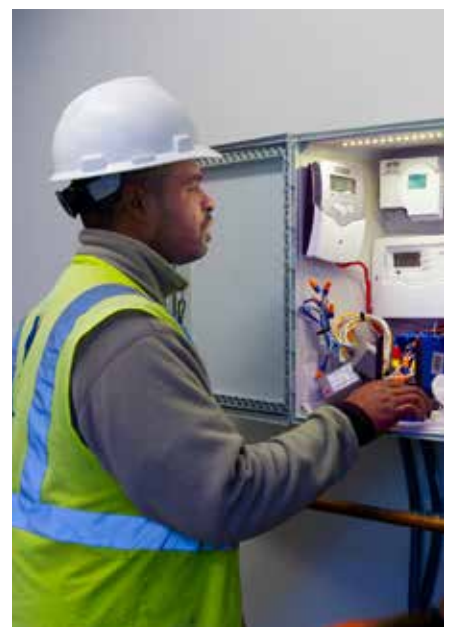
first utility-administered efficiency programs. Today we work to increase efficiency everywhere on a variety of fronts, including local community revitalization, national climate policy, and even China's and India's approaches to growing their economies. NRDC's team of scientists, engineers, economists, policy advocates, and attorneys has the expertise and proven tools to help the world realize the goal of a clean, efficient, and sustainable energy future.





BUILDING THE CLEAN ENERGY FUTURE

In order to avoid further devastating sea-level rise, deadly heat waves, and other climate impacts, the United States must reduce climate-changing pollution by at least 80 percent from 1990 levels before 2050. Even to meet the interim U.S. commitment from the Paris climate talks—a 26 percent to 28 percent reduction in greenhouse gases by 2025 compared with 2005—it will be necessary to accelerate our energy efficiency progress.





BUILT-IN EFFICIENCY

If you don't have much insulation in your walls, or double-pane windows, upgrading the energy efficiency of your home will save a ton of energy and slash your utility bills. But what if you didn't have to do it in the first place because every home was built to the latest energy efficiency standards that keep money in your pocket? That's the purpose of building energy codes, which NRDC has been working on developing and updating since the 1970s, first in California and now nationally. But what about the equipment within these buildings like refrigerators and TVs? NRDC supports rebate programs to enable consumers to afford higher-efficiency models, label programs like **ENERGY STAR**® that identify the more efficient models, and efficiency standards that ensure all appliances achieve minimum energy-saving levels so you don't have to worry about buying an energy hog.

Our analysis shows that we can achieve the 2050 goal of an 80 percent reduction by rapidly scaling up clean energy strategies—energy efficiency, demand response, renewable electricity, electrification of vehicles, and decarbonization of equipment and appliances (such as water heating) that use fossil fuels—and by modernizing the electricity grid. At least half of those greenhouse gas reductions must come from energy efficiency and other reductions in energy demand in buildings, industry, and transportation (more than 60 percent from buildings alone).

EFFICIENCY AND ECONOMIC GROWTH

Increasing our energy efficiency has enabled the United States to break the link between economic growth and energy consumption.

Over the past four decades, the nation's economy has nearly tripled while energy use has increased by only one-sixth. In fact, the amount of energy required to produce an inflation-adjusted dollar's worth of economic output dropped by more than 60 percent between 1970 and 2015, thanks in large part to gains in efficiency.



HOW WE WORK

IDENTIFYING OPPORTUNITIES FOR SWEEPING CHANGE

NRDC's advocacy helps transform the way people use and generate energy. Government policies and private markets can unleash vast amounts of untapped energy efficiency, and that's why NRDC works in both arenas to optimize these opportunities. Yet many hurdles remain, including the need to pay for more efficient technologies up front (while the savings accrue over time) and complicated or unclear processes that consumers must follow to access utility- and state-level efficiency programs.



NRDC helps remove these hurdles. We identify opportunities to spur sweeping changes across entire sectors of the economy, from utilities to real estate to manufacturing. Then we design solutions that jump-start transformation, such as smarter leases; expanded and more effective utility energy efficiency programs, building codes, and appliance standards; better financing tools; and incentives that drive rapid improvements throughout an industry. Here's how we work:

ENGAGE AT MULTIPLE LEVELS, including city, state, and federal utility commissions; state legislatures; Congress; the Federal Energy Regulatory Commission; the U.S. Department of Energy; and other government agencies. We build on our city- and state-level progress to push for greater action. Many of the efficiency standards for appliances and buildings that we secured in California, for instance, serve as models for national standards. And we have supported the adoption of similar standards in China and India. In addition, the groundbreaking model we helped create in New York City to reduce energy waste in existing buildings is being exported to 20 other large cities.

DEPLOY AN ARRAY OF TOOLS that collectively tap NRDC's scientific research, financial and economic analysis, legal prowess, policy expertise, political muscle, and citizen engagement. For example, we partnered with utilities to design a regulatory solution that enables them to help customers save energy without the utilities being harmed financially. Then we worked with regulators and lawmakers to popularize this mechanism, known as revenue decoupling, which now reaches more than half of all U.S. states.

BUILD STRATEGIC PARTNERSHIPS with a broad array of allies and stakeholders across political, social, and geographical lines in order to create broad-based support and public will for efficiency policies. To address the need for more efficiency in multifamily rental housing that is home to millions of low-income families, we formed partnerships with other groups to combine NRDC's expertise in energy efficiency and utility engagement with their knowledge of the affordable housing sector and ability to reach underserved communities. Now, with nearly four dozen coalition partners in 12 states, we have significantly increased energy efficiency investments by utilities in affordable multifamily housing. On numerous occasions, we also have joined with manufacturers, consumer groups, government agencies, and trade organizations to negotiate agreements that cut energy use in products ranging from cable set-top boxes to giant rooftop air conditioners.

SUPPORT MARKET ENVIRONMENTS that motivate manufacturers, businesses, and customers to rapidly embrace new breakthroughs in efficiency. We work with utilities and other administrators of energy efficiency programs to develop comprehensive offerings that help all customers (including low-income) save big on their utility bills and that increase demand for energy-efficient products. We also design and promote state, federal, and utility power acquisition programs that fully value the carbon-free, zero-pollution, and affordability benefits of energy efficiency and other consumer-driven resources.

FIGHT TENACIOUSLY to make the nation's energy system more efficient—a process that can take years. Because of energy efficiency's proven success, we helped ensure it was included as a key solution for states to use in meeting their emissions limits under the Clean Power Plan, which requires at least a 30 percent reduction in carbon pollution from power plants by 2030. Energy efficiency is up to the challenge of helping to meet this goal and more, and NRDC will continue fighting to ensure America has the tools and policies to make it happen.



REDUCING ENERGY WASTE IN HOMES, BUSINESSES, AND INDUSTRY

Residential and commercial buildings account for about 40 percent of the energy consumed in the United States. Yet much of it is wasted; it literally flies out of drafty windows and doors, or drains from poorly designed equipment and appliances within those buildings.

This presents a major opportunity. Efficiency programs, state and national building energy codes, and appliance and equipment standards can dramatically reduce energy waste—and cut carbon pollution and lower energy bills in the process.



Over four decades of effort, NRDC has assembled a comprehensive suite of policies with a demonstrated record of success. We are continually refining and expanding this package and its implementation to further advance efficiency. Our objectives include:

TRANSFORMING UTILITIES INTO SERVICE PROVIDERS AND INCREASING CUSTOMER-FUNDED ENERGY EFFICIENCY PROGRAMS

Electric and natural gas utilities account for about half of all U.S. global-warming pollution because they burn fossil fuels to produce energy. They are also the most important—although not the only—investors, long-term planners, and resource integrators of the energy system. When utilities help customers cut energy use (and their bills), it reduces the need for new power plants and the amount of fossil fuel pollution that they emit into the air. But the way utilities are traditionally regulated ties their cost recovery to energy sales. If they sell less because of successful energy efficiency efforts, they risk not recovering their fixed costs to ensure that service is available to all customers (such as the cost of transmission infrastructure like poles and wires). NRDC has pioneered creative solutions that enable utilities to remain financially healthy even while they urge consumers to buy insulated windows or energy efficient dishwashers. These solutions encourage utilities to move away from trying to sell as much energy as possible and to view themselves as service providers instead. This is just one example of how NRDC's **Utility Business Model Project** is changing utility and customer incentives to support the cleanest and most efficient, equitable, and affordable energy system possible.

NRDC also spearheaded the design and implementation of energy efficiency programs and accompanying policies that include all types of customers (including low-income) through our **Utility Energy Efficiency Project**. Supportive policies include setting aggressive targets for reducing energy waste, developing incentives that encourage utilities to meet and exceed those targets, and implementing measurement and verification methods to ensure the money invested in efficiency is well spent. U.S. utilities are channeling almost \$8 billion annually into efficiency programs that provide information and financial assistance to customers for measures like more efficient lighting and appliances to cut their utility bills.

NRDC'S GOAL: Promote nationwide adoption of energy efficiency programs that save enough energy annually to equal 2 percent of utility electricity sales (the current average is 0.71 percent). That would be enough to power California, New York, and Illinois combined. Within 15 years, the 2 percent annual savings goal would push total savings to 30 percent. We also work to avoid natural gas consumption equal to 1.5 percent of utility natural gas sales annually. Achieving these goals will reduce dangerous pollution from power generation and make energy services more affordable and reliable by reducing our dependence on fossil fuels.

REFRIGERATOR SUCCESS STORY

Back in the 1970s, as America's houses grew in size, so did the refrigerators inside them. This created a headache for energy planners, who were projecting they'd need to build one nuclear power plant every 10 miles along the entire California coast in order to quench the growing energy thirst of U.S. consumers and businesses. Fortunately, this did not come to pass: NRDC worked with the state of California to implement the first building energy code and the first refrigerator efficiency standard in the nation in the 1970s. Since then the building code has been updated every three years. Refrigerators now use one-fourth of the energy they once did while becoming cheaper and bigger, and a growing set of appliance efficiency standards ensures that consumers can buy and use appliances without worrying that they might cost a fortune in energy bills. America has avoided many unnecessary power plants, pollution has come down, and it will continue to decline as codes and standards keep energy waste in check.



ONE-STOP SHOP FOR EFFICIENCY

Thanks to Energy Efficiency for All (EEFA), state leaders, and partners, in the spring of 2016 the Missouri Public Service Commission (PSC) unanimously approved a three-year, \$10.75 million low-income multifamily housing “one-stop shop” for Ameren Missouri. One of 12 recommendations in EEFA’s Program Design Guide, the move more than tripled the investment originally proposed by Ameren, the state’s largest electric utility. The utility also agreed to provide incentives for low-income multifamily home efficiency programs 25 percent higher than those available to commercial buildings. Separately, a three-year, \$4.79 million one-stop shop program and budget increase were also approved by the PSC for Kansas City Power and Light (KCP&L), the state’s second-largest electric utility. In addition to best-practice program design, the KCP&L plan includes low-income multifamily housing incentives 20 percent higher than those available to commercial buildings. This is a huge leap forward for a utility that invested only about \$31,000 in low-income multifamily energy efficiency during the 2012–2015 program cycle.

ENSURING ENERGY EQUITY

Affordable rental housing is critical for low-income Americans, but many apartments are in need of repair and come with higher energy bills. Increasing the energy efficiency of rental housing saves energy, improves residents’ health and comfort, and helps keep housing affordable. This benefits families, communities, and building owners. That is why NRDC is a key partner in the **Energy Efficiency for All Project (EEFA)**. Its mission is to help make multifamily housing for low-income and underserved communities healthier and more affordable, and it secured more than \$200 million in additional funding from utilities and other providers for programs that advance energy efficiency (as well as water efficiency and renewable energy) in 12 states. EEFA builds local, state, and national networks of advocates and engages building owners in the fight for higher levels of program funding that addresses the savings potential. It also advises housing finance agencies on best practices for engaging owners and providing financing. And it works with electric and gas utilities (and their regulators) interested in innovative energy efficiency program designs. NRDC partners in this project with the Energy Foundation, Elevate Energy, the National Housing Trust, and hundreds of local, state, and national groups.

NRDC’s **Center for Market Innovation (CMI)** launched our Affordable Multifamily Housing Integrated Retrofit Demonstration Project to more comprehensively identify and address the barriers facing this underserved sector. We provided owners of affordable multifamily housing in New York City with a set of tools to help them engage in the energy retrofit process, evaluate efficiency-related financial opportunities, and find financing solutions. The project identified a suite of energy performance measures in larger affordable multifamily buildings that provide 20 to 30 percent energy savings compared with current operations, with a payback of three to seven years.

NRDC’S GOAL: To accelerate the adoption of comprehensive energy performance measures in affordable multifamily housing by developing resources that help building owners assess and incorporate the economic opportunity of these energy efficiency and clean energy improvements at the time of property acquisition or refinance. Through EEFA, cut electricity use by one-third and natural gas by one-quarter in affordable multifamily housing in the next 20 years while also reducing energy costs, preserving affordable housing, and improving the health and well-being of residents.

LOCKING IN SAVINGS THROUGH STANDARDS

Building energy codes and appliance efficiency standards represent the most effective ways to spur more efficiency gains in buildings, lighting, appliances, electronics, and other equipment. NRDC was the leading advocate of stronger and more flexible building codes, which then became the basis for tougher standards nationally and abroad. We participated in setting the world’s first major appliance efficiency standards in California, home to one in every eight U.S. consumers. Our successful litigation against weaker national standards set us up to be the

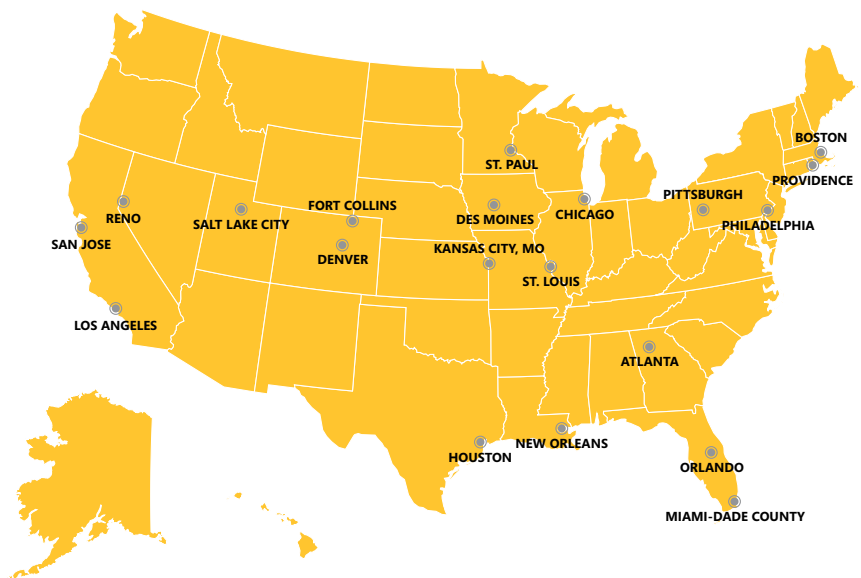
lead negotiator with the appliance industry on bipartisan efficiency legislation that passed in 1987, empowering the U.S. Department of Energy to set national appliance efficiency standards. Since then, these standards have cut utility costs by \$2 trillion while reducing climate-warming emissions by 7 billion tons.¹

NRDC then began pushing for policies to reward manufacturers for embracing energy-saving technologies, utility programs that encourage retailers to offer these higher-efficiency products, and incentives like rebates for consumers to buy them. Since then, standards have helped steer entire markets toward efficiency.

NRDC's **Center for Energy Efficiency Standards** has played a central role in developing and adopting standards that set minimum levels of efficiency in the market. We help create test procedures to set and enforce standards, work with utilities to promote efficient appliance models, and support labeling programs like the government's ENERGY STAR, which helps consumers identify the most efficient models on the market. Taken together, standards already on the books will decrease peak electricity demand by 240 gigawatts in 2035—more than twice the capacity of America's nuclear power plants—while reducing the risk of rolling electricity service brownouts or outright blackouts.^{2,3}

NRDC'S GOAL: Build on existing building codes and appliance standards to cut energy use in residential and commercial buildings by 60 percent below 2010 levels by 2050. That represents a reduction of 14 quads in annual energy use by 2050—equivalent to the annual output of more than 1,300 large (500-megawatt) power plants. This reduction will avoid greenhouse gas emissions equivalent to the annual tailpipe pollution from more than 600

City Energy Project Partner Cities



million passenger cars—more than twice the number of registered vehicles in the United States.

CUTTING ENERGY AND POLLUTION IN OUR CITIES

The energy used to heat, cool, and power buildings is the biggest source of carbon pollution in most U.S. cities, often contributing 50 to 75 percent of harmful greenhouse gas emissions. And yet the abundant opportunities to reduce energy consumption in existing buildings remain largely unrealized, despite the potential for enormous economic, environmental, and public health benefits. By measuring and monitoring usage, improving the efficiency of operations, and taking advantage of new technologies (such as smarter lighting and more efficient heating and air-conditioning systems), these buildings can cut energy waste. Building off groundbreaking policy initiatives in a few leading locations around the country, NRDC launched the **City Energy Project (CEP)**, a joint partnership of NRDC and the Institute for Market Transformation, to help cities slash energy use in large buildings and make U.S. cities

healthier and more prosperous places to live. The pioneering actions of the 20 cities involved in the City Energy Project—from Atlanta to Denver, Los Angeles to Orlando—are expected to save more than \$1.5 billion in energy costs and cut carbon pollution equivalent to the emissions from up to 2 million cars annually by 2030. The CEP will also create thousands of new, local jobs for architects, engineers, construction workers, software technicians, and electricians. The progress of the 20 partner cities will help shape and define next-generation energy efficiency efforts in communities. Over the next several years, the City Energy Project will continue to advance innovative and proven building energy efficiency strategies through collaboration with even more cities and partners across the country.

NRDC'S GOAL: Reduce energy use in large existing buildings by at least 10 percent by 2030 and contribute to economic growth in each CEP municipality. Catalyze the widespread adoption of policies and programs that create permanent retrofit markets beyond the CEP cities.



PUSHING THE ENVELOPE ON UTILITY-RUN ENERGY EFFICIENCY PROGRAMS

Across the Midwest region, NRDC has built strong precedent for deep, cost-effective energy efficiency savings through utility-led programs. We work both collaboratively with utilities and through advocacy aimed at public utility commissions to secure aggressive energy savings commitments and drive down costs while spurring increasingly innovative programs. In recent years, our energy efficiency program advocacy has yielded utility commitments to increase efficiency portfolio savings in Illinois and Missouri by hundreds of thousands of megawatt-hours (MWh) annually. In Michigan and Missouri, we have built and expanded on critical multifamily efficiency opportunities for low-income communities, which are traditionally underserved by utility-run programs. And in Ohio, despite stalled state-level energy efficiency requirements, advocates have secured utility commitments to continue robust program offerings that have totaled more than 1 million MWh in annual energy savings from efficiency programs.

USING MARKET INNOVATION TO CUT ENERGY WASTE IN COMMERCIAL REAL ESTATE

Research confirms that retrofitting offices or building out new spaces to maximize efficiency pays for itself through savings on energy bills, often within a few years. Efficient office spaces also attract more tenants and provide more comfortable working environments. Yet it can be difficult for building owners and tenants to know where to start. NRDC's **Center for Market Innovation** launched a High Performance Demonstration Project—working with commercial office tenants such as Li & Fung, Bloomberg LP, Coty, and Reed Smith, and with buildings such as the Empire State Building. Its mission: to create replicable processes and resources that help the real estate sector evaluate and implement a cost-effective set of energy efficiency measures into tenant buildout—when a new tenant is preparing to move into an office space. With more than 1.3 million square feet of projects underway, the CMI has proved that tenants can see energy savings of 30 percent to 50 percent, with a three- to five-year payback period and rates of return on investment of more than 25 percent.

In addition, the CMI has worked with a range of real estate and finance sector stakeholders to help create financial products, leasing language, and model processes that make it easier for owners and tenants to embrace and benefit from efficiency.

NRDC'S GOAL: Create a new “business as usual” standard of energy-efficient commercial tenant spaces that can replicate the High Performance Demonstration Project’s 30 percent to 50 percent energy savings through industry and service provider offerings across business sectors and geographic markets, thus accelerating the market shift to more efficient office space.

USING CARBON POLICIES TO CUT ENERGY USE AND POWER PLANT POLLUTION

Power plants produce 40 percent of U.S. carbon pollution; they are America's largest source of climate-warming emissions. Numerous states and the federal government have acted to limit carbon pollution from power plants. In 2005, nine states in the Northeast and Mid-Atlantic joined together in the Regional Greenhouse Gas Initiative (RGGI), which NRDC helped develop, to limit power plant pollution. A year later, California put economy-wide carbon pollution standards in place through AB32, the state's landmark legislation to address its contribution to climate change. Both California and the RGGI states use clean energy solutions like energy efficiency and upgraded building codes to help drive down emissions from the power sector. The RGGI states have integrated clean energy with their carbon pollution limits by auctioning permits to emit carbon dioxide and funneling the revenue primarily into energy efficiency programs. The RGGI states invested around \$790 million in auction revenue into energy efficiency programs between 2009 and 2014, an investment that will reduce customer energy bills by \$3.62 billion.

At the national level, NRDC led the charge for the U.S. Environmental Protection Agency (EPA) to use the Clean Air Act—the nation's bedrock environmental law—to tackle carbon pollution. In 2015, EPA established the first-ever national limits on

carbon pollution from power plants with its Clean Power Plan. And, as with RGGI and AB32, NRDC succeeded in ensuring that energy efficiency could be integrated as a means of reducing pollution from the power sector and complying with the Clean Power Plan pollution limits. With the election of Donald Trump and ongoing litigation, the future of the Clean Power Plan is uncertain. But whatever happens in the near term, carbon pollution standards are inevitable. Indeed, the U.S. Supreme Court has already ruled that the EPA must address dangerous carbon pollution under the Clean Air Act. And when national standards go into effect, NRDC will continue to work to ensure that energy efficiency is fully deployed to help achieve these emissions reductions at low cost.

NRDC'S GOAL: Maximize new investment in energy efficiency and other clean energy resources to achieve customer savings, reduce pollution, and position states to comply with carbon pollution standards.

ENSURING RELIABLE ELECTRIC SERVICE THAT FULLY VALUES ENERGY EFFICIENCY

America's electric grid is changing in dramatic ways. For its first 125 years, it was designed around large fossil fuel and later nuclear power plants located near major cities. Now many clean energy resources, including energy efficiency, are producing results. Optimizing our energy use helps keep the lights on, strengthens reliability, and reduces power plant pollution. NRDC is helping ensure the nation's transmission grid integrates this no-emissions "resource" in planning and meeting customer service needs. Together with partners, we launched the **Sustainable FERC Project** to advocate before the federal agency overseeing the nation's transmission system. Keeping up with the increasing demand for electricity is one of the chief concerns of power

grid operators and regulators, but by reducing it, efficiency avoids the need to build and maintain costly power plants and grid infrastructure. Energy efficiency is especially useful for reducing power needs—and improving reliability—during hot summer months and cold winters, when demand can spike unexpectedly and stress the grid. And by reducing demand, efficiency helps to accelerate the closure of unnecessary, polluting power plants.

NRDC'S GOAL: Realize the full value of energy efficiency investments by: 1) requiring regional grid operators (known as regional transmission organizations, or RTOs, and independent system operators, or ISOs) to fully account in their load forecasting processes for all of the energy efficiency happening in their region's states, so that the forecasts correctly signal when transmission infrastructure and power plant capacity is truly needed; 2) ensuring that wholesale capacity and ancillary service market rules allow for participation by energy efficiency resources—that is, that they calculate how much energy use can be avoided—just as they do for traditional energy sources like coal; and 3) actively promoting the use of energy efficiency and other alternatives as cost-effective solutions to identified grid reliability needs that might otherwise require building new wires, poles, and other transmission infrastructure.

SAVING WATER AND ENERGY THROUGH GREATER EFFICIENCY

It requires energy to heat water for our showers, sinks, laundry, and kitchen appliances and to heat our homes and buildings. In new buildings, efficient hot water distribution systems can result in water becoming hotter more quickly, which means we don't need as much energy to heat it or waste so much water waiting for it to reach the desired temperature. This "purging" at showers, kitchen sinks, and lavatory faucets is responsible for 95 percent of the nearly 3,000 gallons of hot water wasted in a typical

MAKING SURE EFFICIENCY COUNTS

Accounting for all energy efficiency in a transmission grid operator's long-term forecast of energy demand can save consumers hundreds of millions of dollars and is good for the environment. In 2016, following more than a year of our advocacy on the issue, the giant grid operator PJM Interconnection serving 13 Mid-Atlantic states and the District of Columbia "found" an additional 6,470 megawatts of energy efficiency savings through 2019 in its forecast—about a 4 percent decrease in total demand. Absent this better accounting of the effects of appliance standards and other efficiency, PJM would have issued a higher forecast, which would have driven the building of unnecessary and possibly dirty power plants and new transmission infrastructure. In other words, customers would be paying for electricity and transmission lines they didn't need. Our work with PJM created a foundation for the Sustainable FERC Project to promote several best practices for load forecasting across the country. While accurately predicting future electricity demand is harder than forecasting the weather, the economic and environmental payoffs are enormous.



ATLANTA BECOMES FIRST CITY IN SOUTHEAST TO PASS LOCAL ENERGY EFFICIENCY POLICY FOR BUILDINGS

Buildings account for 66 percent of total energy use throughout Atlanta. In April 2015, the Atlanta City Council unanimously passed a comprehensive energy and water efficiency policy that will reduce energy use in large buildings, drive down carbon emissions, and create more transparency in the real estate market. The ordinance calls for annual benchmarking and transparency, requires audits every 10 years, and encourages voluntary retrocommissioning. Using these tools, the city of Atlanta anticipates that the ordinance will lead to a 20 percent reduction in commercial energy use by 2030, spur the creation of more than 1,000 jobs annually in the first few years, and reduce carbon emissions by 50 percent by 2030 (from 2013 levels). The City Energy Project worked for several years with the city of Atlanta to develop and implement this policy and to defend it from a preemption effort in the Georgia State Legislature in 2016.

home each year. Pipe insulation in new homes can cut this hot water and energy waste by 15 percent to 30 percent. Through its **Center for Energy Efficiency Standards** and its **Utility Energy Efficiency and Water Projects**, NRDC helps advance improved model building and plumbing codes and supports efforts to upgrade the energy and water efficiency of appliances like dishwashers, washing machines, and commercial and residential water heaters to save money, energy, and water. When water is saved, it also reduces the amount of energy needed to convey, treat, and deliver it to our homes and businesses as well as the energy to collect and treat the resulting wastewater.

NRDC'S GOAL: Continue to reduce overall water use in the United States by 20 percent between 2010 and 2020 through energy efficiency and conservation. Ensure that new national building and plumbing codes are enacted so that, when fully implemented, they will save 300 million gallons of water more each day by 2030 than do current codes.

PROMOTING ENERGY EFFICIENCY AROUND THE GLOBE

China, India, and other rapidly expanding economies are lifting millions of people out of poverty. Yet they also generate enormous amounts of pollution to produce energy, much of which is lost through leaks and outdated technologies. If these economies can be more productive with their energy use, it can power economic growth and reduce dangerous pollution at the same time.

NRDC is helping nations seize this opportunity. Drawing on our decades of experience spearheading efficiency gains in the United States, we help local partners design policies and set standards that cut costs, reduce pollution, and improve appliance and equipment performance.

As the first international NGO (non-governmental organization) to launch a clean energy program in China, NRDC helped develop that nation's original energy codes for residential and commercial buildings. Our experts also worked with officials in Jiangsu Province to develop the first "efficiency power plant." Instead of building coal-fired power plants to meet its large manufacturing sector's growing demand for electricity, Jiangsu invested money to help factories buy better machinery that uses less energy and saves money. Jiangsu's successful experience eventually led to the creation of national "demand-side management" regulations that are now delivering energy savings year after year. Our work with Shanghai to develop China's first demand response city pilot had the same multiplying effect, where cities and provinces across China are now implementing demand response to improve power grid operation and efficiency. In addition

to policy advice, we are providing hands-on technical assistance and training to help small and medium industries improve their energy management practices, save energy, and reduce pollution.

NRDC also works to increase efficiency in India's booming consumer appliance market. We support local partners to improve standards, testing, and harmonization—making sure companies sell their most efficient products in all countries. Meanwhile, two-thirds of the large buildings that will exist in India in 2030 have not yet been constructed. If they include sustainable materials and efficient appliances, they can cut energy use in half. In the states of Andhra Pradesh and Telangana, NRDC worked with local partners and state and city governments to develop and enact comprehensive laws on commercial building energy-efficiency codes. We are working in the IT hub of Hyderabad on an innovative implementation framework to ensure strong code compliance. We also work with real estate developers to drive market transformation toward energy efficiency, providing a scalable growth model for rapidly growing states and cities in India.

In Latin America, NRDC has advised on the region's efficiency laws and recommended ways to encourage utilities to provide efficiency programs.

NRDC is also involved in international standards efforts. For example, NRDC created and facilitated a cross-Atlantic network of leading U.S. and European efficiency experts and is actively participating in various standards-setting processes for refrigerators and certain lighting and consumer electronics products, creating a single test method that can be used around the world. NRDC is also a founding board member of a new public/private partnership led by the United Nations Environment Programme (UNEP) called United 4 Efficiency. This project is designed to bring standards and labeling programs to developing countries for a handful of products, including lighting, refrigerators, air conditioners, motors, and distribution transformers. According to UNEP estimates, a successful transition to these more efficient products has the potential to save more than 600 gigawatts of electricity capacity and prevent 1.25 billion tons of carbon dioxide emissions throughout the developing world.

WHY NRDC?

All of these efforts represent a breadth and depth of expertise and a comprehensive treatment of the issues that exists in no other organization. This makes NRDC among the most effective energy efficiency advocates operating today. We know how it's done and how much more must be accomplished. NRDC is prepared to bring the benefits of efficiency to the world.

CALIFORNIA LEADING THE WAY

California has taken additional significant steps to further ramp up its long—and bipartisan—energy efficiency leadership to help improve the quality of life for all Californians. Recent legislation and regulatory decisions include doubling expected energy savings by 2030, ensuring 10 years of efficiency funding to enable long-term planning, upgrading the efficiency in existing buildings, and improving efficiency programs for California's low-income residents.

Making more efficient appliances, equipment, and buildings delivers significant health, environmental, and economic benefits to California. Efficiency has also cut electricity demand by one-quarter since 1990, helped keep residential bills lower than the national average, avoided at least 50 large and polluting power plants, and will continue to reduce demand into the future.

While efficiency helps everyone, it is especially important to low-income households, which spend a disproportionate amount of their budgets on energy bills. Since 2003, approximately three million low-income California households have benefited from free efficiency programs. Furthermore, as California increases investments to make buildings more efficient, additional workers will be needed to manufacture efficient goods and install efficiency improvements, helping to keep California's economy strong and growing.

1 DeLaski, A., et al., "Next Generation Standards: How the National Energy Efficiency Program Can Continue to Drive Energy, Economic, and Environmental Benefits," Appliance Standards Awareness Project, August 2016, <http://www.appliance-standards.org/documents/reports/report-overview-next-generation-standards>.

2 Billingsley, M.A., et al., "The Program Administrator Cost of Saved Energy for Utility Customer-Funded Energy Efficiency Programs," Lawrence Berkeley National Laboratory, March 2014, <https://emp.lbl.gov/publications/program-administrator-cost-saved>. Molina, M., "The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs," American Council for an Energy-Efficient Economy, March 2014, <http://aceee.org/research-report/u1402>.

3 Lowenberger A., et al., "The Efficiency Boom: Cashing In on the Savings from Appliance Standards," American Council for an Energy-Efficient Economy, March 2012, <http://aceee.org/research-report/a123>.



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