

**To:** PacifiCorp 2011 IRP Team  
**From:** HEAL Utah and Utah Physicians for a Healthy Environment  
**Date:** March 24, 2011  
**Re: Comments on 2011 PacifiCorp Draft IRP**

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On behalf of HEAL Utah and Physicians for a Healthy Environment, we respectfully submit the following comments on the 2011 PacifiCorp Draft Integrated Resource Plan (IRP).<sup>1</sup>

The present IRP draft is deficient in its consideration of the negative health effects inherent in an electricity generation portfolio that heavily relies on fossil fuels. These risks and health effects should be addressed thoroughly in the IRP.

As it does not provide analysis of data regarding the external costs of energy through harm to human health incident to the extraction and combustion of fossil fuels for electricity production, Pacificorp's 2011 IRP draft is both legally and technically inadequate. The draft fails to fully consider the "long run public interest" of the state of Utah as required under Utah State Law,<sup>2</sup> Division of Public Utilities rules<sup>3</sup> and Guidance.<sup>4</sup> There is credible data available on the health effects of fossil fuel emissions which provides insight into the costs and benefits of resource development and retirement as laid out in the IRP and accompanying action and business plans. We are concerned that Utahns and PacifiCorp's Utah rate payers are left unprotected by PacifiCorp's failure to address this data. We see the necessity of addressing these issues in a way that is cost effective and protective of public health. The IRP quantifies many risks and incorporates them into its resource planning process. This affords the public and regulators opportunity to participate with PacifiCorp in dealing with the analyzed risks. Health effects need to be among these analyzed risks.

#### 1. Background:

We should note that PacifiCorp does not function in a free market, but is allowed the role of a utility by representatives of the people of Utah, through the Public Service Commission, the Division of Public Utilities and under legislation contained in Title 54 of the Utah State Code. According to the Public Service Commission, "integrated resource planning is an open, public process through which all relevant supply-side and demand-side resources, and the factors influencing choice among them, are investigated in the

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<sup>1</sup> PacifiCorp, 2011 Integrated Resource Plan: Public Version for Comment. Version Data: 7 March 2011. (2011 PC IRP)

<sup>2</sup> U.S.C. 54.17, <http://le.utah.gov/UtahCode/section.jsp?code=54-17>.

<sup>3</sup> U.A.C r746, <http://www.rules.utah.gov/publicat/code/r746/r746.htm>.

<sup>4</sup> Utah Public Service Commission. In the Matter of the PacifiCorp 2006 Integrated Resource Plan, Docket Number 07-2035-01. 6 February 2008. (PSC 2008)

search for the optimal set of resources to meet current and future electric service needs at the lowest total cost to the utility and its customers, in a manner consistent with the long-run public interest, given the expected combination of costs, risks and uncertainty.”<sup>5</sup>

In 2007 the Public Service Commission did not acknowledge PacifiCorp’s integrated resource plan, and offered extensive guidance to improve future IRP filings. Their report recommends that “future IRP’s discuss, and where possible quantify all externalities, both positive and negative, that can be identified including societal health effects from activities associated with the company’s operations, climate change, and impacts on local and regional economies.”<sup>6</sup>The PSC report relates a litany of deficiencies recapitulating salient public comment.<sup>7</sup> The present IRP draft fails to correct the following deficiencies present also in the 2007 version.<sup>8</sup>

- (1)The IRP only considers the direct cost of anticipated regulation.
- (2)There is no analysis of resource choice impacts which will not be reflected in the resource price.
- (3)Specific health effects of resource choices are neither discussed in detail nor quantified.

These deficiencies leave the 2011 IRP as it was in 2007, without the necessary analysis to determine if the conclusions of the IRP are consistent with the public interest. We are confident that there is sufficient data for PacifiCorp to complete the required analysis and that the public health burden from the company’s operations is meaningful and significant.

## 2. Health Effects:

In 2007 the Public Service Commission noted that “comments concerning the unexamined health impacts of alternative types of generation technologies are much more comprehensive than in the past and we concur with all parties that further expansion of the type of external costs considered is required going forward.”<sup>9</sup> Today the body of literature on the health burden of electrical generation operations is far more comprehensive than it was in 2007. The data, models, methodologies, and findings of this research are available from peer reviewed sources and are easily available for PacifiCorp to cite, refute, or discuss in their IRP. The 2011 IRP discusses alternative

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<sup>5</sup> PSC 2008, 5.

<sup>6</sup> PSC 2008, 24.

<sup>7</sup> PSC 2008, 7.

<sup>8</sup> It should be noted the 2009 IRP exhibited many similar deficiencies, and that the division did not recommend that the IRP be acknowledged. Also in 2009 the quality of information on these health effects had not grown to 2011 levels.

<sup>9</sup> PSC 2008, 29.

generation options, detailing transmission and other costs. The health effects of energy production deserve similarly detailed attention.

(a) Combustion of Fossil Fuels:

The National Academies <sup>10</sup> and the Harvard School of Public Health <sup>11</sup> have both published current and comprehensive works on the health costs of fossil fuel emissions from electricity production. Additionally, a study based on the same bodies of research has been contracted and published by the state of Utah.

These three studies represent an important cross-section of research on air pollution resulting from energy production and the resulting public health effects. The National Academies Report is a national application of the research, while the Harvard paper is a survey of the current literature and the Utah study produced by Synapse Energy Economics focuses on Utah specific data. While these are similar studies we should note that their estimates vary widely because they include different factors. For example, the Harvard paper estimates the impacts of mountain top removal and does not mention the costs of water use. <sup>12</sup> On the east coast, where mountain top removal is an issue and water rights are not, this is sensible. Similarly, in Synapse’s Utah-specific work there is no consideration of mountain top removal while water issues take center stage.

These studies discuss a list of pollutants and health effects which we aggregate in Table 1.

Pollutant	Health Effects
SO <sub>2</sub>	Respiratory illnesses—wheezing and exacerbation of asthma, shortness of breath, nasal congestion, and pulmonary inflammation—plus heart arrhythmias, LBW, and increased risk of infant death. (Harvard 2008 85)
NO <sub>x</sub>	When combined with V.O.C. they form particulates (see PM <sub>2.5</sub> ), ozone, and cause HABs. (Harvard 2008 85,86)
VOC	Combine with NO <sub>x</sub> to form PM <sub>2.5</sub> and ozone. (Harvard 2008 85)

<sup>10</sup> Committee on Health, Environmental, and Other External Costs and Benefits of Energy Production and Consumption; National Research Council. Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use. <http://www.nap.edu/catalog/12794.html>. 2010. (NAS 2010)

<sup>11</sup> Paul R. Epstein, et al. “Full cost accounting for the lifecycle of coal” Ann. N.Y. Acad. Sci. 1219:73-98 (Harvard 2011)

<sup>12</sup> Harvard 2008.

Pollutant	Health Effects
PM <sub>2.5</sub>	All-cause premature mortality, cardiovascular and cardiopulmonary mortality, as well as respiratory illnesses, hospitalizations, respiratory and lung function symptoms, and school absences. Those exposed to a higher concentration of PM <sub>2.5</sub> are at higher risk. Lung and heart disease, and increased hospitalization costs. Diabetes mellitus enhances the health impacts of particulates and has been implicated in sudden infant death syndrome.(Harvard 2008 85)
Ozone	Ozone can burn the deep alveolar tissue in the lungs, causing it to age prematurely. Chronic exposure can lead to asthma and chronic obstructive pulmonary diseases, and is particularly damaging to children, active young adults who spend time outdoors, and the aged. (Harvard 2008 85, Theo Colburn, et al. Natural Gas Operations from a Public Health Perspective. International Journal of Human and Ecological Risk Assessment, Accepted for Publication 4 September 2010)
HAB	Gastroenteritis, neurological deficits, respiratory illness, and diarrhetic, paralytic, and neurotoxic shellfish poisonings. (Harvard 2008 86)
Mercury	Cardiovascular disease, and neurological effects in infants and children, including delayed achievement of developmental milestones and poor results on neurobehavioral tests—attention, fine motor function, language, visual-spatial abilities, and memory. (Harvard 2008 87)

The Harvard School of Public Health summarizes the human health impacts of coal combustion as three-fold: (1) increased mortality and morbidity due to combustion and pollution, (2) hospitalization costs from increased morbidity, and (3) higher frequency of sudden infant death syndrome in areas with high quantities of particulate pollution.<sup>13</sup>

All three reports quantify the above effects both in quantity and cost. The Synapse study finds that power plant emissions cause 202 premature deaths, 154 hospital visits for respiratory injuries, and 175 asthma related emergency room visits each year.<sup>14</sup> The National Academy of Sciences study identifies nearly 9,000 premature deaths from air pollution.<sup>15</sup> The Harvard School of Public Health finds 2,800 non-fatal cases of lung cancer and 38,200 nonfatal heart attacks among other morbidity effects and costs.<sup>16</sup> These data offer an important context when discussing the valuation of mortality and morbidity effects. Whatever the costs PacifiCorp associates with these deaths and illnesses it is essential that the IRP examine the unavoidable impacts of energy production on public health. Presently, the IRP modeling includes only CO<sub>2</sub> costs, while

<sup>13</sup> Harvard 2008 79-80

<sup>14</sup> Fisher, Jeremy, John Levey, Yurika Nishioka, Paul Kirshen, and Rachel Wilson. Co-Benefits of Energy Efficiency and Renewable Energy in Utah. Cambridge: Synapse Energy Economics, Inc, 2010. [http://geology.utah.gov/sep/renewable\\_energy/pdf/synapse\\_co-benefits.pdf](http://geology.utah.gov/sep/renewable_energy/pdf/synapse_co-benefits.pdf). (Synapse 2010)

<sup>15</sup> NAS 2010

<sup>16</sup> Harvard 2011 85

other pollutants are discussed in the context of present and expected regulatory requirements with no discussion of their impacts on human health. We invite PacifiCorp to either adopt the methodology from the literature in this area, or present their own analysis for review in the IRP process.

The National Academies report spends considerable time detailing how mortality and morbidity are rendered in dollars and cents per kilowatt-hour. All studies considered include some form of the same discussion. Morbidity is more straightforward than mortality in these valuations. Morbidity data is observable: the cost of hospitalization or other treatment, lost wages to the worker, lost productivity to firms, etc.

Mortality is somewhat more complex. The National Academies, Synapse, and most of the studies in the Harvard paper use the EPA's standard value for the cost of premature death. Here we defer to the National Academies:

One important example of a value taken from the literature is commonly referred to as the "value of a statistical life" (or VSL), which characterizes the rate at which people are willing to trade increased risk of death for other goods and services. By observing in many occupational and other settings how much people have been willing to pay to reduce the risk of death (or are paid in compensation for taking additional death risks) or by conducting surveys that ask people how much they are willing to pay to lower their death risks, *estimates have been made for the VSL that are used in regulatory decision making around the world, including various agencies in the U.S. government. We used these values in our study.*<sup>17</sup>

Synapse's decision to use the EPA's VSL was hotly criticized at the public meeting proceeding the report's publication<sup>18</sup> and in the following media attention.<sup>19</sup> When pressed as to why the EPA's VSL was used, Synapse representatives pointed out that they have used this value for human life in similar analysis conducted for other states and thus could not credibly devalue the lives of Utahns arbitrarily in comparison to the citizens of other states. Whatever the debate on these assumptions, there is value in this metric as it is the metric of regulation, especially in the present context of PacifiCorp's proclivity for resisting pollution control measures until they are absolutely

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<sup>17</sup> NAS 2010 51

<sup>18</sup> John Hollenhorst. Insiders Detail State's Issue with Energy Study. KSL.com. <http://www.ksl.com/index.php?&sid=11442332>. 5 July 2010. Accessed 17 March 2011. (KSL 2010)

<sup>19</sup> KSL 2010

assured to be part of regulation.<sup>20</sup> Under the present pollution control paradigm the *only* VSL likely to impact ratepayers is the EPA value. This valuation paradigm has been in use for more than twenty years at the EPA,<sup>21</sup> so valuing with the same parameters prepares the IRP for the potential regulatory landscape when regulations are passed.

For a sense of scale we reproduce data from the Harvard Paper here.<sup>22</sup> We present these data to illustrate the kind of damages and costs that should be considered in the integrated resource planning process. The essential role of this analysis in the IRP process is clear when the average cost of electricity in Utah is considered. Our coal-rich electricity presently averages 6.49¢/kWh<sup>23</sup> and would at least double if all the costs were considered under the Harvard rubric. Utah-specific damages and costs are of course different. But if there is a fundamental disagreement by PacifiCorp of the assumptions or modeling done by the Harvard School of Public Health regarding the VSL estimates we would invite them to include their own analysis of these costs in the interest of having a transparent IRP.

<b>Impact</b>	<b>Monetized Estimate</b>	<b>in ¢/ kWh</b>
Emissions of air pollutants from combustion.	\$187 Billion	9.31¢
Lost productivity from mercury emissions	\$1.6 Billion	.1¢
Excess mental retardation cases from mercury emissions	\$361 Million	.02¢
Excess cardiovascular disease from mercury emissions	\$3.5 Billion	.21¢
Total Emissions Costs	\$193 Billion	9.64¢
Total Cost (all factors)	\$345 Billion	18¢

<sup>20</sup> Chad A. Teply. Direct Testimony, In the Matter of: the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations, Docket Number: 10-035-124. <http://www.psc.utah.gov/utilities/electric/10docs/10035124/70683Direct%20Testimony%20of%20Chad%20A%20Teply.doc>. 24 January 2011. Accessed 17 March 2011. 13-14.

<sup>21</sup> Viscusi, W. Kip, et al. *Economics of Regulation and Antitrust*. 4th ed. MIT Press. 732. In 61 FR 45778, 62 FR 38856, 64 FR 9560, and 65 FR 6698 the EPA uses 6.3 million 2000 dollars (7.9 million in 2010 dollars) as a basis for their regulations. Both 62 FR 38856 and have specific reference to air quality.

<sup>22</sup> Harvard 2008 91.

<sup>23</sup> U.S. Energy Information Administration. Utah Electricity Profile. [http://www.eia.gov/cneaf/electricity/st\\_profiles/utah.html](http://www.eia.gov/cneaf/electricity/st_profiles/utah.html). Data Release March 2010. Accessed 17 March 2011.

The 2007 IRP non-acknowledgment document mentions specifically that “the Utah Geological Survey is examining how to include other externalities in utility planning processes and we expect this work, when it is available to be taken into consideration by the Company.”<sup>24</sup> The Utah Geological Survey has since published the Synapse report on their website.<sup>25</sup> Significantly, the Synapse report considers the costs in Utah based on Utah generation facilities rather than on national averages while also considering uniquely western issues such as water. The description posted on the UGS download site for the Synapse report is notable and worth quoting at length:

Synapse Energy Economics, Inc. (Synapse) was contracted by several Utah State agencies, including the Utah State Energy Program, the Division of Public Utilities, the Division of Air Quality, the Committee of Consumer Services, and the Governor’s Energy Advisor, to develop and apply methods of calculating water and health co-benefits of displacing electricity generation technologies in Utah with new energy efficiency or renewable energy.

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Monetized externalities and co-benefits can be considered on par with energy production direct costs (such as capital, fuel, and operational costs) and benefits (such as reliability and availability).

...

Modeling emissions avoidance, externalities, and co-benefits can be useful for planning and licensing purposes. The results of this study may be used in state processes for considering the full costs and benefits of new generators in utility integrated resource plans (IRPs); determining effective strategies to comply with federal or regional air quality plans and state implementation plans (SIPs); estimating pathways to meet emissions targets for regional and federal regulations, calculating benefits of state, regional, or federal renewable portfolio standards; and examining indirect costs and benefits of transmission expansion plans. This approach can help lead to resource planning and policy decisions that better reflect the interests of Utah and its residents.<sup>26</sup>

As the USGS clearly demonstrates, this type of study (if not this very study) is intended for consideration during the IRP process, especially when considered in combination with the Public Service Commission language referencing similar ongoing work.

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<sup>24</sup> PSC 2008 29.

<sup>25</sup> [http://geology.utah.gov/sep/renewable\\_energy/pdf/synapse\\_co-benefits.pdf](http://geology.utah.gov/sep/renewable_energy/pdf/synapse_co-benefits.pdf)

<sup>26</sup> Utah Geological Survey. Study of Co-Benefits of Efficiency and Renewables in Utah: Air Quality, Health, and Water Benefits. [http://geology.utah.gov/sep/renewable\\_energy/co-benefits.htm](http://geology.utah.gov/sep/renewable_energy/co-benefits.htm). Accessed 17 March 2011.

The Synapse study finds that removing the oldest coal plants from Utah's generation mix has a distributed health benefit of 6.9¢/kWh.<sup>27</sup> Regardless of the dollar value, the report uses standard procedures for quantifying the actual effects of emissions on health and finds that power plant emissions cause 202 premature deaths, 154 hospital visits for respiratory injuries, and 175 asthma related emergency room visits each year.<sup>28</sup>

This study met significant resistance despite producing conservative estimates and using established methodology. To illustrate this point we reproduce two items published in the media immediately following the publication of the study.

First, Jim Holtcamp a representative of Utah Manufacturers argued that the study:

- Ignored PacifiCorp's plan to reduce emissions
- Didn't consider car and truck exhaust
- Used worst-case risk scenarios
- Used too high a value for water<sup>29</sup>

And second, Rocky Mountain Power's representative Jeff Hymas published the following statement:

"We disagree with the study's conclusions. Rocky Mountain Power participated in an initial review of the published study along with a broad group of Utah business stakeholders including the Salt Lake Chamber of Commerce, Utah Manufacturers Association, Utah Association of Energy Users, Utah Industrial Energy Consumers, Utah Mining Association, Deseret Power and others. Together, we identified enough concerns with the assumptions used in the study's analysis to determine that its results should not be relied on."<sup>30</sup>

There is nothing in these concerns that provides reason or excuse for ignoring the data that these results are based upon. If there are valid concerns with health effect modeling held within the company we invite and feel that the guidance discussed above compels PacifiCorp to address these concerns in the IRP and present their own analysis for review. We request that PacifiCorp employ analysis and data comparable to

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<sup>27</sup> This is much lower than the harvard work, because of regional differences not reflected in the Harvard work (for example Utah coal is generally higher quality coal and thus burns cleaner with fewer emissions/kWh) and differing estimation methodologies.

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<sup>29</sup> <http://www.ksl.com/?nid=148&sid=11442332>

<sup>30</sup> <http://www.ksl.com/?nid=148&sid=11372355&pid=2>



that used by Synapse, Harvard, and The National Academies, and if there are material differences in PacifiCorp's findings we reiterate our call for PacifiCorp to include its own analysis of these costs in the interest of having a transparent IRP.

### 3. Conclusion

The present draft of the 2011 PC IRP does not consider adequately the externalities of the company's operations. We recommend that the company in future drafts consider these costs with rigor commensurate to that applied to other risks in the IRP. The deficiencies that we identify show the IRP draft to be out of compliance with statute, rule, and guidance, and if these are not addressed we recommend non-acknowledgment for the IRP.

Respectfully submitted,

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