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September 28, 2011

HAND-DELIVERED

Kate Whitney
Montana Public Service Commission
1701 Prospect Ave.
Helena, MT 59620

Re: Docket No. D2011.5.38

Dear Ms. Whitney:

Two days ago, on Monday, September 26, Human Resource Council, District XI and the Natural Resources Defense Council filed the direct testimony of Dr. Thomas Power in the above-referenced docket. That testimony cited an incorrect number for energy savings in the 2010-2011 tracker year. The testimony took the number from NorthWestern Energy's June application that initiated this docket. But, the number had been adjusted in a response to a data request, filed on September 7th. Not reporting the correct number was an oversight on our part.

In order to ensure that the record is accurate and because so little time has past since the testimony was filed, I am refilling the testimony with some minor revisions and ask that it be substituted for the testimony filed on Monday.

The incorrect number appears in the second paragraph of Dr. Power's response in section 7 of the testimony. There Dr. Power states that for tracker year 2010-2011 total energy savings were 9.2 aMW. The correct number, however, is 8.56 aMW. The revised testimony makes this change. In addition, in that same section, Dr. Power utilized the 9.2 aMW in some calculations. Those calculations were re-done using the correct number and the revised testimony reflects the results of those calculations. Finally, awareness of the correct number enables Dr. Power to make an additional point. This additional point is found in two sentences on page 22, lines 5-8 of the revised testimony.

As the cover page indicates, the testimony is now entitled, "*Revised*" Direct Testimony, and, to further distinguish it from the testimony filed on Monday, the testimony is dated with today's date. Other changes from the originally filed testimony include adding line numbering to the document and repaginating it.

Thank you for your attention to this matter and I apologize for any confusion this may have caused.

Sincerely,

Chuck Magraw

Cc: Service list

DEPARTMENT OF PUBLIC SERVICE REGULATION
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MONTANA

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IN THE MATTER OF NorthWestern Energy's Application for Approval of Electric Supply Deferred Cost Account Balance and Projected Electric Supply Cost	))))	REGULATORY DIVISION DOCKET NO. D2011.5.38

Revised
Direct Testimony of

THOMAS MICHAEL POWER
Consulting Economist
Power Consulting, Inc.
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on behalf of

Human Resource Council, District XI
Natural Resources Defense Council

September, 2011
[Revised September 28, 2011]

1. Introduction and Outline of Testimony

Q. Please state your name and occupation.

A. My name is Thomas Michael Power. I am a Research Professor and Professor Emeritus in the Economics Department at the University of Montana, Missoula, Montana. I am appearing in these proceedings, however, as an independent consulting economist, a principal in Power Consulting, Inc., on behalf of Human Resource Council, District XI and the Natural Resources Defense Council.

Q. Have you previously testified before this and other regulatory commissions as an expert witness?

A. Yes. I have testified before this Commission on numerous occasions over the past 35 years. I have also testified before federal and state regulatory authorities throughout the United States and Canada on more than seventy-five occasions. A brief summary of my professional experience and training can be found in the last section of this testimony.

Q. What issues will you address in this direct testimony?

A. This testimony will focus on several aspects of NorthWestern Energy's (NWE's) energy efficiency programs, the costs and impacts of which are included in the electric tracker filing that is the subject of this docket. This testimony will discuss:

i. The economic logic of a regulated utility investing in improving the efficiency with which its customers use electricity and natural gas.

ii. The distinction between the two parts of NWE's energy efficiency programs: those funded by the Universal System Benefits (USB) mechanism and those that are funded the same way other NWE energy supply resources are funded.

iii. Whether the costs of NWE's investments in energy efficiency should be expensed each year or whether those energy efficiency investments should be amortized over their economic lives.

iv. Whether it is appropriate to use estimated energy savings from NWE's energy efficiency programs in calculating the Lost Revenue Adjustment Mechanism (LRAM) in tracker proceedings.

v. Whether it is appropriate to measure and count future energy savings from installed lighting efficiency measures.

vi. The recent success of NWE's energy efficiency programs in saving electric energy and the greater difficulties it may have in the future meeting its energy efficiency savings targets.

vii. My qualifications as an expert witness.

2. The Economic Logic of Regulated Utilities Running Customer Energy Efficiency Programs

Q. Why have Human Resource Council, District XI (HRC) and the Natural Resources Defense Council (NRDC) intervened in this electric tracker docket?

A. Both organizations have a long history participating in Montana Public Service Commission proceedings to support rational utility planning that leads to customers' loads being served by energy policies and portfolios that have the lowest overall social costs. This has led both organizations to support utility

investments in energy efficiency when that energy efficiency has social costs that are lower than the costs associated with the expansion of conventional electric generating plants or other sources of electric supply. Both organizations have also been deeply concerned about the burden of rising energy costs and stagnant and, in some years, declining real income for low and moderate income households, and the impacts of alternative rate designs on those customers.

As a result of more than a decade of involvement in MPSC proceedings in the 1970s and 1980s, HRC and NRDC entered into an agreement with the Montana Power Company in 1987 to participate with the utility and other stakeholders in planning efforts aimed at minimizing the total costs associated with electric supply and reducing the burden of utility bills on low and moderate income households.

Out of those collaborative efforts over the last 25 years came many elements of NWE's and the MPSC's current policies including:

a. Collaborative energy supply planning that has incorporated both renewable resources and energy efficiency in the utility's electric supply portfolio;

b. Utility supported energy efficiency programs as part of electric and natural gas supply;

c. A free low income weatherization program;

d. Low income electric and natural gas bill assistance in the form of low income discounts and utility contributions to Energy Share;

e. The recognition that when a utility's financial health is tied to sales of energy it has a disincentive to acquire energy efficiency, the awareness of which led to the adoption of the Lost Revenue Adjustment Mechanism, which seeks to better align utility and customer interests in pursuing cost effective energy efficiency measures.

f. The rejection of rate designs that incorporate features like high monthly fixed charges and declining block rates that discourage energy conservation and burden small utility customers, including most low income customers.

This tracker, because it deals with both the recovery of the costs of the energy efficiency programs that are part of the electric energy supply portfolio as well as the calculation of the Lost Revenue Adjustment, could affect several of these existing utility regulatory policies that HRC and NRDC have long supported.

Q. Why did the Montana Power Company and now NorthWestern Energy as well as many past Commissions support utility funded energy efficiency programs? Are not such programs just subsidies or handouts to some customers at the expense of other customers?

A. No. Improving the efficiency with which customers use electricity and natural gas is the cheapest way to provide energy services to customers. When the investment in energy efficiency costs less than the investment in conventional energy supply, the total cost of supply is reduced by investing in energy efficiency, which causes customers' bills to be lower than they would be otherwise would be. Put differently, when energy efficiency investments are cost-effective relative to other sources of energy supply, the least cost electric supply portfolio should include more investments in customer energy efficiency.

In that sense utility funded cost-effective energy efficiency programs are no more a subsidy or a handout than a utility's decision to invest in a gas-fired facility instead of a coal-fired facility when the combined capital and fuel costs of

the gas generator are lower on a risk-adjusted basis than the coal generator. It is simply a matter of putting together a lower cost energy portfolio for customers that balances costs and risks.

Q. Why cannot such investments in cost-effective energy efficiency measures simply be left to customers who have a self-interest in minimizing their energy bills?

A. Many cost-effective energy efficiency investments are, in fact, made by individual households and businesses although often it is building codes, appliance efficiency standards, and public education programs that inform customers of the cost-effective alternatives available that actually lead to the end result of energy savings. However, studies over the last half-century have highlighted a broad range of barriers to households and businesses investing up to the cost-effective level in energy efficiency measures. These barriers include households highly discounting the future savings associated with energy efficiency investments because of stress on household budgets, the technical character of making cost-effective energy efficiency decisions, the pro-active nature of such decisions and the difficulty individuals have, given all of the issues in modern day-to-day life competing for attention, prioritizing energy efficiency, the division for renters between who pays the utility bill and who owns and controls investments in the rental unit, etc. What research has repeatedly made clear is that there is a large backlog of cost-effective energy efficiency investment opportunities in both households and businesses. This creates an opening for utility investments and can help meet customers' energy needs at a lower cost

than if the utility were limited to only expenditures to expand the supply of electricity or natural gas.

Q. But are not improvements in energy efficiency self-defeating since they make energy use cheaper and that encourages people to use more energy causing a "rebound" or "take-back" effect that can wipe out most of the reduction in energy usage?

A. No. Such claims are periodically made by some commentators but rarely by economists.[1] For over a century economists have recognized that reductions in costs boost the purchasing power of individuals and households who can then use that enhanced purchasing power to purchase more of the good whose cost has been reduced or more of any of the multitude of different desirable products available on the market. There is no reason to believe that those increased purchases would be focused only on the good whose cost has been reduced. For instance, if the cost of lighting your home has declined because of the availability of more efficient lighting devices or a more efficient building shell reduces the cost of keeping your house comfortable, that does not mean that you will then go out and spend all of the savings on more lighting or more heating. People have other demands on their budgets that are likely to be the focus of the additional spending and most of them are not as energy intensive as, say, home heating.

[1] E.g. see J. Tsao et al. "Solid-state lighting: An energy-economics perspective," *J. of Physics D Applied Physics* 43, 354001, 2010, for an example of such "rebound" analysis in a physics journal. For an economist's view of the issue see Steve Sorrell, "The Rebound Effect: An Assessment of the Evidence for Economy-wide Energy Savings from Improved Energy Efficiency." UK Energy Research Centre. http://www.ukerc.ac.uk/Downloads/PDF/07/0710ReboundEffect/0710ReboundEffectReport.pdf. Both reject the suggestion that energy efficiency efforts are self-defeating.

A. Are you saying that the "rebound" or "take-back" effect of improvements in energy efficiency do not exist?

Q. Certainly not. But even those who have sought to implicitly criticize energy efficiency using this argument characterize the direct rebound effect as "zero or very small."[2] In any event, energy analysts, including those who have designed and evaluated NWE's customer energy efficiency programs, regularly take those and other effects into account when calculating the net energy impact of the programs, which are always significantly lower than what engineering calculations would suggest. Accordingly, while those (and other) effects have long been recognized, they are swamped by the positive benefits from implementing cost-effective energy efficiency programs. As a result, energy efficiency efforts such as those undertaken by NWE and other utilities are not in any sense "self-defeating."

Q. But is it not true that despite decades of focus on improving the energy efficiency of our homes, appliances, and cars, energy consumption has continued to rise steadily except in times of serious economic disruption? What explains that growth in energy consumption despite improvements in energy efficiency?

A. To begin with, the premise of the question is problematic because the nation has failed to mount a sustained, serious effort to acquire energy efficiency. Looked at from a national context, a commitment to pursue energy efficiency has

[2] Jonathan G. Koomey, Ph.D. , Consulting Professor, Civil &Environmental Engineering, Stanford University, NRCD Switchboard, "Energy Efficiency and the 'Rebound Effect,", February 24, 2011, http://switchboard.nrdc.org/blogs/dgoldstein/energy_efficiency_and_the_rebo.html#comment12628 .

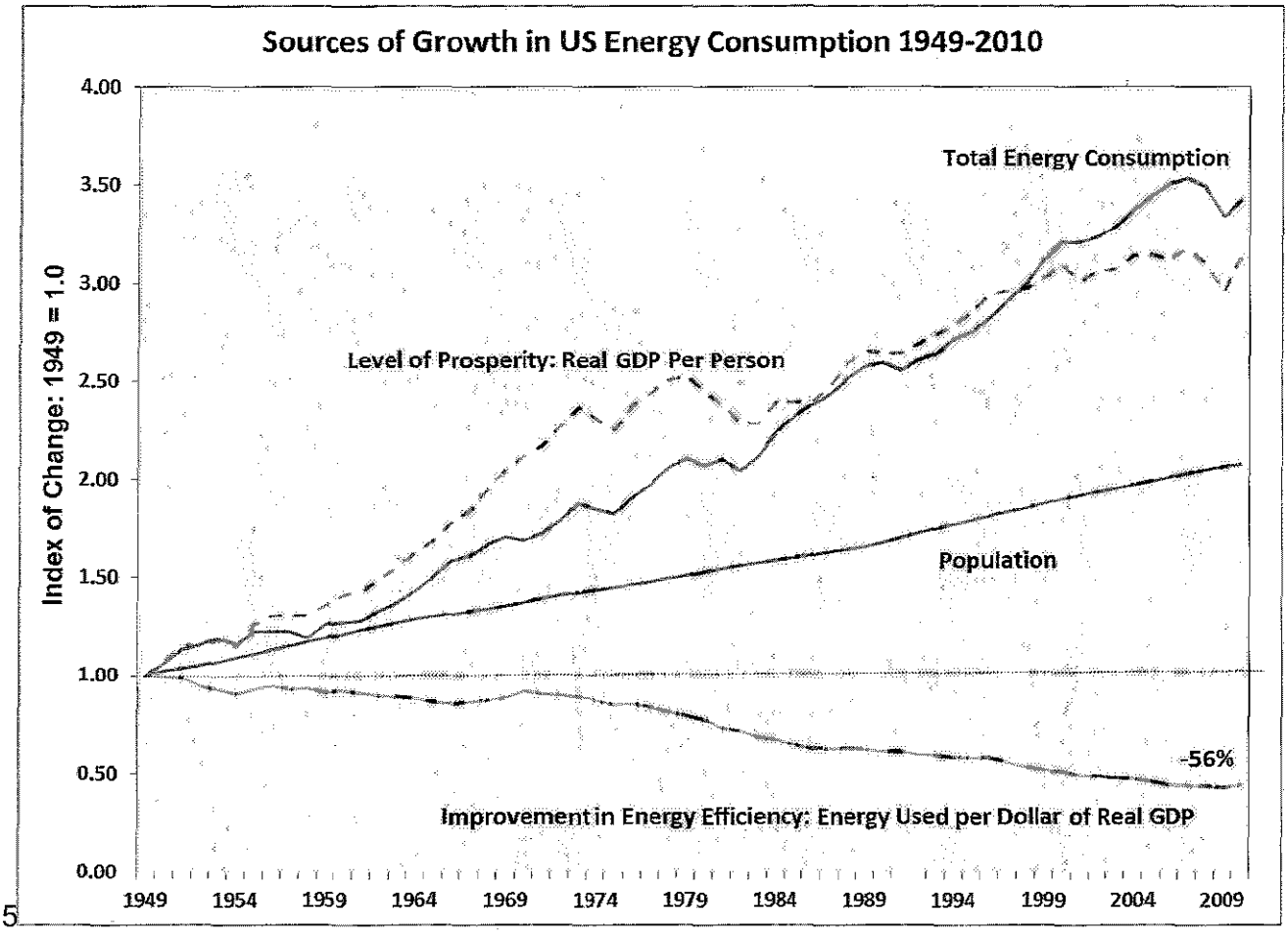
been uneven both temporally and geographically. Inconstancy best describes the way our nation, overall, has addressed energy efficiency.

Accepting the above question on its own terms, the primary explanation for why energy consumption continues to rise in the face of efforts to save energy is that the economy has grown dramatically. Over the last sixty years our population has doubled, significantly increasing the demand for almost everything, including energy. In addition the volume of goods and services produced by our economy has grown even more spectacularly. The volume of economic production available to support each person has tripled even after the impact of inflation has been removed. So we are collectively consuming much more "stuff" and it takes energy to produce those greatly expanded amounts of consumer goods. The combination of those two aspects of the growth of our economy, by themselves, could have led to a six-fold increase in energy consumption if energy usage rose directly with population and production per capita. But that did not happen. Energy usage increased by only about half that amount.

The explanation for that constrained growth in energy use lies in the ongoing improvements in the efficiency with which we used energy in our economy. The energy usage per dollar of economic production (inflation removed) declined by 56 percent over the last 60 years. Most of that decline took place after the first of our energy crises in the mid-1970s. Following that energy scare, we as a nation began to pay greater attention to improving the efficiency with which we used energy. Those efforts have been spasmodic depending on

whether energy costs were rising or falling, but their overall impact on the energy intensity of our economy has been significant.

The chart below shows these long run trends.



Sources: Energy Consumption from US DOE-EIA; GDP from US BEA; Population from US Census Bureau.

Q. Can the energy policy decisions of this Commission help assure the effectiveness of NWE's energy efficiency programs?

A. Yes. The energy prices faced by consumers matter. Rate designs that lower the price consumers pay for each unit of energy they consume will

encourage higher energy usage and discourage conservation efforts. Rate design can be used to help keep accurate price signals in front of customers while not increasing their bills or allowing the utility to over-collect revenues. For example, keeping the monthly fixed charges relatively low is one such a rate design.

In addition, removing the financial disincentives to utilities associated with successful energy efficiency programs is also important. Since some of the utility's fixed costs are appropriately collected in energy charges, when customers reduce their energy consumption because of energy efficiency programs, the utility can under-collect its authorized fixed costs. The Lost Revenue Adjustment Mechanism (LRAM) was adopted to reduce that disincentive.

3. NWE's Two Sets of Energy Efficiency Programs: USB and Energy Supply

Q. NWE's energy efficiency programs are funded by two sources: conventional energy supply expenditures which are the subject of this tracker docket and Universal System Benefits programs funded by a separate charge on customers' utility bills. In fact, there is a Commission docket underway (D2011.3.26) that is focused on the natural gas USB program. What is the logic of this division of NWE's energy efficiency programs?

A. The USB program was established by statute as part of the utility "restructuring" law that was passed in the late 1990s. Because restructuring was expected to lead to many different natural gas and electric suppliers competing to serve Montana customers, it was expected that that competition would make

many existing utility customer programs non-viable. Energy efficiency, low income, and "infant industry" renewable energy programs, and other utility initiatives, were considered vulnerable to elimination due to those expected competitive pressures.

Over the years, with this Commission's approval, utility energy efficiency programs that met a cost-effectiveness test that demonstrated that they were less costly than other sources of energy supply migrated from being funded by USB to become part of the utility's energy supply portfolio. The idea was that they should be treated the same as any other energy supply purchase that NWE made in developing its portfolio to serve customers.

The low income programs funded by USB are not solely focused on obtaining an optimal energy supply portfolio to serve all customers. The low income discount, for instance, attempts to reduce the burden of high utility costs on those least able to pay and, in that sense, meet the social objective of assuring access to utility services for all residents. That is not to say that there are not benefits of these programs to the utility and other customers. Unpaid bills, bill collection efforts, and utility service disconnects and reconnects are costly to the utility and, therefore, to all customers. Various low income programs seek to minimize some of those utility costs while also pursuing straightforward social objectives such as protecting access to utility services for all households and avoiding the social costs associated with inadequate access.

The free Low Income Weatherization Program seeks to make low and moderate income homes more energy efficient, thus reducing household energy

bills. In that sense low income weatherization contributes to energy savings on the NWE system and reduces the amount of energy resources NWE has to obtain from other sources. However, this low income program also pursues health and safety objectives that are not related to least cost energy supply. NWE recognized this function of the low income weatherization program as long ago as 1988. In testimony at that time an NWE witness described the low income weatherization program as "further[ing] important social goals." Hauser testimony at 6, attached to PSC-035. Unsafe heating systems are replaced as are broken windows, doors, and other structural elements of the home, for example. Because of the multiple social objectives that low income weatherization pursues, it is not subject to an exclusively energy supply benefit-cost test. This does not mean that the program elements are not evaluated in the broader cost-effective framework of meeting those multiple objectives at as low a cost as possible.

It is because of the multi-purpose objectives of the low income programs that they continue to be funded through USB rather than utility energy supply. It is important to realize, however, that there remains a practical utility cost-reduction side to these low income programs. In a pragmatic way they seek to both reduce costs to the utility and its customers while also providing essential services to low and moderate income households.

Q. Is it appropriate for NWE to count the energy savings associated with the USB low income energy efficiency programs towards NWE's energy savings (DSM) targets?

A. Yes. Those targets are tied to estimates of the available energy savings associated with the building stock on its system. That includes the housing stock inhabited by low and moderate income families. Low income housing represents some of the housing that is least likely to attract private investment to improve its energy integrity. In that sense, it is one of the obvious targets for a utility energy efficiency program that seeks to realize the energy efficiency potential that markets left to themselves are likely to ignore.

4. Recovering the Costs of Energy Efficiency Programs: Expensing v. Capitalization

Q. This Commission currently allows NWE to collect its annual expenditures on customer energy efficiency programs through the annual energy supply trackers. This is not how the capital costs of other sources of energy supply are collected. The capital costs of coal- and gas-fired electric generators, for instance, are amortized over their economic lives and only a part of the capital cost is recovered from customers each year. Should utility investments in improving the efficiency with which its customers use electricity and natural gas be treated differently than other parts of the energy supply portfolio?

A. NWE witness William Thomas, in his direct testimony, has summarized the advantages and disadvantages of amortizing NWE's energy efficiency investments like other energy supply capital costs as opposed to expensing those energy efficiency investments in the year they are made. (Table 6, pp. WMT-37 to WMT-40)

Previous to the nationwide push to "restructure" electric utilities into competing electric suppliers, this Commission and the Montana Power Company

agreed that utility energy efficiency investments should be treated the same as other energy supply investments and amortized over their economic lives. With the push towards competitive electric supply, however, accountants and investors became quite worried about the fact that the promise that the regulatory agency makes to a regulated utility that it will be able to collect over future decades the amortized costs of utility investments in customers' homes and business was not really a fungible asset. That promise could not be sold to another owner since the utility did not own a physical asset it or some new utility owner could control. In that sense the utility's energy efficiency investments were not like an electric generating facility that could be sold, as Montana Power's fleet of generators was. The amortization of these investments represented a "regulatory asset" that could vanish in the restructuring of utility regulation or actual deregulation. That, in general, did not happen. Commissions around the country, including in Montana, imposed "transition charges" on customers so that utilities could continue to recover their past investments.

When this Commission ordered NWE to resume running utility funded customer energy efficiency programs similar to those the Montana Power Company had run, NWE, cognizant of past investor and accountant suspicion of regulatory assets, ask that the investment costs of the energy efficiency measures installed in customers' premises be collected in rates in the year they were made rather than being amortized over those efficiency measures' expected lives. The Montana Commission agreed.

In short, this Commission, in different historical situations, has approved both expensing and amortizing utility investments in improving the energy efficiency of customer premises.

Q. Do you have a recommendation with respect to expensing versus amortizing NWE's energy conservation investments?

A. Conventional utility regulatory principles would appear to support amortizing these investments. These are long-lived investments whose benefits will be spread over many years. To match the costs customers pay with the benefits they received, such investments are almost always amortized. To do otherwise is to impose a high up-front cost on current ratepayers while the benefits will flow to future ratepayers who may not be asked to pay for the investment that made those benefits possible. It should be noted, however, that under conventional utility accounting practices, which do not levelize payments on long-lasting investments, capital recovery tends to be front-end loaded. So, in that sense, the difference between continuing to expense utility investments in efficiency and recovering the costs associated with a capital asset may not be that great in terms of who pays and who benefits. Summing up, given that energy efficiency investments are part of the supply portfolio (which is why they are being included in tracker proceedings), it is worth considering why their costs should be recovered in a different manner than other energy supply investments.

Q. Mr. Thomas asserts that it costs ratepayers less if energy efficiency investments are expensed (WMT-37 at 26-29). Do you agree with that?

A. I do not believe that is true. That assertion appears to assume that there is no time value of money (or cost of capital) for customers. As a result, it is implied that customers are indifferent between paying higher rates now as opposed to paying higher rates in the future. But we know that having higher levels of disposable income now is very valuable to consumers. That is the reason they have been willing to pay very high interest rates associated with credit cards. The time value of money may be considerably higher for many customers than for the utility's investors. Customers might well prefer spreading the cost of paying off the utility's investments over time at about a 10 percent interest rate rather than having to pay it all off now at the cost of reduced present consumption. Given that current customers may no longer be NWE customers when many of the benefits of the energy efficiency programs are realized, they may be even more interested in spreading out the costs on the same time horizon as the benefits.

Q. Mr. Thomas also says that expensing the costs of the energy efficiency investments "is consistent with the concept of matching costs and revenues within the electric tracker." (WMT-37 at 13-14) Do you agree?

A. That is not my understanding of what the current NWE tracker proceedings attempt to do. It is true that tracker proceedings around the nation once primarily focused on helping the utility recover its variable operation and maintenance costs, primarily fuel and purchased power costs. In that setting the only costs at issue were annual expenses for which there was no question but that they should be "expensed."

The electric trackers in Montana (and elsewhere) have tended to become mini-rate cases in which rates are adjusted to reflect not only fuel and purchased power costs but also a broad range of other costs including amortized capital costs (e.g. the annual ownership costs of Colstrip 4) and operating costs that do not fluctuate the way fuel and purchased power costs do. Given that the amortization of some investment costs are already being recovered in the tracker, it is not clear to me how doing the same for the investment costs of energy efficiency programs would violate any regulatory principle.

Q. Does that mean that you are recommending that the Commission order the investment costs of the NWE energy efficiency programs to be amortized over the expected useful life of those investments?

A. No. I agree with Mr. Thomas that there are aspects of such a decision that need more careful exploration. In particular, I am not familiar with current accounting rules about regulatory assets and how investors look upon growing regulatory assets on a utility's balance sheet.

As just discussed, a decade or so ago it was because of investor concerns that such "assets" were not supported by a fungible physical facility that led utilities to shy away from burdening their balance sheets with regulatory assets. I believe that it is worth exploring this issue in more detail and its implications for both NWE and its customers. In addition, the details of the amortization of energy efficiency investments, e.g. identifying an appropriate amortization period, need to be discussed and analyzed.

For that reason, I support Mr. Thomas's suggestion that a stakeholder group explore this issue to become more fully informed about the implications of the amortization of utility investments in customer energy efficiency. This could lay the basis for more fully informed presentations to this Commission in a future docket. Alternatively, I suppose, the Commission could open a docket to, possibly among other things, consider this issue in more detail.

Q. In 2005, in Docket No. 2004.6.90, you filed testimony supporting the expensing of utility expenditures for energy efficiency. Have your views changed since then?

A. My views have changed only in the sense that NWE is confronting a different legal and regulatory landscape than it was at that time. In that testimony I made it clear that if utility expenditures on energy efficiency were to be increased (which they have) and if NWE was allowed to own its own generation and did, in fact, make such investments, it would be appropriate to revisit the issue. That is the gist of my testimony here as well.

5. Using Forecasted Energy Efficiency Savings in the Lost Revenue Calculation

Q. The Commission identified an additional issue it wished parties in this case to discuss: Whether the Commission should change its policy and allow NWE to use "forecasted lost revenues that will result from energy savings achieved through its demand-side management programs" in calculating the electric supply rates that come out of this tracker? Do you support this change?

A. Since that is the approach taken with respect to other energy supply costs, it would seem appropriate to extend the same procedure to all of the costs

associated with NWE's energy supply portfolio, including NWE's energy efficiency programs.

However, it is not clear that this is a major issue. Present practice is simply to utilize "actual" energy savings for the previous year and then calculate the lost transmission and distribution revenue resulting from those actual savings when establishing a tracker rate for the current year. This means that the recovery of lost transmission and distribution revenue is always a year behind when it was "lost." Given that NWE has a constant planned annual energy savings going forward, it is not clear that continuing to disallow estimates of energy efficiency savings would add any significant instability to energy supply rates. However, consistency in how all energy supply costs are handled in the tracker would appear to be a better approach.

6. Measuring Future Energy Savings from Lighting Efficiency Measures

Q. What are your thoughts on whether if federal regulations effectively force households and businesses to use compact florescent or other high efficiency lighting, NWE should continue to count the energy savings associated with past investments in encouraging customers to use these more efficient lighting systems.

A. This subject was discussed at an Electric Technical Advisory Committee meeting. Two points were raised; both in my opinion warranting no change in continuing to count the energy savings from installed lighting measures. First is that if the LRAM is allowed to operate and accumulate lost revenue payments to the utility for years on end before being "reset" in a rate case, NWE would be

receiving lost revenues for energy savings that would have taken place even if NWE had not encouraged the earlier adoption of more efficient lighting systems. Note that for this to be an issue rate cases would have to rarely occur. If, however, rate cases take place on anything approximating a reasonable schedule, the LRAM will be reset to zero and any reduction in electricity consumption, resulting from whatever cause, will be accounted for in the normal calculation of approved rates. Assumedly, after the federal regulations are fully in place, NWE will focus its energy efficiency efforts in areas not already covered by federal regulations.

The other point was more opaque and seemed to revolve around concerns that NWE's efforts in encouraging the adoption of more efficient lighting were misplaced since federal regulation ultimately, as it turned out, was going to accomplish the same outcome without NWE efforts in this area of energy efficiency. An argument could be made that the benefits of the lighting programs only lasted until the federal regulations took effect. It's possible then that someone might want to argue that much of the investment in lighting efficiency that NWE made should not be recoverable in rates because it was imprudent.

If these arguments are made I would strongly urge the Commission to reject them in their entirety. In essence, this would penalize NWE for doing a good job at acquiring energy efficiency for the benefit of its customers. Part of NWE's energy efficiency programs focus on making customers familiar with more efficient appliances and products so that customers are willing to adopt those products themselves, with or without the assistance of the utility. That is what

"market transformation" is all about. It is the experience of the efficacy of technologies in actual use in homes and businesses that ultimately lead to individual adoption of those measures and the shifting upward of appliance and home efficiency standards to set a new, higher minimum standard. NWE's energy efficiency programs need to be seen as part of that broader effort to put some of its energy efficiency programs out of business because either state or federal standards or market forces or both have made those programs unnecessary. This certainly should not be held against the utility. It should be interpreted as a sign of the success of NWE's and other energy efficiency programs' efforts to "transform" markets and regulatory standards.

7. The Need for a Significant Transition in NWE's Energy Efficiency Programs

Q. In your comments above, you have been very supportive of NWE's energy efficiency programs. Do you expect those programs to continue performing at their recent relatively high levels of energy savings?

A. In the early years of NWE's energy efficiency programs, NWE missed its target energy savings levels for three straight years. Since 2006-2007, however, the energy savings of those programs have increased two and a half fold, growing at an average rate of over 25 percent per year for the last four years and significantly exceeding the target levels for the last two years. (William Thomas direct testimony Table 1, p. WMT-4 and Exhibit WMT-1 Revised) The recent performance of NWE's energy efficiency acquisition program is impressive. I *hope* those programs can continue to be as successful going forward, but NWE

is going to have to deploy significant new programs to continue with this level of success.

For the 2010-2011 tracker year NWE estimates that annualized energy savings associated with both its USB and energy supply energy efficiency programs totaled 8.56 average megawatts. While this accomplishment remains almost 50 percent above the annual target, this represented a growth of only 3 percent over the 2009-2010 savings. Thus, it's possible that the growth in savings associated with NWE's energy efficiency programs is leveling off. In addition over 60 percent of these savings were associated with residential and commercial lighting programs. 25 percent of the savings were associated with the efforts of the Northwest Energy Efficiency Alliance (NEEA) to which NWE makes substantial contributions. If we focus on the non-NEEA programs NWE is funding, 83 percent of the savings were associated with NWE's lighting programs. (Table A, Exhibit WMT-1Revised) The 5.4 average megawatts associated with those lighting programs in 2010-2011 represent most of the 6 average megawatt energy savings target NWE has for future years. As the potential savings associated with those lighting programs are displaced by federal regulations, NWE is going to have to develop significant new programs that target entirely different energy savings potentials in the residential and commercial sectors. That will be a significant challenge.

8. Qualifications of Thomas Michael Power

Q. What is your current professional association?

A. I am a Research Professor and Professor Emeritus in the Economics Department at The University of Montana in Missoula, Montana. I am also a Principal in Power Consulting, Inc., an independent economic consulting firm.

Q. Please describe your formal education and training.

A. I received my Bachelor's Degree in Physics from Lehigh University in Bethlehem, Pennsylvania. I graduated with honors and Phi Beta Kappa. I was elected a Woodrow Wilson Fellow in national competition and attended Princeton University where I received my Masters and Doctoral Degrees in Economics.

I taught math and physics at Lehigh University and have taught economics at Princeton University, Lehigh University, and the University of Montana. I have been on the faculty of the University of Montana since 1968. I served as Chairman of the Economics Department from 1978 to 2007. In August 2007 I retired from University teaching and administration. My specialties are regional economics and resource economics.

Q. Have you testified as an expert witness before utility regulatory commissions before?

A. Yes. Since 1974 I have appeared many times before numerous federal, state, and municipal regulatory commissions.

I have testified before the Federal Energy Regulatory Commission, the Northwest Regional Power Planning Council, and the Bonneville Power Administration as well as before various congressional committees.

I have also testified before the utility regulatory commissions in the following states: Arizona, Colorado, Florida, Idaho, Indiana, Illinois, Kansas, Montana, Nebraska, Nevada, Oklahoma, Oregon, Texas, Utah, and Washington.

In addition, I have testified in utility cases before the City Councils of Seattle, Austin, and Spokane. I have also testified before the Snohomish County, Washington, Public Utility Board and the Springfield, Oregon, Public Utility Board. I have testified in State District Courts in Idaho, North Dakota, Oregon, and Montana and in Federal Court in Montana.

I have testified before the Montana Board of Natural Resources and the Washington Department of Ecology, and the Washington Energy Facility Site Evaluation Council on the siting of energy facilities.

I have served as lecturer at National Association of Utility Regulatory Commissioners' Technical Conferences and at annual conferences of the Mid-America Regulatory Commissioners and the Western Utility Regulatory Commissioners.

Since 1988 I served on the Montana Power Company Conservation and Least Cost Planning Advisory and Universal Benefits Advisory Committee until the Montana Power Company left the utility business. Since NorthWestern Energy Company took over the Montana Power distribution system, I have served on its Technical Advisory Committee and Universal Benefits Advisory Committee as well as its Natural Gas Technical Advisory Committee. For several years I also served on the Montana Regulatory Reform Working Group. In the past I have served on the Montana Governor's Citizens Advisory Council

on Energy. More recently I served on the Governor's Energy Security Task Force.

Q. Have you done other studies dealing with energy economics?

A. Yes. In 1975, I received an NSF/RANN grant to assemble a team of economists, geologists, and energy technologists to study coal development in the Northern Great Plains. That study led to a series of almost a dozen reports, the final summary being published as ***Projections of Northern Great Plains Coal Mining and Energy Conversion Development 1975-2000 A.D.*** Several of the other papers dealing with defining coal markets and energy projection techniques have also been published.

Between 1976 and 1985 I conducted studies of the economics of alternative energy systems, transmission reliability, the applicability of the PURPA rate making standards to hydroelectric system "going thermal", utility avoided costs, optimal operation of storage hydroelectric facilities, development of electric utilities on Indian reservations, and the impact of energy facility development on local economic development. In 1995 ***Public Utilities Fortnightly*** published my article on "Making Sense of Peak Load Cost Allocations."

Q. Can you give examples of other studies have you done in the field of resource economics?

A. In 2007 Stanford University Press published a book I edited and contributed to entitled ***Accounting for Mother Nature: Changing Demands for Her Bounty*** (with Terry Anderson and Laura Huggins). In 2001 Island Press

published ***Post-Cowboy Economics: Pay and Prosperity in the New American West***, which I co-authored with Richard Barrett. In 1996 two other books of mine were published. Island Press published ***Lost Landscapes and Failed Economies: The Search for a Value of Place.*** M.E. Sharpe published ***Environmental Protection and Economic Well-Being: The Economic Pursuit of Quality.*** The latter book is the rewritten and updated Second Edition of ***The Economic Pursuit of Quality***, which was published by M.E. Sharpe, New York in 1988. In 1980 Westview Press published my first book, ***The Economic Value of the Quality of Life.***

I have also contributed two dozen chapters to various other books. Among the many articles and reports I have published are: "Public Timber Supply, Market Adjustments, and Local Economies: Economic Assumptions of the Northwest Forest Plan," (***Conservation Biology***, 20(2):341-350, 2006), "The Economics of River and Wetland Restoration in the Vermillion River Basin," ***Great Plains Natural Resources Journal,***4(2), Spring, 1999, "The Wealth of Nature," ***Issues in Science and Technology***, National Academy of Sciences, Spring, 1996, "Economic Well-being and Environmental Protection in the Pacific Northwest," ***Illahee: Journal for the Northwest Environment***, 11(3 & 4), Fall-Winter, 1995, and "Urban Disamenities" ***Journal of Urban Economics***, June, 1981.

I have published papers on almost a dozen federal irrigation projects in the western states in addition to papers dealing with the value of in-stream flows for wildlife and recreational uses. I have testified before the State Board of

Minerals and the Environment and the Oahe Conservancy Board in South Dakota as well as the Alberta Energy Resources Conservation Board and Natural Resource Conservation Board on topics related to resource development. I have also testified several times before various Canadian Federal Environmental Review Boards.

Q. Does that conclude your testimony?

A. Yes, it does.

CERTIFICATE OF SERVICE

I hereby certify that on the *28th* of September, 2011, a copy of Dr. Thomas Power's Revised Direct Testimony was served by first class and electronic mail on the parties to this proceeding.

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Charles E. Magraw