STATE OF IOWA
BEFORE THE IOWA UTILITIES BOARD

IN RE:	)	
	)	
APPLICATION OF INTERSTATE POWER AND LIGHT COMPANY FOR APPROVAL OF AN ENERGY EFFICIENCY PROGRAM	)	**DOCKET NO. EEP-08-01**
	)	

DIRECT TESTIMONY OF CHRISTOPHER A. JAMES ON BEHALF OF THE COMMUNITY COALITION (COMMUNITY ENERGY SOLUTIONS, IOWA FARMERS UNION, IOWA PHYSICIANS FOR SOCIAL RESPONSIBILITY)

PUBLIC VERSION
CONTAINS NO CONFIDENTIAL MATERIAL

August 29, 2008

PUBLIC VERSION

Table of Contents

PUBLIC VERSION

List of Exhibits

Exhibit A:	Resume of Christopher James
Exhibit B:	Sales Forecast, IPL's EE Plan, Economic and Achievable Potential (MWh) for 1.0% EE Scenario
Exhibit C:	The Sustainability and Costs of Increasing Efficiency Impacts: Evidence from Experience to Date; Kenji Takahashi, David Nichols, August 2008
Exhibit D:	Nuclear Power, Joint Fact Finding, the Keystone Foundation, July 2007
Exhibit E:	Energy Information Administration, Coal News and Markets, August 22, 2008
Exhibit F:	The public health benefits of insulation retrofits in existing housing in the United States; Jonathan Levy, et al, April 2003
Exhibit G:	Climate Change and Power: Carbon Dioxide Emissions Costs and Electricity Resource Planning; Synapse Energy Economics, Inc., March 2007

1. INTRODUCTION

Q. What are your name, position and business address?

A. My name is Christopher A. James. I am a Senior Associate at Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics ("Synapse") is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission and distribution system reliability, market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Synapse's clients include state consumer advocates, public utilities commission staff, attorneys general, environmental organizations, federal government and utilities. A complete description of Synapse is available at our website, www.synapse-energy.com.

Q. Please summarize your educational background and recent work experience.

A. I graduated from the Worcester Polytechnic Institute in 1978 with a Bachelor of Science Degree in Mechanical Engineering. My undergraduate thesis focused on design and construction of a low-cost hyperbolic solar collector. In 1988, I received a Master of Arts Degree in Environmental Studies from Brown University. My graduate thesis focused on criteria and toxic emission from medical waste incineration. In addition, I have taken numerous EPA courses in air pollution science, combustion, continuous emissions monitors and boiler operation. I have taken two courses in negotiation and mediation, offered through Harvard University and Willamette University, and one environmental law course offered through the University of Hartford.

From 1984 to 2007, I worked for, in chronological order, the Rhode Island Department of Environmental Management; the US Environmental Protection Agency, Seattle, Washington; and the Connecticut Department of Environmental Protection. I was Manager of Climate Change and Energy Program for the CT DEP, and also served as Director of Air Planning. From 1999 to 2007, I served as the DEP representative to the Connecticut Energy Conservation Management Board (ECMB), a statutorily created body responsible for the oversight, planning and administration of the state's energy efficiency, conservation and load management programs, currently funded at approximately $87 million annually. In my capacity on the ECMB, I was responsible for working with other Board members to provide guidance, assistance and advice to the distribution companies responsible for developing and implementing annual energy efficiency programs. My experience on the Board included review and analysis of specific energy efficiency program measures as well as strategic planning to better integrate measures across sectors and customer classes, and critique and advice for ramping up new programs.

I also served as co-chair of the National Association of Clean Air Agencies global warming committee, co-chair of the New England Governors/ Eastern Canadian Premiers global warming committee, co-chair of the Regulatory Assistance Project's distributed resources collaborative, and co-chaired the NESCAUM collaborative to develop a model rule for environmental performance standards. I was the Connecticut staff lead for development of the Regional Greenhouse Gas Initiative; DEP staff lead on the Governor's Climate Change Coordinating Committee and the Connecticut DEP representative to the New England Demand Response Initiative. I was also one of only two air regulators on the EPA/DOE Leadership Group to develop and implement the National Action Plan for Energy Efficiency.

I joined Synapse in August 2007. My recent clients have included the Maine Public Utilities Commission, the New Jersey Ratepayer Advocate, AARP, the National Association of Clean Air Agencies, Environmental Defense, EPA and the Regulatory Assistance Project.

I have testified before state regulatory commissions in Connecticut in dockets related to the siting of a new power plant and emissions standards for new distributed resources. I have also participated in and presented testimony before state and Federal courts in cases involving violations of the Clean Air Act. These include asphalt plants, wood products facilities, aerospace production facilities and power plants. I was involved in the first nationally coordinated enforcement actions of the Clean Air Act in 1991-92 against Louisiana-Pacific; in multimedia enforcement actions against two pulp mills in Alaska; and in several actions against power plants, including VEPCO, Ohio Edison and AEP. Each of the power plant cases were settled prior to the remedy phase of the respective trials.

A copy of my current resume is attached as Exhibit A.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Community Coalition.

Q. Have you testified previously before this Commission?

A. No.

Q. What is the purpose of your testimony?

A. Synapse was retained by the Community Coalition to assist in its evaluation of the Application of Interstate Power and Light Company's ("IPL" or "the Company") energy efficiency plan that was filed with the IUB on April 28, 2008.

This testimony presents the results of our analyses.

Q. Please summarize your conclusions.

A. My conclusions are as follows:

1. Despite the fact that IPL says the 1.5% annual energy savings scenario will be difficult to achieve, this scenario is very achievable and should be pursued.

2. The projected costs of both IPL's 1.3% annual energy savings base case ("base case") and their 1.5% annual energy savings scenario are too high and not reasonable:

   a. IPL's cost estimates for the 1.3% base case and 1.5% savings scenario are not reflective of what Iowa utilities have achieved in the past or what other utilities are currently experiencing.

   b. Furthermore, IPL has not justified the significant cost differential (almost $200 million additional) between the1.3% base case and the 1.5% savings scenario.

3. As a result, IPL overestimates the costs of energy efficiency, and underestimates the amount of energy efficiency that can be achieved by 2013.

4. This flawed approach leads to IPL's conclusion that growth in electricity demand will lead to a need for additional supply during the period from 2009 to 2013. The overestimation of the cost of energy efficiency also enables IPL to favor adding a new coal-fired power plant in 2013.

5. In fact, IPL could even achieve more than 1.5% annual energy savings. There are additional opportunities that IPL's plan does not recognize. These include: combined heat and power, and demand response as a resource in conjunction with energy efficiency.

6. IPL has ignored some of the benefits of energy efficiency to Iowa's consumers and businesses. These benefits include: deferring the need to construct new or upgrade existing generation, deferring the need to construct new or upgrade existing transmission lines and distribution system, reducing ratepayer bills, reducing emissions of criteria air pollutants (such as those which contribute to acid rain, smog and haze) and greenhouse gas emissions, and reducing public health costs (from reduced number of asthma cases, visits to emergency rooms, lost productivity at work, etc.)

7. For these reasons, the Board should require IPL to revise, amend and resubmit their energy efficiency plan. IPL can achieve higher annual energy savings at lower costs than those the company is assuming in its energy efficiency filing. I note that the IUB has already approved the generating certificate for IPL's proposed new Marshalltown generating unit. Requiring both increased expenditures for energy efficiency and the simultaneous expenditure for construction of the new generating unit will test the flexibility of Iowa's rate structure. The IUB should consider delaying any further action on IPL's ratemaking principle request until the IUB has reached a decision in this docket for IPL's energy efficiency filing. Moving on the energy efficiency first would be the most prudent.

Q. Please explain how you conducted your investigations in this proceeding.

A. We have reviewed the application, testimony and exhibits filed by IPL in this proceeding. We have reviewed the information and documents provided by IPL in response to data requests submitted by the Community Coalition. We also have reviewed public information related to the issues addressed in IPL's application, testimony and exhibits and in our testimony and exhibits. We have also included information from:

Quantec et al. Assessment of Energy and Capacity Savings for Iowa; Prepared for the Iowa Utility Association, February 2008.

Kenji Takahashi and David A. Nichols. The Sustainability and Costs of Increasing Efficiency Impacts: Evidence from Experience to Date, ACEEE Summer 2008 Conference, August 2008.

2. IPL HAS NOT MET THE REQUIREMENTS OF THE IUB TO SUBMIT AN ENERGY EFFICIENCY PLAN THAT RESULTS IN ACHIEVING ENERGY SAVINGS LEVELS OF 1.5% BY 2011

Q. Describe the Iowa Utilities Board (IUB) order and IPL's response.

A. On January 14, 2008, the IUB issued an order directing Iowa's utilities to submit energy efficiency plans which, when implemented, would result in annual energy savings equal to 1.5% from energy efficiency measures. The annual energy savings of 1.5% was to be achieved by 2011, and continued through 2013.

Q. What does "annual energy savings equal to 1.5%" mean?

A. This quantity, 1.5% refers to the total energy savings that would be achieved through energy efficiency, demand response and renewable energy measures as compared to the company's electricity sales forecast for a given year, in this case, IUB directed that the company plan to achieve 1.5% of annual savings by 2011. The effect of energy efficiency measures is projected to be 1.2% of annual savings by 2011.

Q. What is the effect of this level of annual energy savings on a company's proposed electricity sales?

A. The level of annual savings reduces the estimated electricity sales. If a company estimates that annual electricity growth in Iowa is 1.5%, then an energy efficiency program that achieves annual energy savings of 1.5% will effectively reduce the annual electricity growth to zero for that year. Energy efficiency savings are cumulative with persistent performance, over the life of the measures that are installed. In this example, assuming Iowa's estimated electricity growth continued to grow at 1.5% annually, energy efficiency programs that achieve annual energy savings of 1.5% would maintain Iowa's electricity sales at a constant level.

Q. Does IPL's energy efficiency plan comply with the January 14, 2008 IUB order directing the company to submit a plan that will achieve annual energy savings of 1.5% by 2011?

A. Not fully. The primary focus of the plan is still on their 1.3% base case with 1% savings through efficiency in 2013, although IPL has included a 1.5% savings scenario in the plan. Energy efficiency measures are proposed to achieve 1.2% of the 1.5% annual energy savings under the 1.5% savings scenario.

Q. Has IPL considered the findings and recommendations in the Quantec report in the IPL EE plan?

A. It appears the measures considered in IPL's energy efficiency plan are based on Quantec report and the amount of savings assumed under the 1.5% plan is consistent with the recommendations included in the Quantec report. However, IPL's 1.5% annual energy savings scenario is at the lowest level of achievable potential in the range of 30% to 85% identified by the study (per page 9 of the Quantec report). At page 4 of her direct testimony, IPL witness King states that IPL's plan will achieve 43 percent of the estimated energy efficiency potential over the five-year period included in their plan. Synapse analyzed IPL's filing and found that IPL would actually achieve only 29% and 32% of the estimated economic energy efficiency potential over the five year period under the 1.3% and 1.5% scenarios respectively, as shown in Exhibit B.

Q. Please describe the terms technical potential and economic potential, as used in the Quantec report.

A. Technical potential means all measures considered to be implemented in an energy efficiency program, regardless of the economics associated with the measure. Economic potential means taking into consideration economic factors, whether from the utility perspective, in terms of their avoided costs and discount rates, or from a societal perspective, in terms of avoided costs and benefits considered using societal rates. Economic potential is usually higher when societal costs are used, and lower when utility costs are used. In a typical study that considers the economic and technical potential of energy efficiency measures, a range of what can be implemented, in terms of these two factors, through a company's energy efficiency plan is provided. Based on my review of the literature, the range of what measures are adopted to capture the economic potential varies from about 30 to 70% over a five year period. This means that the least performing program has either planned for or implemented energy efficiency measures that are designed to achieve 30% of the economic potential of energy efficiency measures for that state, and the best performing program has planned for or implemented measures that are designed to achieved 70% of the economic potential over five years.

Q. Please describe IPL's 1.5% savings scenario.

A. The Company proposes to achieve 1.5% savings in 2013 with 1.2% savings through energy efficiency and the rest through demand response and renewable energy. First, the Company states that this goal will be difficult to reach. Additionally, IPL's estimate of the cost to achieve this level is unrealistically high as compared to what we have seen for IPL in the past as well as for other utilities.

Q. Do you agree that this goal be difficult for IPL to reach?

A. No. Many utilities are achieving these levels of savings. The table below reflects examples of what some utilities have been achieving.

Figure 1: Examples of High Annual Electric Energy Savings Realized through Energy Efficiency Programs Since 2000

Jurisdiction or Entity	Annual Savings (Percent)	Year(s)	Source
Interstate Power & Light (MN)	3.0	2001	Garvey, E. 2007. "Minnesota's Demand Efficiency Program."
San Diego Gas & Electric (SDG&E) (CA)	2.1	2005	SDG&E 2006. Energy Efficiency Programs Annual Summary
Minnesota Power	1.9	2005	Garvey, E. 2007
Vermont	1.8	2007	Efficiency Vermont 2008. 2007 Preliminary Results and Savings Estimate Report
Southern California Edison (SCE)	1.7	2005	SCE 2006. Energy Efficiency Annual Report
Pacific Gas & Electric (PG&E) (CA)	1.5	2005	PG&E 2006. Energy Efficiency Programs Annual Summary
Massachusetts Electric Co.	1.3	2005	MECo 2006. 2005 Energy Efficiency Annual Report Revisions
Connecticut IOUs	1.3	2006	CT Energy Conservation Management Board (ECMB). 2007
Cambridge Electric (MA)	1.1	2000	MA DTE 2003.
Seattle City Light (WA)	1.0	2001	Seattle City Light 2006. Energy Conservation Accomplishments: 1977-2005
Western Mass. Electric Co. (MA)	1.0	2000	MA Dept. of Telecommunications & Energy (DTE) 2003. Electric Utility Energy Efficiency Database

Source: Synapse Energy Economics 2008

Additionally, the potential study states that this goal is reachable.

Q. Do you agree with the Company's estimated costs to achieve these levels of savings?

A. No.

Q. Is IPL's assumption on cost of saved energy for energy efficiency measures under both 1.3% scenario and 1.5% scenario reasonable?

A. No.

Q. **Please explain in detail IPL's cost estimates for those scenarios.**

A. Table 1.1 of IPL's plan estimates that a program to achieve 1.3% annual energy savings rate will cost $410 million for the period from 2009 to 2013. Of this $410 million, $144 million is for a demand response portfolio, $30 million is for outreach and education; and $34 million is for renewable energy. Total costs for the energy efficiency portfolio alone are reflected in Table 3.1 of IPL's plan; these are estimated to be $211 million for the 2009 to 2013 period.

However, details of the estimated costs to achieve 1.5% annual energy savings was not provided in IPL's April 23, 2008, filing. Section 1.4 of IPL's energy efficiency plan reflects that based on IPL analysis, cumulative IPL costs to implement a plan to achieve a 1.5% savings level would cost $435 million over the 2009 to 2013 period vs. $236 million for IPL's base case of achieving 1.0% by 2011 and 1.3% savings by 2013.

Q. **Describe the differences between the 1.3% base case and the 1.5% scenario in terms of their effects on electricity demand.**

A. Two graphs are shown below. The first is for IPL's base case of 1.3% annual energy savings (of which 1.0% is achieved from energy efficiency); the second graph is for IPL's 1.5% annual energy savings (of which 1.2% is achieved from energy efficiency). Data reflect IPL's electricity sales forecast, the net effects of energy efficiency measures, a line representing the achievable potential as 43% of economic potential and a line representing the full economic potential of all energy efficiency measures. To create this chart, we assumed the level of savings in 2006 sustained in the following two years (2007 to 2008) because savings data for those years are not available. Assuming that Quantec study estimated efficiency potential as of around 2007, we then estimated cumulative energy savings starting in 2007 through 2013 so as to compare the cumulative savings to the economic potential estimated by Quantec.

The differences between the two graphs are shown through comparing electricity sales for 1.0% annual energy savings v. 1.2%. Electricity sales for 1.2% annual energy savings show a nearly flat line for the period. If IPL's 1.5% annual energy savings actually included 1.5% from energy efficiency, the annual electricity sales would likely be flat if not be decreasing over the period.

Figure 2: Energy Efficiency at 1% in 2013 vs. Economic and Achievable Potential

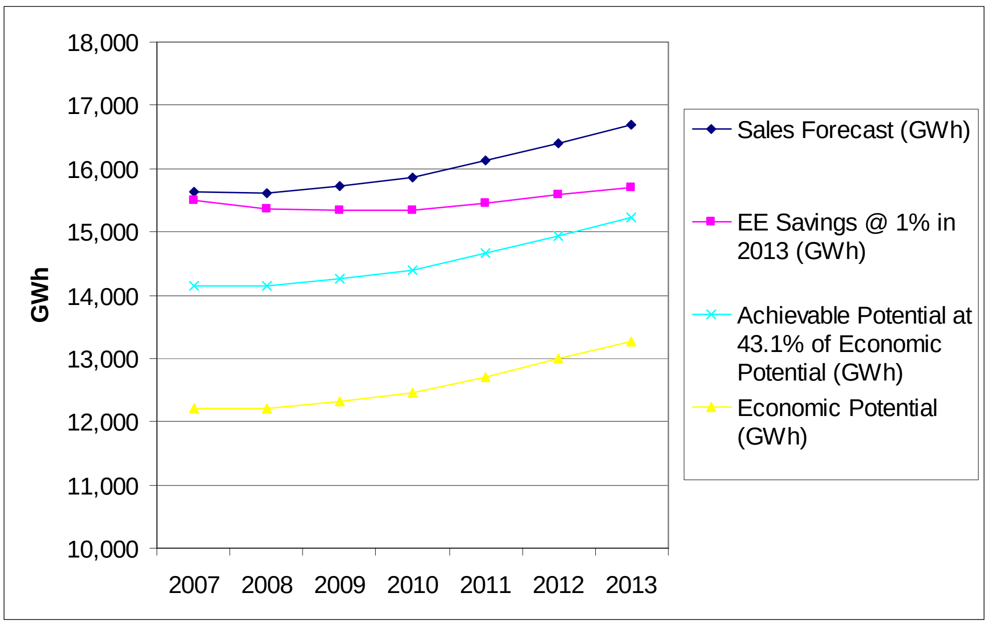

Figure 3: Energy Efficiency at 1.2% in 2013 vs. Economic and Achievable Potential

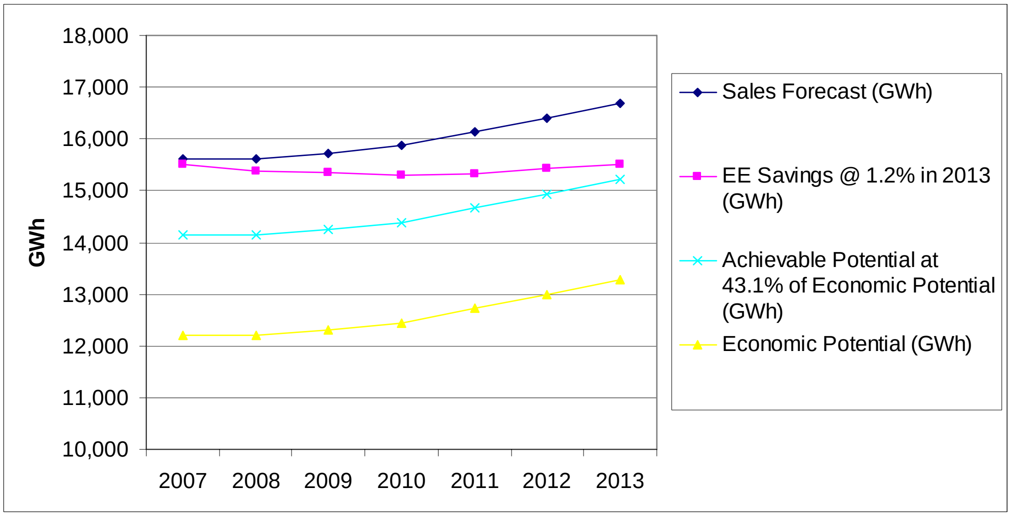

Exhibit B provides the data used for the two graphs above.

Q. What do these two charts describe in terms of the level of energy savings that can be achieved?

A. Quantec conducted a literature of achievable potential studies as compared to economic potential study and found out a wide range of achievable potential, from 30% to 80%. Based on this finding, IPL stated that “attaining 50 percent of economic potential to constitute reasonably achievable savings for a five to ten-year resource acquisition effort” (page 24, first paragraph in IPL’s Energy Efficiency Plan). IPL estimated their 1.0% efficiency target by 2013 in the 1.3% base plan is equal to 43% of economic potential and called it aggressive. However, we estimated that 1% and 1.2% annual savings would result in 29% and 32% of economic potential in 2013 respectively, significantly lower than what IPL claims it could achieve. We provide an explanation of these numbers below as well as in the Exhibit B. Given these findings as well as our research on leading energy efficiency programs elsewhere, we believe IPL could achieve more at low costs.

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Q. Why do you think IPL's description of the costs to implement their energy efficiency programs is not reasonable?

A, These plans are not reasonable because: (1) while IPL explained barriers against efficiency measures in general, it failed to explain the link between those barriers and the difficulty to reach 1.2% from 1% and also it did not provide sufficient reasoning and evidence for the cost increase under the 1.5% scenario (with 1.2% efficiency goal); (2) the Company's reported costs for past efficiency efforts; and (3) the costs and savings other utilities are obtaining.

Q. Please explain why IPL did not provide sufficient reason or evidence for the cost increase and the link between barriers and reaching 1.5% annual energy savings from energy efficiency.

A. IPL has assumed certain factors to escalate the costs of implementing a program that would achieve 1.5% annual energy savings, but has not provided adequate justification. IPL's response to Data Request No. 9 which simply repeats the testimony of IPL witness King's direct testimony at page 13 provided the following cost escalation factors for each program cost category: 15% annually for planning and design, administration, advertising and promotion; 20% annually for incentives; and 5% annually for monitoring and evaluation. IPL has also not provided an analysis or justification for any barriers that would need to be addressed or overcome to achieve 1.5% annual energy savings.

Q. Please explain how IPL's past efficiency programs performed and compare them to IPL's plan.

A. IPL has not provided the levelized costs for each year. We estimated and compared the levelized cost of saved energy and first year energy savings as a percent of sales for three historical years (2004 to 2006). We also estimated the levelized cost of saved energy and first year energy savings for the two efficiency scenarios in the plan based on the IPL's budget and first year savings data we obtained from IPL's filing and Iowa Utilities Board's report on Iowa utilities' demand side management programs.

This calculation is important in order to establish a basis for IPL's energy efficiency program, and to compare these data with the budget estimates that IPL has provided in the company's April 23, 2008, energy efficiency filing, and compared with the experience with energy efficiency programs that have been implemented elsewhere in the United States. The figure indicates that while historically IPL has kept cost of energy efficiency lower as it increases its efficiency program scale, IPL is assuming a totally different cost trend for its future programs. The results are presented in the table and figure below. All the dollar values are converted to the 2009 dollar value using a 2.5% inflation rate as the benefit cost and cost levelization estimates by IPL are also expressed in the 2009 dollar value. To estimate the levelized cost of savings, we assumed a 12 year measure life and a 2.3% real discount rate (which is estimated based on a 4.81% nominal discount rate and a 2.5% nominal inflation rate). A 4.81% discount rate is the value used by IPL for the societal cost test. We used a 12 year measure life because it has been has been recognized as a rule of thumb estimate by industry experts including U.S. Department of Energy and Environmental Protection Agency[1] as well as the American Council for Energy Efficient Economy that the cost of saved energy will be higher for the period from 2009-2013 than it was for the period 2004-2006. IPL has also not provided justification for the escalation factors it used (per IPL witness King at page 13 of her direct testimony). IPL's

[1] [DOE and EPA] U.S. Department of Energy and U.S. Environmental Protection Agency. 2006. *National Action Plan For Energy Efficiency*. Washington, DC: U.S. Department of Energy and U.S. Environmental Protection Agency; Kushler, M., D. York, and P. Witte. 2005. *Examining the Potential for Energy Efficiency to Help Address the Natural Gas Crisis in the Midwest*: Washington, DC: American Council for an Energy Efficient Economy, 2005; Bender, S., M. Messenger, and C. Rogers. 2005. *Funding and Savings for Energy Efficiency Programs for Program Years 2000 through 2004.* Sacramento, CA: California Energy Commission.

April 23, 2008 energy efficiency filing reflects a significant increase in the cost of saved energy for its future energy efficiency program; IPL has not justified the bases for this increase or the difference in trends for the cost of saved energy in the past (2004-2006) v. that estimated for the future (2009-2013).

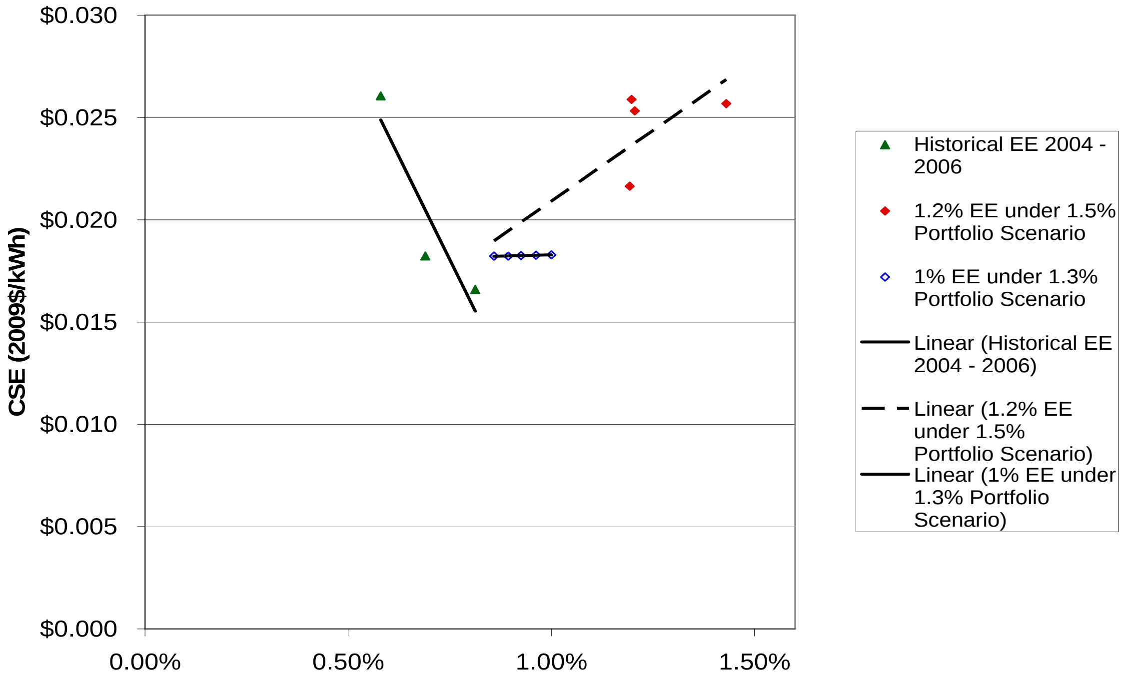
Figure 4: IPL Historical EE Savings, Spending and Cost of Saved Energy

IPL Historical EE Savings, Spending and Cost of Saved[2] Energy

	2004	2005	2006
First Year Savings (MWh)	82,625	103,634	120,542
Spending (nominal$)	19,958,293	18,077,576	19,749,409
Spending (2009$)	22,925,571	20,114,243	21,302,853
Sales (MWh)	14245634	15019361	14829537
Savings as % of Sales	0.58%	0.69%	0.8%
First Year Cost/Annual Savings (nominal$/kWh)	0.24	0.17	0.16
Levelized Cost @ 12 year life (nominal$/kWh)	$0.026	$0.019	$0.017
First Year Cost/Annual Savings (2009$/kWh)	$0.28	$0.19	$0.18
Levelized Cost @ 12 year life (2009$/kWh)	$0.026	$0.018	$0.017

[2] Historical sales data are obtained from U.S. EIA's Form 861 database. Savings as % of sales for 2004 and 2005 are taken from Figure 1.1 in IPL's Energy Efficiency Plan, and savings for 2006 are taken from Iowa Utilities Board 2008. The Status of Energy Efficiency Programs in Iowa and the 2007 Iowa Residential Energy Survey Report to the Iowa General Assembly January 1, 2008

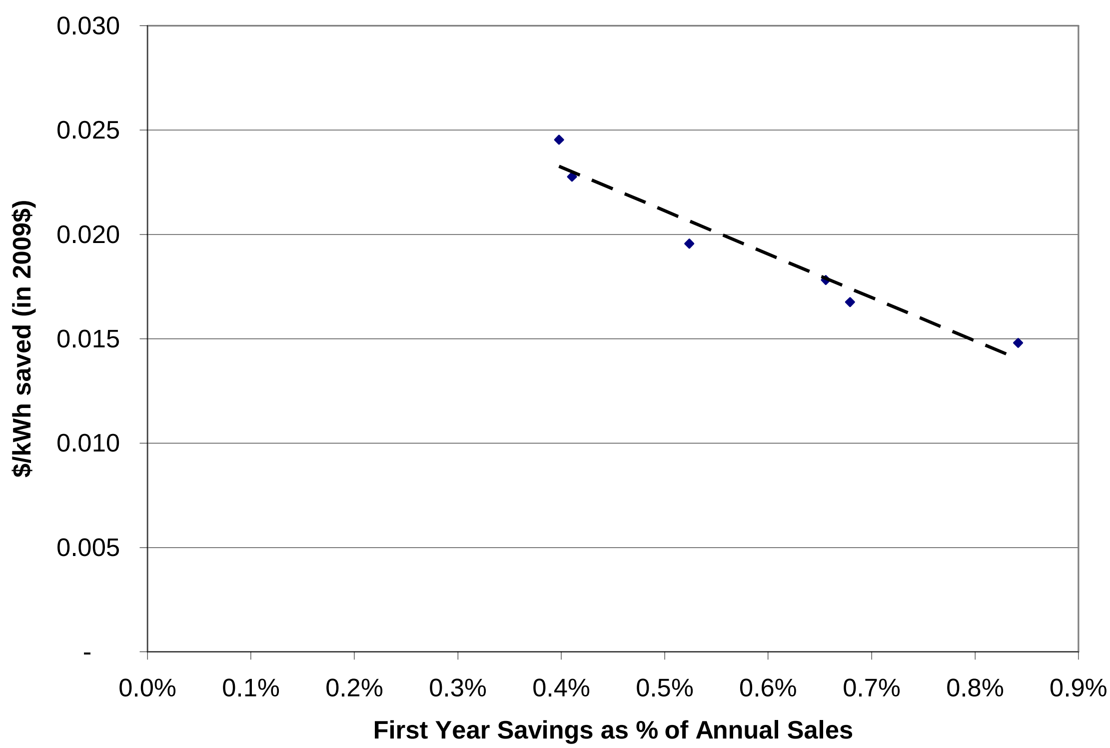
Figure 5: Historical and Projected Costs of Energy Efficiency Programs for IPL L



The x-axis reflects IPL's data on annual energy savings. The y-axis provides the cost of saved energy. The green triangles on the left side of the graph show that for 2004-06, IPL achieved annual energy savings of 0.58 to 0.8% with a cost of saved energy that declined from $0.026/kWh to $0.017/kWh as the level of annual savings increased. By comparison, IPL's April 23, 2008, cost estimates for energy efficiency submitted to the IUB shown by the red triangles on the right side of the graph, reflect a totally different set of costs and annual energy savings. For 2009-2013, IPL's data reflects that its cost of saved energy would increase each year, as annual energy savings increase.

Even if we look at the historical cost trend for both IPL and MidAmerican for a longer period of time, we identified a declining cost trend curve. Our analysis is presented below. The data represents the aggregated cost and savings by IPL and MidAmerican from 2001 to 2006, and obtained from Iowa Utilities Board 2008: The Status of Energy Efficiency Programs in Iowa and the 2007 Iowa Residential Energy Survey Report to the Iowa General Assembly January 1, 2008.

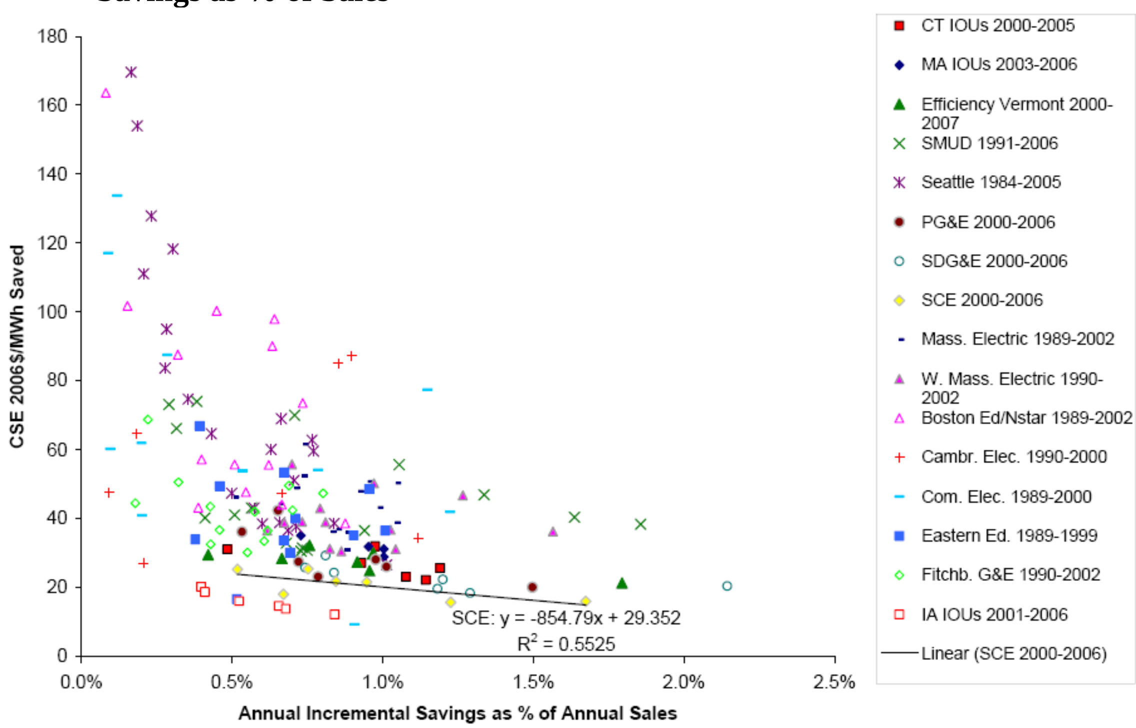
Figure 6: Historical Costs of Energy Efficiency Programs for Iowa IOUs



Q. What is the experience with levelized cost of saved energy and program scale for of other utilities' efficiency programs?

A. Synapse has collected data on utility cost and savings for a large number of utilities and states to examine the empirical relationship between cost of saved energy and scale of efficiency programs. Figure 7 below is part of the results of the study, attached as Exhibit C. Each data point represents first year energy savings and annual utility spending for one year by one utility, a group of utilities or a program administrator. There are over 160 data points stretching from the1980s to 2007 grouped into 16 data sets, each of which represents a utility, a group of a utility, or a program administrator. The study fit linear regression trend curves for each dataset and found out that each dataset has a negative slope coefficient, meaning that the costs were lower when the program scales are larger. Further, the study found that programs that are achieving 1% or higher experienced lower per unit cost as the program scale increased.

Figure 7: Utility Cost of Saved Energy (2006$/MWh) vs. Incremental Annual Savings as % of Sales



The study concluded that:

> A key result is that, among all of the datasets that we have collected, all of the slope coefficients of the linear trend lines are negative. This strongly suggests that per-unit cost of energy efficiency (EE) decreases as the

amount of EE savings increases. It is important to emphasize that this finding contradicts the generally accepted theory that costs of EE increase when EE savings amounts increase. The fact that the coefficient is negative in every case is particularly striking. While there exists a possibility that unit costs might begin to increase at much higher levels of EE program savings, this evidence suggests that current program savings levels have not yet approached any such point.

The study points out the following reasons for this negative cost trend in the past: "(1) economies of scale are at work (e.g., allocating marketing and administration costs over more EE savings, achieving lower unit costs for program inputs); (2) economies of scope are at work (e.g., exploiting synergies among different measures); (3) administrators become smarter and more organized in designing and developing EE programs; or (4) administrators have more credibility or more resources available for quality program design and development, etc."

Q. Why is information about the cost of saved energy and the levelized costs important?

A. The cost of saved energy is important to determine the efficacy of energy efficiency programs, to compare these costs with the costs of building a new generating plant or upgrading an existing plant and to compare with the costs of operating an existing plant. The costs of saved energy are also useful to compare with information on electricity rates by customer class. The levelized costs of energy efficiency are also useful to compare against the levelized costs of a proposed new generating plant.

Q. What is the cost of saved energy for the economic potential for each customer class in the Quantec report?

A. The table below summarizes the results from the Quantec report. Note that "the study was based solely on incremental costs of identified measures, including only direct capital and installation labor costs." (Quantec et al. 2008, page 20) In other words, while these estimates include participants' contribution to purchasing efficient measures, they do not include costs associated with program administration, planning, marketing, and measurement and verification. The cost of saved energy analysis we presented above includes all of the program costs listed above, but does not include participants' costs.

Figure 8: Cost of Saved Energy from Quantec report

Sector	**Average Levelized Cost**
Residential	$0.04
Commercial	$0.03
Industrial	$0.01
Total	$0.03

Q. How do these costs compared to the cost of new generation and existing generation?

A. New coal and natural gas fueled plant costs have been in a range of 8-11cents /kWh (on a levelized basis). No new nuclear plants have been constructed in the US, but a recent report by the Keystone Foundation (Exhibit D) estimates costs in a similar range to those of new coal. Fuel costs have also escalated significantly in the last three years, and remain much higher than 2005 in spite of the recent decrease in oil prices. Natural gas fuel prices of $10/ MMBtu equate to approximately 10 cents/kWh just for the fuel costs. According to recently published EIA data, Exhibit E, prices of Appalachian coal have more than doubled since January 2007.

http://www.eia.doe.gov/cneaf/coal/page/coalnews/coalmar.html#spot

EIA data does not reflect price increases for Powder River Basin (PRB) coal, but the delivered cost for PRB coal has increased significantly due to increased fuel costs. The factors contributing to these escalating costs are not expected to be temporary.

Q. What is the relevance of the cost of new and existing generation compared to that for the cost of energy efficiency programs included in IPL's filing?

A. IPL's filing reflects levelized costs for implementing energy efficiency programs in their 1.3% base case of 5 cents/kWh for the residential portfolio and 4 cents/kWh for the non-residential portfolio. For the IPL 1.5% scenario, the relevant levelized costs are 6 cents/kWh for the residential portfolio and 4 cents/kWh for the non-residential portfolio. As stated above, we believe IPL has overestimated these costs because the company has not justified the bases for the cost escalation factors it used to scale up the annual level of savings through energy efficiency, and the bases for the company's high program administration and marketing costs for some of their proposed measures. . Projected costs are also inconsistent with the costs of the programs that IPL has implemented recently, IPL's 2004 to 2006 programs achieved energy efficiency savings at levelized costs of less than 2 cents/kWh. The current and expected future escalation in the cost of new plant construction, and the continued high and volatile costs associated with the operation of existing plants creates significant headroom to implement energy efficiency measures. We believe, based on extensive data analysis of comparable programs, that IPL can achieve much greater annual energy savings at lower costs than their filed plan. The high cost to construct and operate generation creates even more opportunities to capture all cost-effective energy efficiency.

Q. What are your initial conclusions with respect to IPL's energy efficiency plan?

A. IPL has underestimated the amount of energy efficiency savings that can be achieved, and has overstated the costs to achieve these savings. IPL has not adequately addressed barriers to achieve annual energy savings of 1.5%. We believe that IPL can achieve annual energy savings of 1.5% or more at lower costs than IPL has estimated. IPL would likely also benefit from working with other Iowa utilities, such as MidAmerican and Aquila to develop one comprehensive state-wide program. This approach would take advantage of economies of scale to implement energy efficiency measures, reduce advertising, marketing and promotion budgets, implement a consistent program across the state that minimizes consumer confusion, and provide greater opt-in opportunities for municipal utilities and cooperatives.

3. ADDITIONAL ENERGY, ECONOMIC, ENVIRONMENTAL AND PUBLIC HEALTH BENEFITS OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

Q. Does the IPL energy efficiency filing provide an estimate of the energy and capacity benefits associated with implementation of IPL's proposed energy efficiency program?

A. Yes, table 1.1 of IPL's filing (page 4) provides estimates of energy and capacity savings for the company's 1.3% base case.

Q. Are there other benefits associated with implementation of an energy efficiency program?

A. Yes.

Q. Please describe them.

A. Energy efficiency measures have direct and indirect benefits in the energy, economic, environmental and public health components. For the energy component, energy efficiency provides measurable and quantifiable energy and capacity benefits. Energy efficiency can be procured as a resource at costs that are one-third to one-half those associated with the construction of new generating plants, and less than the costs of existing generating plants. Energy efficiency can provide these benefits at peak and base load time periods depending upon the measures being implemented.

Energy efficiency also defers and avoids the need to upgrade existing or install new transmission capacity.

The economic benefits of energy efficiency, in addition to those embedded above related to the cost of new generation and transmission systems, include reduction in consumers' energy bills, and increasing local and regional economic growth through jobs that are created to install, service and maintain energy efficiency measures. These jobs are skilled labor, and cannot be outsourced to another country. Reducing consumers' energy bills puts more money in their pockets, rather than exporting it outside of the US or outside the state to pay for the costs of fossil fuels and the infrastructure needed to protect, secure and transport these fuels.

Energy efficiency measures further provide several environmental benefits, including reductions in criteria air pollutants, such as those that contribute to acid rain and smog, mercury, and greenhouse gases. Energy efficiency also reduces water consumption and improves water quality. By avoiding the need to construct new power plants, energy efficiency also reduces the thermal discharge and water consumption associated with the operation of fossil fuel and nuclear power plants.

The public health benefits from energy efficiency are beginning to be evaluated and characterized. The US Environmental Protection Agency has developed a tool called COBRA (for Co-Benefits Risk Assessment) that can calculate the estimated public health benefits from reducing energy consumption. These benefits include avoided asthma cases, reduced visits to hospital emergency rooms, reduced number of sick days, etc. Exhibit F provides a paper by Jonathan Levy, Yurika Nishioka and John Spengler (all Department of Environmental Health, Harvard School of Public Health) "The Public Health Benefits of Insulation Retrofits in Existing Housing in the United States", Environmental Health: A Global Access Science Source, 2003, estimated that improved insulation in the US would save significant quantity of energy, reduce air emissions, and improve public health, including fewer deaths and asthma attacks.

4. IPL HAS NOT ADEQUATELY CONSIDERED THE CURRENT AND FUTURE RISK OF COAL-FIRED COMBUSTION AND HOW ENERGY EFFICIENCY WOULD MITIGATE THESE RISKS

Q. The IUB January 14, 2008 Order directed IPL to include the effect of a national carbon dioxide cap and trade system or a carbon tax into the company's analysis of future supply options and avoided costs. Please describe IPL's approach to accounting for future regulation of greenhouse gases.

A. IPL witness Kimberly King, at page 10 of her direct testimony, stated that IPL included a low carbon price of $8/ton starting in 2010 and escalating 5.8% annually, to reach a price of $14/ton by 2020. A high carbon price of $15/ton was assumed for 2010, escalating at a rate of 8.5% annually, to reach a price of $34/ton in 2020. Witness King also indicated, at pages 12-13 of her direct testimony, that implementation of a national program to reduce greenhouse gas emissions would be expected to increase their avoided energy costs, would modestly increase the economic potential of energy efficiency measures, but would make no difference in the number of measures included in its energy efficiency filing.

Q. Has Synapse conducted any analysis of the price of carbon?

A. Yes.

Q. Please describe this analysis.

A. Synapse's "Climate Change and Power: Carbon Dioxide Costs and Electricity Resource Planning" (Exhibit G) includes a price forecast for carbon based upon our review of various Congressional legislation being considered and the modeling that has been completed by EPA , MIT and others in support of that legislation. Synapse's report includes a low, medium and high price forecast for carbon for the period from 2010 to 2030.

Q. How does IPL's carbon price compare with those in the Synapse report?

A. IPL's low and high carbon price estimates are in the range of the Synapse price forecast.

Q. Do you agree with IPL's analysis regarding the effects of placing a price on generation based on its greenhouse gas emissions?

A. I agree in part, that the avoided energy costs will increase as a result, but I disagree with IPL's assessment that the increase in avoided energy costs will not increase the economic potential for energy efficiency measures, and thus not increase the amount of annual energy savings that could be achieved.

Q. Please explain.

A. IPL's estimates that applying their high carbon price estimate will increase avoided energy costs from 7.1 cents/kWh to 9.4 cents/kWh (see page 11 of IPL witness King's direct testimony), or about 32% over the period from 2009 to 2018. This increase means that energy efficiency and renewable energy measures that are not considered cost-effective today will likely to be much more cost-effective when a price for carbon is included. As explained above, current energy efficiency programs are achieving savings equal to 1-1.5% annually at a cost of saved energy of 3-3.5 cents/kWh. As also noted, these costs are much less than the costs of new generation, but may not be significantly less than the current cost of avoided energy, depending upon what assumptions a particular utility is using. Increasing the cost of avoided energy from 7.1 to 9.4 cents/kWh, as IPL notes, will create significant headroom for additional and significant energy efficiency measures to be deployed. For example, measures that today may be discarded due to a cost of saved energy of 5 cents/kWh, such as many residential program measures, become cost effective when the avoided energy costs are at the levels IPL has included in their carbon price estimates. IPL's filing indicates that they have included the future price of carbon into their analysis of potential energy efficiency measures that might become more cost-effective under a scenario where greenhouse gas emissions are capped, and a price is associated with each ton of greenhouse gases emitted. However, IPL has not provided information about how a future price on carbon was factored into the company's analysis, and their conclusion that placing a price on carbon will not affect the ability to capture more cost-effective energy efficiency is not justified.

Q. What are the effects of IPL's analysis of greenhouse gas regulations and establishing a price for carbon on their energy efficiency filing?

A. IPL and the Quantec report understate the amount of energy efficiency that could be achieved when greenhouse gas emissions are regulated, at either a state or national level. IPL has not adequately explained the basis for their conclusion that no new energy efficiency measures would be revealed when the cost of avoided energy increases 32%.

Q. Describe the current and future risks of coal-fired combustion.

A. Current risks from coal-fired combustion include air and water quality impacts. Coal-fired combustion emits criteria air pollutants, such as those that contribute to acid rain (oxides of nitrogen and sulfur oxides), regional haze and visibility impairment (fine particulate, sulfates and nitrates), and greenhouse gases, that contribute to global warming. The substantial quantity of cooling water needed for plant operations often requires that coal plants are located along rivers and water courses. The quantity of water needed for cooling and the temperature of the water discharged back into the river can create impacts to local streams and rivers. Additional current and future risks associated with coal-fired combustion include:

- Increased cost of construction due to escalations in materials used in the construction of power plants, the energy required to extract and refine those materials, and substantial increases in the labor rates to design and construct these plants. The cost of the fuels used in power plants has also increased significantly. While oil and natural gas prices have increased by factors of two or three over the last few years, coal prices have not been immune to these effects. Coal sourced from Appalachia has nearly doubled since the beginning of 2007 (according to EIA data). Powder River Basin coal prices have remained relatively constant, but the transportation costs have increased significantly due to increased fuel costs. Powder River Basin coal prices are also expected to increase due to global demand for coal.
- State and Federal actions to reduce emissions that cause or contribute to global warming will require significant reductions in greenhouse gas emissions. The plans adopted and legislation enacted mean that the intensity and quantity of greenhouse gases will place additional costs on the operation of plants that emit such gases. Since coal plants emit higher quantities per MWh than other fuels used for combustion, the effect will be to make coal plant operation more expensive.

- The effects of climate change are expected to include increased frequency of extreme weather patterns, including higher intensity precipitation events, as well as heat waves and droughts. Long-term planning based on past historical climate records has become an imprecise and imprudent means by which to consider future risks. Municipal, state and federal agencies are realizing that terms such as "100 year floods" are meaningless when such events occur once every decade, or even more frequently.

Q. Does IPL's energy efficiency plan include an analysis of the current and future risks discussed above?

A. IPL's plan includes a discussion related to the company's expectation that greenhouse gas emissions will be regulated in the future, and that this regulation will result in a price, or adder, being placed on the combustion of fossil-fuels related to its carbon intensity and/or quantity of emissions.

Q. How can energy efficiency reduce the risks associated with coal-fired generation?

A. Energy efficiency is the most cost-effective resource today. We believe that IPL can achieve annual energy savings levels of 1.5% or even greater, based upon what we know they have achieved in the recent past, what is being achieved by utilities in other parts of the United States, and what we know about the ability to implement further energy efficiency measures in the future. Achieving this level of annual energy savings will avoid the need to build and operate expensive new generating capacity and to pay for the costs of the greenhouse gases emitted from this plant. The high costs associated with construction and operation of new generation, and those to pay for the price of carbon for each ton of emissions would be borne by Iowa's ratepayers. Also, implementing an effective energy efficiency program could make Iowa eligible for additional allowances under a national program to cap and reduce greenhouse gases. The Lieberman-Warner bill for example included a provision that would provide an additional 2% of allowances to states that have implemented effective energy efficiency programs. With each allowance estimated to have a value of $11-20/ton initially, this amount of funding could help Iowa to achieve even more annual energy savings without requiring additional ratepayer funds. Energy efficiency therefore avoids and mitigates the economic risks associated with new generation; helps to reduce the risk of additional global warming from increased emissions of greenhouse gases, and could make Iowa eligible for additional economic benefits when national legislation to reduce greenhouse gases is enacted.

5. IPL CAN ACHIEVE ANNUAL ENERGY SAVINGS OF 1.5% OR GREATER THROUGH STRATEGIC AND SUSTAINED PROGRAM PLANNING, COMBINED HEAT AND POWER (CHP), DEMAND RESPONSE AND CLEAN DISTRIBUTED GENERATION

Q. Could IPL achieve more than 1.5% annual energy savings?

A. Yes.

Q. Please describe how these higher annual energy savings levels could be achieved?

A. IPL could achieve higher annual energy savings than is provided in their filing by:

1. Working with other Iowa utilities to develop a statewide energy efficiency plan. This will reduce program, administration, marketing and measurement and verification expenses and allow these dollars to be transferred to incentives that can directly be invested to improving the amount of annual energy savings.

2. Move the demand response program to a utility funded effort. The chief benefits of demand response are to reducing peak demand and hourly energy prices. IPL has not justified why it needs to spend more on demand response then it proposes to spend on residential or non-residential energy efficiency programs, both of which provide for annual energy savings.

3. Complete a comprehensive plan that integrates energy efficiency measures across customer classes and economic sectors. Many of IPL's energy efficiency measures appear to be disparate and not well connected with other measures. The whole house program, explained in more detail below, is one such example.

Q. IPL witness Kimberly King described at pages 5 and 6 of her direct testimony IPL's plan to focus on what is referred to as a "whole house" or "whole building" approach to energy efficiency. What are the benefits of this approach?

A. There are several benefits. For existing homes or buildings, an audit of a premises and its components often reveals multiple components where the efficiency of the energy used in the structure can be improved. These include not only traditional measures to improve the efficiency of lighting and motors but also the HVAC system, boilers, day lighting etc. If the program is able to evaluate the performance of the entire building, a comprehensive approach can be implemented to improve that buildings energy use. For example, during an audit, the company may learn that the building has an older an inefficient boiler. A whole building approach would identify this inefficient boiler as one item needing attention, and would be part of the recommended measures that could be implemented to reduce energy consumption. When the recommended energy efficiency measures are completed, this will reduce the overall energy consumption of the structure, and a smaller boiler can be installed to service to lower building consumption. This approach therefore amplifies the amount of savings that can accrue. First, the direct reduction in consumption through the improved energy efficiency measures. Second, the smaller boiler has a lower capital cost than one that would have been a direct replacement. Third, the smaller and new boiler is more efficient than the older one and has lower fuel costs. Fourth, by sizing the boiler appropriately for the load, it operates more efficiently, meaning less maintenance is required. Fifth, other benefits from this approach include reduced air pollution. These increased benefits are additive and cumulative, and provide energy savings at lower costs, thus increasing the overall benefit/cost ratio of the portfolio.

Absent a whole building approach, the recommended measures to improve electric efficiency at a building would be installed, but the boiler would now be oversized for the new and lower load demanded. This mismatch can lead to comfort problems (i.e. the building is too hot or too cool since the boiler has a certain operating range at which it is most efficient), and to maintenance problems for the boiler (if it is run to maintain the same level of comfort for the new lower load, it will tend to operate at the lowest end of its range).

Q. Does IPL's energy efficiency filing indicate how IPL will implement the "whole house" approach?

A. No. While IPL witness King describes this new approach in her direct testimony, there is no evidence in IPL's filing that IPL has considered adopting and implementing this approach in their 2009 to 2013 plan. Table 4.10 of IPL's filing includes a new program entitled "Home Performance with Energy Star." This program would begin with 25 homes in 2010 and increase to 100 by 2013. Half of IPL's budget for this program is for advertising and promotion, with less than 5% of the budget for incentives. IPL has not adequately provided information about the design and implementation of this program, nor provided justification for the high percentage of budget being spent on advertising, for what is a very modest program design. Robert Denk, of the National Association of Homebuilders, was quoted in the Des Moines Register in December 2006 that about 10,000 new homes are built in Iowa each year. While IPL's service territory includes only a portion of the entire state, IPL's proposed whole house program of 25 or 100 homes a year does not even begin to address the potential energy savings that could be achieved if homes were designed and constructed as efficiently as possible from the beginning. This is a very important point. Homes and buildings are expensive assets, compared to automobiles for example. Homes are designed to last for decades, if not longer. Designing and constructing homes and buildings as efficiently as possible from the beginning ensures that their energy performance will persist over the life of the structure. While the initial costs to design and construct the most efficient home possible may be slightly higher than a "conventional" home, the energy savings from the more efficient structure accrue from the beginning and more than pay off any differential. Recent research performed for the Green Building Institute also indicates that the differential capital costs to build a highly efficient structure are modest, 2-3%. The second important point related to "doing it right the first time" is that retrofitting energy efficiency measures after the structure is completed are more expensive and difficult, and may only be able to focus on incremental savings, such as lighting, missing the opportunities to achieve significant savings. I attempted to learn additional details about IPL's whole house program, its design and its implementation. IPL's responses to these two separate data requests do not provide an adequate explanation for the questions asked.

Q. Are there any other IPL programs that have design flaws?

A. Each of the program areas IPL has included in is energy efficiency filing are important parts of any energy efficiency program. However, IPL does not appear to have adequately considered the synergistic effects of energy efficiency, demand response and renewable energy. Applying all cost-effective energy efficiency measures first for example reduces building energy consumption, such that the scale and costs of a customer side wind turbine, solar thermal or solar PV are appropriately aligned with the building load. Reducing building energy demand also reduces base energy consumption and can amplify the benefits of a demand response program. The benefits of IPL spending $124 million on non-residential demand response are uncertain, and IPL has not adequately explained how their program would produce the anticipated level of energy and capacity savings IPL's energy efficiency appears to be a collection of various disparate measures whose sum total produces a certain level of annual energy savings rather than a constructive thoughtful plan that rapidly ramps up penetration of cost-effective measures, integrates lessons from other states and from pilot programs, and captures the complementary benefits of demand response and renewable generation .

Q. What other programs are included in IPL's energy efficiency filing?

A. IPL's filing includes a description of a demand response and a renewable energy program.

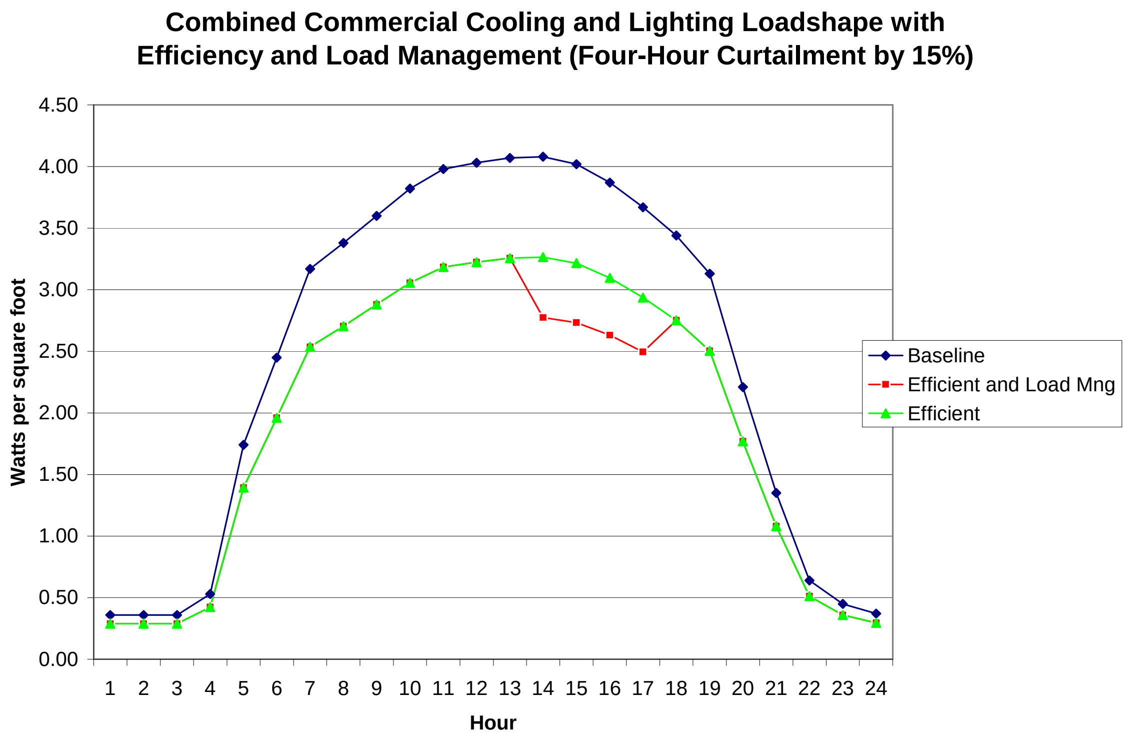
Q. Please describe the demand response program.

A. IPL's filing, table 1.1, page 4, for their base case, proposes to spend $144 million from 2009 to 2013 on a two-component demand response portfolio. The first is a residential, direct load control measure where customer's air conditioners are remotely cycled on and off during periods of peak electricity demand. The second is a load curtailment measure focused on non-residential customers that is linked to locational marginal pricing criteria for Iowa load zones and coordinated with MISO. My review of IPL's budget reflects that the company is placing more emphasis on demand response, i.e. reducing peak demand, than on energy efficiency. The cost of IPL's proposed demand response program is $33 million greater than the amount IPL proposes to spend on non-residential energy efficiency programs and $44 million greater than the amount proposed to be spent on residential programs. Demand response is an effective means to reduce peak electric demand, but it does not help to defer the need to build new base-loaded generation, and it does not reduce greenhouse gas emissions. Depending upon the program, if customers who are interrupted (as proposed by IPL's program) turn on their back-up generators to provide electricity, greenhouse gas and other emissions can actually increase, since these back-up generators emit more pollutants per MWh than large generators. One area that IPL could focus on in its renewable energy program would be to apply incentives to increase the role of renewable energy to provide for back up generation, including installation of batteries for storage.

Q. Could demand response play a role in conjunction with an energy efficiency program?

A. An effective demand response program can reduce electricity during peak demand periods when prices are at their highest. In so doing, the hourly electricity prices in a load zone can be decreased. Customers participating in demand response program benefit directly by receiving payments for their participation, and indirectly by the reduced hourly prices that benefit all customers. As demonstrated by the New England Demand Response Initiative (NEDRI), effective demand response programs operated in conjunction with good energy efficiency programs can significantly reduce peak electricity demand, as shown in the figure below, reflecting results from a commercial office building. Note that the emphasis is to first reduce energy demand through energy efficiency, then to consider how a demand response program could provide additional economic benefits at times of peak electricity demand:

Figure 9: Combined Commercial Cooling and Lighting Loadshape with Efficiency and Load Management



Source NEDRI Framing Paper number 4, Energy Efficiency, May 2002, Jeff Schlegel.

Q. Would IPL's demand response program provide these same benefits?

A. It is unlikely, and IPL does not indicate its filings how it would integrate energy efficiency with a demand response program. IPL's filing also does not provide information on customer side responsibilities. For example, if a load is interrupted, are customers allowed to switch to back-up generators. IPL's residential program cycles home air conditioners off and on every 15 minutes over a period a several hours. The benefits of this are uncertain. Typical demand response programs applied at the residential level remotely control customer air conditioners for several hours at a time. The amount of demand curtailed is known, measurable and predictable. Cycling units on the frequency in IPL's plan would not appear to achieve any peak benefits. Load would drop for 15 minutes, then increase again, and during a period when electricity demand is already high (otherwise, IPL would not be directly controlling customer air conditioners). Likewise, for the non-residential program, it is unclear if IPL has completed any strategic planning to guide effective implementation of a demand response program.

Q. Describe IPL's residential renewable energy program.

A. IPL's filing proposes to implement a new renewable energy portfolio which includes customer education and customer owned generation. IPL's proposed renewable generation portfolio includes small scale wind, PV, hydro and geothermal resources. In 2009, IPL's plan proposes one wind, two solar water heaters and three solar PV installations, ramping up to 20, 75, and 75 such installations respectively by 2013.

Q. Describe the potential effectiveness of IPL's residential renewable energy portfolio.

A. IPL's program is timid at best. Solar water heater and solar PV technologies are mature now, and more rapid deployment will lead to further economies of scale and reduction of costs. Small scale wind technologies are also becoming cost effective and competitive with the cost of conventional fossil-fuel generation technologies. Table 8.2 of IPL's filing (page 153) reflects that IPL proposes to spend $2.4 million of the total $8.847 million (or 27%) of direct utility costs on planning, program administration and advertising. IPL has not provided adequate justification for these costs. IPL could amplify the benefits of its renewable energy program by ensuring that the customer first applies all cost-effective energy efficiency measures. This will better align the size of the renewable energy generators with the building's load. Including passive solar design elements in new and modified buildings can also reduce demand. Finally, incorporating renewable energy elements into IPL's "whole house" program would help to provide significant energy and capacity benefits.

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Q. Describe IPL's non-residential renewable energy portfolio and its effectiveness.

A. IPL's non-residential renewable energy portfolio includes the same elements as the residential portfolio, but with an emphasis on geothermal heat pumps, and inclusion of one biomass digester per year starting in 2012. The non-residential portfolio is also timid, and would benefit from the same type of program planning and integration as I described above for the residential portfolio.

Q. What other programs should be included in IPL's filing?

A. Combined heat and power (CHP) would make an excellent addition to IPL's filing. CHP is an integrated approach to providing for energy and capacity at the customer location. The customer's electricity demand is matched with that of clean generation, and the waste heat from the generation is used on-site for heating, cooling and process loads. A customer's electricity demand should first be reduced by installing all cost-effective energy efficiency measures. This approach will reduce the size of the generation needed, and help to better utilize the thermal benefits from CHP on-site. IPL's filing indicates that the majority of their expected load growth would be from the industrial and commercial sectors, which are both prime applications for CHP.

6. RECOMMENDATIONS

Q. Do you have particular recommendations for IPL that would improve their energy efficiency plan?

A. Yes. Overall, IPL's proposal appears to be simply a collection of different measures without any indication of how various programs could be coordinated and integrated with each other. IPL's filing does not provide any indication of a systemic, sustained and strategic plan that captures all cost-effective energy efficiency and deliberately plans for the deployment of new measures and technologies. IPL's own data reflects that they are currently achieving energy savings at a cost of saved energy of less than 2 cents/kWh. This points to the significant amount of energy savings available, at costs that are much less than the cost of new and existing generation. IPL's plan should be one that is strategic, sustained and includes a portfolio of demand side resources. While IPL's plan contains a number of good elements, they don't appear to be well integrated and coordinated. It's almost as if someone decided that, for example, IPL should have a "whole house" program. And, decided that 25 houses was a good number without first thinking about what a good business model might be, and developing program measures organically through planning. There are many excellent examples of energy efficiency programs operating in the United States today, and IPL could learn from the lessons of these programs, build upon them, and achieve the savings levels, and more, as ordered by the IUB. IPL's plan could provide significant and cost-effective savings for Iowa's ratepayers. IPL should recognize the benefits from a portfolio of integrated demand side resources, in conjunction with deployment of clean distributed and renewable generation at the customer level. The Quantec report found significant potential for energy efficiency in each customer class. Per table 2.11 of IPL's filing, the quantity of the economic potential, 678 MW, exceeds that of the proposed capacity of Sutherland Generating Station #4. The levelized costs to achieve this quantity of energy efficiency, at 5, 3 and 1 cents/kWh respectively for residential , commercial and industrial customer classes, are much less than the costs of constructing new generation. Based on Synapse's experience, a provided for in Exhibit C, we have not yet seen a correlation between increasing levels of energy efficiency savings and increasing costs. A prudent energy efficiency program should be capable of achieving all cost-effective energy efficiency at levels much lower than the 5 cents/kWh residential costs included in IPL's filing. For example, many of the programs we reviewed are achieving savings in the range of 1-1.5% of sales at costs of 3-3.5 cents/kWh. The benefits of energy efficiency are also cumulative over time. IPL has not adequately provided an explanation of why the quantity of energy efficiency included in the Quantec report cannot be achieved. IPL's program cost estimates in their filing for the difference between achieving 1.3 and 1.5% of annual sales are not adequately explained, and appear to be overstated.

IPL’s demand response program would benefit from the same level of sustained strategic thinking recommended above for their energy efficiency program. IPL’s filing for this program maintains the same number of participants at 154 throughout the 2009-2013 period. A strategic and thoughtful program design, coupled with effective implementation would be capable of increasing participant levels and savings. IPL should be required to complete a demand response potential study, and then implement the recommended findings, to better integrate demand response into IPL’s resource portfolio.

On the generation side, IPL’s plan has not considered the benefits, both from on-site generation and increased energy efficiency, from combined heat and power (CHP). IPL’s filing indicates that industrial and commercial loads are driving a significant portion of load growth in their forecasts. These sectors are excellent candidates for a focused effort to reduce energy consumption and to install CHP. IPL’s filing estimates that implementing energy efficiency programs for these sectors would cost 3 cents/kWh for commercial and 1 cent/kWh for industrial customer classes. Applying all cost-effective energy efficiency first, then installing CHP where appropriate would offset this expected load growth, increase the reliability of supply, and provide a cost-effective means for these sectors to procure their energy independence. IPL should be required to complete a study of the potential for CHP in Iowa, and then to implement the recommendations of this study to take full advantage of the cost effective CHP benefits.

For renewables, IPL would again benefit from the same type of programmatic planning that is recommended above for energy efficiency and demand response. IPL's filing has established a basis on which improvements can occur. The level of incentives IPL proposes is in the range of those implemented in other states. But, IPL can improve upon the quantity of installations. Per IPL's table 8.2, one wind turbine, two solar water heaters and three solar PV installations would be completed in 2009, ramping up to five, ten and ten such installations, respectively in 2010. These are mature technologies. IPL has not adequately justified or explained barriers to more aggressive penetration that would be capable of achieving much greater levels of generation. IPL should also look at other business models that have been used to substantially increase the amount of renewable generation without requiring additional ratepayer investments, such as the Sun Edison model. This model links a PV developer with a business, essentially leasing their rooftop to provide for long-term renewable generation.

In conclusion, my recommendations to the IUB are:

- Require IPL to revise, adjust and resubmit an energy efficiency plan that complies with the IUB January 14, 2008, Order to achieve a level of 1.5% annual energy savings through energy efficiency measures alone by 2011, continuing through 2013 (energy savings from demand response and renewable energy would be in addition to these benefits.

- IUB should require IPL to revamp its "whole house" program, and submit a revised program to the IUB to be implemented during 2009. Revisions should include a strategic plan with input from home builders and potential home owners, and from associations such as the Green Building Institute.

- Require Iowa's utilities to adopt a coordinated statewide energy efficiency program with voluntary opt-in available for non-regulated utilities. This will reduce administrative, program and marketing expenses, reduce consumer confusion and inconvenience, and increase the quantity of energy efficiency savings by ensuring that implemented measures will be deployed statewide (taking advantage of economies of scale, working directly with manufacturers, etc.).

Q. Does this conclude your testimony?

A. Yes, it does.