March 2008

Let's Be Number One: Improving Iowa's Utility-Run Energy Efficiency Programs

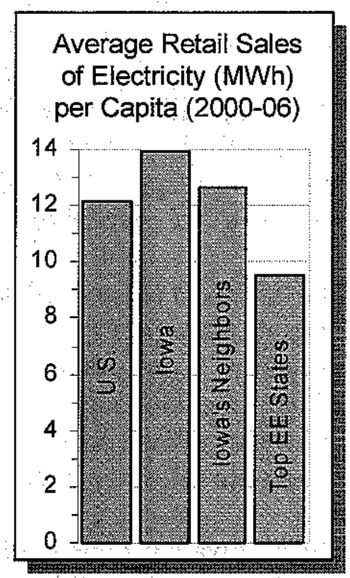
By Andrew Johnson and Teresa Galluzzo

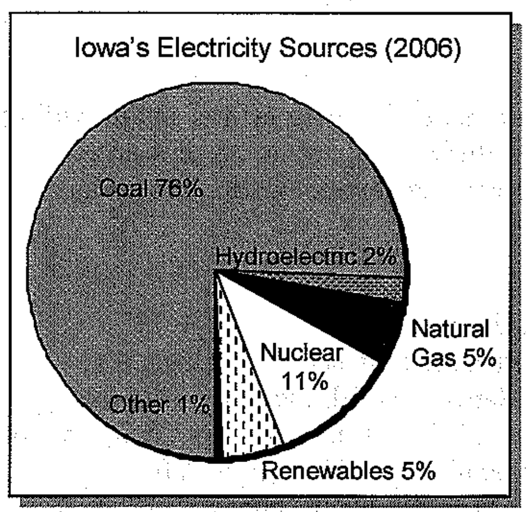
Electricity is such an integral part of our lives that we may rarely give a thought to the number of things we plug in and turn on each day. Now, however, thinking about our electricity use is vital. Our spiraling consumption of energy from fossil fuel sources is seriously affecting our climate and our pocketbooks.

This report describes Iowa's electrical consumption and production and focuses on the role energy efficiency (EE) can and must play in Iowa's future. It describes Iowa's laudable efforts to invest in EE through utility-run programs and make suggestions for how to effectively carry these efforts further.

Iowa's Electricity Consumption

Iowa's electricity sales per capita are higher than the nation's, our neighboring states, and states that are leaders in EE. Without aggressive action, this will likely remain the case, because our consumption has also been growing faster than each of these other groups of states. From 2000 to 2006, Iowa's retail sales of electricity increased by an average of 1.5 percent. The nation's average growth was 0.2 percent, Iowa's neighboring states averaged 1.2 percent, and leading EE states averaged 0.3 percent.





Iowa's Electricity Production

Coal is Iowa's primary source of electricity generation. In 2006, more than 75 percent of Iowa's electricity was generated from burning coal. Iowa is considerably more dependent on coal than the rest of the nation; the national average was 49 percent. In recent years Iowa has diversified its power sources. Although still a small portion of our electricity production, renewable sources have been a major growth spot in our generation mix.

The Role of Energy Efficiency at the State Level

Iowa's electricity demand is forecasted to continue increasing. But the realities of fossil fuel costs and climate change mean Iowa needs to reduce its electricity use from fossil fuel sources. Expanding our EE investments can have large, nearly immediate and economically beneficial impacts.

Iowa was an early leader in EE. In 1990 Iowa passed a landmark law requiring the state's investor-owned utilities (IOUs) to offer EE programs for all types of customers: residential, commercial and industrial. The law also requires Iowa's municipal electric utilities (Munis) and rural electric cooperatives (RECs) to offer EE programs to their customers, but these programs do not have to be reviewed or approved. In 2006, the IOUs' programs yielded a 0.8 percent retail energy savings, the Munis saved 0.15 percent and the RECs saved 0.6 percent.

Iowa's Electric Utilities Energy Efficiency Efforts (2006)

	EE Spending	EE Spending as % of Revenue	MWh Saved from EE	EE Savings as % of Retail Sales
Investor-Owned	$75,466,606	3.4%	274,975	0.80%
Municipals	$3,420,358	1.0%	8,355	0.15%
RECs	$11,691,595	2.7%	31,921	0.60%

Iowa's long tradition of EE is a significant and proud accomplishment. However, Iowa is not meeting some of its stated efficiency goals. The 2001 Energy Policy Task Force convened by then-Governor Tom Vilsack, had the goal of meeting all of Iowa's future energy demand by increasing EE rather than increasing supply. More recently Governor Culver signed the Energy Security and Climate Stewardship Platform, calling for meeting at least 2 percent of annual retail sales of natural gas and electricity through EE improvements by 2015 and an additional 2 percent annual savings thereafter. Similarly, the legislatively appointed 2007 Energy Efficiency Study Committee suggested increasing annual energy savings to 1.5 percent of retail sales by 2012.

Due to recent lack of federal action on EE, states across the nation are increasing their EE efforts. Overall, states are spending about three times as much as the federal government on efficiency programs. Some of Iowa's neighboring states in particular have become leaders, outpacing our efforts. Minnesota, which has an electrical system similar to Iowa's, not only spends more than Iowa on efficiency efforts per capita, but in 2006 Governor Tim Pawlenty called for 1.5 percent per year savings of electric sales, 1 percent of which must come from EE.

Given Iowa's yet unmet efficiency goals and the fact that states are increasing their efforts and providing us with examples of big EE accomplishments, Iowa needs to seize this opportunity to become an even more energy efficient state. To do this, we must first address shortcomings in our existing programs.

Shortcomings in Iowa's Utility-Based EE Efforts

• *Programs are Confusing, Inconsistent and Not Universally Available*

Each of Iowa's 183 electric utilities runs its own EE programs with a separate set of offerings. As a result, Iowa's EE effort is sorely lacking in comprehensiveness. Many of the EE measures with the greatest potential for savings are unavailable to many Iowans. If available, utilities' energy audits are not comprehensive or standard. Financial assistance and advice is generally available only for efficiency upgrades that pertain to the type of energy provided by the utility. For example, gas utilities do not provide compact fluorescent light bulbs.

• *Utilities' Duplication of Program Administration Costs Money*

Each of Iowa's utilities is charged with developing, promoting, administering and evaluating its own EE programs. There is significant duplication of effort, and therefore a great deal of potential cost savings. Iowa's two electric IOUs spent an average of 27 percent of their total efficiency spending on costs other than EE incentives. More than 50 percent of Munis' and RECs' spending was not for incentives.

- *Utilities Do Not Have Incentive to Push EE*

There is an inherent conflict of interest when a utility is required to encourage its customers to buy less electricity (and hence reduce revenue), and yet is also expected to lead in developing innovative and increasingly effective ways to maximize those lost sales. This fundamental conflict has caused many states to take different approaches to the administration of state-level EE programs such as third-party private or public administration or a regional administration. Others have rewarded utilities for meeting higher EE goals.

- *Utilities and State Policy Fail to Prioritize EE*

Traditionally, growing electricity demand has been met through increasing supply. Recently, some states have turned to demand-side management to offset demand growth. These states have begun to think of EE as a resource and planned for acquiring efficiency rather than generation. Iowa's utilities do not treat EE as a resource on par with supply resources. Iowa does not have a statewide EE resource standard nor a requirement that utilities take advantage of cost-effective EE potential. And there is no requirement that Iowa utilities first acquire efficiency potential before pursuing supply-side resources to meet future power demands.

- *Misplaced Emphasis on Peak Load Management*

Load management is designed to reduce peak load use during the few times when energy demand is high and delivery system reliability is in jeopardy. In 2006, Iowa IOUs spent over $35 million on electric load management, significantly more than any of the other 20 states that implement load management. Load management is an important component of utility planning efforts, and effective programs save both utility and ratepayer dollars. However, load management likely fails to reduce overall energy use or greenhouse gas emissions, and can actually increase both. It also seriously bloats our efficiency spending per capita, ballooning the overall size/cost of the program and making it difficult to place reasonable expectations on improvement and growth in the true efficiency programs. Whereas load response provides economic savings but little, if any, energy savings, EE can provide both quite effectively.

The deficiencies in these programs are reflected in the smaller amount of EE savings Iowa has achieved compared to leading states. In 2000 and 2001 top EE states were achieving electrical EE savings of 0.7 percent to 2 percent of retail sales. During the same period Iowa achieved 0.4 percent annual savings. In recent years, increased spending has brought Iowa's IOUs savings up substantially to 0.8 percent. However, other states are now aggressively moving toward 1.5 percent to 2 percent annual savings.

Recommendations

Iowa has the potential to move beyond these shortcomings, and more efficiently invest in its EE programs so that our state realizes its true efficiency potential. Other states across the country, including our neighbors are making big strides and Iowa should too.

Other states' experiences demonstrate that greatest progress in statewide efficiency programs come with some form of third-party administration. We recommend the current rate surcharge be replaced by a uniform public benefits charge on all ratepayers, and the bulk of the resulting public benefits fund be used to establish a third-party, comprehensive, statewide energy efficiency program.
We recommend directing a percentage (starting at 10 percent and rising over time) of the public benefits fund towards a coordinated, guided matching grant program for local (countywide) EE initiatives to

harness the power of local creativity, community pride, economic self-interest and personal responsibility.

In addition, we recommend Iowa's leaders think boldly and establish policies that meet the following principles:

- *Align EE, renewable energy and greenhouse gas reduction goals with utility financial interests through legislative and administrative actions.*

- *Provide universal and comprehensive EE and renewable energy programs and services to all Iowa residents through a public benefits fund created from sales on all energy sources.*

- *Treat EE as a resource in an integrated resource planning process, establish aggressive EE and renewable energy standards, and require all cost-effective EE and renewable energy be acquired prior to new fossil fuel generation.*

- *Set aggressive greenhouse gas reduction goals, and incorporate them into all energy-related planning and programs, including peak load management programs and the prioritization and cost-benefit analyses for statewide EE.*

- *Ensure just and fair policy effects and implementation across the economic spectrum.*

The Iowa Policy Project

For the full report, see www.iowapolicyproject.org

The Iowa Policy Project was founded in 2001 to promote public policy that fosters economic opportunity while safeguarding the health and well-being of Iowa's people and the environment. By providing a foundation of fact-based, objective research and engaging the public in an informed discussion of policy alternatives, IPP advances accountable, effective and fair government.

The Iowa Policy Project is a 501(c)(3) nonprofit, nonpartisan organization. Contributions are tax-deductible. For more information, see our website or call (319) 338-0773.

A Climate Policy Challenge: Minimizing Impacts on Low-Income Iowans

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January 2008

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A Climate Policy Challenge: Minimizing Impacts on Low-Income Iowans

By Beth Pearson

Iowa is taking important strides in responding to climate change. In November 2007, Governor Chet Culver signed the Midwestern Regional Greenhouse Gas Reduction Accord, a historic agreement including plans for the implementation of a regional cap-and-trade system designed to help the Midwestern states meet established emissions reductions targets. The accord builds on other, recent initiatives through which Iowa has demonstrated leadership in responding to climate change.

In 2007, the Iowa Legislature created the first-ever Iowa Office of Energy Independence, along with a $100 million Iowa Power Fund to invest in renewable energy research and development and the Iowa Climate Change Advisory Council to determine the best strategies for reducing greenhouse gas emissions in the state. The Office of Energy Independence has already released its "Iowa Plan for Energy Independence," outlining goals and policy reforms that will make Iowa a national leader in energy solutions.[1] It is clear that Iowa has powerful new tools at its disposal to address climate change.

These initiatives are crucial steps for Iowa. Two days after Governor Culver signed the Midwestern governors' accord, the Intergovernmental Panel on Climate Change (IPCC) released its most recent assessment of the impact of climate change, confirming that quick action is necessary to reduce greenhouse gas emissions.[2] Research is needed to identify and model specific ways that climate change will affect various sectors of Iowa's economy and environment, but it is clear, as acknowledged in the Midwestern Regional Greenhouse Gas Reduction Accord, that "the effects of climate change present growing economic, social and environmental risks in the Midwest and the world."[3]

The high impact of climate change on low-income Iowans

Risks associated with climate change are particularly high for low-income Iowans, who are disproportionately vulnerable to its economic, environmental and social consequences. The IPCC report stresses that climate change will have a range of significant effects, from an increase in heat waves and extreme high temperatures to changing precipitation patterns, shifts in regional agricultural productivity, new disease vectors and increased mortality from heat waves, floods and droughts.

Evidence is growing that low-income individuals in both developed and developing countries are at greater risk of the negative effects of climate change. For instance, the IPCC points out that warmer and

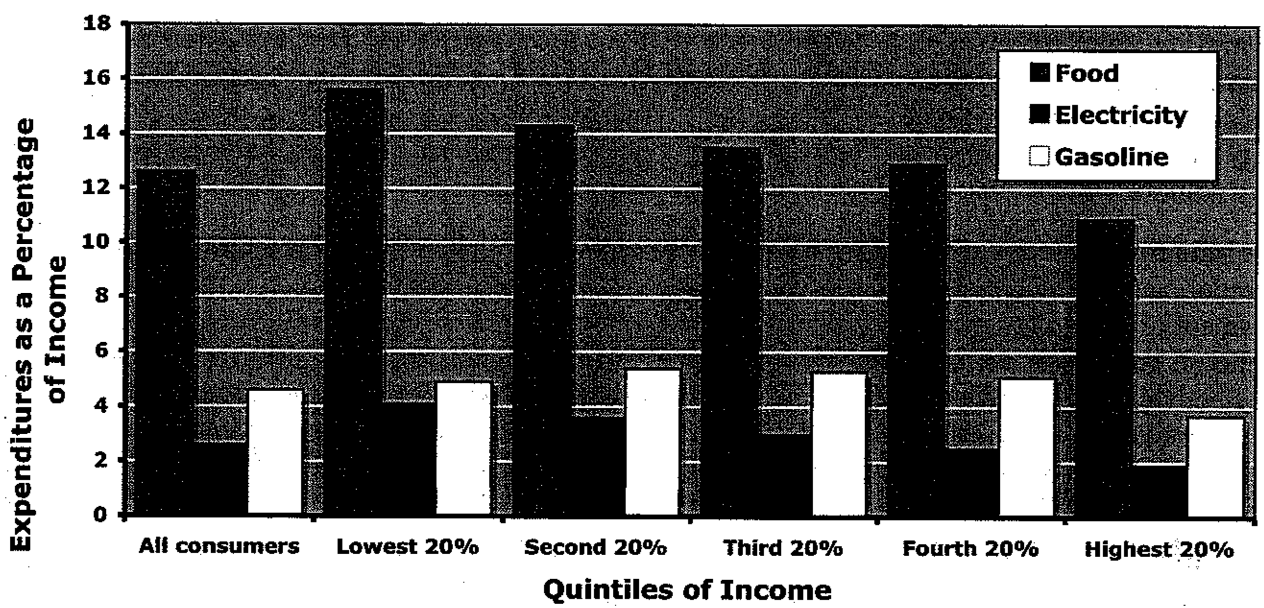
1 Iowa Office of Energy Independence (2007) *Iowa Plan for Energy Independence*. State of Iowa Office of Energy Independence. Available from: http://www.energy.iowa.gov/OEI/docs/Final_Plan.pdf.
2 Intergovernmental Panel on Climate Change (2007). *Climate Change 2007: Synthesis Report*. Fourth Assessment Report, Intergovernmental Panel on Climate Change. Available from: http://www.ipcc.ch/.
3 Midwestern Governors Association (2007) *Midwestern Regional Greenhouse Gas Reduction Accord*. See: http://www.midwesterngovernors.org/resolutions/GHGAccord.pdf.

more frequent hot weather, heat waves and heavy precipitation events will mean an increased risk of mortality, especially for people without adequate housing or access to air conditioning or transportation. Extreme weather events can cause property damage and increased insurance premiums that many low-income individuals may not be able to afford. Global climate change will also mean reduced air quality in urban environments where many low-income populations live.

Low-income individuals have fewer resources to help them adapt to the effects of climate change, which means they face greater threats to their health and well-being.[4] For instance, because a disproportionate number of low-income Iowans lack health insurance, they will face increasing health risks without access to affordable care. Likewise, low-income Iowans have fewer resources to cope with a sudden decline in earnings due to unemployment caused by the restructuring of the economy.

Changes in global crop productivity, water supply and energy needs due to climate change will cause higher prices of basic necessities such as food, water and electricity. Low-income households spend a larger share of their income on these necessities than do more affluent households, meaning they will be disproportionately affected by the rising cost of basic commodities. Figure 1 uses 2006 Consumer Expenditure Survey data to show the share of income spent on these necessities by U.S. consumers.

Figure 1. Basic-Needs Spending Takes Greater Share of Lower Incomes



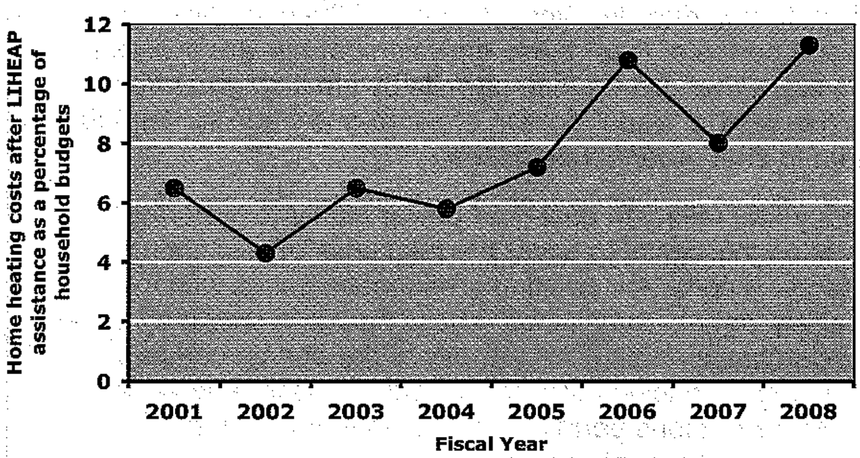
Even with existing programs such as the Low Income Home Energy Assistance Program (LIHEAP), a federal program that provides assistance to low-income households for home energy needs, home heating costs are taking up an increasing share of low-income household budgets in Iowa. As Figure 2 shows (Page 3), the share of Iowa household budgets devoted to home heating costs has increased from 6.5 percent in 2001 to a projected 11.3 percent in 2008.

This increase is driven both by increases in energy prices and decreases in LIHEAP payments. For instance, heating and cooling costs for households that heat with natural gas, which make up a larger

4 *Stern Review Report on the Economics of Climate Change* (2007). "Part II: Impacts of climate change on growth and development, Chapter 5: Costs of climate change in developed countries," p. 10. Available from: http://www.hm-treasury.gov.uk/media/9/1/Chapter_5_Costs_Of_Climate_Change_In_Developed_Countries.pdf.

percentage of low-income households in the Midwest than in any other region of the country,[6] increased 7 percent between FY2007 and 2008 and are now 70 percent higher than in 2001.[7] Heating and cooling costs have increased at a greater rate than have the incomes of households in the lowest income quintile. At the same time, average LIHEAP payments have declined 43 percent over the past six years.

Figure 2. Increasing Out-of-Pocket Expenses for Home Heating in Iowa[5]



Funding for low-income assistance programs such as LIHEAP is further endangered by climate change, which can strain government budgets by damaging public infrastructure. The IPCC identifies damage to urban and rural infrastructure as a major climate change impact, suggesting the need for substantial investments on the part of state and federal governments. For example, increases in heavy precipitation events and extreme weather could necessitate state investment in levee systems or water sanitation facilities. Over the long term, changes in warming and drainage patterns can cause the need to redesign road systems. These changes and investments mean increased public costs associated with the impacts of climate change, which could put pressure on Iowa's state budget and endanger the funding of important services to low-income Iowans.

The disproportionate impact of climate change on low-income groups and the high costs associated with these impacts makes it clear that we need solutions that address climate change while taking into account the specific vulnerabilities of low-income Iowans. Any analysis of the effects of climate change in Iowa should include an examination of the particular form these effects will take for low-income segments of the population. Most importantly, low-income advocates and low-income Iowans themselves should be engaged in discussions related to addressing the impacts of climate change.

Cap-and-trade policies must be designed to work for low-income Iowans

One major policy response to climate change included in the Midwestern Regional Greenhouse Gas Reduction Accord is the adoption of a regional cap-and-trade system. (See box, Page 4.) Like climate change itself, cap-and-trade policies to address climate change will have a disproportionate impact on low-income Iowans. A cap-and-trade system is an essential policy response to climate change; however, as Iowa policymakers work to design this system, they must take into account the likely impacts of these policies on low-income Iowans.

5 Iowa Community Action Association (2007). "Energy Agenda."

6 U.S. Department of Health and Human Services (2005) *LIHEAP Home Energy Notebook for Fiscal Year 2003*, Table A-3. Available from: http://liheap.ncat.org/pub.htm.

7 Economic Opportunity Studies (2007) "The Outlook for the FY 2008 Energy Bills of Low-Income Consumers." Available from: http://www.opportunitystudies.org/repository/File/weatherization/Outlook_FY2008_Energy_Bills.pdf.

How does cap-and-trade work?

A cap-and-trade system lowers emissions of greenhouse gases by mandating a maximum level of emissions (usually expressed in tons of carbon dioxide) and also making emission more expensive. The government decides on a "cap" level of total emissions that is below current emissions levels and then slices the cap up into individual permits that allow the holder of the permit to emit a unit of carbon dioxide. Since the goal of the cap-and-trade system is to reduce emissions over a period of time, these emission permits are scarce and therefore valuable. Permit holders can either use up their permits by emitting greenhouse gases, or they can choose to sell (hence the "trade" portion of a cap-and-trade system) their permits to others who will use them to emit greenhouse gases.

So, for instance, an energy company that relies on coal-fired power plants to generate electricity would have to possess enough permits to cover the total units of greenhouse gases produced by their power plants. A company emitting greenhouse gases without sufficient permits would face penalties for non-compliance. These penalties would be set at levels above the expected cost of purchasing emissions permits. If the energy company reduces its use of fossil fuels and starts producing more of its electricity with renewable technologies, it could sell some of the emissions permits that it no longer needs to companies that are emitting higher levels of greenhouse gases.

In essence, a cap-and-trade system means that the emission of greenhouse gases now has an up-front cost for the emitter. Firms pass this increase in their production costs on to consumers of energy. Individuals, state and local governments, and other firms are all consumers of energy, which means all these groups will bear the cost of pricing and reducing greenhouse gas emissions.

The biggest decision faced by policymakers with regard to the design of a cap-and-trade system is whether to auction off emissions allowances or give them away. Emissions permits remain valuable, regardless of whether they are auctioned off or given away. This is because the "cap" component of the cap-and-trade system restricts the overall supply of energy produced from fossil fuels and drives the price of this energy up until the quantity demanded drops equal to supply. This means that energy companies can sell their products for higher prices, regardless of whether they had to purchase their emissions permit or not. Consumers pay a higher price for energy no matter what, but if energy companies haven't had to buy their emissions permits, they can reap what the director of the Congressional Budget Office has described as "windfall profits" from the sale of more expensive energy.[8]

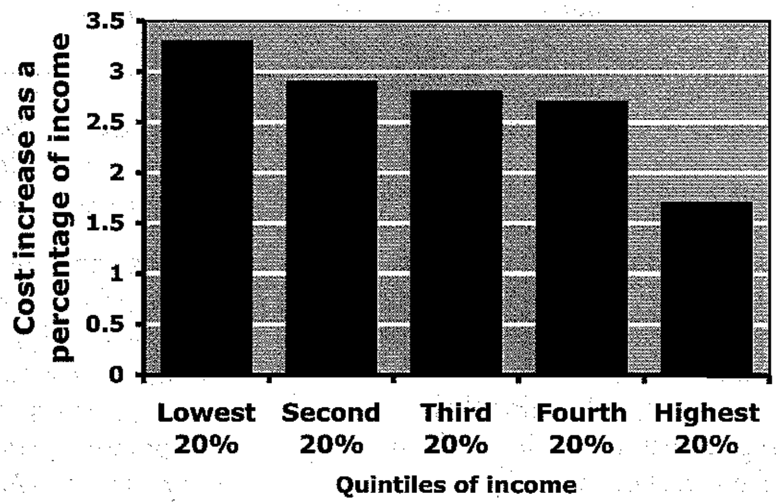
On the other hand, if the government auctions the emissions permits, it will generate substantial amounts of revenue that can be used to offset the effects of increased prices on energy consumers. Recognizing that the implementation of a cap-and-trade system will also have some costs for producers of energy, the revenue from the auctioning of emissions permits could also be used to help firms and producers. The question of whether emissions permits are auctioned off or given away is particularly important from the perspective of low-income households. Giving away emissions permits and failing to fund measures to offset the disproportionate impacts of price increases on low-income households is a choice that can be avoided.

8 Statement of Peter R. Orszag. Director, Congressional Budget Office. "Approaches to Reducing Carbon Dioxide Emissions," before the Committee on the Budget, U.S. House of Representatives, November 1, 2007.

Energy, climate policies disproportionately affect low-income households

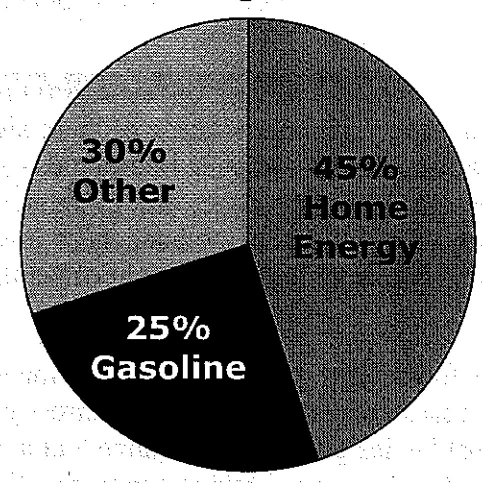
Low-income households will be more heavily affected than more affluent households by increases in the cost of energy due to climate change. However, policies that address climate change by restricting emissions also raise the price of energy and disproportionately impact low-income households. The Center on Budget and Policy Priorities estimates that even a modest, 15 percent reduction in emissions would come with an average annual increase of $750-$950 in energy-related costs for the poorest one-fifth of the population.[9] As Figure 3 indicates, emissions reductions alone have a regressive economic impact in that low-income households bear a larger share of cost increases associated with emissions reductions than do upper-income households.

Figure 3. Disproportionate Cost to Low-Income Households to Reduce Emissions[10]



While some cost increases will show up on home-energy bills, it's important to remember that increased prices for energy will affect the prices of all goods that rely on energy for their production or transportation. In fact, as shown in Figure 4, only 45 percent of energy-related cost increases experienced by low-income households would be due to home-energy cost increases, with gasoline costs and costs related to other forms of consumption making up the remaining 55 percent.

Figure 4. Impact on Low-Income Budgets* Goes Well Beyond Home Energy



** Shares of cost increase for poorest 20 percent of population by product category.*

Source: Center on Budget and Policy Priorities; calculations based on Consumer Expenditure Survey data and Congressional Budget Office methodology.

9 Greenstein, Robert, Sharon Parrott and Arloc Sherman, (2007) "Designing Climate-Change Legislation That Shields Low-Income Households From Increased Poverty and Hardship." Center on Budget and Policy Priorities, Revised November 8, 2007. Available from: http://www.cbpp.org/10-25-07climate.htm. CBPP figures refer to impacts on low-income households of a national, rather than regional, cap-and-trade system.
10 Congressional Budget Office (2007) *Trade-Offs in Allocating Allowances for CO_2 Emissions.* Economic and Budget Issue Brief, April 25, 2007. Available from: http://www.cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap_Trade.pdf.

Making sure climate-change and energy policies work for all Iowans

Climate-change and energy policies can and should work for all Iowans. The December 2007 *Iowa Plan for Energy Independence* recognizes the importance of developing energy solutions that consider the needs and concerns of all Iowans. One of the plan's five articulated goals is to ensure that energy is affordable, especially for Iowa's low-income, disabled and elderly populations. Low-income Iowans and low-income advocates must be partners in crafting solid policy solutions addressing climate change.

The Center on Budget and Policy Priorities has suggested six principles to encourage the design of climate-change policy that takes into account the needs of low-income households. These principles can provide an important framework for Iowa to lead on state and regional responses to climate change.

Low-Income-Friendly Principles for Climate-Change Policy

Center on Budget and Policy Priorities

- Higher energy costs should be fully offset for people in the lowest income quintile and meaningful relief should be provided to those in the second quintile
- Assistance should reach as close to 100 percent of low-income households as possible
- Larger households should get more assistance than smaller ones
- Help should not be targeted on energy bills alone
- Delivery mechanisms should be highly efficient
- Assistance should get bigger as emissions controls get stronger

Climate-change policy will be less effective if the concerns of low-income Iowans are left out of the policymaking process. Low-income Iowans are energy consumers, too. If low-income individuals are prevented from changing their energy consumption due to the high up-front cost of investing in energy-saving automobiles, appliances, furnaces, storm windows and the like, not only do they pay a high price for being unable to take advantage of energy efficiency technologies but they also prevent the state as a whole from reducing its carbon footprint.

State governments need resources in order to take advantage of these significant economic opportunities and ensure energy consumers — particularly low-income households — aren't negatively affected by the implementation of good climate-change policy. Since energy-related cost increases will affect government budgets in the same way they will affect the budgets of Iowa families, governments need to design climate-change policies that generate enough revenue to offset these costs and provide resources for energy and economic initiatives.

State policymakers should likewise focus on ways to combine low-income assistance with energy efficiency measures so that energy assistance payments don't indirectly perpetuate inefficient energy use. And, importantly, policies must be designed that recognize that a majority of the costs associated with increasing energy prices will affect household budgets in ways other than the home energy bill; low-income households in Iowa will need programs that go beyond home heating payment assistance.

Low-income Americans constitute a substantial portion of the nation's energy consumers. For instance, households eligible for federal assistance account for 26 percent of the nation's total electricity consumption.[11] Energy efficiency should not be a luxury good available only to households in upper-

11 Energy Information Administration (2001) *Residential Energy Consumption Survey.* Table CE1-3c. "Total Energy Consumption in U.S. Households by Household Income, 2001."

income brackets. State programs that fund or subsidize the purchase of energy-efficient appliances and weatherization improvements can make energy efficiency an option for all Iowans.

Increased state funding for LIHEAP (Low Income Home Energy Assistance Program) benefits would help low-income consumers cope with increased home energy bills, especially if LIHEAP's weatherization assistance component could be expanded. Iowa's Weatherization Assistance Program, which aims to make the homes of low-income clients more energy-efficient, has produced an annual savings per home of $435 and reduced the state's energy consumption by 2,776,170 kWh per year.[12] However, an additional 166,971 low-income homes in Iowa could benefit from the Weatherization Assistance Program but have not been reached under the program's current funding levels.

The 2007 plan of the Iowa Office of Energy Independence recommends the implementation and enforcement of energy-efficient building codes and also calls for Iowa's state government to lead by example by conducting energy audits on all state buildings and implementing energy efficiency retrofits. Minimum standards for home rental properties and public housing units should also be developed and enforced so that low-income renters can benefit from energy efficiency and taxpayers aren't subsidizing substandard conditions through the LIHEAP program. Because many low-income families rent their homes or apartments, they must rely on landlords to make efficiency improvements. The most substantial energy savings result from major improvements to homes and buildings, such as installing a high-efficiency furnace or wall insulation. Landlords serving low-income Iowans should be required to retrofit their properties and should receive at least partial assistance in making these improvements.

Innovative policy can also be implemented to help low-income households purchase energy-efficient appliances. A shared savings program or a zero-interest loan program administered through utilities would give low-income households the resources necessary to make an up-front purchase of an energy-efficient appliance and then make loan repayments through their energy bill. The cost of energy saved with the installation of the new appliance would be applied to repaying the loan, and when repayment was complete, the household's bill would drop to a level that reflected its reduced energy consumption.

However, high household energy bills account for a minority of the total, energy-related increase that will be experienced by low-income consumers in Iowa as a result of implementing effective climate and energy policy. Even if LIHEAP funds are increased to account for higher home-energy costs, low-income Iowans will be left trying to cope with higher costs of gasoline and groceries. The establishment of a refundable "climate change tax credit" targeted at low-income Iowans and the delivery of a rebate through the state Electronic Benefit Transfer (EBT) system that is currently used to deliver food stamp benefits are ways to off-set energy-related cost increases that won't show up on a home energy bill. These policies deliver targeted assistance in a way that gives households the flexibility to cope with the impact of higher energy prices on all aspects of their budgets.

Policy decisions related to the implementation of the Midwestern Regional Greenhouse Gas Reduction Accord must recognize the importance of auctioning emissions permits to generate revenue, rather than giving these permits away to polluters. Other states taking part in regional greenhouse gas reduction schemes have already realized the importance of this policy choice. For instance, Northeastern and Mid-Atlantic states that are members of the Regional Greenhouse Gas Initiative formed in 2003 have all chosen to auction off almost all of their emissions permits. A sufficient portion of the proceeds from the auctioning of emissions permits should be statutorily directed towards addressing the negative distributional effects of climate change policies in ways that go beyond simply increasing funding to

12 Dalhoff Associates (2007) *Report on the Impacts and Costs of the Iowa Low-Income Weatherization Assistance Program—Calendar Year 2006*, p. 2. Available from: http://waptac.com/si.asp?id=1143.

energy efficiency or energy assistance programs. Iowa policymakers can advocate for adopting these principles in federal climate policy, in addition to committing to them at the state level.

Innovative Policy Solutions for Low-Income Iowans

As illustrated above, public policy choices have a role in helping low-income Iowans cope with responses to climate change. Some innovative options:

- Expand Iowa's Weatherization Assistance Program to make the homes of low-income Iowans more energy-efficient.
- Develop minimum efficiency standards for rental properties.
- Provide funding for the retrofitting of rental properties with energy-efficient appliances, insulation, and high efficiency furnaces.
- Establish a shared savings or zero-interest loan program to make energy-efficient appliances affordable for everyone.
- Design policies that offset energy-related costs that won't show up on home energy bills.
- Auction any emissions allowances made available in a regional cap-and-trade system.

Conclusion

Building strong partnerships with low-income Iowans on climate change policy is crucial to ensuring that low-income advocates and environmentalists don't end up on opposite sides of the debate over what constitutes effective climate change policy. The shift to sustainable energy solutions can produce significant economic opportunities for Iowa, but these opportunities may not be realized if the impact of cost increases on low-income households is used as a justification for shying away from state leadership on climate-change issues.

Low-income Iowans can take advantage of the economic opportunities offered by state and regional responses to climate change, but only if Iowa continues to take bold steps in adopting a progressive energy agenda. The Blue-Green Alliance estimates that over 9,500 new manufacturing jobs could be created in Iowa as a result of a national commitment to renewable energy technologies.[13] In addition, Iowa is the 10th-windiest state in the nation and the country's third-largest producer of wind power.[14] The manufacturing of solar and wind power components is a natural economic opportunity for Iowa, given our renewable resource base and early establishment as a base for renewable energy component manufacturing. Iowa's working families can prosper through the creation of quality jobs that make Iowa a national leader in a new, green economy.

Iowa families deserve a bold public response on issues of climate change and energy choices. Policy choices must emphasize sustainability without forgetting that all Iowans must be able to afford to take advantage of sustainable energy sources. Upholding these principles will require innovative policy approaches and a strong commitment on the part of state lawmakers. Leadership already demonstrated on energy and climate-change issues indicates that Iowa will not shy away from the challenge of ensuring that all Iowans share in new energy opportunities.

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13 Blue-Green Alliance (2007) *Iowa's Road to Energy Independence.*

14 Iowa Department of Natural Resources (2002), Elliot and Schwartz (1993). See also the Iowa Policy Project's 2003 report, *Wind Power and the Iowa Economy.* See: http://iowapolicyproject.org/Environment_Energy.html.

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By John A. "Skip" Laitner and Teresa Galluzzo

Iowa has the potential to vastly improve its energy productivity. A broad array of practices and technologies can be tapped for their energy efficiency (EE) benefits. These range from the purchase of Energy Star appliances and office equipment to the use of more energy-efficient industrial processes. EE also means achieving greater fuel economy in vehicle fleets and seeking more energy-efficient electricity production from combined heat and power plants or waste-to-energy generation systems. Compared to normal energy production and consumption patterns, studies typically find a potential savings of 25-30 percent through the year 2030 when cost-effective EE practices are implemented. With further research and development the amount of efficiency potential will likely grow over time.

Cost-effective improvements in overall EE allow Iowans to have the same or improved lifestyle and save money; provide a small but important net gain in jobs and the state's income; and reduce the carbon dioxide emissions that contribute to global climate change. What makes all these benefits possible?

While electricity production and consumption is an important part of the Iowa economy, the utility industry is not especially labor intensive compared to the rest of the economy. Nor does it contribute to the state's income at the same rate as other sectors of the economy. The critical data for Iowa (based on 2006 economic accounts) are summarized in the table below, where dollars indicate dollars of revenue.

Based on Iowa-specific data, today's electricity production provides an average of 2.2 direct jobs per million dollars of revenue. All other sectors of the economy – from manufacturing to commercial services – provide an average of 7.9 jobs. Similarly, the electricity sector contributes only 22 cents of each dollar of revenue to wage and salary incomes, while all other sectors contribute 29 cents per dollar of revenue (IMPLAN 2008).

Iowa Electricity Sector Contributes Less to Jobs and State Income than Other Iowa Sectors

Direct Impact	Electricity	All Other
Employment (jobs per million dollars)		
2006	2.2	7.9
2030	1.5	5.0
Contribution to Income (per dollar)	$0.216	$0.293

This economic context is not unique to Iowa. This pattern is repeated through all regions of the U.S. That is, energy-related sectors stimulate less economic activity per dollar of revenue than almost all other business activities. The electric sector is capital intensive and relies on resources that are manufactured outside the state. It also imports a great deal of its inputs, in Iowa's case coal and nuclear fuel. This means if Iowa invested in greater EE the resulting energy bill savings would allow consumers and businesses to spend money for other goods and services that actually increase the number of jobs and income compared to the jobs and income provided directly by the energy industry. With EE improvements, people are able to save money from reducing their own energy use and from a potential decrease in energy prices as demand is reduced.

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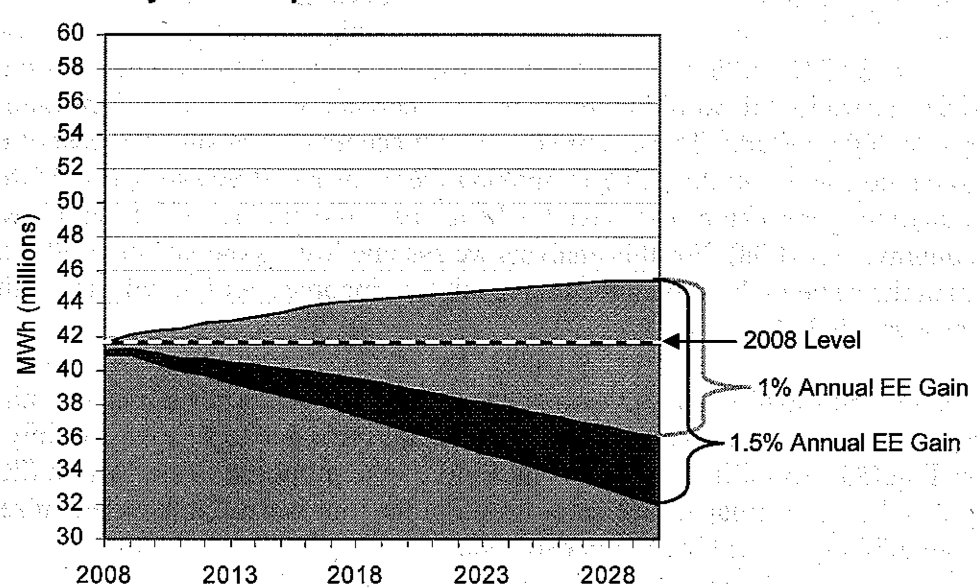
A number of good jobs could be created for directly implementing EE measures – installing energy efficient windows, lighting, insulation and thermostats. However, this number is small relative to the number of jobs created from the increased spending that comes when people have more money in their wallet from spending less on energy. Geller et al (1992) estimated only 10 percent of the jobs created as a result of EE are related directly to installing EE practices.

Energy Efficiency Impacts in Iowa

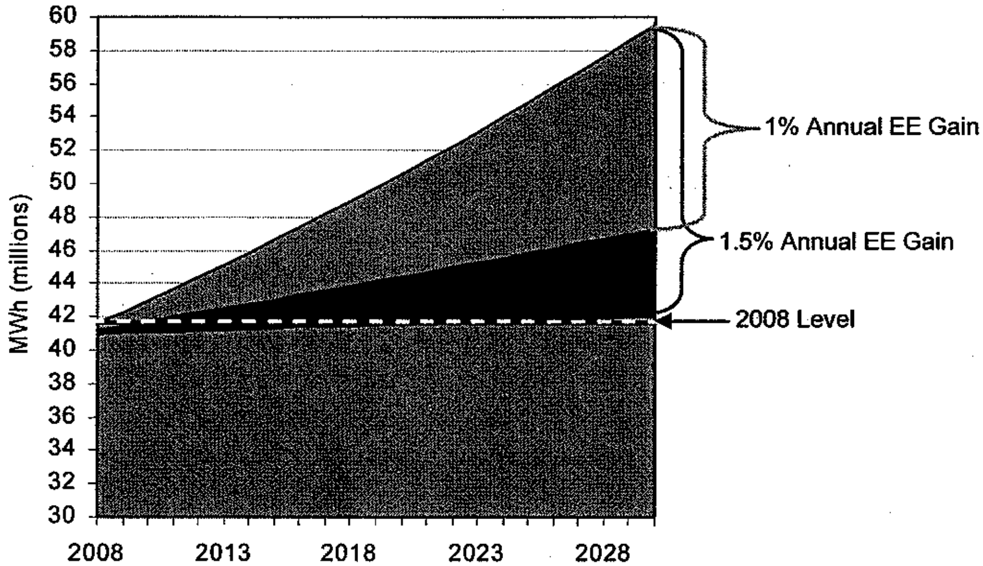
We can adapt the actual Iowa data shown in the table above to determine the potential impact on the state's economy if business and policy leaders promoted greater EE. Two reasonable scenarios are annual EE generated savings of 1.0 or 1.5 percent. Leading EE states have achieved these levels or more, and states – including our neighbors Illinois and Minnesota – have set goals for achieving 1.0 or 1.5 percent savings annually. In 2007, Governor Culver signed the Energy Security and Climate Stewardship Platform, calling for meeting at least 2 percent of annual retail sales of natural gas and electricity through EE improvements by 2015 and achieving an additional 2 percent of savings every year thereafter.

Throughout this report we will look at the impacts of these EE gains based on two different electricity consumption forecasts. One estimate is based on the Energy Information Administration's (EIA) regional forecast. By this estimation, if Iowa's future consumption is congruent with its neighbors, in 2030 it would be consuming 9.1 percent more electricity than in 2008. The second estimate is based on Iowa's two investor-owned utilities' (IOUs) predicted average annual electricity growth rate. Based on this growth rate, Iowa would see a 43.1 percent increase in electricity consumption from 2008. (See note at end of document for more information on how these estimates were calculated.)

Iowa's Electricity Consumption to 2030: Based on EIA Data



Iowa's Electricity Consumption to 2030: Based on IOU Data



If Iowa improves its EE by 1.0 percent annually, there will be a total reduction in electricity consumption of 20.6 percent over the period. If Iowa reduces electricity usage by 1.5 percent annually, there will be a total reduction in electricity consumption of 29.4 percent compared to estimated forecasts for 2030. This will save money for consumers and businesses. Presumably that electricity bill savings will be spent in other ways, and for this analysis we assume this spending occurs in Iowa in the same proportions as current non-electricity spending.

The latest data from the EIA shows Iowa spent an estimated $3,038 million for its total use of electricity in 2006.[1] If we use the EIA-based estimate we would expect the state's electricity bill to increase by 9.1 percent to $3,315 million in 2030 (expressed in constant 2006 dollars). If we use the IOU-based estimate, Iowa's electricity bill would increase by 43.1 percent, to about $4,347 million in 2030 (expressed in constant 2006 dollars). These estimates do not account for changes in cost of electricity any greater than all other consumer products, likely making them conservative estimates. At the same time, normal productivity gains can be expected to change both the number of jobs and Iowa's income by 2030 (Economy.com 2008). For this analysis we assume Iowa's income per dollar of economic activity will remain the same in 2030 with the end result that incomes per job will rise with the level of productivity gains through 2030.

Using this information we can estimate the impact of efficiency gains on both jobs and the state's income. In order to calculate net gains in employment due to EE, we multiply 2030 annual electricity spending ($3,315 million or $4,347 million) by the proposed EE reduction (20.6 percent or 29.4 percent) and then by the estimated difference between the jobs per million dollars of revenue in the electricity sector and jobs created in all other sectors:

[1] The latest data for total energy expenditures available at this point is for the year 2005 (EIA 2008a). This information was updated to 2006 using working estimates from the revised *Annual Energy Outlook 2030* (EIA 2008b).

Net Jobs from EE Gains: Based on EIA Data
1.0% Annual EE Gain: 3,315 * 20.6% * (5 – 1.5) = 2,390 net jobs
1.5% Annual EE Gain: 3,315 * 29.4% * (5 – 1.5) = 3,411 net jobs

Net Jobs from EE Gains: Based on IOU Data
1.0% Annual EE Gain: 4,347 * 20.6% * (5 – 1.5) = 3,134 net jobs
1.5% Annual EE Gain: 4,347 * 29.4% * (5 – 1.5) = 4,473 net jobs

In other words, if Iowa chooses to promote EE so that electricity consumption is reduced by 1.5 percent per year (29.4 percent in 2030) the state economy should provide 3,411 more jobs under the EIA-based estimate or 4,473 under the IOU-based estimate. While these numbers are small in absolute terms, such gains are significant in a state like Iowa with its relatively low population. For example, in 2007 Siemens Power Generation announced it would manufacture wind turbine blades in Fort Madison and Hendricks Industries said it will be producing wind turbine towers in Keokuk. These two companies will provide 883 jobs in Lee County. These jobs will constitute more than 5 percent of the nonfarm jobs in the county.

We can use a similar calculation to estimate the impact of efficiency gains on wage and salary incomes in the state. We multiply 2030 annual electricity spending ($3,315 million or $4,347 million) by the proposed efficiency reduction (20.6 percent or 29.4 percent) and then by the estimated difference between the electricity sector's impact on Iowa's income and all other sectors' impact on state income:

Increase in Iowa's Income: Based on EIA Data
1.0% Annual EE Gain: 3,315 * 20.6% * (0.29 – 0.22) = $47.8 million (in 2006 dollars)
1.5% Annual EE Gain: 3,315 * 29.4% * (0.29 – 0.22) = $68.2 million (in 2006 dollars)

Increase in Iowa's Income: Based on IOU Data
1.0% Annual EE Gain: 4,347 * 20.6% * (0.29 – 0.22) = $62.7 million (in 2006 dollars)
1.5% Annual EE Gain: 4,347 * 29.4% * (0.29 – 0.22) = $89.5 million (in 2006 dollars)

EE gains of 1.5 percent can generate a net income benefit of $68 million (according to the EIA-based estimate) or $90 million (according to the IOU-based estimate) for the Iowa economy. These numbers are conservative because they assume the electricity savings exactly offset the cost of the investments. (This still provides a net benefit for the state's income because the spending has shifted to other sectors such as construction, manufacturing or finance.) Even with a longer expected payback as the costs of EE grows, the EE investments would likely pay back within a five- to nine-year period. So with buildings and equipment that last 15 years and longer, it is still likely the productivity gains would be significantly larger than suggested here.

Conclusion

This analysis looks only at annual efficiency gains of 1.0 or 1.5 percent in Iowa's electricity sector and shows small but net positive benefits for Iowa by 2030 – a net gain of 2,390 or 3,411 (EIA-based estimate) or 3,134 or 4,473 (IOU-based estimate) jobs and $47.8 million or $68.2 million (EIA-based estimate) or $62.7 million or $89.5 million (IOU-based estimate) in state income. Setting these annual goals for a total reduction of electricity consumption of 21 or 29 percent by 2030 are in line with what

ACEEE and other studies suggest is possible with EE improvements. They suggest gains of 25 to 30 percent are achievable by 2030.[2]

By Either Measure, Increasing Iowa's EE Would Create Jobs, Income in 2030

	Annual EE Savings	Cummulative EE Gains	Net Jobs Created	Additional State Income Generated (2006 dollars)
EIA Data	1%	20.6%	2,390	$47.8 million
EIA Data	1.5%	29.4%	3,411	$68.2 million
IOU Data	1%	20.6%	3,134	$62.7 million
IOU Data	1.5%	29.4%	4,473	$89.5 million

If we had expanded our analysis to include all energy sectors, the gains in jobs and state income would have been larger. Also if we had looked at the combined possibilities of EE and renewable energy the benefits for jobs, the economy and for reducing carbon dioxide emissions would be larger. Other analyses have documented the job increases and economic benefits of increases in overall EE and/or renewable energy in Iowa (e.g. Madsen et al 2008 and Nayak 2005).

This short analysis suggests there is a very real possibility of an innovation strategy that emphasizes a cost-effective substitution of productivity for energy consumption and production. These findings show the good news about climate change policies. Rather than ratcheting down the economy, climate change policies accomplish just the opposite: They can spur investments that provide Iowa and the United States with needed goods and services while also providing them more efficiently.

*** Note on Details of Estimated Electricity Forecasts:**

Energy Information Administration (EIA) Regional Forecast
Because the EIA does not forecast electricity usage by state, we estimated Iowa's share of the regional consumption. To do this we divided the electricity consumed in Iowa's seven-state region by Iowa's population share. This produced consumption numbers fairly similar — an average difference of 3 percent — to actual electricity consumption from 1960 to 2004. This finding gives us some confidence that doing a similar calculation for the EIA's regional forecast through 2030 may be a fairly accurate indicator of Iowa's electricity consumption in coming years. By this estimation, in 2030 Iowa would be consuming 9.1 percent more electricity than in 2008.

Investor Owned Utilities' (IOU) Growth Rate Forecast
Iowa's two IOUs, MidAmerican and Interstate Power and Light, sell 75 percent of the electricity in Iowa. From 2008 to 2026 they predict a 1.64 percent average annual growth rate. We applied their growth rate to the 2008 EIA sales estimate. Appling a steady growth rate does not show the small yearly changes in growth rate the IOUs are predicting, but we use this average rate because we are extending their estimate out to 2030, four years beyond their forecast. Based on this growth rate Iowa would see a 43.1 percent increase in electricity consumption from 2008 to 2030.

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[2] There is a very large literature and set of reports on the greater EE potential in the U.S. and around the world. See, for example: McKinsey Global Institute 2007 and 2006, Expert Group on Energy Efficiency 2007, and Laitner et al. 2006. There are also a large number of assessments completed for many of the states that also inform policymakers about cost-effective policy options. See: Eldridge et al. 2008 (Maryland), Elliott et al. 2007 (Texas), and Laitner and Kushler 2007 (Michigan).

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