STATE OF OREGON

Public Utility Commission

In the Matter of PacifiCorp's Filing of Revised Tariff Schedules for Electric Service in Oregon	Docket No. UE 246

Direct Testimony of
William Steinhurst, Ph.D.

On Behalf of
Sierra Club

June 20, 2012

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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and occupation.

A. My name is William Steinhurst, and I am a Senior Consultant with Synapse Energy Economics (Synapse). My business address is 32 Main Street, #394, Montpelier, Vermont 05602.

Q. Please describe Synapse Energy Economics.

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

Q. Please summarize your work experience and educational background.

A. I have over thirty years of experience in utility regulation and energy policy, including work on renewable portfolio standards and portfolio management practices for default service providers and regulated utilities, green marketing, distributed resource issues, economic impact studies, and rate design. Prior to joining Synapse, I served as Planning Econometrician and Director for Regulated Utility Planning at the Vermont Department of Public Service, the State's Public Advocate and energy policy agency. I have provided consulting services for various clients, including the Connecticut Office of Consumer Counsel, the Illinois Citizens Utility Board, the California Division of Ratepayer Advocates, the D.C. and Maryland Offices of the Public Advocate, the Delaware Public Utilities Commission, the Regulatory Assistance Project, the National Association of Regulatory Utility Commissioners (NARUC), the National Regulatory Research Institute (NRRI), American Association of Retired Persons (AARP), The Utility Reform Network (TURN), the Union of Concerned Scientists, the Northern Forest Council, the Nova Scotia Utility and Review Board, the U.S. EPA, the Conservation Law Foundation, the Sierra Club, the Southern Alliance

for Clean Energy, the Oklahoma Sustainability Network, the Natural Resource Defense Council (NRDC), Illinois Energy Office, the Massachusetts Executive Office of Energy Resources, the James River Corporation, and the Newfoundland Department of Natural Resources.

I hold a B.A. in Physics from Wesleyan University and an M.S. in Statistics and Ph.D. in Mechanical Engineering from the University of Vermont.

I have testified as an expert witness in over 30 cases on topics including utility rates and ratemaking policy, prudence reviews, integrated resource planning, demand side management policy and program design, utility financings, regulatory enforcement, green marketing, power purchases, statistical analysis, and decision analysis. I have been a frequent witness in legislative hearings and represented the State of Vermont, the Delaware Public Utilities Commission Staff, and several other groups in numerous collaborative settlement processes addressing energy efficiency, resource planning and distributed resources.

I was the lead author or co-author of Vermont's long-term energy plans for 1983, 1988, and 1991, as well as the 1998 report *Fueling Vermont's Future: Comprehensive Energy* Plan and Greenhouse Gas Action Plan, and also Synapse's study *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. In 2008, I was commissioned by the National Regulatory Research Institute (NRRI) to write *Electricity at a Glance*, a primer on the industry for new public utility commissioners, which included coverage of energy efficiency programs. In 2011, NRRI commissioned a second edition of that work.

My resume is attached to this testimony as Exhibit Sierra Club 201.

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

A. I am testifying on behalf of the Sierra Club.

Q. Have you testified previously before the Oregon Public Utility Commission (the Commission)?

A. No, I have not.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to consider whether certain capital expenses for certain environmental retrofits made by Pacificorp, doing business as Pacific Power (the company) were prudent and should be allowed recovery. As I conclude that those capital expenses were not prudent, I propose disallowances and remedial requirements. I also address the question of coordination between the company's integrated resource plan (IRP) activities and its rate case requests.

Q. How is your testimony organized?

A. My testimony is organized as follows:

1. Introduction and Qualifications.
2. Summary of Conclusions and Recommendations.
3. Prudence and the Company's Proposal
4. Recommendations

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary conclusions.

A. My primary conclusions are summarized as follows:

(1) The company seeks recovery in this proceeding for the capital and operating costs of certain major environmental retrofits (specifically, LNB and FGD for Naughton 1 and 2, plus certain Naughton common facilities (collectively, the Naughton Environmental Retrofits). The company also seeks recovery in this proceeding for certain major environmental retrofits (specifically Hunter 1 and 2 SO2 Retrofits, Hunter 2 SO2 Project, Hunter 302 Clean Air – PM, and Hunter 1 Turbine Upgrade – Interconnection) to Hunter 1 and 2 (collectively, the Hunter Environmental Retrofits).

(2) Over the near- to mid-term, the company faces substantial additional costs due to known and likely environmental regulations that will have to be made to keep those plants in operation, and the company knew or should have known that those known and likely regulations would impose such costs at the

relevant decision points for the Naughton and Hunter Environmental Retrofits.[1]

(3) Furthermore, the available evidence indicates that the company failed to determine in a reasonable manner whether the Environmental Retrofits would be cost effective, in general, and, specifically, in the light of those known and likely environmental regulations. The company's 2009 analysis of the Naughton Environmental Retrofits not only failed to account for those known and likely regulations, but was also fundamentally flawed in its assumptions, methods, scope and timing. The company's 2009 analysis of the Hunter Environmental Retrofits suffered from similar shortcomings. Those flaws and omissions were ones that were inconsistent with the duties of a reasonable person charged with responsibility for managing a utility business affected with the public interest.

(4) The flaws and omissions in analysis and management decision making just described constitute imprudence. The decisions to incur the Environmental Retrofit capital expenses were imprudent. Likewise, the company's failure to reanalyze and reverse those decisions at suitable times prior to commencement of construction was an act of ongoing imprudence.

(5) The available evidence also indicates that the company until recently continued to fail to properly reflect those known and likely environmental regulations or their potential costs in its resource planning.

Q. Please summarize your primary recommendations.

A. The Commission should disallow the costs of the Naughton and Hunter Environmental Retrofits, including return of and on the capital invested, the associated operation and maintenance (O&M) costs for those Environmental

[1] Those regulations, their timing, and their likely consequences are explained in the prefiled testimony of Sierra Club witness Dr. Jeremy Fisher.

Retrofits, and the costs due to lost output from the affected plants as a result of the Environmental Retrofits.[2]

The company should be required to make a compliance filing to document the amount of those costs. That compliance filing should be subject to review and approval in this proceeding by the parties and Commission.

The Commission should also require the company to provide a prompt and full analysis and accounting for the effect of existing and upcoming environmental regulations on its entire fleet of coal plants, as well as the full range of options for addressing those regulations, including both supply- and demand-side resources as well as alternatives to continued operation such as retirement or repowering. The costs facing the existing fleet should be reflected properly and fully in that analysis, including not only the costs requested for meeting environmental compliance criteria today, but also the capital and operating expenses associated with reasonably anticipated environmental retrofits and other environmental mitigation requirements, as well as a price on carbon dioxide (CO_2) representative of likely regional and federal policies on greenhouse gas emissions. Such analyses should be fully documented and transparent and should provide the Commission and intervenors with an opportunity to evaluate fully the proposed investments in the context of the full range of costs that the company will face at its units and a full range of alternatives to keeping those units in operation in order to determine if ratepayers should bear the costs, among any other purposes to which the analysis may be put.

Without such an analysis, it is impossible for the Commission or any intervener to fully assess whether the company's plans for the maintenance, upgrades, and operations of its fleet of plants is in keeping with least-cost principles, and

[2] By "costs due to lost output from the affected plants," I mean the sum of (1) the cost of replacement power or additional production at other plants needed by the company due to any plant or unit downtime caused by the installation or operation and maintenance of the Environmental Retrofits, (2) the cost of additional production at other plants or of replacement power needed by the company due to either parasitic loads or reduced capacity at any plant or unit caused by the operation of the Environmental Retrofits, less (3) the variable costs of production avoided at the plants or units affected by the installation and operation of the Environmental Retrofits.

whether the company's proposed investments represent a suitable use of ratepayer monies. The Commission may wish to require that the company use existing and appropriate venues, such as the ongoing 2012 coal study and screening analysis, for the submission and review of the recommended analysis and for evaluating the company's planning and decision-making regarding existing coal-fired units. To the extent that the 2012 coal study and screening analysis or some other ongoing activity fully meet this recommendation, the evidence in this proceeding form an additional justification for the Commission to mandate full and responsive completion of such activities.

3. PRUDENCE AND THE COMPANY'S PROPOSAL

Q. What are the costs that the company is seeking to recover and that you conclude are imprudent?

A. A portion of the requested rate base increase in this proceeding is due to rate base additions for the Naughton and Hunter Environmental Retrofits. I will explain below why those capital expenses, along with their associated operation and maintenance (O&M) costs and costs due to lost output from the affected plants, were imprudent. Dr. Fisher details the Naughton and Hunter Environmental Retrofits and the company's analyses of them in his prefiled testimony.

Q. Has the company presented information sufficient for the Commission to be able to evaluate the prudence of the capital expenses for pollution control equipment proposed for recovery in the current docket?

A. No. The company has presented testimony asserting certain reasons supposedly supporting the need for the Environmental Retrofits. Dr. Fisher explains why those arguments do not hold water. He also explains various flaws in the analysis and management decision-making leading to capital expenses for the Naughton and Hunter Environmental Retrofits. I will explain below why those flaws amounted to imprudence.

Q. Please explain your understanding of prudence determinations and their effect in a rate case.

A. It is my understanding that only prudently incurred expenses, including recovery of and on prudently incurred investments used and useful for the provision of utility service, may be recovered in retail rates. In addition, only prudent investments used and useful for the provision of utility service may be included in rate base. Conversely, imprudently incurred expenditures are traditionally disallowed. Finally, costs must also be reasonable, necessary and verifiable in order to be recoverable.

Q. Who must demonstrate the imprudence or non-used and useful status of costs?

A rate-regulated utility traditionally enjoys a rebuttable presumption that its expenditures and investments are prudent, as well as used and useful. That presumption can be rebutted by evidence sufficient to support a finding that utility expenditures or investments were imprudent or not used and useful. Once that presumption has been rebutted, then the burden traditionally shifts to the utility to provide evidence sufficient:

(1) to form the basis for findings that costs were prudent and used and useful; and,

(2) to overcome any evidence to the contrary.

In Oregon, statute provides that "At the hearing [on a rate increase request] the utility shall bear the burden of showing that the rate or schedule of rates proposed to be established or increased or changed is fair, just and reasonable." ORS 757.210(1)(a). Just and reasonable rates do not include costs that are imprudent, are not used and useful, or are not consistent with sound and economical management of the utility. However, the Commission has ruled that a utility need not initially present evidence on the prudence every item of expense. Commission Order No. 02-469. As I am not an attorney, I will not attempt to sort out that issue, but simply observe that the case presented by witness Fisher and myself is adequate to burst any presumption of prudence the company may enjoy.

Q. Please explain your conclusions regarding the prudence of the company's Naughton Environmental Retrofits.

A. With respect to prudence, the company's actions count as imprudent for several reasons.

First, installing the Naughton Environmental Retrofits was not a cost effective decision given the information the Company had or should have had at the time the investment decisions were made and at times after that decision when the company could have changed course.

Second, the company chose to exercise its management discretion and to invest in the Naughton Environmental Retrofits in such a manner that would result in ratepayers bearing substantial and unnecessary costs, a clear abuse of discretion by the management of an enterprise entrusted with the public good and, therefore, imprudent.

Third, the most basic duty of a public utility is to provide adequate service at just and reasonable rates, but the Naughton Environmental Retrofit costs were not necessary nor were they the least cost resource choice for the provision of utility service over the long term. Among other errors and omissions, the company did not properly consider all the relevant costs of and alternatives to the Naughton Environmental Retrofits. Therefore, rates that include recovery for these costs are inimical to the public interest, create economic waste, and would be, by definition in excess of just and reasonable rates and thus not recoverable in rates.

Fourth, the company knew or should have known about—and did not properly consider—a number of emerging federal requirements that will require additional expenditures on control technology or may lead to plants being repowered or retired. In this way, the company has asked ratepayers to fund piecemeal work that could be done more efficiently or not at all once it has a better understanding of the full suite of federal requirements. Instead, the company chose to gamble on the installation of pollution controls that it hoped would meet (or be a cost effective foundation for meeting) EPA's final requirements and any other requirements. This gamble not only violates the principle that utility property

must be used and useful for public convenience at the time of rate consideration, but it is, at bottom, imprudent speculation.

Thus, the Naughton Environmental Retrofit capital expenses were not prudent. The prudent action would have been to fully evaluate the likelihood and costs of future regulations and to act on that knowledge as required to provide long term least cost service and to properly analyze the Naughton Environmental Retrofits against all the relevant alternatives. To have done otherwise risks installing expensive pollution controls that fall short of meeting EPA requirements and would therefore require a new round of capital expense, shutdowns, or both.

Q. Are there examples that show that the company knew or should have known about the potential cumulative effect on its coal plants of then current and emerging environmental regulations?

A. Yes. The company's own documents that shows it has known of the potential for such a cumulative effect prior to April 2009.[3] Pacificorp's SEC 10-K of March 31, 2003, said:

> While the Company is unable at this time to predict with certainty the level of capital expenditures relating to air quality and carbon dioxide emissions, it believes these amounts could be significant but will be spread over a number of years. The Company also believes that the impact will be mitigated by recovery through the regulatory ratemaking process.[4]

There is similar material in the more recent SEC filings. For example, in the 10-K for the transition from April 1 2006 to Dec 31 2006 (PacifiCorp acquired by MEHC), the New Source Review section reads:

> Pending or proposed air regulations will require PacifiCorp to reduce its electricity plant emissions of sulfur dioxide, nitrogen oxides and other pollutants below current levels. The reductions will be required to address regional haze programs, mercury emissions regulations and possible re-interpretations and changes to the federal Clean Air Act. In the future, PacifiCorp expects to incur significant costs to comply with

[3] See 2009 Hunter SAP included as Exhibit Sierra Club 117. That SAP was dated April 2009, so the company clearly was aware of the cumulative regulatory requirement issue prior to that date.
[4] PacificCorp SEC 10-K of March 31, 2003 available at http://www.sec.gov/Archives/edgar/data/75594/000007559403000009/p03310310kfinal.htm

> various stricter air emissions requirements. These potential costs are expected to consist primarily of capital expenditures. PacifiCorp expects that these costs would be recovered in rates and, as such, would not have a material adverse impact on PacifiCorp financial results.[5]

In the 2008 IRP Update, the company acknowledges that the impending regulations may have a significant impact on its fleet:

> There are currently a multitude of environmental regulations, which are in various stages of being promulgated, as outlined on the timeline below. Each of these regulations will have an impact on the utility industry and could affect environmental control requirements, limit operations, change dispatch, and could ultimately determine the economic viability of PacifiCorp's generation assets. The US Environmental Protection Agency has undertaken a multi-pronged approach to minimize air, land, and water-based environmental impacts. Aside from potential greenhouse gas regulation, no single regulation is likely to materially impact the industry; however, <u>in concert they are expected to have a significant impact –especially on the coal fueled generating units</u> that supply approximately 50% of the nation's electricity. [IRP Update, p. 17, <u>emphasis</u> added].[6]

This foreknowledge of the likely cumulative effect of then-current and emerging regulations is precisely the knowledge that makes the company's failure to comprehensively assess the costs of those regulations in its management decisions a clear act of imprudence. Indeed, the company has only recently begun to evaluate the regulations "in concert," even though it anticipated that those regulations would have a significant impact on coal-fired power plants.

This management behavior is the epitome of imprudence. To the extent that the company makes any investment or incurs any costs based on that faulty and shortsighted analysis, those investments and costs would be imprudent.

[5] Pacificorp 10-K for Transition April 2006 to Dec 2006 available at http://www.sec.gov/Archives/edgar/data/75594/000007559407000003/p10k123106.htm

[6] For Pacificorp 2008 IRP Update, see http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2008IRPUpdate/PacifiCorp-2008IRPUpdate_3-31-10.pdf

Q. Please explain your conclusions regarding the prudence of the company's Hunter Environmental Retrofits.

A. With respect to prudence, the company's actions here also count as imprudent for several reasons.

The reasons are similar to the case of the Naughton retrofits. The retrofit was not necessary and the company's analyses did not consider the merits of deferring this decision. They also were flawed and, when corrected and combined with a reasonable carbon costs, show that the retrofit is marginal and risky under the best circumstances, and a significant liability under reasonably expected conditions.[7]

Thus, the Hunter Environmental Retrofit capital expenses were not prudent. The prudent action would have been to fully evaluate the likelihood and costs of future regulations and to act on that knowledge as required to provide long term least cost service and to properly analyze the Hunter Environmental Retrofits against all the relevant alternatives. To have done otherwise risks installing expensive pollution controls that fall short of meeting EPA requirements and would therefore require a new round of capital expense, shutdowns, or both.

Q. Can you identify the other costs that the company is likely to incur, and that Oregon ratepayers may be asked to bear, in the near- to mid-term for power plant retrofits?

A. Yes, in broad terms. According to Dr. Fisher, EPA has or is poised to promulgate a series of rules that will apply to generating units in the electric sector, including the company's fleet of generating units. The rules will address air emissions, coal combustion residue, water intake and water effluent. Public statements of the company, set out above, explain that it anticipates substantial additional expenditures on retrofits to meet certain of these rules.

Q. Why must the Commission consider costs outside those proposed for recovery in the current docket?

A. Determination of the prudence of the company's investment and the most economically efficient resource choices requires a comprehensive and detailed

assessment of the costs associated with a variety of options. This assessment must include a full understanding of all of the known costs associated with specific options, as well as an understanding and evaluation of costs that can reasonably be anticipated for specific options. While the company is not seeking cost recovery for all of the upcoming costs in this docket, evaluating these expenditures in isolation from known and likely upcoming expenditures biases the review in favor of the Environmental Retrofits.

Q. Please explain how a rate case is related to the company's IRP process.

A. An integrated resource planning process, by definition, must abide by two broad principles. First, all resources must be considered—and considered on a "level playing field." Second, the IRP process must deliver an integrated portfolio of resources with the mix of resources that will provide adequate and reliable service at the lowest life cycle cost, with the life cycle cost comparisons (between resources or portfolios) and with an acceptable level of risk to ratepayers. The company has used IRP for years, and it is appropriate that the company's rate requests be consistent with these principles of IRP.

Q. Can it be difficult for utilities to plan for compliance given the sheer number of regulatory activities that EPA is currently undertaking?

A. Although anticipating upcoming regulations can be challenging, EPA is expressly pursuing a multi-pollutant approach to help companies comprehensively plan for compliance. For example, in January, 2010, EPA announced its intention to ensure better air quality, and promote a cleaner and more efficient power sector and have strong but achievable reduction goals for SO_2, NO_X, mercury, and other air toxics. In other words, the company moved forward on these retrofits prior to having a full understanding of the magnitude of later, related costs.

[7] Witness Fisher details the flaws in assumptions and modeling for the Hunter retrofits in Sec. 8 of his prefiled testimony.

The company's premature actions are all the more imprudent because EPA has emphasized the agency's efforts to take a multi-pollutant sector-based approach to regulation in order to provide certainty and clarity.[8]

On this issue, the company argues

> Q. Does the Company believe that its CAl properly balances stakeholder interests?
>
> A. Yes. Environmental benefits, including visibility improvements, will flow from the projects installed under the Company's CAl. The Company believes that the emission reduction projects and their timing appropriately balance the need for emission reductions with the concerns of our customers for low-cost energy, concerns of state utility commissions, and concerns of other stakeholders.

(Direct Testimony of Chad A. Teply at 11, ll. 3-7.) While additional controls would result in environmental improvements, the question of whether the generation in question is "low-cost" cannot be resolved without taking into account known and likely upcoming rules and associated compliance costs. In evaluating additional investment in existing capacity for recovery from ratepayers, the Commission should be rigorous in its scrutiny and require the utility to go beyond simply the question of whether a particular retrofit is mandated for continued operation.

In some regards, the company's most recent planning and decision processes demonstrate efforts to consider a range of compliance options at different plants, as well as new resource options for meeting its customer's needs. However, the company's planning and decision process for the Environmental Retrofits was shortsightedly based on the assumption that existing units must continue to operate regardless of likely costs, with ratepayers bearing the burden. The

[8] Lisa Jackson, *Remarks on the 40th Anniversary of the Clean Air Act, As Prepared*; September 14, 2010. Available at http://yosemite.epa.gov/opa/admpress.nsf/a883dc3da7094f97852572a00065d7d8/b6210c1d1d49b7a4852577fb006f435a!OpenDocument. Accessed 4/8/11.

company failed to use appropriate venues, such as integrated resource planning, to allow the Commission to consider in comprehensive fashion whether ratepayers should fund continued operation of existing coal-fired units in light of existing and future regulatory requirements. Resource retirement, repowering, energy efficiency, and portfolio replacement do not appear to have been options in compliance planning, nor did resource replacement emerge as an option in integrated resource planning until required by this Commission for the the company's 2011 IRP Update.

Q. Is it sufficient for the company to determine the cost-effectiveness of the retrofits currently required for compliance?

A. No. While Dr. Fisher and I have explained why the specific Environmental Retrofits were not necessarily required for compliance, such an evaluation would be incomplete even if they had been necessary, as it ignored relevant planning information that the company's management knew or should have known, and put ratepayers at risk for the costs of capital expenses that, when considered as part of a whole, might not be cost-effective. In fact, Dr. Fisher shows that the capital expenses actually were not the least cost choice given the information that the company had or should have had at that time.

Even worse, however, the company pursued a piecemeal approach—planning for meeting only one or two upcoming requirements, rather than considering the full costs to ratepayers of continuing to operate the affected plants. Without factoring in the full range of known and likely costs that ratepayers would have to bear, it is not possible to assert that the power plants in question produce low-cost generation. It is worth noting that, among all the other reasons given here for considering the company's decisions to be imprudent, its piecemeal approach to evaluating capital retrofits to existing power plants ignores the 40-year-plus trend of steadily increasing and tightening environmental regulation nationwide. Now and for future analyses, it is reasonable for the Commission and the company to assume additional regulation and additional regulatory costs will be imposed. Such an assumption will support evaluation of individual compliance expenditures within a broader context of the full range of compliance obligations

and costs that the company is likely to face at a particular unit rather than reviewing compliance obligations one by one.

The company's piecemeal approach to evaluating the upcoming costs of compliance deprived ratepayers of the benefit of a comprehensive review and prudence management of utility investments. The Commission should not countenance consideration of one regulation at a time in an environment of multi-pollutant requirements when evaluating the known and likely costs of continued operation and retrofit. It is not reasonable to put ratepayers at risk of having to fund multiple modifications or retrofits to meet compliance obligations if, taken as a whole, those compliance activities are less economical than alternatives.

The summaries of upcoming environmental requirements presented in Dr. Fisher's testimony evidence the potential synergistic magnitude of existing and proposed regulatory requirements. These mandates will inevitably inform utilities decisions as they make future resource allocations to meet customer demand and determine the most appropriate investments for recovery from ratepayers. Given the wide coverage of these mandates, it will be essential that, for future planning purposes and rate treatment, the Commission and the utilities consider their potential impact in a comprehensive, rather than singular, case-by-case basis. A step-wise, consistent decision-making process for deciding whether to retrofit existing plants, new plants or employ some other resource will be essential to ensuring the best outcome for ratepayers. When evaluating alternatives, utilities must consider the market cost of existing, unused natural gas capacity, the cost of a new combined cycle natural gas plant, as well as that of wind, other renewables, demand response, and energy efficiency, in comparison to the specific retrofit costs faced by an individual unit.

It is critical for companies to consider a reasonable range and intensity of risks and uncertainties, particularly those associated with environmental regulation. These include carbon costs, ozone regulation, mercury regulation, coal combustion waste risks and requirements, and other pending regulatory issues, as discussed in Dr. Fisher's testimony. I recommend that utilities be directed to

include the costs and risks of existing and emerging regulations on a joint, multi-pollutant basis in evaluating investment plans, even when the final form or timing of a regulation is unknown, given the capital intensive and long-lived nature of investments in the electric industry.

Q. Are there other reasons why the Naughton Environmental Retrofit capital expenses were imprudent?

A. Yes. As explained by Dr. Fisher, the company failed to update its analyses between decision dates, despite rapid and substantial changes in the planning environment. Among the crucial errors were failure to reflect in the analysis changing market prices for power, changing fuel costs, and changing O&M costs, using inconsistent generation estimates, and the serious error of assuming that the plants would have to be retired in 2008 or 2009, rather than 2012 or more likely 2015. The changes in the power planning environment were well known to utility managers. The company's management likely knew of them as soon as they occurred and certainly should have known of them. In the face of such knowledge, failure to reconsider such large capital expenses while there was time to do so was imprudent. Further, those analyses, while they may have had a positive present value revenue requirement differential (PVRR(d)) over the full life of the plant, did not break even for so long a period that a reasonable person would have considered the positive PVRR(d) be quite risky, especially compared to more modular options such as energy efficiency and renewables, not to mention the simple option of considering the whole decision inside the company's portfolio analysis as it uses in its IRP. The analysis supporting the Naughton FGD retrofits was executed months before the NTP date, and nearly a year and a half before the project broke ground. Circumstances, and particularly natural gas price outlooks, had changed markedly during that time. As the long-term outlook for natural gas fell, the Company's long-term electricity market price fell as well, weakening the justification for the Naughton retrofits markedly. It is incumbent on management to review their decisions diligently and, in the face of new information or findings, re-assess their findings and act accordingly. Even given the highly flawed analysis in this case, simply repeating the analysis prior to

proceeding and prior to construction would have revealed a very different set of outcomes.

Q. Are there other reasons why the Hunter Environmental Retrofit capital expenses were imprudent?

A. As explained above, the reasons are similar and the flaws in analysis and decision making leading to those reasons were also similar. However, the way they fit together is slightly different. One key question was the choice of carbon costs for the analysis. As Dr. Fisher showed, the company analyzed on a wide range of carbon cost projections, but took decisions that made sense only if it had relied only on the lowest of those projections, a projection ($8) that was about one-fifth the dollar value of the next highest projection it considered at that time. Even so, combined with the corrections to the company's other assumptions and analysis set out by Dr. Fisher, the benefits become so marginal in the $8 case that a reasonable person would have reconsidered, and the supposed benefit becomes wholly unsupportable with higher carbon prices.

4. RECOMMENDATIONS

Q. What recommendations do you have for Commission?

A. I recommend that the company's Naughton and Hunter Environmental Retrofit capital expenses be disallowed. That disallowance should include not only recovery of and on the capital costs of the Environmental Retrofits, but also any associated operation and maintenance (O&M) costs and costs due to lost output from the affected plants. The term "costs due to lost output from the affected plants," means the cost of replacement power or additional production needed by the company due to any plant or unit downtime caused by the installation or operation and maintenance of the Environmental Retrofits. This also includes the cost of additional production or replacement power the company needs due to either parasitic loads or reduced capacity at any plant or unit caused by the operation of the Environmental Retrofits, less the variable costs of production avoided at the plants or units affected by the installation and operation of the Environmental Retrofits. The company should be required to make a

compliance filing to document the amount of those costs. That compliance filing should be subject to review and approval in this proceeding by the parties and Commission.

Q. Does your opinion change if construction has already commenced or is complete on one or more of the imprudent retrofits that are being proposed for cost recovery in this proceeding or if any such construction has already been permitted?

A. No. Such costs should still be disallowed. The disallowances I recommend are fully consistent with traditional ratemaking, whether or not the imprudent capital expenses have already been made, in whole or in part.

Q. Does your opinion change if additional capital expenses for a specific imprudent retrofit are being proposed for recovery, but some of that retrofit's cost was already allowed in rate base in a prior rate case?

A. No. The Commission should disallow as imprudent that portion of the capital expenses not already allowed into rate base by prior Commission Order. The Commission should also consider, now and in the future, whether any of those or similar capital expenses (that is, capital expenses now found to have been imprudent but which have been allowed into rate base by prior Commission Order) are used and useful in the provision of utility service. Under traditional ratemaking practice, the cost of capital expenses that have already been allowed into rate base (whether by an explicit finding of prudence or in accordance with a utility's presumption of prudence), but which are no longer used and useful (if they ever were) may be subject to a disallowance, the extent of which is within the Commission's discretion.

Q. Does your opinion change if any of the associated operation and maintenance (O&M) costs and costs due to lost output from the affected plants have already been allowed in a prior rate case?

A. That would depend on the specific circumstances. For example, if any of those costs were booked as a current expense in a prior year and, so, are no longer to be recognized in a future rate year, there would be nothing to disallow. On the other hand, if any of those costs had been booked and deferred for later amortization but not yet reviewed for rate recovery, any remaining unamortized balances should be disallowed, along with any accrued carrying charges. If there is some

other mixed circumstance, the proper treatment would depend on the details. As the company is in the best position to know how it booked and amortized any such costs, it should be required to identify them and describe their treatment to date for consideration as part of the compliance filing recommended above.

Q. Do you have additional recommendations for the Commission?

A. The company is requesting the opportunity to recover significant costs from ratepayers associated with the continued operation of its existing coal-fired power plants. It is my understanding that the company has made numerous investments similar to the Environmental Retrofits at other existing generators, as well as transmission and distribution investments associated with the operation of such plants. Further, it is quite likely that continued operation of many of the company's existing generators will require further environmental retrofits or equally large non-environmental capital expenses.

The facts and events presented in the Sierra Club's testimony in this proceeding demonstrate that the company's management and decision making processes for such generation and transmission and distribution investments has, at least in the past, been fundamentally flawed. This does not create an atmosphere of confidence consistent with the usual presumption that utility management is prudent and economical. However, I would not go so far as to recommend that the Commission remove that customary presumption entirely, at least not yet.[9] However, the Commission should also require the company to provide a prompt and full analysis and accounting for the impact of existing and upcoming environmental regulations affecting its entire fleet of coal plants, as well as the full range of options for addressing those regulations, including both supply- and demand-side resources as well as alternatives to continued operation such as retirement or repowering.

I discuss how the Commission might consider doing so above in this testimony, but specifically I recommend that the Commission take a proactive approach to

ensure sound decision-making and to ensure that the Commission has sufficient information to evaluate company decisions that could result in significant costs to ratepayers. In particular, I recommend that the Commission establish as its norm an expectation that a comprehensive and consistent planning process, fully documented and available for later scrutiny, be carried out by any utility that wishes to seek rate recovery for major capital improvements to existing generation and transmission assets. In general, the Commission's guidelines for such a process should require:

(1) A thorough inventory and description of all the relevant resource options, together with an assessment of their costs, benefits, uncertainties and risks, as well as the probabilities of those risks,

(2) An objective analysis of how those uncertainties and risks affect the performance of various resource plans individually and in combination,

(3) Development of a plan relying on a portfolio of resources that manages risk and uncertainty to a reasonable level while delivering the lowest life cycle cost over the fullest possible range of plausible future scenarios.

If the company fails to do so or fails to coordinate its rate requests with its IRP planning processes and principles, the Commission should consider imposing a further penalty in the form of a reduction to the company's allowed rate of return.

Q. Does this conclude your testimony?

A. Yes, it does.

[9] As mentioned earlier in this testimony, it may be that no such presumption exists in Oregon. If so, this recommendation is all the more reasonable.

PUBLIC UTILITY COMMISSION OF OREGON

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SIERRA CLUB EXHIBIT 201

Résumé
of William Steinhurst, Ph.D.

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA.
Senior Consultant, July 2003 to Present
Consulting services to state and provincial energy regulators and public advocates, state provincial and national energy departments, and non-governmental organizations on regulatory policy, power supply procurement, electric industry restructuring, portfolio management, rate setting and rate design, economic impacts of efficiency and renewable generation programs, and other utility and energy topics. Expert witness services and litigation advice. Co-authored reports, journal articles and conference presentations on portfolio management, energy efficiency programs, and electric reliability.

Vermont Department of Public Service, Montpelier, VT.
Director for Regulated Utility Planning, 1986-2003
Preparation of long range policy plans in the areas of electric utilities, energy and telecommunications, including oversight of research, modeling, public input processes, policy analysis and writing. Development of policy positions and drafting of legislation and rules concerning utility resource planning, power supply acquisition, generation and transmission permitting, environmental costing, energy efficiency and alternative generation, utility restructuring and retail choice, distributed utility planning, rate setting and rate design, mergers, financing and acquisitions, decision analysis, power contract restructuring, Qualifying Facility contracts and permits, net metering, and other critical regulatory issues. Extensive expert testimony on those matters, as well as utility bankruptcy, prudence reviews, and critical utility policy matters. Extensive legislative testimony.

Planning Econometrician, 1981-1986
Energy demand forecasting, economic and demographic projections, economic and policy impact analysis, avoided cost estimates, and other quantitative analysis for utility and energy policy making. Development of State's basic policies regarding least cost planning and resource selection, including methods for evaluation of and program design for generation, transmission and demand-side options. Implementation of utility energy efficiency program requirements.

Vermont Agency of Human Services, Montpelier, VT.
Director of Planning, 1979-1981

Vermont Department of Social and Rehabilitation Services, Waterbury, VT.
Director of Planning and Evaluation, 1977-1979
Acting Deputy Commissioner, 1977

Vermont Department of Corrections, Montpelier, VT.
Director of Planning and Research, 1974-1977
Chief of Research and Statistics, 1973-1974

Pre-2004 Energy Consulting

Illinois Energy Office, 1986.
Massachusetts Executive Office of Energy Resources, 1986.
Northern Technology, Inc., Gorham, NH, 1983-1985.
James River Corporation, Green Bay, WI, 1985.
Newfoundland Department of Natural Resources, 1995

Teaching

University of Vermont, Burlington, Vt., 1977 to 1989
Adelphi University, Garden City, N.Y., 1980 to 1988
University of N. H., Complex Systems Ctr., Grad. Studies Comm., 1992-1994
Institute of International Education, Least Cost Planning Seminar, 1999
Community College of Vermont, 2002-2004

Miscellaneous

National Science Foundation Undergraduate Research Grant, 1965.
Wesleyan University Astronomy Prize, 1967.
Association for Criminal Justice Research (Northeast/Canada), Director, 1973 to 1981, Secretary/Treas., 1973 to 1980.
University of Vermont Graduate Award in Statistics, May, 1980.
Contributing Editor, Current Index to Statistics, 1976-1985.
Chair, Session on Energy Economics, New England Business and Economics Association Annual Meeting, 1983.
Member, Intl. System Dynamics Soc., Tau Beta Pi.
Northeast International Committee on Energy, New England Governors' Conference/Eastern Canadian Premieres, various periods, 1986 to 2003
Director, Vermont Girl Scout Council, 1989-1991, 2000-2008; Secy., 1991-1997
3rd Vice President, Girl Scouts of the Green and White Mountains, 2009 to date
Editor, Intl. System Dynamics Soc. Bibliography, 1990-
Advisory Group Member, New England Project, MIT Analysis Group for Regional Electricity Alternatives, 1991-1995.
Chair, Steering Committee & Modeling Subcommittee, New England Governors Conf. Regional Energy Planning Project, 1991-1995.
Member, Montpelier School System Technology Steering Committee and Montpelier High School Technology Committee, 1992-1993.
Reviewer, Vermont Experimental Program to Stimulate Competitive Research, 1993-
Invited Speaker, 3rd Intl. Conf. on Externality Costs, Ladenburg, FDR, 1995.
Member, Steering Committee, New England Governors Conference, Restructuring/ Environmentally Sustainable Technologies Project, 1996-1997
U. S. DOE Distributed Generation Collaborative, 2000-2003
Justice of the Peace, Montpelier, Vermont, 2007–

EDUCATION

Degrees

B.A., Physics, Wesleyan University, Middletown, CT, 1970
M.S., Statistics, University of Vermont, Burlington, VT, 1980
Ph.D., Mechanical Engineering , University of Vermont, Burlington, VT, 1988

Continuing Education

Seminar in Electricity and Telecommunications Demand, 1981
Advanced Workshop in Regulation and Public Utility Economics, June, 1982 and
June, 1983, Rutgers University
Transmission Reliability Assessment, Power Technologies, Inc., 1986
Regional Forecasting and Simulation Modeling, January, 1991, U. Massachusetts-Amherst

TESTIMONY, EXPERT REPORTS and AFFIDAVITS

Vermont Public Service Board

On behalf of the Vermont Department of Public Service:

Docket 4661 - Green Mountain Power Rate Increase

Dockets 5009/5112 - Vt. Electric Coop. Rate Increase

Dockets 5108/5109 - Vt. Marble Co. Small Power Rate

Docket 5133 - Moretown Hydro Energy Co. Small Power Rate

Docket 5202 - VPPSA Refinancing

Docket 5248 - DPS Ontario Hydro Power Purchase

Docket 5270 - Least Cost Planning and Demand-Side Management

Docket 5270-GMP-1 - Highgate Apartments Fuel Switching

Docket 5270-CV-1&3 - Demand-Side Management Preapproval and Ratemaking Principles

Docket 5270-CV-4 - IRP

Docket 5270-VGS-1 - Demand-Side Management Preapproval

Docket 5270-WEC-1 - Demand-Side Management Preapproval

Dockets 5270-BRTN-1, 5270-CUC-3, 5270-HDPK-1, 5270-JHNS-1, 5270-JKSN-1,
5270-LDLW-1, 5270-LYND-1, 5270-MRSV-1, 5270-ORLN-1, 5270-RDSB-1,
5270-ROCH-1, 5270-STOW-1, 5270-SWNT-1, 5270-VMC-1 - IRP's

Docket 5270-VGS-2 - Demand-Side Management Preapproval

Docket 5277 - DPS Ontario Hydro Transactions Agreement

Docket 5330A - Hydro Quebec Power Purchase

Docket 5330E - Hydro Quebec Power Purchase, Waiver and Amendment

Docket 5372 - CVPSC Rate Increase

Docket 5491 - CVPSC Rate Increase

Docket 5630/32 - VEC Debt Restructuring & Rate Increase

Docket 5634 - NET Toll Dialing Plan

Docket 5638 - CVPSC Mack Molding*

Docket 5664 - EPACT Standards

Docket 5810/11/12 - VEC Debt Restructuring & Rate Increase

Docket 5825 - Ludlow IRP - externalities

Docket 5826 - Vermont Marble Electric Division - IRP - externalities

Docket 5832 - Lyndonville IRP - externalities

Docket 5841/5859 - Citizens Utilities Prudence Review & Revocation Petition

Docket 5854 - Electric Restructuring*

Docket 5857 - GMP Rate Increase*

Docket 5971 - VEC Bankruptcy Reorganization*

Docket 5980 - Proposal for Statewide Efficiency Utility

Docket 5983 - GMP Rate Increase (HQ Issues)

Docket 6018 - CVPSC Rate Increase (HQ Issues)

Docket 6107 - GMP Rate Increase (HQ Issues)

Docket 6140 - Electric Industry Restructuring (various presentations)*

Docket 6033/6053/6110/6142/6158/6326/6327/6371/6462/6464 - various municipal electric rate increases*

Docket 6270 - Qualifying facility contract reform

Docket 6290 - Distributed Generation*

Docket 6300 - Sale of Vermont Yankee

Docket 6330 - Petition of CVPSC and GMP on Restructuring (various presentations)*

Docket 6149/6315 - WEC electric rate increases* (HQ and Settlement Issues)

Docket 6460 - CVPSC Rate Increase (HQ Issues)

Docket 6495 - Vermont Gas Systems Rate Increase (Deferral Account and Hedging)

Docket 6565 - Various station service contracts

Docket 6596 - CUC rate Increase (HQ Issues)

Docket 6758 - Fourteen Utilities - Violations of Statutes on Special Contracts and Special Rates—Phases I & II

For consulting clients:

Docket 6958 - Green Mountain Power Rate Design - for AARP

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 7085 – CVPS Street Lighting Tariff – for Village of Woodstock

Docket 7175 - Green Mountain Power Rate Design – for Conservation Law Foundation and AARP

Docket 7176 - Green Mountain Power Alternative Regulation Plan—for Conservation Law Foundation and AARP

Docket 7336 – CVPS Alternative Regulation Plan – for Conservation Law Foundation*

Docket 7466—Efficiency Utility Structure—for Conservation Law Foundation

Docket 7670—20 Utilities Petition to Purchase Power from Hydro Québec US— for Conservation Law Foundation

Vermont State Environmental Board

Docket 5W0584-EB - Developers Diversified Land Use Permit

Federal Energy Regulatory Commission

Docket Nos. ER95-1586-000 and EL96-17-000 - Citizens Utilities Company **

California Public Utilities Commission

Multi-Stakeholder Study of Alternatives to the Mohave Generating Plant Pursuant to CPUC Decision 04-12-016 - for Southern California Edison (February 2006) *

R.06-02-013 – Long Term Procurement Plans of PG&E, SCE and SDG&E&E – for the Division of Ratepayer Advocates (March 2007)

Connecticut Department of Public Utility Control

Docket No. 03-07-16 - Alternative Transitional Standard Offer (live testimony Dec. 2004, prefiled comments Jan. 2003) *

Delaware Public Service Commission

Docket No. 04-391 – Standard Offer Service – for the Commission Staff (live testimony October 2006)

District of Columbia Public Service Commission

Formal Case 1047 – Investigation into the Structure of the Procurement Process for Standard Offer Service – for the District Office of People's Counsel (June 2006 to date) **

Florida Public Service Commission

Dockets 080407 through 080413-EG – Commission Review of Numeric Conservation Goals – for the Southern Alliance for Clean Energy and the Natural Resources Defense Council (August 2009)

Illinois Commerce Commission

Docket No. 05-0159 - Commonwealth Edison Basic Utility Service Procurement
Docket No. 05-0160, 0161 and 0162 - Ameren CILCO, AmerenCIPS, and AmerenIP - Basic Utility Service Procurement

Indiana Utility Regulatory Commission

CAUSE NO. 42598 - Vecrtren North - Gas cost rate making mechanism and demand side management programs (Sept. 2004)
CAUSE NO. 42612 - Public Service of Indiana - demand side management programs (Sept. 2004)

Kansas Corporation Commission

Docket No. 11-GIME-492-GIE – Predetermination Rulemaking – Sierra Club (February 2011) *
Docket No. 11-KCPE-581-PRE – Predetermination hearing – Sierra Club (June 2011)

Massachusetts Department of Public Utilities

Docket 07-050 – Investigation into Rate Structures that will Promote Efficient Deployment of Demand Resources – for The Energy Consortium (June 2007) *

Mississippi Public Service Commission

Docket 2008-AD-158 – Proceeding to Review Statewide Electric Generation Needs – for The Sierra Club (June 2008)
Docket 2008-AD-477— Docket to Consider Standards Established by the Energy Independence and Security Act of 2007, Section 111(d) of Public Utility Regulatory Policy Act (16 U.S.C. § 2621)—for The Sierra Club (November 2009) *

New Hampshire Public Utilities Commission

Docket DE 07-064 – Revenue Decoupling Investigation – for Conservation Law Foundation (May 2007 to date) *

New Mexico Public Regulation Commission

Case No. 10-00086-UT – Public Service of New Mexico Rate Case — for New Energy Economy (May 2011)

Ohio Public Utilities Commission

Restructuring Roundtable – System Benefit Charges - Commission workshop presenter *
Case No. 09-906-EL-SSO—Competitive Bidding Process—for Ohio Consumers' Counsel (December 2009)

Oklahoma Corporation Commission

Cause No. RM 2007-007 – Demand Side Management Rulemaking – for The Sierra Club and the Oklahoma Sustainability Network (May 2008) *

South Carolina Public Service Commission

DOCKET NO. 2009-261-E—SCE&G DSM filing—for Southern Environmental Law Center and the South Carolina Coastal Conservation League (January 2010)

U.S. District Court for the District of Vermont

Civ. No. 2:03-cv-279 – Circumferential Highway Impact Analysis – for Vermont Public Interest Research Group, Inc., Friends of the Earth, Inc., Conservation Law Foundation, and The Sierra Club (January 2004) **

Civ. No. 11-cv-99 – Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. v. Peter Shumlin, et al. – for the Defendants (September 2011) **

U.S. District Court of Appeals for the District of Columbia

No. 11-1315 (Consolidated with Lead No. 11-1302 and Associated Cases 11-1323, 11-1329, 11-1338, 11-1340, 11-1350, and 11-1357—Luminant Generating Co., LLC, *et al.* v. U.S. EPA *et al.*—for American Lung Association, Clean Air Council, Environmental Defense Fund, Natural Resources Defense Council, and Sierra Club (October 2011) **

Utah Public Service Commission

Docket No. 10-035-124 – Rocky Mountain Power Rate Case – Sierra Club (May 2011)

Virginia State Corporation Commission

Docket # PUE-2009-00023 – Conservation and demand response targets – the Southern Environmental Law Center, Appalachian Voices, Chesapeake Climate Action Network and the Virginia Chapter of the Sierra Club (September 2009)

Docket # PUE-2009-00081 – Demand Side Management Program Approvals – the Southern Environmental Law Center, Appalachian Voices, Chesapeake Climate Action Network and the Virginia Chapter of the Sierra Club (December 2009)

Docket # PUE-2009-00096 – Dominion IRP – the Southern Environmental Law Center, Appalachian Voices, Chesapeake Climate Action Network and the Virginia Chapter of the Sierra Club (February 2010)

Docket # PUE-2009-00097 – APCo IRP – the Southern Environmental Law Center, Appalachian Voices, Chesapeake Climate Action Network and the Virginia Chapter of the Sierra Club (March 2010) (testimony filed pending hearing)

Wyoming Public Service Commission

Docket No. 20000-384-ER-10 – Rocky Mountain Power Rate Case – Powder River Basin Resource Council (April 2011)

* No prefiled testimony
** Affidavit or expert report only

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Backus, G., J. Amlin, W. Steinhurst and P. Cross. *Champlain Pipeline Project: Energy and Economic Systems – Assessment*. Vt. DPS, 1989.

Bartels, C., R. Squires, and W. Steinhurst. *Electric Power Supply in Vermont*. Vt. DPS, 1983.

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Biewald, B., Woolf, T., Roschelle, A., & Steinhurst, W. (2003) *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. Synapse Energy Economics report for NARUC. October 10, 2003.

Blomberg, L., B. Hausauer, and W. Steinhurst, et al., *Fueling Vermont's Future: Comprehensive Energy Plan and Greenhouse Gas Action Plan: Public Review Draft*. Vt. DPS, 1997 and *Final*, 1998.

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Roschelle, A., & Steinhurst, W. (forthcoming). *Best Practices in Procurement of Default Electric Service: A Portfolio Management Approach*. Electricity J.

Schwartz, L., and W. Steinhurst. Is it smart if it's not clean? Questions Regulators Can Ask About Smart Grid and Energy Efficiency, Part one: Strategies for utility distribution systems. Regulatory Assistance Project *Issueletter* prepared for U.S. Environmental Protection Agency. May 2010.

Shapiro, W., W. Steinhurst, et al. *Vermont Telecommunications Plan: Final Draft*. Vt. DPS, Aug. 1996 and *Final*, Dec. 1996.

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Steinhurst, W., *Hypothesis Tests for Parole Survival Analysis*. Masters thesis, University of Vermont, May, 1980.

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------- and N Perrin. *1977-78 High School Survey: Patterns of Substance Use*. Vt. Dept. of SRS, 1979.

-------, N. Perrin, and A. Jette. *Running in the SRS Juvenile System: 1975 - 1979*. Vt. Det. of SRS, 1979.

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von Turkovich, B., and W. Steinhurst. "Plastic Flow Localization and Instability in Metal Processing." *Proc. 14th N. Amer. Manuf. Res. Conf.*, Minneapolis, May, 1986, pp. 340-347.

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Wilson, D., J. O'Rourke, W. Steinhurst, et al. *Welfare Reform: A Vermont Perspective*. Vt. AHS, 1980.

ARTICLES AND PRESENTATIONS

Andersen, D., G. Richardson, J. Rohrbaugh, S. Ratanawijitrasin, W. Steinhurst. "Group Model Building. *Proceedings of the International System Dynamics Conference*. Intl. System Dynamics Soc., 1992.

Biewald, B., Chernick, P., and W. Steinhurst. *Environmental Externalities: Highways and Byways*. Proc. NARUC IRP Conf., Kalispell, MT, 1994.

Hamilton, B., L. Milford, S. Parker and W. Steinhurst, "Fuel Switching in Vermont: Issues and Experiences." *Proc. of ACEEE 1992 Summer Study on Energy Efficiency in Buildings*, 12 pp.

Hogan, C., and W. Steinhurst. "Managing Change in Corrections." *Federal Probation*, June, 1976.

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------- "Hypothesis Tests for Parole Survival Analysis." *Evaluation Review*, 5, 699-711 (1981).

------- "Don't Throw Out the Baby: Some Design Requirements for Federalism Reform." *New England Journal of Human Services*, 1, 41 - 45 (1981).

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