July 31, 2013

Via Email and U.S. Mail

Drake Task Force
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Re: Martin Drake Decommissioning Study – Draft Materials

To Martin Drake Task Force:

Colorado Springs City Council, acting as the Board for Colorado Springs Utilities (CSU), recently requested a study to evaluate alternatives for when and how the Martin Drake Power Plant (Drake), located in downtown Colorado Springs, can be decommissioned. Like many coal-fired power stations across the U.S., the Drake coal-plant causes substantial air pollution and faces a number of existing, new, and potential environmental regulations over the next few years. Over the past several years, numerous questions have been raised by the City Council and the citizens of Colorado Springs about the economic and environmental viability of Drake. In response to concerns, the City Council formed the “Drake Task Force,” a citizen task force to oversee the study of Drake.

The Board contracted with HDR, an outside engineering firm, to provide “an independent evaluation regarding the disposition of the Drake facility based upon economic, social, and environmental considerations.”¹ These comments address the draft study alternatives and quantitative metrics developed by HDR that have been provided for public review and comment. Sierra Club prepared these comments with technical guidance and expertise from Synapse Energy Economics, Inc., an independent energy research and consulting firm.²

² http://www.synapse-energy.com/
Sierra Club is a national, non-profit environmental and conservation organization with members in Colorado Springs and throughout the United States. The Sierra Club is dedicated to the protection of public health and the environment. Sierra Club provides these comments on behalf of itself and the 1,450 members of Sierra Club’s Pike’s Peak Group, the majority of who live in Colorado Springs and purchase utility services from CSU. Sierra Club’s members have a direct and substantial interest in the future of Drake because CSU’s plans for the facility will have environmental, health and economic consequences for Sierra Club members in the Colorado Springs region.

I. BACKGROUND ON MARTIN DRAKE COAL PLANT

The Drake units are small (Drake unit 5, 46 megawatts (MW); Drake unit 6, 77 MW; Drake unit 7, 131 MW)\(^3\), and the units are old, commissioned 39, 45 and 51 years ago, respectively. CSU recently completed a multi-year planning process, the 2012 Electric Integrated Resource Plan (EIRP), which assumed the continued operation of Drake beyond 2030.\(^4\) However, Colorado Springs citizens and various stakeholders raised serious concerns about the continued operation of Drake in the face of massive capital spending requirements. The Board established the Drake Task Force to consider the long-term economic and social impacts of committing to spend hundreds of millions of dollars in capital upgrades on Drake that are necessary to meet basic environmental regulations if the plant continues to operate.

II. THE HDR STUDY

HDR provided two documents for public review on June 25, 2013: the Draft Alternatives List and the Draft Work Metrics Study.\(^5\) The Draft Work Metrics Study proposed including both a Financial Return on Investment (FROI) metric and a Sustainable Return on Investment (SROI) metric. The FROI, as its name suggests, evaluates only financial and economic considerations. The SROI includes a monetized evaluation of social and environmental impacts for each of the alternatives studied.

Sierra Club supports HDR’s proposal to evaluate both the FROI and the SROI. Many of the impacts related to Drake involve financial as well as social and environmental costs. Including both the FROI and the SROI will allow the Board and the public to fully evaluate the impacts of Drake on Colorado Springs. HDR has performed similar analyses in the past for other municipal utilities, such as Holland, Michigan’s Department of Public Works.\(^6\) In the Holland work, HDR found that there were substantial non-financial benefits to ceasing the burning of coal at Holland’s James De Young coal units. In this case, as discussed in more detail below, HDR must ensure that it

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\(^4\) Ibid.

\(^5\) A third document identified by HRD, the Draft Common Assumptions, has not been made available to the public prior to the deadline for comment.

captures all of the social and environmental benefits of eliminating coal combustion at CSU’s Drake units.

HDR also provided a Draft Alternatives list. The Draft Alternatives include a base case scenario that assumes the continued operation of Drake until 2033 (Base Case), and several alternatives that consider accelerated retirement dates for Drake with various sensitivities. The assumptions included in these alternatives, and in particular the Base Case, are critical for making an accurate evaluation of the FROI and the SROI at Drake. The Base Case must include capital and operational cost estimates for compliance with all current and future environmental requirements. The Base Case must also account for the financial risks of construction cost overruns, fuel price increases, carbon prices, and wasted capital costs. Forecasts of environmental and other future regulations, fuel costs, and carbon costs should use up-to-date, widely accepted sources.

Similarly, the alternative cases must include low-capital-cost options, such as replacing Drake with increased energy efficiency levels or renewable energy, as well as considering fueling Drake with natural gas rather than constructing an entirely new gas facility. It is imperative that HDR’s comparison of alternatives considers the provision of electric services to Colorado Springs, and HDR should not immediately assume that a one-for-one replacement of the generation provide by Drake is necessary. Colorado Springs does not need one-for-one replacement of the 260 MW of capacity at Drake because it already has 41% more generating capacity than it can use. The alternatives must also consider the value of energy efficiency and renewable generation, including the benefits that these sources create by hedging against future fuel price spikes in natural gas or coal. In all of the Drake alternative cases, HDR should include an appropriate minimum level of energy efficiency. We address our specific recommendations of the Base Case and alternative case assumptions in more detail below.

A. **BASE CASE**

The Base Case scenario provides the baseline assumptions that HDR will use to compare the relative FROI and SROI of the various alternatives. HDR included two subsets of Base Case scenarios: (1) operating Drake on coal through 2033; and (2) retiring Drake 5 in 2016 and Drake 6&7 in 2020 and replacing with a combined cycle gas unit in 2020. HDR states that these scenarios “are intended to initially compare ongoing Drake facility operation based upon the current forecast of capital additions and performance.” For purposes of these comments, Sierra Club refers to the “Base Case” as the continued operation of coal at Drake. It is critical to ensure that the Base Case is clear about the assumptions that HDR includes in its Base Case cost expenditure estimates. The ongoing cost to operate must include the identified costs to install SO₂ and NOₓ controls to comply with the Regional Haze Rule, and HDR must also consider all other applicable (current and future) regulations.

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1. HDR Must Consider Costs Related to Existing, Proposed, and Potential Environmental Requirements

HDR identified the coal Base Case scenario as requiring NeuStream system operation by January 2015 and the installation of selective catalytic reduction (SCR) by 2023. These requirements stem from Colorado’s implementation of the Regional Haze Rule, which requires Drake to meet an SO₂ limit of 0.26 lb/MMBtu for unit 5 and 0.13 lb/MMBtu for units 6 and 7 by January 1, 2018. Under the Regional Haze Rule, CSU must also install NOₓ controls at Drake and will be required to meet additional requirements to achieve reasonable progress goals for NOₓ starting in the 2018-2023 period, which will likely require the installation of SCR.

The HDR drafts identify capital expenses related to the Regional Haze Rule. However, the Base Case must also include specific plans for compliance with all current and expected environmental regulations. Over the course of the past several years, EPA has promulgated rules to protect human health and the environment. Some of these rules have been in the works for decades while others are more recent initiatives based on new and emerging scientific evidence. There are effectively six types of environmental regulations that may have profound economic implications for coal units at Drake:

- National Ambient Air Quality Standards (NAAQS)
- The Regional Haze Rules
- Mercury and Air Toxics Standards (MATS)
- Coal Combustion Residuals (CCR); and
- Effluent limitation guidelines
- Greenhouse Gas Performance Standards for Existing Power Plants

With the exception of the Regional Haze Rule, HDR has not provided any analysis of the cost impacts that all future environmental requirements will have for Drake. The HDR Study must include a detailed analysis of costs in the Base Case that will be necessary to continue to operate Drake in the face of pending environmental regulations.

a) NAAQS

NAAQS set maximum air quality limitations that must be met at all locations across the nation. Compliance with the NAAQS can be determined through air quality monitoring stations, which are stationed in various cities throughout the U.S., or through air quality dispersion modeling. If, upon evaluation, states have areas found to be in “nonattainment” of a particular NAAQS, states are required to set enforceable requirements to reduce emissions from sources contributing to nonattainment such that the NAAQS are attained and maintained. EPA has established NAAQS for six pollutants: Sulfur dioxide (SO₂), nitrogen dioxides (NOₓ), carbon monoxide (CO), ozone, particulate...
matter (measured as particulate matter less than or equal to 10 micrometers in diameter (PM$_{10}$) and particulate matter less than or equal to 2.5 micrometers in diameter (PM$_{2.5}$), and lead. EPA is required to periodically review and evaluate the need to strengthen the NAAQS if necessary to protect public health and welfare. For example, EPA is currently evaluating the NAAQS for ozone and particular matter.

Drake faces particular difficulties related to the new 1-hour SO$_2$ NAAQS established by EPA. The 2010 SO$_2$ NAAQS imposes a new 1-hour standard at a level of 196 micrograms per cubic meter (“µg/m$^3$”) or 75 parts per billion (“ppb”) based on the 3-year average of the 99th percentile of the annual distribution of daily maximum one-hour average concentrations. 40 C.F.R. § 50.17(a)-(b). Modeling conducted by Sierra Club and provided to CSU earlier this year showed that operation of Drake at the SO$_2$ emissions limits permitted by the Regional Haze Rule (i.e. after installation of NeuStream) will still cause exceedances of the 1-hour SO$_2$ standard in the Colorado Springs region. Figure 1 below is a map of these modeled exceedances showing that areas west and north of Drake, including several schools and parks, will continue to suffer from illegal levels of the plant’s emissions of SO$_2$ even after NeuStream controls are installed.

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10 Supporting data for Sierra Club’s modeling is available at:
It is likely that Colorado will take action to regulate major sources of $\text{SO}_2$ to ensure that the region remains in attainment of the 1-hour $\text{SO}_2$ standard, otherwise Colorado risks triggering a non-attainment designation for Colorado Springs, which in turn would create additional control obligations for Drake in the future. In nonattainment areas, sources must comply with emission reduction requirements known as “Reasonably Available Control Technology” (RACT) to bring the areas into attainment of the NAAQS. A nonattainment designation would also impact other Colorado Springs businesses and industry. All new major sources in a nonattainment area, including major modifications at existing sources, must comply with very strict emissions reductions consistent with “lowest achievable emissions reductions” (LAER) as well as obtain emission offsets.

The independent $\text{SO}_2$ modeling commissioned by the Sierra Club shows that Drake will likely trigger non-attainment of the new 1-hour $\text{SO}_2$ standard in the Colorado Springs region. HDR should therefore include capital expenses for additional $\text{SO}_2$
controls in the Base Case to reflect the costs of meeting more stringent SO\textsubscript{2} limits in the near future.

- Sierra Club recommends that HDR evaluate the costs of installing control technologies to ensure compliance with NAAQS, particularly the new 1-hour SO\textsubscript{2} NAAQS.

### b) Regional Haze Rule

One of the Clean Air Act’s national goals is to reduce existing visibility impairment from manmade air pollution in all “Class I” areas (e.g., most national parks and wilderness areas). (42 U.S.C. § 7491(a)(1)) EPA’s implementing rules require states to create plans to significantly improve visibility conditions in Class 1 areas with the goal of achieving natural background visibility conditions by 2064. These requirements are implemented through state plans with enforceable reductions in haze-causing pollution from individual sources, known as “best available retrofit technology” (BART) determinations. In Colorado, the state BART determination for Drake requires an SO\textsubscript{2} limit of 0.26 lb/MMBtu for unit 5 and 0.13 lb/MMBtu for units 6 and 7. CSU has proposed to meet this limit using NeuStream technology, which is a pilot-level demonstration project that has never been used at scale. The BART permitted limit does not allow Drake to exceed the limit if NeuStream does not work as planned. CSU must meet the permitted emissions limit at Drake, whether with NeuStream or some other technology, by January 1, 2018.

The Regional Haze Rule also requires measures to meet “reasonable further progress” milestones. (See generally 40 C.F.R. §51.308-309). The first reasonable progress period is 2018-2023. The reasonable progress goals will require additional pollution reductions at sources such as Drake, which will likely require the installation of SCR. HDR has accounted for the cost of NeuStream and SCR by 2023 in its Draft Alternatives list.

- Sierra Club recommends that HDR consider a sensitivity that assumes the installation of conventional wet flue-gas desulfurization (FGD) scrubbers at Drake by January 1, 2018 to account for the possibility that the unproven NeuStream technology may not adequately meet the Regional Haze Rule’s requirements.

- HDR should also consider scenarios that avoid the costs of NeuStream or other SO\textsubscript{2} controls through the early retirement (prior to 2018) of Drake.

### c) MATS

In 2000, after a lengthy study, EPA determined it was appropriate and necessary to regulate toxic air emissions (or hazardous air pollutants, HAPs) from utility steam electric generating units. As a result, EPA adopted strict emission limitations for hazardous air pollutants that are based on the emissions of the cleanest existing sources. (Clean Air Act §112(d)) These emission limitations are known as Maximum Achievable Control Technology (MACT). The final MATS rule sets strict stack emissions limits for mercury, other metal toxins, other organic and inorganic hazardous air pollutants (HAPS), as well as acid gasses. Existing sources must comply with MATS by April 2015, with the possibility of a one year extension to April 2016.
Sierra Club recommends that HDR include MATS compliance costs, beginning in 2015, in its analysis of the Base Case. HDR should also consider scenarios that avoid these costs through the early retirement of Drake.

d) Coal Combustion Residuals

Coal-fired power plants generate a tremendous amount of ash and other residual wastes, which are commonly placed in dry landfills or slurry impoundments. Drake disposes of ash in lined ponds, and ships some of its ash to the Ray Nixon coal plant. Regulations governing the structural integrity and leakage from these installations vary. However, the risk associated with these installations was dramatically revealed in the catastrophic failure of the ash slurry containment at TVA’s Kingston coal plant in Roane County, Tennessee in December 2008, releasing over a billion gallons of slurry and sending toxic sludge into tributaries of the Tennessee River.

On June 21, 2010, EPA proposed regulation of ash and scrubber wastes, or “coal combustion residuals” (CCR) as either a Subtitle C “hazardous waste” or Subtitle D “solid waste” under the Resource Conservation and Recovery Act (RCRA). The coal combustion rulemaking was forced by a combination of missed statutory deadlines and court orders. The current rulemaking is 30 years overdue.

If the EPA classifies CCR as “hazardous waste” under Subtitle C, a cradle-to-grave regulatory system will apply to CCR, requiring regulation of the entities that create, transport, and dispose of the waste. Under this hazardous waste designation, the EPA would regulate siting, liners, run-on and run-off controls, groundwater monitoring, fugitive dust controls, and any corrective actions required; in addition, the EPA would also implement minimum requirements for dam safety at impoundments.

Under a “solid waste” Subtitle D designation, the EPA would require minimum siting and construction standards for new coal ash ponds, compel existing unlined impoundments to install liners, and require standards for long-term stability and closure care.

The EPA is currently evaluating which regulatory pathway will be most effective in protecting human health and the environment. Disposal costs for ash at Drake will be affected by the decision, and those costs could increase substantially. Drake produces 73,900 tons of harmful coal ash each year. Other utilities have estimated that disposal costs could reach $100-$300 per ton of ash. This means that Drake could face more than $22 million annually in additional costs to comply with CCR rules that designate coal ash as hazardous. HDR should include in its analysis a sensitivity reflecting the costs facing Drake to comply with both Subtitle C (hazardous) and Subtitle D (solid waste) disposal of Drake’s coal ash.

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Sierra Club recommends HDR include expenses in the Base Case estimates reflecting likely capital and operating requirements for coal ash disposal. The study should consider both hazardous and non-hazardous cost to dispose of Drake’s 73,900 tons of coal ash annually.

e) Effluent Limitation Guidelines

The Clean Water Act requires EPA to develop “effluent limitation guidelines” – clear rules for what large industrial sources of water pollution can discharge into nearby waters. (See 33 U.S.C. § 1311; 40 C.F.R. 423) These rules must consider what is “economically achievable” and must be updated at least once every five years to keep up with improving treatment technology. Although EPA is supposed to update its rules regularly, the power plant rules were last updated in 1982, and so are almost thirty years out of date. A recent report by Sierra Club and other environmental organizations found that most coal power plants use no meaningful treatment to control their water pollution, including dangerous fly-ash and bottom-ash waste, scrubber sludge, and leaching pollution from landfills and ponds. The report specifically identified the Drake coal plant as a facility that does not have any existing limit for toxic discharges, despite required monitoring for lead, arsenic and selenium. The report also revealed that Drake’s Clean Water Act permit expired nearly three years ago in 2010.

On September 15, 2009, EPA announced its intent to proceed with a rulemaking on effluent guidelines for wastewater discharges from steam electric plants, including nuclear and fossil-fired plants. The EPA identified wastewaters from flue gas mercury control systems, regeneration of the catalysts used for SCR, wastes from FGD units, and coal combustion residual storage ponds as waste streams that warrant attention. It is highly likely that new effluent limitation guidelines will address toxic releases from point sources or coal ash ponds such as the ponds at Drake.

The EPA’s proposed update to the 1982 standards contains several options. The two strongest options, labeled Options 4 and 5 in the proposed new rule, work to address the most toxic waste streams, including liquids contaminated by fly ash, bottom ash, scrubber sludge, and leachate from waste dumps. Importantly, only Option 5 meets the Clean Water Act’s mandate to achieve zero liquid discharge, and because it appears that Option 5 is readily achievable it should be selected. Option 5 would achieve the greatest progress toward eliminating pollutant discharges by requiring dry handling of fly ash and bottom ash and requiring vapor compression evaporation for scrubber wastewaters, along with chemical treatment for leachate.

Sierra Club recommends that HDR include the costs for Drake to comply with “Option 5” of EPA’s proposed effluent limitation guidelines.

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14 Ibid., Appendix 2.
15 78 Fed. Reg. at 34,458 (Table VIII-1).
f) Greenhouse Gas Performance Standards for Existing Power Plants

In a June 25, 2013 climate policy speech, President Obama announced that the EPA would begin developing regulations to reduce the emission of greenhouse gases from existing power plants. These regulations, known as New Source Performance Standards (NSPS), are required by Section 111(d) of the Clean Air Act. EPA is required to develop New Source Performance Standards for both new and existing power plants. EPA has already proposed, but not finalized, regulations for new power plants. Administration officials have said they aim to issue a proposed rule for existing power plant by June 2014 and a final rule by June 2015. Based on past practice, states will then have nine months to develop their own plans, and another year to begin enforcing them.

The Drake coal-plant, like all coal plants, is a major source of greenhouse gas emissions. The upcoming regulations for greenhouse gases from existing sources will directly impact Drake and require significant changes to the facility. Although the structure of final regulations are cannot be known at this time, Drake will likely be forced to either switch fuels or to install expensive pollution CO₂ controls such as carbon capture and sequestration.

HDR included in its Draft Work Metrics a valuation of environmental impacts from greenhouse gases. HDR estimated a median cost of $37.12 per ton of CO₂ produced by Drake. This value is an important component that addresses the harmful cost to society that greenhouse gas pollution creates. However, HDR proposed to include the cost of carbon only as part of the SROI. Excluding the cost of carbon from the FROI ignores a major capital expense that Drake will likely incur in the near future to comply with increasingly stringent greenhouse gas regulations. HDR must include some form of cost estimates in the FROI that captures the near-certain risk that CSU will be forced to spend substantial dollars to control Drake’s greenhouse gas pollution.

- Sierra Club recommends that HDR include a cost of carbon in the FROI estimate for Drake because carbon regulation will have financial impacts on CSU’s system, in addition to the societal costs of carbon pollution.

2. HDR Must Include Construction Cost Escalation and Overrun Risk in the Base Case

HDR identified installation of NeuStream as part of the coal Base Case scenario. The cost assumptions included with this scenario must include adders for cost escalation and overrun risk. After the small-scale testing phase, the estimated cost of installing NeuStream emissions control technology at Drake was $80 million. Since then, CSU has reached 30 percent design plans for the full scale project, and the cost estimate has increased by over 50 percent, to $121 million. All large construction projects have

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overrun risk, and the NeuStream project as Drake is particularly susceptible to overruns because the equipment has never been constructed or operated on a utility-scale power plant before. HDR should therefore increase the current design estimate cost of $121 million for this project, recognizing the likelihood that further substantial increases may occur and that construction of NeuStream creates additional financial risk for CSU.

- Sierra Club recommends that HDR account for the high risk of cost overruns for the NeuStream project, which has never been constructed or demonstrated at utility-scale.

3. **HDR Should Consider the Same Level of Decommissioning in the Alternative and Base Case Scenarios**

Upon the proposed Base Case retirement of Drake in 2033 or any other year, CSU will be required to decommission the contaminated Drake site. There are varying standards of remediation, each with implications for future use of the site for electrical, industrial, commercial, residential, or recreational uses. The purpose of the study is to compare the Base Case to alternatives; therefore, it is important that the same level of decommissioning and remediation be assumed in all cases. HDR’s description of the Base Case calls for the Drake units to “be abandoned in place with no decommissioning costs.”

It would be inconsistent to compare the FROI of abandoning Drake in place in the Base Case with alternatives that bear the financial costs of decommissioning.

HDR must also consider the availability of grants to clean up the Drake site if it is decommissioned in the near-term. Because those grants may not be available decades from now, the financial and sustainable analyses of decommissioning should include the additional benefit of the grants in assessing any near-term decommissioning alternatives.

- Sierra Club recommends that HDR include the same level of decommissioning and reclamation under both the Base Case and alternative scenarios. HDR should also consider the availability of near-term grants that could offset the decommissioning costs of Drake.

4. **B. ALTERNATIVE CASES**

HDR identified several potential alternative scenarios, including an “Alternative Base Case” that assumed replacement of Drake with a combined cycle nature gas equivalent in 2020. Other alternatives include a 15 year retirement of Drake (2028), an “accelerated” decommissioning plan (unspecified less than 15 years), and a “decelerated” decommissioning plan (unspecified more than 15 years).

HDR indicates that it will consider the “best time” to decommission Drake within the alternatives selected. As discussed above, CSU is currently facing a series of major capital expense deadlines to comply with the Regional Haze Rule and the MATS rule. HDR should therefore include a decommissioning scenario or a switch to natural gas fuel scenario for Drake in the near-term (within five years) so that CSU could immediately

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19 HDR Study of Alternatives, p.2.
cease and avoid further capital expenditures for NeuStream controls and for any potential MATS controls. This alternative should consider allowing the plant to continue to operate up to the Regional Haze regulatory compliance deadline of January 1, 2017. Allowing the plant to operate up to the compliance deadline would extract the maximum amount of value from the plant without having to spend additional money on emissions controls.

Similarly, in scenarios where Drake is retired or converted to natural gas, HDR should identify and remove major capital expenditures in the years leading up to the retirement. For example, if a routine major maintenance is required every ten years, and an alternative scenario assumes the retirement of Drake in 2018, then HDR should eliminate any major recurring maintenance costs that occur within 2-3 years before the planned retirement. Under normal operations, CSU would not make these major maintenance expenditures at Drake if it was planning to close the plant shortly after. The alternative scenarios must similarly identify and exclude those major maintenance expenditures.

- Sierra Club recommends that HDR include a near-term (within 5 years) decommissioning alternative that would allow CSU to avoid any additional capital expenditures on pollution control technology.
- Sierra Club recommends that HDR eliminate major maintenance expenditures in the years leading up to retirement or fuel switching in the alternative scenarios.

1. **HDR Must Consider Replacement of Drake Based on Needs of Forecasted System Demand plus a Reasonable Reserve Margin**

   HDR indicated that the study would assume new generators would have a “nominal 260 MW”\(^\text{21}\) capacity, which would create a one-for-one capacity replacement for Drake.\(^\text{22}\) This assumption that an alternative would need to replace all of Drake’s generating capacity is not necessary. CSU currently has capacity in excess of required reserves. HDR should not assume a one-for-one replacement of the generation provide by Drake. Colorado Springs does not need one-for-one replacement of the 260 MW of capacity at Drake because the 2012 EIRP showed that CSU has a 41% reserve capacity margin.\(^\text{23}\) This is a huge overcapacity for the CSU system. The existing reserve margin is more than double CSU’s desired reserve margin of 18%, which means that in 2013 CSU has more than 178 MW of wasted, excess generation capacity.

   Even without implementing all cost-effective energy efficiency, CSU forecasts show excess generating capacity persists until 2028.\(^\text{24}\) In the alternative scenarios, HDR should appropriately size the replacement resources that are as small as possible while still ensuring adequate reserve margin. The study should not assume excessive margins created by installing unnecessarily large units merely to match the size of Drake. Such replacement resources could come in the form of smaller generators, or as appropriately sized power purchase agreements to meet the applicable need. HDR must base its study

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\(^{21}\) 2012 EIRP, p.5.

\(^{22}\) HDR Study of Alternatives. Page 2, Section 1.1.1 and 1.3.1.

\(^{23}\) 2012 EIRP, Table 3.2.

\(^{24}\) 2012 EIRP, Table 3.2, page 12.
of alternatives on actual reliability requirements necessary to meet forecasted load plus a reasonable reserve margin. Replacing Drake’s generating capacity one-for-one would result in a substantial over-build in CSU’s system and would therefore overestimate the cost of those alternative scenarios.

- Sierra Club recommends that HDR base the study of alternatives on actual reliability requirements necessary to meet forecasted load and a reasonable reserve margin, not a one-for-one replacement of Drake.

### 2. HDR Should Tailor Alternatives to Avoid Wasted Capital Costs

The decision to deploy NeuStream to control SO$_2$ at Drake involves considerable financial risk. There are two distinct ways in which CSU could find itself facing what are effectively substantial stranded costs: (1) retiring the plant after making an expenditure that fails to meet environmental compliance requirements, or (2) making the expenditure of $121 million or more and having to retire Drake or switch to burning natural gas based on future economic or regulatory pressures.

CSU plans to use NeuStream for SO$_2$ emissions control to comply with the Regional Haze Rule, instead of widely used flue-gas desulfurization (FGD) technology. CSU has stated that “Martin Drake units 6 and 7 will be deemed as meeting emissions regulations”\textsuperscript{25} once the NeuStream emissions control equipment is installed. However, Colorado’s BART determination for Drake requires the facility to meet a specific emissions limit regardless of whether CSU installs NeuStream or some other technology to control SO$_2$. To date, there are no installations of NeuStream emissions control technology on power plants in excess of 20 MW.\textsuperscript{26} Upon completion of construction and commissioning of the NeuStream installation, if Drake still emits SO$_2$ in excess of Colorado’s source-specific BART determination (0.26 lb/MMBtu for unit 5 and 0.13 lb/MMBtu for units 6 and 7), CSU would be forced to install additional SO$_2$ control equipment at Drake or reduce/cease coal-fired generation at Drake before January 1, 2018. Either of these outcomes would result in higher costs faced by CSU than planned, and the reduction or cessation of coal operations would result in substantial costs for stranded equipment that is not useful for CSU customers.

Further, even if the NeuStream emissions control does allow Drake to comply with the Regional Haze Rule, some combination of changes in fuel prices, environmental regulations, or other circumstances may result in the retirement of Drake soon after 2018. In that case, CSU risks losing any undepreciated portion of the NeuStream expenditures, and those costs would effectively become stranded at that time.

CSU has already spent over $27 million on research and development efforts related to NeuStream, $29 million on design and engineering, and $21 million in payment commitments on equipment that will be delivered over the next year.\textsuperscript{27} Much of these expenditures would be superfluous should CSU abandon its efforts to install NeuStream.


\textsuperscript{26} Ibid, p.3.

\textsuperscript{27} Ibid, p.7.
at Drake. Nevertheless, CSU risks even greater wasted capital costs if it continues to fully install NeuStream and the technology either fails or CSU chooses to retire Drake before the currently planned date of 2033.

Similarly, other major capital expenditures at Drake could be wasted if CSU retires the coal plant before the end of the expected useful life of the equipment. Other major costs at Drake include the installation of SCR controls in 2023 (or earlier), the cost of additional SO₂ controls that will likely be required to meet the 1-hour SO₂ NAAQS, and major expenditures for large routine capital replacement costs. HDR should consider the ability to avoid these major capital expenditures in its retirement scenarios. For example, if an environmental requirement such as MATS requires significant capital investment by a date certain, HDR should consider a retirement option on or before that date. Similarly, if a major routine capital expense (such as a turbine replacement) is scheduled to occur shortly before a proposed retirement date, HDR should assume that CSU would be able to forgo the major capital expense if it is not essential given the remaining life of the plant.

- HDR should identify major capital expenditures throughout the expected useful life of Drake and tailor the retirement alternatives to avoid those expenditures.

3. **HDR Should Include Cost Effective Demand Side Management (DSM) in the Alternative Cases**

Demand side management (DSM) and other energy efficiency measures are by far the most economic option for meeting CSU’s forecasted needs. However, CSU’s DSM plans in its 2012 EIRP are inadequate and therefore will result in a higher cost for ratepayers than an appropriately sized DSM plan. The 2012 EIRP relies on a DSM study performed by Summit Blue that projects a medium case ten-year cumulative energy savings of 5.7 percent. This level of investment in DSM is far too low.

Southwest Energy Efficiency Project (SWEEP) recommended that “Colorado Springs Utilities pursue a more aggressive DSM goal of 10% cumulative savings” over ten years. CSU included SWEEP’s recommended level of DSM investment as part of the analysis in its 2012 EIRP, but CSU ultimately relied on DSM investment at a 4-percent-over-ten-year level in it’s the 2012 EIRP’s demand forecast. This means that the 41% reserve margin would be even higher if CSU matched the DSM spending in the 2012 IRP action plan for its current business case, which includes “a budget for 10 percent DSM…in order to provide opportunities to achieve efficiencies with the goal of reducing average electric use by 10 percent in 2020.” In other words, if CSU actually spends as much as it has budgeted, then the forecasted need in the CSU system will be even less than the 2012 EIRP estimates and it would be even easier to remove Drake from the system. HDR should clarify the level of DSM spending in the Base Case. HDR

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28 2012 EIRP, Chapter 5.
29 Ibid, Table 5.2, p.32.
30 Ibid, p.32.
31 Ibid, Table 3.2, p.12.
should also include all cost-effective DSM, which at a minimum should exceed the 10% DSM budget included in CSU’s action plan.

- Sierra Club recommends that HDR clarify the level of DSM in the Base Case and include all cost-effective DSM measures in each of the alternative scenarios.

4. **HDR Should Account for the Benefits of Fuel and Regulatory Hedging Provided by Renewables**

Most of the alternatives considered by HDR involve continued reliance on coal, natural gas, or oil. Only two options, #23 and #25, specifically identify renewable generation as a replacement for Drake’s capacity. HDR’s omission of renewables as a replacement alternative ignores valuable benefits for Colorado Springs customers. Importantly, HDR’s work metrics do not include the value of hedging against future risks of fuel price spikes or environmental regulations (such as carbon costs). Wind and solar power provide a hedge against possible volatile fuel and commodity prices that could result in price spikes for consumers. Renewable resources have little or no fuel costs, and therefore provide a more stable base for determining the cost of power. Renewable resources also hedge against the risk of incurring carbon costs from increasingly stringent regulatory requirements, which were discussed above in more detail. In particular, it is very likely that future regulation of greenhouse gases will result in additional costs for Drake as well as potential natural gas replacement alternatives. In a recent speech, President Obama emphasized the need to address climate change by controlling greenhouse gas emissions from existing power plants, which will include Drake. Finally, wind and solar power provide a hedge against current and future renewable energy requirements. CSU’s 2012 EIRP projects insufficient RECs for RPS compliance beginning in 2022. As compliance requirements across Colorado and in the broader region increase, the availability of RECs at low prices are likely to diminish. Building wind and solar protects CSU against all of these risks.

- Sierra Club recommends that HDR account for the value that renewable energy sources provide to hedge against the risk of fuel prices, carbon prices, and increased renewable energy credit prices.

5. **HDR Should Not Inflate Wind Integration Costs**

CSU’s 2012 EIRP includes a brief discussion of a 2010 KEMA wind integration study. The KEMA study appears to have been published before CSU acquired an additional 230 MW of combined cycle generation at the Front Range Power Plant. In addition to the added ramping capability, CSU’s ownership of 100 percent of the power from Front Range will allow for increased operational flexibility because CSU can cycle the plant to more closely match renewable energy production. Furthermore, CSU owns

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33 HDR Alternatives, Table 1.4-1, page 7.
34 2012 EIRP. Figure 4.2, page 31.
35 http://www.whitehouse.gov/share/ climate-action-plan
36 2012 EIRP, Figure 4.2, p.20.
37 Ibid., p.23.
two 30 MW combustion turbines (CTs) at the Ray Nixon Power Plant, and the 28 MW ponded Tesla Hydro facility. CTs and ponded hydroelectric generators typically have very fast ramp rates, and therefore they are useful to help integrate the intermittent nature of wind generation. HDR’s study also considers alternatives that include new dispatchable generators, which would also serve to increase CSU’s ability to integrate wind inexpensively. Based on the high availability of these flexible resources, CSU’s wind integration costs from the 2010 KEMA wind integration study appear far too high and do not account for the specific operational abilities in CSU’s system. HDR should evaluate and confirm a reasonable cost for integrating wind as an alternative resource to Drake.

HDR must also properly size any replacement renewable energy resources. CSU asserts that Drake cannot be replaced with renewable resources because wind and solar are intermittent. Rejecting all renewable resources because they are intermittent is not appropriate. Renewable resources provide valuable energy generation and capacity to electricity systems if they are properly sized and integrated into the system. As noted above, renewable generation also protects CSU customers from price spikes in fuel and regulatory costs. HDR should include a scenario with an appropriate amount of renewable generation to meet CSU’s needs.

- Sierra Club recommends that HDR properly account for wind integration costs by considering the specific flexibility within CSU’s system.

6. HDR Should Account for the Financial Value of Drake Site Redevelopment

HDR has appropriately assigned a social value to the redevelopment of the Drake site. However, even for commercial redevelopment, HDR has assigned the value to the SROI account. If the Drake site is developed for non-municipal use, it should be expected that CSU would sell or lease the land to a developer, not give it away. In that case, the revenue from the sale should appear in CSU’s account, and the FROI should reflect the financial value of the sale of a CSU asset.

- Sierra Club recommends that HDR account for the economic value of the redevelopment of the Drake site in the FROI analysis.

III. All Cases

Sierra Club recommends the following for all scenarios in the HDR study:

1. HDR Must Use Current Best Forecasts

In all cases, HDR should rely on widely accepted, up-to-date, and internally consistent forecasts. HDR has proposed to use the Ventyx Spring 2013 WECC forecast

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for fuel costs and escalation,\textsuperscript{40} which seems appropriate. However, it is not clear what source HDR will use for forecasted energy sales, peak load, or carbon price. HDR should disclose these sources and, where feasible, share the forecasts with the public.

2. **HDR Must Use Accurate Forecasts for CSU’s Energy Needs**

CSU projected forecasted energy sales and peak load in its 2012 EIRP. However, as noted above, that projection appears to rely on a DSM of 4 percent over ten years, instead of the 10 percent level the resource plan ultimately proposed in its action plan. The system energy compound growth rate forecasted from 2014 to 2031 in the 2012 EIRP is 1.47 percent,\textsuperscript{41} whereas the compound growth rate forecasted by the Energy Information Administration for the Rockies electricity market module is slightly less, 1.35 percent per year.\textsuperscript{42} CSU’s projected growth rate is therefore too high, particularly in light of the fact that two large consumers within the CSU service territory, the United States Air Force Academy and Fort Carson, have committed to becoming net-zero energy users.\textsuperscript{43,44} CSU must take into account these two institutions’ zero-net-energy plans for future load and energy needs in its demand forecasts. CSU has stated that it still needs to build excess capacity for these customers to provide 100% backup power. Rather than assuming the need to build additional thermal facilities just to sit idle as potential backup for the military, CSU (and HDR) should consider the availability of regional resource adequacy contracts to provide capacity in an emergency. CSU customers should not subsidize the capacity needs of large customers.

3. **HDR Must Include All Reasonable Expected Forward-Looking Renewable Portfolio Standard Requirements**

Colorado enacted an RPS standard in 2004, and has expanded it numerous times.\textsuperscript{45,46,47,48} CSU considers a future increase in its required RPS mandate credible, as the 2012 EIRP “evaluated…a range of possible future compliance requirements for municipal utilities.”\textsuperscript{49} At a minimum, HDR should include a sensitivity for a 20% RPS requirement in all scenarios.

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\textsuperscript{40} HDR Study of Alternatives. Page 6.
\textsuperscript{41} 2012 EIRP, Table 3.1, page 10.
\textsuperscript{49} 2012 EIRP, Page 19.
Sierra Club appreciates the opportunity to provide these comments on the proposed draft material provided by HDR for the Drake decommissioning study. Sierra Club hopes that HDR and CSU will continue to make materials publicly available, including all data and assumptions, so that the public may continue to engage in this important process.

Sincerely,

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