

Laura Ackerman

**From:** Laura Ackerman  
**Sent:** Wednesday, November 08, 2017 11:52 AM  
**To:** Mike Petersen; Laura Ackerman  
**Subject:** Avista Hearing brief testimony

I am Laura Ackerman of The Lands Council. Thank you for coming to Spokane, Commissioners and good afternoon. Most of our members and supporters are Avista customers. At The Lands Council we don't support the transport and building of coal facilities in the Northwest for climate and health reasons. We have worked against the building of coal facilities for several years. Likewise we strongly believe Avista needs to quit using coal in their energy mix by 2025.

We strongly appreciate Avista's leadership position in Spokane and the Inland Northwest. They seriously contribute to the good of people's lives here. But the time for coal to exit has come and Avista needs to make a concerted effort on getting out of coal and that means getting out of Colstrip by 2025 by having units 3 and 4 paid for.

We very much understand that low-income rate payers struggle with sometimes paying their bill and we think Avista should put funds into weatherization programs and renewable energy. Weatherization is a onetime cost for very long lasting benefits. I have a print out of just one study on this from 2015 from Columbia University.

Coal has famously been called "A Dead man Walking" by Kevin Parker. It's a stranded asset and we can't leave any rate payers to pay for the non-future of coal. The Institute for Energy Economics and Financial Analysis reports that US Renewable costs fall below existing coal and nuclear. Avista needs to set a clear date for their Colstrip exit before Hydro One buys them because the words coal and future don't belong in the same sentence.

Global warming significantly harms human health and if we can kick our coal habit we can reduce the negative impacts of coal burning in the world. See the attached story by the AP on a report by Dr. Howard Frumkin of the U of W. Air pollution, and coal is a significant part of it, is simply put, a killer. Chinese cities with high air pollution tied to higher mortality rates. See attached studies. In fact there are dozens of studies (which I would be happy to send you) on the harm air pollution does not only to physical health but mental health. *include the costs of human health w/ coal burning.*

We don't burn the coal in Spokane from Colstrip, but our coal by wire harms our fellow Americans and that is not acceptable anymore. I know of four energy companies getting out of coal and into clean energy. Patricia Kampling of Alliant Energy Corp says sometimes you have to let go of your past. This is the task of Avista. They have been around for over a century and they can do this; they have the resiliency to let go and move into the future because again, the words coal and future don't belong in the same sentence.

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MICKELANDER



**Subject:** Higher air pollution in Chinese cities tied to higher mortality rate

# Higher air pollution in Chinese cities tied to higher mortality rate

**Date:** November 6, 2017

**Source:** American Public Health Association (APHA)

**Summary:** New research examined the burden of air pollution and its association with mortality in Chinese cities.

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New research presented today at APHA's 2017 Annual Meeting and Expo examined the burden of air pollution and its association with mortality in Chinese cities. The study by researchers at Drexel University Dornsife School of Public Health showed a significant correlation between higher air quality index concentrations and higher mortality rates. The study is the first to provide strong evidence of the burden of air pollution in major Chinese cities, as well as the impacts of air quality and climate change on urban population mortality.

Study authors examined daily air quality data from more than 100 cities in China between 2012 and 2015 and compared the data with mortality numbers available from the Chinese Center for Disease Control and Prevention. Air quality was measured with the air quality index, a pollution yardstick that includes ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide and nitrogen dioxide. A higher air quality index value indicates a greater amount of pollution.

When researchers compared higher air quality index valued cities with mortality rates, they found that the two measures were significantly correlated. They also confirmed that cities with lower air quality index values had lower mortality rates. This correlation remained significant after researchers adjusted for covariates. Significantly, more than 5 percent of the variation in all-cause mortality could be explained by the difference in air quality index across China.

"Our research shows that air pollution is not just significantly linked to health problems like cardiovascular disease, diabetes and asthma, but also to a significantly higher rate of death," said Longjian Liu, MD, PhD, MSc, who presented the study and serves as a visiting associate professor at Harvard University T.H. Chan School of Public Health and associate professor at Drexel University Dornsife School of Public Health. "People living in cities across the globe need to know how air pollution can harm them long term. They are the ones who will pay the price of poor air quality if action isn't taken to clean up their air."

The study observed that the monthly average air quality index of cities differed significantly by temperature, with the highest air quality index values occurring in winter and the lowest in summer. The study also showed significant geographic clustering of cities by air quality index, with the highest values in northern cities and the lowest in southeast China.

Researchers also found that heat index, precipitation and sunshine hours were negatively associated with air quality index.

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## Story Source:

[Materials](#) provided by [American Public Health Association \(APHA\)](#). *Note: Content may be edited for style and length.*

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## Doctors: Global warming is taking a toll on people's health

Image

A patient suffering from dengue fever lies in a hospital bed on Oct. 19, 2017, in Peshawar, Pakistan. Cases of dengue fever — a mosquito-borne and -spread disease — have doubled every decade since 1990. Dr. Howard Frumkin, a former environmental health director at the U.S. Centers for Disease Control and Prevention, said climate change is part of the reason.

(Muhammad Sajjad / AP)

**Seth Borenstein** Associated Press  
Oct 30, 2017

Global warming is hurting people's health a bit more than previously thought, but there's hope that the Earth — and populations — can heal if the planet kicks its coal habit, a group of doctors and other experts said.

The poor and elderly are most threatened by worsening climate change, but there remains "glimmers of progress" especially after the 2015 Paris agreement to limit heat-trapping carbon dioxide emissions, according to a new big study published Monday in the British medical journal Lancet.

Comparing the report to a health checkup, four researchers and several outside experts described Earth's prognosis as "guarded."

"There are some very severe warning signs, but there are some hopeful indicators too," said co-author Dr. Howard Frumkin, a professor of environmental health at the **University of Washington**. "Given the right treatment and aggressive efforts to prevent things from getting worse, I think there's hope."

The report highlighted health problems stemming from more frequent heat waves, disease spread by insects, air pollution and other woes. While the disasters have been costly, deaths haven't been increasing because society is doing a better but more expensive job adjusting to the changing conditions, the researchers noted.

A team of 63 doctors, public health officials and scientists from around the world wrote what they considered the first of a regular monitoring of the health of the planet, similar to having a "finger on the pulse of the patient," said Dr. Hugh Montgomery, an intensive care specialist and director of the University College of London's Institute for Health and Performance.

Based on 40 indicators, the study said "the human symptoms of climate change are unequivocal and potentially irreversible."

While other disease rates are dropping, cases of dengue fever — a mosquito-borne disease — has doubled every decade since 1990 with 58.4 million cases and 10,000 deaths in 2013. Frumkin, a former environmental health director at the U.S. Centers for Disease Control and Prevention, said climate change, which allows mosquitoes to live in more places and stay active longer with shorter freeze seasons, is part but not all of the reason.

The same goes for the increase in tick-borne Lyme disease in the United States, Frumkin said, adding "the ticks do better with warmer weather."

Between 2000 and last year, the number of vulnerable people — those over 65 or with chronic disease — exposed to heat waves increased by about 125 million, the study said.

It also highlighted the increasing likelihood of food shortages as climate change worsens.

Columbia University's Madeline Thomson, who wasn't part of the study team, praised the work, saying "climate is a stress multiplier" so it is important to monitor this way.

Acting on climate can have side benefits, Frumkin said. Cutting coal takes smog and soot out of the air, while eating less meat and bicycling and walking more to use less electricity means fewer accidents and reduced obesity, he said.

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November 6, 2017 [Read More](#) →

## **Report: U.S. Renewable Costs Fall Below Existing Coal and Nuclear**

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**SNL:**

The cost of building and operating new renewable energy projects has fallen so far that it can be less expensive than operating existing coal and nuclear generators, according to a recent analysis by Lazard Ltd.

Falling renewable energy generation costs, especially from new large-scale wind and solar farms, have for years put the cost of green energy below generating power from new coal-fired and nuclear power plants in many places around the world on an unsubsidized basis, but this year, in its annual analysis of energy costs, Lazard found that costs have reached a new milestone.

“This is new and we are just now starting to see the impact on a large scale,” Jonathan Mir, head of Lazard’s North American Power Group, said in an interview. “The fully loaded lifetime costs of natural gas, utility-scale wind and solar are in some cases below the cost of nuclear and coal. Which means you can build from the ground up a new resource and undercut the price of nuclear and coal in certain geographies.”

Mir already sees this new trend playing out in the marketplace, for instance, with respect to American Electric Power Co. Inc.’s recently announced 2,000-MW Wind Catcher Wind Farm to supply power to customers in Arkansas, Louisiana, Oklahoma and Texas. “AEP is doing this because it is the cheapest way to provide energy in those states,” Mir said. The trend toward replacing old coal and nuclear assets with new renewables and gas is unfolding in global markets with access to inexpensive gas, particularly the United States, and places with good wind and solar resources.

[More \(\\$\): New wind, solar, gas ‘undercut’ operating coal, nukes on cost, report says](#)





# Energy efficiency upgrades ease strain of high energy bills in low-income families

Date:

June 10, 2015

Source:

Columbia University's Mailman School of Public Health

Summary:

Low-income families bear the brunt of high-energy costs and poor thermal comfort from poorly maintained apartment buildings. To study how energy efficiency upgrades could help, researchers surveyed residents in a low-income community in New York City and found that while energy efficiency upgrades varied by ownership status, low-income single-family homeowners reaped the greatest benefits. Overall, respondents experienced improved thermal comfort, enhanced health and safety and reduced energy costs as a result of the upgrades.

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FULL STORY

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Low-income families bear the brunt of high-energy costs and poor thermal comfort from poorly maintained apartment buildings. To study how energy efficiency upgrades could help these households, researchers at Columbia University's Mailman School of Public Health surveyed residents in a low-income community in New York City. They found that while energy efficiency upgrades varied significantly by ownership status, low-income single-family homeowners reaped the greatest direct benefits. Results overall showed that respondents experienced improved thermal comfort, enhanced health and safety and reduced energy costs as a result of the upgrades.

This study examines a full range of potential benefits associated with energy efficiency among low-income homeowners, tenants and landlords. Findings are online in the journal *Energy Research & Social Science*.

"Overall, energy efficiency upgrades are a promising intervention to mitigate the energy and structurally related challenges facing low-income households," said Diana Hernández, PhD, assistant professor of Sociomedical Sciences at the Mailman School of Public Health. "However, results also illustrated that weatherization alone was insufficient to address all of the housing comfort and safety issues facing low-income households.

Dr. Hernández and her research team surveyed 20 heads of households as well as landlords of buildings in a variety of housing types that had recently undergone upgrades. Most participants identified as Hispanic or Latino (80 percent), and more than half of participating households had at least one child under 18 years old living in them. Many participating households were also inhabited by elderly residents who often suffered from chronic health conditions exacerbated by energy insecurity.

Results revealed different experiences of low-income renters compared to homeowners. Renters cited greater physical comfort and less economic stress; homeowners realized lower heating costs, an increase in property values, and an improvement in landlord/tenant relationships.

During in-depth interviews, participants reported significant discomfort from uncomfortably cold and drafty homes during the winter months for a variety of reasons, including poor building conditions, high costs of heating fuel, and broken or inactive boilers. More than half expressed worry that they would not be able to pay

their energy bills, or had cut back on basic household necessities in order to pay their energy bills. Half of participants said that they had either skipped paying their energy bills or made partial payments during one or two months within the previous year. Financial strains and thermal discomfort presented economic challenges to participants while also affecting mental health and stress levels.

Of the more than half of participants who reported reductions in energy costs as a result of the upgrades, the majority cited savings of 30 percent or \$20-60 per month. Landlords reported significant savings from the upgrades, mostly due to lower heating fuel prices, even after accounting for upgrade costs. In addition, homeowners, tenants, and landlords reported an improved sense of safety or wellbeing, reduced stress and anxiety, and positive feelings about an investment in the property.

"While our study showed that the energy efficiency upgrades were largely beneficial, in most cases, the systemic nature of the cited problems are beyond the reach of energy efficiency upgrades and require more intensive housing and policy interventions," noted Dr. Hernández. "Recommendations for addressing this should focus on: regulations that raise minimum indoor temperature standards which now are way below ideal thermal comfort levels, debt forgiveness with the cooperation of utility companies, subsidized energy costs to low-income households through fuel assistance and rate variability for hardship, and increasing consistent funding for the Weatherization Assistance program or similar programs that offer no-cost or low-cost upgrades to low-income households."

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#### Story Source:

Materials provided by [Columbia University's Mailman School of Public Health](#). Note: Content may be edited for style and length.

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#### Journal Reference:

1. Diana Hernández, Douglas Phillips. **Benefit or burden? Perceptions of energy efficiency efforts among low-income housing residents in New York City.** *Energy Research & Social Science*, 2015; 8: 52 DOI: [10.1016/j.erss.2015.04.010](https://doi.org/10.1016/j.erss.2015.04.010)

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**From:** 350spokaneteam@googlegroups.com on behalf of Laura Ackerman [lackerman@landscouncil.org]  
**Sent:** Tuesday, November 07, 2017 10:47 AM  
**To:** Beggs, Breean; Stuckart, Ben; Waldref, Amber; Stratton, Karen; Kinnear, Lori; Mumm, Candace  
**Subject:** Mandatory state policies work best to curb power plant emissions

# Mandatory state policies work best to curb power plant emissions, study finds

## US state policies aimed at mitigating power plant emissions vary widely in effectiveness

**Date:**  
November 6, 2017

**Source:**  
Emory Health Sciences

**Summary:**  
U.S. state policies aimed at mitigating power plant emissions vary widely in effectiveness, finds a new study. The analysis shows that policies with mandatory compliance are associated with the largest reductions in power plant emissions.

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FULL STORY

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U.S. state policies aimed at mitigating power plant emissions vary widely in effectiveness, finds a new study by researchers at Emory University.

*Nature Climate Change* published the analysis, which shows that policies with mandatory compliance are associated with the largest reductions in power plant emissions.

"Based on the results of our study, we recommend that states adopt a policy of mandatory greenhouse gas emissions registry and reporting by power plants," says Eri Saikawa, an assistant professor in Emory's Department of Environmental Sciences. "We also found a significant impact in states that adopt public benefit funds aimed at energy efficiency and renewable energy programs."

Saikawa, an expert in public policy and the science of emissions linked to global warming, co-authored the study with Emory graduate Geoff Martin. Martin received his master's degree in environmental sciences in May and now works as an energy coordinator for the town of Hartford, Vermont.

Their findings were released as the U.N. Climate Change Conference (COP23) opens in Bonn, Germany. Delegates from around the world are gathering to hammer out details for meeting the goals of the 2015 Paris Agreement. The United States was among the 195 countries that committed to this framework to reduce greenhouse gas emissions -- although the Trump administration has said it plans to withdraw from this historic accord.

"Due to the current void in national leadership on the issue of climate change, efforts at the state and local level are more important than ever," Saikawa says. "U.S. cities and states need to step up and do what they can."

Global atmospheric CO2 levels increased at record speed last year, to reach a level not seen for more than three million years, the U.N. warned in a report released last week.

About 30 percent of U.S. greenhouse gas emissions come from the electric power sector. For the *Nature Climate Change* paper, the researchers started out to review the potential impact of President Obama's Clean Power Plan -- which established the first national carbon pollution standards for power plants. When President Trump took office, and announced plans to repeal the Clean Power Plan, the researchers shifted focus.

They analyzed 17 policies adopted by various states relating to climate and energy. States that adopted a mandatory policy for power plants to register and report greenhouse gas emissions showed the largest reductions, at an average of 2.6 million metric tons of carbon dioxide (CO2) emissions per year.

The second most significant policy involved public benefit funds allotted for energy efficiency and renewable energy programs. That policy was associated with a reduction of 1.5 million tons of CO2 emissions from power plants.

It's unclear whether one of these single policies was the actual driver of the reduction in emissions, or an indicator that a state takes climate change mitigation seriously and is attacking the issue on many fronts, Saikawa says.

For instance, three states -- New York, Connecticut and Oregon -- have each adopted both of the top two most effective policies, along with at least eight others.

Georgia, on the other hand, has adopted only one state policy to curb power plant emissions -- calling for voluntary reporting of emissions. Emissions are on the rise in Georgia, along with several other states that had adopted a voluntary reporting policy, the analysis showed.

In 2007, China surpassed the United States as the largest emitter of greenhouse gases globally. "But the per capita emissions in the United States are more than double that of China," Saikawa notes.

Emory is one of 50 universities from around the country to hold official U.N. observer status for COP23. Saikawa will be on the ground in Bonn to lead a delegation of 12 Emory undergraduates and one graduate student.

"It will be interesting to hear the take of officials from the Trump administration this year," Saikawa says.

The Obama administration played a key role in securing the Paris Agreement, to keep global warming to no more than 2 degrees Celsius since the start of the Industrial Revolution.

"U.S. coalitions from the state and city level are forming and they will likely have a strong presence at side events for COP23," Saikawa says. "Many groups are working at the local level around the world to try to meet the goal of the Paris Agreement."

Emory is co-hosting an event on Thursday, November 16 at COP23, focused on ways to mitigate climate change impacts in the developing world. Saikawa will appear on a panel, along with John Seydel, director of sustainability for the city of Atlanta.

"We'll be discussing how efforts at the city and state level in the United States might be replicated in other parts of the world," Saikawa says.

## Story Source:

Materials provided by [Emory Health Sciences](#). *Note: Content may be edited for style and length.*

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## Journal Reference:

1. Geoff Martin, Eri Saikawa. **Effectiveness of state climate and energy policies in reducing power-sector CO2 emissions.** *Nature Climate Change*, 2017; DOI: [10.1038/s41558-017-0001-0](https://doi.org/10.1038/s41558-017-0001-0)
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# [A Well-Publicized and Misguided Energy Efficiency Critique](#)

## **From the University of Chicago, a Narrow Study That Misses the Big Picture**

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A recent study out of the University of Chicago questioning the cost-effectiveness of home energy efficiency programs captured the imagination of the press last week.

Much of the coverage, unfortunately, was only marginally informed.

The study itself was narrow but the accompanying policy brief and press statements generalized to a much broader conclusion, saying that its core finding misses the larger energy efficiency story. The review, which analyzed the performance of the federally funded low-income Weatherization Assistance Program in Michigan, concluded that the program overstates the savings it produces.

What the study failed to mention is that the federal Weatherization Assistance Program has wider effects than the authors acknowledge and that the program is a drop in the bucket when it comes to the variety and scale of energy efficiency programs across the country. The American Council for an Energy Efficient Economy estimates, for instance, that natural gas and electric utilities spent more than \$7.7 billion on energy efficiency programs in 2013 alone. By comparison, the Weatherization Assistance Program's 2013 budget was \$132 million, less than 2 percent of that larger amount. What the University of Chicago researchers looked at was but a tiny sliver of the national energy efficiency picture.

And while the Chicago study states that the scope and scale of the program it examined were “dramatically increased” by money from the American Recovery and Reinvestment Act of 2009, it fails to note that budget support for the program immediately and precipitously fell off as soon as funding from that law ran out.

Utilities and state government programs throughout the U.S. have been offering a wide range of energy efficiency programs that include mark-downs on the price of energy efficient products, rebates for more efficient industrial motors and processing equipment, home energy audits and much more.

And as any utility or consumer advocate will attest, energy efficiency programs targeting low-income customers are typically among the least cost-effective—but have the greatest positive impact on poor households. As the Chicago study notes, weatherization on houses occupied by low-income families often has to be spent on structural fixes before actual energy efficiency upgrades can be made, and the Weatherization Assistance Program includes safety improvements like smoke-detector installation and gas-leak repairs.

**THE POLICY BRIEF ACCOMPANYING THE CHICAGO STUDY ONLY MAGNIFIES THE IMPRESSION THE RESEARCHERS CONVEY IN THEIR PAPER**, suggesting that energy efficiency programs be judged solely on their rate of return per dollar invested. A Wall Street Journal article on the

Chicago research goes so far as to compare the rate of return of the Weatherization Assistance Program to those that can be made in the stock market or real estate.

In the real world of energy efficiency, the more valuable question to explore is not about absolute returns on efficiency investments, but how those returns they stack up against investments in power generation. This is the very question that utilities, regulators and advocates are pressing more and more these days. Is it cheaper to invest in programs that save energy than to build new power plants?

The answer is almost always “yes,” and if you factor in the cost of carbon-dioxide emissions from coal- and natural-gas-fired power plants, the case for energy efficiency is beyond dispute.

*Cathy Kunkel is an IEEFA fellow.*

Posted in: [Commentary](#), [Energy Efficiency](#), [Utility trends](#)

Comments are closed.



## NATIONAL EVALUATIONS: SUMMARY OF RESULTS

DOE is pleased to summarize the results of two major national evaluations of the Weatherization Assistance Program (WAP or Weatherization). These evaluations were multiyear, peer-reviewed, statistically robust efforts led by Oak Ridge National Laboratory (ORNL). They are the most comprehensive, detailed analysis of the WAP and its operations ever conducted. The Retrospective Evaluation covers Program Year (PY) 2008 and is reflective of a typical year in WAP operations. The Recovery Act Evaluation covers Program Year (PY) 2010 and provides insight into the unique program that was administered by DOE in the national effort to create jobs and promote economic recovery, as part of the American Recovery and Reinvestment Act of 2009.



### KEY FACTS FROM THE WEATHERIZATION RETROSPECTIVE EVALUATION (2008)

*Weatherization provides cost-effective energy savings to American families, provides additional health and safety benefits, supports jobs, and provide a stable platform for additional investment in energy efficiency.*

Program Wide Energy Savings (Present Value)	\$340 million
Single-Family Home Average Annual Energy Cost Savings	\$283
Single-Family Home Savings-to-Investment Ratio (SIR)	1.5
Jobs Supported	8,500
Program Wide Savings-to-Investment Ratio (SIR)	1.4
Program Wide Benefit Cost Ratio Including Health and Safety Benefits	4.1

*The WAP Retrospective Evaluation is a large, comprehensive evaluation reflecting typical program operations.*

Evaluation Sample Size - Total Dwelling Units	30,000
Evaluation Sample Size - Utility Bills Analyzed	8,000

**TABLE 1. OVERVIEW OF BENEFITS FROM THE WEATHERIZATION PROGRAM**

SUMMARY OF BENEFITS	RETROSPECTIVE (2008)	RECOVERY ACT (2010)
<i>Program Wide Benefits for All Housing Types</i>		
Total Homes Weatherized	97,965	340,158
Average Cost per Weatherized Home	Total Cost: \$4,695/DOE Investment: \$2,301	Total Cost: \$6,812/DOE Investment: \$5,926
Average Energy Measure Costs	\$2,899	\$3,545
Savings Per Household (Present Value)	\$4,243	\$3,190
Energy Savings (Present Value)	\$340 million	\$1.1 billion
Total Benefits including Health & Safety (Present Value)	\$13,550	\$13,167
Savings-to-Investment Ratio (SIR)	1.4 <sup>i</sup> Energy Benefits	0.9 <sup>i</sup> Energy Benefits
Jobs Supported	8,500	28,000
Carbon Reduction	2,246,000 metric tons	7,382,000 metric tons
<i>Benefits for Single-Family Homes</i>		
Percent of Single-Family Homes Weatherized	64% <sup>ii</sup>	65%
Average Annual Energy Bills	\$2,279	\$1,863
Average Energy Measures Costs	\$2,846	\$3,777
Average Savings Per Home (Present Value)	\$4,196	\$3,803
Average Annual Energy Cost Savings	\$283 (12%)	\$223 (12%)
Average Annual Energy Savings - Gas	18%	16%
Average Annual Energy Savings - Electric	7%	8%
Savings-to-Investment Ratio (SIR)	1.47 Energy Benefits	1.01 Energy Benefits

<sup>i</sup>These values represent conservative estimates that include funding from some non-DOE sources that are not uniformly subject to DOE's SIR requirement that is used to guide the measures that are installed. These funds are often used for higher cost energy measures that result in lower SIR for the combined funds.

<sup>ii</sup>This value includes 5% for small multifamily homes consistent with the definition for the 2010 study; the costs and benefits are provided for site built homes only; the SIR with small multifamily homes remains at 1.47.

**TABLE 2. KEY PROGRAM CHARACTERISTICS FOR THE STUDY PERIODS**

PROGRAM CHARACTERISTICS	RETROSPECTIVE (2008)	RECOVERY ACT (2010)
States/Territories (Grantees) Served	50 States, District of Columbia	50 States, District of Columbia, U.S. Territories
Average Spending Limits	\$2,500 <sup>iii</sup>	\$6,500
Eligible Households	35 million	38.6 million
DOE Investment	\$236 million	\$2 billion
Non-DOE Investment	\$614 million	\$715 million
Health and Safety Expenses	10-15%	up to 20%
Other Factors	---	Prevailing wage requirements Program ramp up Greater assistance to cooling dominated climates

<sup>iii</sup> Before Consumer Price Index (CPI) adjustment.

**TABLE 3. KEY PROGRAM CHARACTERISTICS FOR THE STUDY PERIODS**

EVALUATION SCOPE	RETROSPECTIVE (2008)	RECOVERY ACT (2010)
Single Family/Mobile Homes	20,000+	35,000+
Multifamily Units	10,000+	10,000+
Electricity & Natural Gas Billing Histories <sup>iiii</sup> <i>(for weatherized and comparison single family + mobile homes)</i>	8,000+ from over 1,000 natural gas and electric utilities	16,000+ from over 400 natural gas and electric utilities

<sup>iiii</sup> For weatherized and comparison single family + mobile homes.

Results for both the Retrospective and the Recovery Act Evaluations are summarized in Table 1 across all housing types that Weatherization services (e.g., single family, mobile homes, and multifamily homes) and for single-family homes in particular as they are the major building type assisted through the program. Table 2 summarizes the major characteristics of the WAP program for each of the two study periods, and Table 3 provides an overview of the scope of data collection for each of the evaluations.

## WEATHERIZATION: GOING FORWARD

The National Retrospective and Recovery Act Evaluations provide a comprehensive picture of the Weatherization Assistance Program, including the characteristics of the clients, housing stock and service providers. They also provide valuable information on the costs and benefits of WAP services in different parts of the country and for different types of housing. As Weatherization moves forward, the results of the National Evaluations will provide valuable insight into the opportunities for policy and practice enhancement that will allow WAP to build on its successful history of improving families' lives while saving energy. The National Evaluation demonstrates that, thanks to the dedication of the entire WAP network, Weatherization Works!

For more information go to <http://weatherization.ornl.gov>.

# Unrealized Potential in U.S. Renewables

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## Seeker:

Years of efforts to nurture renewable energy have borne fruit dramatically in recent years, with wind and solar farms sprouting worldwide.

That growth has largely overshadowed fossil fuels like coal, which is struggling in competitive electric markets against cheap, cleaner natural gas. But people who study the system say there's a lot of potential that isn't getting tapped, in the United States and abroad.

"We're not saturated in terms of the resource availability at all in any state," Stanford University engineering professor Mark Jacobson told Seeker. "It's just a question of deciding to deploy more."

Fossil fuels — coal and natural gas — still provide about two-thirds of the electricity Americans use. They're cheap, but they produce carbon dioxide and other gases that have been building up in the atmosphere, driving global temperatures upward, and destabilizing Earth's climate.

By comparison, renewables other than long-established hydroelectric dams provided less than 7 percent of US electric power, and all but about 1 percent of that was from wind. But the numbers have been growing rapidly in recent years, buoyed by tax credits and state rules setting targets for renewable power.

More than a quarter of new utility-scale generating capacity came from solar panels last year, with wind providing nearly a third. Small-scale rooftop solar panels on homes and businesses add about half of 1 percent.

Jacobson has published a detailed but ambitious blueprint for converting the world to renewables by mid-century. Some of the Great Plains states are well along: Iowa and South Dakota generated more than 30 percent of their power from wind in 2016. Jacobson said there's still huge amounts of wind power that can be harnessed in the Great Plains and off the coasts by wind turbines.

Solar has the most technical potential in the southern United States, "but most of the country could tap into it," said Bret Fanshaw, solar program coordinator at the advocacy group Environment America.

A 2012 study by the National Renewable Energy Laboratory, an arm of the Department of Energy, found large-scale solar projects in rural states could produce thousands of gigawatts more power than today, especially in the southern and Plains states. Rooftop solar panels could add hundreds of gigawatts more — not only in sunny states like Florida and California, but in the Great Lakes and Northeastern states as well.

Meanwhile, wind turbines across the central United States and offshore in the Atlantic, Pacific, and Gulf of Mexico could yield nearly 15,000 more gigawatts, or dozens of times more electricity than what Americans consume today., the study found.

The landscape is shifting even more dramatically toward renewables around the world.

“Countries are taking a step back on coal,” David Schlissel, who directs resource planning analysis at the Cleveland-based Institute for Energy Economics and Financial Analysis, told Seeker. “There are new coal plants being proposed and built, but they’re taking a step back on their plans for coal and moving toward renewables.”

In August, the US financial giant JP Morgan Chase announced it was pouring \$200 billion into clean energy between now and 2025 — and would power all its operations with renewables by 2020. The company’s offices total about 75 million square feet, the equivalent of 27 Empire State buildings. It’s also curtailed investment in coal, swearing off funding for new coal-fired plants in the developed world and limiting funds in the developing world to high-tech, cleaner generating units.

But while other countries are moving toward wind and solar, Schlissel said, policies in the United States have lagged behind. Some public utilities have fought rooftop solar in the South, where their plants rely more heavily on coal. The Republican-led Trump administration is fighting market trends to revive the country’s moribund mines, while the bulk of the GOP now resists efforts to address carbon emissions — or calls the issue a hoax.

“I don’t think politically we’re going get from where we are today in 20 years to full renewables,” Schlissel said. “I think the future is going to be consistently declining coal, though it won’t be a straight line down ... and then the alternative is going to be a mixtures of renewables and natural gas.”

[More: Here Are the Best Places to Expand Renewable Energy in the US and Abroad](#)

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