

**pzcounter**

---

**From:** Kerrin McCall <kerrinmac@gmail.com>  
**Sent:** Wednesday, October 19, 2016 9:47 PM  
**To:** pzcounter  
**Subject:** Redundant line analysis  
**Attachments:** analysis.doc; outage history.doc; Winter Peak for the Ketchum and Elkhorn Substations.docx

Dear Commissioners,

I attended last weeks meeting on the proposed redundant line. During my remarks I offered to send details for the outage history of the existing 138v transmission line. This information was supplied to me by IPCo when I was compiling an analysis of the proposed line, and at a later date. I have attached that analysis and the outage details here. I have also attached data for the winter peak and average peak load history since 2010. Since 2007 when the winter peak was 65MW, the peak has load has consistently dropped. I bring attention to this because IPCo bases their need to supply adequate reliability on that number, even though it is not relevant to current use. This is significant when assessing alternative emergency backup generation for the North Valley.

Best,  
Kerrin McCall

**RECEIVED**  
OCT 20 2016  
BLAINE COUNTY  
LAND USE & BUILDING SERVICES



**Idaho Power Co. Proposed Subtransmission Line :  
Hailey - Ketchum**

**An Investigative Analysis**

**by  
Kerrin McCall**

**RECEIVED**

OCT 20 2015

BLAINE COUNTY  
LAND USE & BUILDING SERVICES

**Introduction**

The Wood River Electrical Plan (WREP ) December 2007 by Idaho Power Company (IPCo) addresses the current electrical supply system for the Wood River Valley from Timmerman Hill to the SNRA and recommends new infrastructure and routing for the entire system. The following document addresses the North Valley component of the WREP which is a 138kV transmission line proposed to be constructed along Highway 75 between the Wood River Transmission Station just north of Hailey and the Ketchum Substation. The proposed line would serve residents and businesses from north of East Fork to the Sawtooth National Recreation Area. The purpose of this analysis is to provide information concerning this project in addition to materials presented by Idaho Power so that the public can make an educated decision about the need for an additional transmission line.

**Community Advisory Committee (CAC)**

Idaho Power invited 19 members of the Wood River Valley (WRV) community to help layout the WREP. The committee is represented by city and county government officials, a developer, a rancher, the BLM and USFS, a former Blaine County Commissioner and alternate representatives from the Sun Valley Company. A list of the CAC members is included as **Exhibit 1**. The team met with Idaho Power through the winter and spring of 2007 to learn



about electrical generation, transmission, energy efficiency and the regulatory process. The committee then worked with IPCo to lay out transmission line routes and substation sites. On April 12, 2010 the CAC reconvened to address the entire proposed system and refine the route of the North Valley transmission line. Although some members of the original CAC are no longer participating, including the one representative from the environmental community, IPCo, when asked if new members could join, declined, saying that there was too much background information and history for a new person. It is critical that the environmental community is represented on the CAC and currently there is no environmental representative. The WRV, and the North Valley in particular, is a very environmentally sensitive area and a majority of the community members want infrastructure additions reviewed from environmental and aesthetic perspectives and values. IPCo should not exclude the environmental community from the CAC. Instead they should make every effort to orient a new CAC member from the environmental community to review and understand WRV CAC history from 2007 to the present.

### **History of the Line - 1995**

On June 2, 1995 Idaho Power Company filed an application with the Public Utilities Commission (PUC) requesting an amendment to delete prior authorization to construct a new 138kV transmission line from Hailey to Ketchum. The purpose of the proposed line was to provide backup service (redundancy) for the existing 138kV line which runs north and east out of Hailey through Elkhorn to the Ketchum Substation.

At the time of the application, Dan Olmstead of Idaho Power said that "Laying a power line is typically controversial, but this one is more so because it is not needed to address capacity problems. Olmstead continued "It's up to the customers whether they want to live with one line and put up with the minor inconveniences of interruption of service, or do they prefer to build another line they would have to look at forever."

Idaho Power performed an extensive study for the feasibility and need for an additional 138kV line which reviewed capacity requirements for service to the North Valley. The study concluded that the existing line with a 120MW (megawatt) load capacity was capable of handling the capacity of maximum buildout for the North Valley. It also stated that the line had an excellent record of reliability and that the company had taken a number of steps to further improve the line's reliability. These steps included the following:

1. Structural Assessment- Energy Data Management of Colorado performed a field inspection and structural analysis of the poles, cross-arms, insulators and conductors which confirmed that the line was in good condition and in compliance with the National Electrical Safety Code Standards.
2. Electrical Assessment: - Energy Data Management and Power Engineers of Hailey analyzed the historical performance of the line from 1980- 1994. The line was determined to have an excellent outage history with only two unplanned outages between 1981 and 1995 for a total duration of 3 minutes.
3. Fire Protection: Osmose, Inc coated the transmission poles with Fire-Guard protectant which is designed to protect the poles through 3 fires.
- 4, Avalanche Study: Power Engineers and Energy Data Management determined that all structures had adequate strength to withstand a 50 year recurrence avalanche.
5. Enhanced Maintenance Plan: Idaho Power has developed an enhanced maintenance plan to repair and replace power line components as needed.
6. Emergency Action Plan: Idaho Power has prepared a detailed, comprehensive emergency action plan to facilitate a rapid and effective response to a service outage or other emergency regarding the power line.

In summary for the 138kV line application, Idaho Power completed an extensive public participation process regarding the possible construction of a second or redundant transmission line from Hailey to Ketchum. IPCo's reported to the Idaho Public Utilities Commission (IPUC) that "the

"overwhelming response from the parties commenting was that, despite the unavoidable risk of an outage to the existing transmission line, the proposed transmission line should not be built." The reasons for public opposition to the line included "difficulty in finding an acceptable route, aesthetic impacts, health and safety concerns, and the excessive cost of burying part or all of the line," (which would be incumbent on the community to pay for). The cost in 1995 of an overhead line could have been \$3 - \$4 million dollars and as much as \$14 million to bury. IPCo also reported to the IPUC that "If longer and more frequent outages occur in the future or if the Company experiences substantial growth in the Ketchum / Sun Valley area, it would once again be appropriate to examine the options. (To date neither of these issues warrants a new line.) Sun Valley Company, Idaho Power's biggest customer in Blaine County favored maintenance of the existing line over building a redundant line. In August 1995, the IPUC " removed the authority for the construction of a second 138kV line. IPCo's filing for cancellation was based on "right-of-way problems and the extraordinary measures it has taken to improve the dependability of the line which has an excellent record of reliability. "

## **Current Transmission Line Proposal**

### **Visual Impact**

To date there are two height scenarios with more information from IPCo in July. **1.** The steel or wood poles of this transmission line could be 70' – 85' tall or more than twice as tall as the distribution poles currently running along the highway or nearly three times the height of a two story home. They would be spaced every 300' meaning there could be 175 -200 poles. There will be several tiers of line including the existing distribution line strung on these poles and a lightning shield on top. **2.** The poles could be 55' high with a lightning shield and the entire distribution line buried. Considering that Blaine County recently rejected 40' residential wind turbines in the

highway view corridor because residents were opposed for reason of aesthetics, the height of these pole could be an issue.

The transmission line can be buried for the total length or part of the length of the line which would eliminate the visual impact. Burying a 138kV line costs ten times more than an overhead line and the costs are incumbent on the community to pay. When looking at a variety of scenarios in the next section of this document, it becomes clear that burying all or any of the line is expensive.

It should be noted that the existing line, built in 1962, was built out of sight, off the highway corridor, and over three miles of difficult terrain instead of straight from Hailey to Ketchum. IPCo has not been able to give information about the decision many years ago to build the line along this route. Surely there are documents regarding the acquisition of the Right of Way for the 1962 line that would help understand this decision. One can surmise that the community and IPCO did not feel it was appropriate to build it along the highway in the view corridor.

In addition to the transmission line a "control house" will be built at the Ketchum substation. Normally a control house contains relays, batteries and switches to operate equipment when power fails – in essence these are security devices and are normal in a substation. Details of this structure have not yet been disclosed.

### **Proposed Route**

Currently, IPCo has not yet provided a routing graphic. When the graphic is available it will be provided on the Environmental Resource Center's website. The following is the best information on the route as of July 1, 2010. The 138kV line will leave the Wood River Transmission Station north of Hailey crossing to the west side of Hwy 75 and run to Greenhorn Gulch and Golden

Eagle where it will again cross the highway and proceed north on the east side of the highway to Elkhorn Rd. Here, the line will split. Presumably creating two 138kV lines. One section will run on the North side of Elkhorn Rd. to the Elkhorn Substation across from Twin Creeks (where the existing 138kV runs to the substation). The other 138kV line will go through Ketchum to the Ketchum Substation on Sun Valley Rd. Some or all of these sections could be buried at a cost to the taxpayers. The section going through Ketchum to the substation would definitely be buried with each block it passes through disrupted for a minimum of two weeks. All above ground sections would require conditional use permits from the county (Scenic Corridor code) or the cities involved. It should be noted that the route of the proposed line follows the "Sawtooth Scenic Byway" the 100<sup>th</sup> National Forest Scenic Byway. Beginning in Shoshone, the route runs north through the Wood River Valley and into the Sawtooth National Recreation Area.

### **Cost**

The cost of this line in 2101 dollars depending on route, overhead and underground segments, and distribution line treatment, will run between \$11,000,000 and \$58,000,000. The cost of new overhead infrastructure would be paid for by ratepayers statewide. In 2007, when the WREP was competed, the cost per mile overhead was \$300,000 and the buried cost was \$3,000,000. Any part of the line that is buried is ten times the cost of an overhead line less the cost of the overhead per mile. For example in 2010 dollars: one mile of overhead line costs \$400,000 and one mile of buried line is \$4,000,000 less \$400,000 or \$3,600,000 per mile. The cost of the buried line is incumbent on the community. A bond would have to be floated to pay for the buried line. Depending on where the line was buried (Ketchum, Sun Valley, Blaine County) the issue would be put to vote to determine if taxpayers would choose to have their property taxes raised to pay for the buried sections of the line. Although the CAC asked IPCo for a breakdown of

cost three years ago, the company has not provided those figures. According to Len Harlig who sits on the CAC, IPCo has promised some figures sometime this summer. The following is an estimate of these costs based on different scenarios.

**Various scenarios for the route and approximate cost in 2010 dollars** (these figures are estimates by the preparer of this document based on available information. Drawings indicating the location and graphics depicting the structures with lines and equipment will be available through the ERC website when IPCo makes them available.

- burying entire line straight into Ketchum Substation (KS) \$43,200,000
- burying entire line and distribution lines \$57,840,000
- overhead to hospital, 70'-85' poles, then buried to Ketchum Substation and Elkhorn substation with existing distribution lines on the same poles \$21,200,000
- above with buried distribution and 55' poles \$32,240,000
- overhead 70'-85' poles, then buried from Elkhorn Rd. into Ketchum \$12,600,000
- no new 138kV and buried existing distribution lines along Hwy 75 \$11,000,000

### **Permits, Process, Timelines**

A conditional use permit will need to be issued from Blaine County, the cities of Ketchum, and Sun Valley if IPCo crosses their jurisdiction with the new line. A building permit is required for the "control building" needed at the Ketchum Substation. Prior to these applications IPCo will conduct public involvement for several months throughout the valley. If this involvement is only in the form of open house presentations, there is very little opportunity

for open group discussion and dialogue which gives the public the chance to hear, participate in and document these discussions. As of June 21, 2010, there is no specific timeline for this public education as engineering and cost analysis needs to be completed before conversations with the city and county officials, stakeholders and the rest of the public. Public hearings will be scheduled for sometime in the fall. Formal public hearings with the Idaho Public Utilities Commission (IPUC) and IPCo officials present a great opportunity to present testimony that is meaningful and will require a formal response from IPCo.

### **The Christmas Power Outage and How It Relates to the Proposed Line**

The 2009 Christmas power outage, as untimely as it could possibly have been, **did not result** from any failure of the Hailey to Ketchum transmission line but the outage does relate to the current Hailey to Ketchum proposal in that it clarifies where infrastructure improvements are needed. The unfortunate outage was a result of the failure of the Midpoint and then the King line, to which the load was transferred after the Midpoint Line failed. These lines run from south of Shoshone and Hagerman respectively. If redundancy is an argument for reliable power, would a third line south of Hailey have made a difference? Certainly, a second line from Hailey to Ketchum would have had no effect on supplying electricity to the valley's guests, residents and businesses during the 2009 Christmas power outage. The public needs to be made fully aware that the causes of the Christmas outage had absolutely nothing to do with the existing Hailey to Ketchum line.

Problems exist on the Midpoint and King lines and these lines should be the first priority in transmission upgrades. Idaho Power has failed to give full attention to the plan they indicated in Appendix B p.7 of the WREP which states that. "If the stronger line is out of service (Midpoint to Wood River Transmission Station ) , the remaining line service capacity may limit the

ability to service the load. If this were to occur when loads in the Valley were high ( a cold winter day), it would likely result in some Valley electrical load being interrupted via rotational outages". This is what happened at Christmas but with an extended outage (there were no rotational outages which is an IPCo activated event, and were not executed by IPCo and arguably might have prevented the Christmas 2009 outage). Since 2006 the Midpoint line has not had enough capacity to serve the entire electrical load should the weaker line be out of service. On P. 7 of Appendix B in the WREP, the report states that the "Midpoint Line must be able to serve the entire load 90% of the year." 90% of the load is 92MW. This 90th percentile load grew 4MW in one year prior to 2007. The line failed because of heavy icing (which could have been avoided with state of the art monitoring, see next paragraph ) and when the load was transferred to the King line that line failed because of faulty splicing ( a maintenance issue which should have been attended to before problems occurred) and the subsequent failure of 6 aluminum conductors held within the splicing. A question to ask is "What has IPC done to the Midpoint and King Lines since the 2007 WREP to manage this issue? Contrary to some reports, the Christmas outage was not a perfect storm because the problem was identified years ago.

If IPCo knew the line was inadequate then why did they not have the most effective technology to quickly locate the point of failure? Cameras and remote monitoring should be standard. Icing on the line is certainly not a new phenomenon. The longest span with the least ground clearance is the first to go, yet a spokesperson for IPC said "Repair crews didn't know what and where the problems were." During Idaho Power's January meeting before the Blaine County Commissioners concerning the Christmas outage they said that company plans to more carefully check lines for breakdown. A more efficient and thorough maintenance schedule could certainly prevent problems evidenced by the enhanced maintenance of the existing Hailey to Ketchum line which has had minimal outages.

If Idaho Power and the community are concerned about reliable power then the first issues of concern and infrastructure improvement should logically be the Midpoint and King Lines. Looking at Table 5 Appendix B p.8 of the WREP justifies giving priority to the Midpoint and the King line over the Hailey-Ketchum Line;. From 1996-2006 there were 37 sustained outages for the two south lines and 4 for the Hailey to Ketchum Line. There were 72 momentary outages for the two south lines and only 4 in the Hailey-Ketchum line. From this data it would seem reasonable for Idaho Power to first address the urgency of the south lines and fixing the problem where there are statistically more outages. Instead it is prioritizing the North Valley line which has had minimal problems.

### **Need - Redundancy**

Redundancy and capacity are the two components that determine the need for reliability offered by an additional transmission line. A redundant line serves to maximize dependability by being available to carry its total load plus the total load of the line it is backing up the load when the line it is backing up has an outage caused by weather, operator error (i.e. IPCo's mistake), range fires, maintenance or equipment failure. Redundancy as defined in the WREP is "Two separate lines that can handle extreme peak loads alone without rotational outages." (This statement seems to verify that if "rotational outages" had been used by IPCo during the Christmas 2009 problems or any other scenario where there is not a redundant line, the need for a redundant line would not be necessary. Put another way, rotational outages when properly used are an alternative to a redundant line. As used in engineering, redundancy means *"the inclusion of extra components that are not strictly necessary to functioning, in case of failure of other components."*

The issue of redundancy is the same now as it was in 1995 when Dan Olmstead of IPCo said "It's up to the customers whether they want to live

with one line and put up with the minor inconveniences of interruption of service, or do they prefer to build another line they would have to look at forever." It is suggested that all the same studies, enhanced maintenance and emergency action plans be carried out on the existing line today as were enacted in 1995 to ascertain and assure the line's reliability.

The existing 138kV line continues to have an excellent record of reliability with only 8 outages over the last 15 years and Idaho Power maintains and services this line to a much higher standard than most other transmission lines. There have been no outages on the existing Hailey to Ketchum 138kV line in the last 3 years. (ask Bryan for percentages) Bryan Hobson, Transmission and Delivery Planning with Idaho Power supplied the following information for the years 1995 -2006: 2 momentary outages were attributed to weather conditions (snow/ice loading) and 2 were caused by lightning. The momentary outages are defined as less than 5 minutes. Most of them were a few seconds. Of the 4 sustained outages, the cause of one was unknown, and then there was one each due to vandalism, equipment failure, and maintenance. The 4 sustained outages were 5 minutes, 104 minutes, 148 minutes and 58 minutes. It needs to be emphasized that there have been no outages in the last 3.5 years.

Bryan Hobson of IPCo says that "The total length of the existing Wood River Substation to Ketchum line is 12.4 miles. I think the term "difficult terrain" is subjective, but I would say that most of the line (at least 75% is in difficult terrain because it does not have easy access (especially in the winter) or it is located near the base of a mountain or on the slope of a mountain where avalanche and or fire hazards exist." An independent tracking of the line by vehicle and USGS topographical maps of the Hailey and Sun Valley quadrants ( which show the powerline's route) reveal that there are approximately 7.5 miles which run adjacent to a county or city road which allows for full access for repairs year round. There are 1.5 miles of the route on the north side of East Fork Road which although visible from and parallel to the road run along

the steep uphill side of the road. Finally, there are 3.5 to 4 miles which are have difficult access summer and winter. These figures with nearly 75% of the line with reasonable repair access indicate the reverse of Hobson's assessment.

From these figures and the data on maintenance and outages, it can be said that the line continues to have an excellent record of reliability. Considering the existing line's record and its access for repairs the delivery of future electrical supply can be considered as reliable as it has been in the past. That is if the south lines that feed the H- K line are well maintained and then upgraded as planned. It will serve the community well to review the reasons why a line was turned down in 1995

Regardless of the line's record of reliability, there is a perceived need for a redundant line within segments of the community, specifically the business sector, the City of Sun Valley and Sun Valley Company. There is the fear that another 24 hour outage is possible, even though (it must be emphasized again ) *the Christmas outage did not occur as a result of the failure of the Hailey to Ketchum line.* However, in conjunction with the Castle Rock Fire and the sustained, severity of the economic downturn, the Christmas outage was another blow to retailers. The perception that redundancy is a secure solution to future outages is real to many, yet, as proven by the two failed south lines which caused the 2009 Christmas outage, the most secure solution to prolonged outages is excellent maintenance and state of the art surveillance on the existing 138kV line serving Ketchum. From the perspective of the business community, although the risk of transmission failure is very small, the potential risk to the economy is large. Sun Valley Company has the largest stake in an electrical outages and the Christmas outage was proof of their concern. Although the company received a stack of letters expressing gratitude for the manner in which the SVCo took care of their guests during the outage, there is a deserved fear that another outage

could happen with far worse results, including not only the company's reputation but extensive and expensive damage to pipes and infrastructure.

In researching this report, the question has arisen several times as to who is driving the new line and should they not be the ones to pay for the buried sections if permitted. In conversation with a SCo representative, there was no explicit effort in this respect but the company does support a redundant transmission line and is represented on the Community Advisory Committee. ICo is certainly a driving force in pushing through a new transmission line. As discussed in the section of this analysis titled "**Distributed Power/ Microgrid / Micropower**" consumer controlled energy production poses a threat to the business model utilities have depended on for more than a century.

When reviewing the need for an additional transmission line, it must be taken into consideration that reliability of electrical power delivery in the twenty first century is subject to threats that are different and potentially more severe than local outages. The Wood River Valley is part of an extensive electrical grid. A major disruption on the Oregon coast could throw out power in our community and has. If there were a desire to dismantle the valley's electrical transmission, there would be nothing to stop a person with that intention from tampering with more than one line. Our valley's electrical system is connected to the south valley and the south valley is connected to the regional grid. It is therefore pro-active and wise to consider how our community can become more energy self-reliant and resilient to all manner of electrical disruption. This subject is addressed in the section of this study titled "**Energy Self-Reliance and Renewable Alternatives**".

### **Need - Capacity**

Capacity is the maximum amount of power in megawatts MW, carried by a transmission line. The existing Hailey to Ketchum 138kV line has a 120MW

capacity. The historic winter peak line loading was New Year's Eve 2007 with 64MW or 53.5% of capacity. Data provided by Idaho Power show that in the following two years peak line loading dropped : Christmas Eve 2008 at 61MW and New Year's Eve 2009 at 60MW. The Wood River Valley, especially the North Valley, has its peak load in winter unlike the most of the rest of the state which has a summer peak load due to air conditioning and agriculture.

By means of comparison the historic peak load consumed by Blaine County from Timmerman Hill to the SNRA was 99.5MW in the winter of 2006. (WREP Appendix B - Page 1). This demand included an estimated population of 21,600, plus an unknown figure, perhaps 5,000 for people staying in private residences and second homes,. 1,564 holiday guests in hotels and condominiums ( figures based on pillow count and percentage of lodging occupancy taken from SV-Ketchum Chamber of Commerce tourism profile) totaling 28,164 consumers, as well as the business centers of Bellevue, Hailey, Ketchum and Sun Valley, and Sun Valley Company (lodges and lifts).

For the purposes of analyzing capacity for the Hailey to Ketchum line, it is essential to distinguish the North Valley (north of East Fork to the SNRA), as that is the area the proposed line is to serve. The WREP does not make this distinction in its calculations. The distinction is crucial and the following calculations show definitively why capacity is not an issue for a second transmission line.

Currently, the estimated population of Ketchum is 3,500; Sun Valley 1,200 and the county population from north of East Fork to the SNRA, which is the population the line will serve, is estimated at 5,000. This total population is 9,700 with available figures to date. Assuming an additional 6,564 electrical users are added at the Christmas/ New Year's peak historical electrical load (the same figure added in the calculations for the entire county in 2006)) the total holiday population would be 16,264. That is 11,900 less than the

28,164 population estimated by Idaho Power to demand the historic peak load of 99.5MW for the entire county, and 64MW or 53.5% of capacity for the existing Hailey to Ketchum line as indicated again by Idaho Power in Appendix B - Page 1 of the WREP. This means that the North Valley ( north of East Fork) will need to grow by 11,900 people just to reach a load of 99.5MW and then by another 6,200 people on the existing line to reach capacity of 120MW. That is an additional 18,100 people in the North Valley (north of East Fork) bringing the total population to 27,800. Of course the numbers are variable and some people use more electricity than others with larger homes in the North Valley and greater wealth demanding more use. Nonetheless the numbers needed to reach capacity are impressive. IPCo certainly needs to publicly clarify this issue so that residents understand that that there is no need for additional capacity.

Considering the current density and the limited land for construction due to BLM and Forest Service public lands as well as the Hillside Building Ordinance, the high cost of land, and an economy that can no longer be sustained by construction as it has been for many years, it seems unlikely that the pressure of population could ever demand 120MW in the North Valley, unless the current population more than doubles its electrical demand, which is highly unlikely. The trend is just the opposite as energy efficiency, demandside management and energy conservation become more important due to diminishing fossil fuels and increased renewable energy capacity. The current problems with the BP Gulf oil blow out should help drive home the need for re-emphasis on all sustainable activities and reduced dependency on fossil fuels.

Although the electrical supply must assure capacity for the highest use - Christmas and New Year's Eve - these are only two days during a two week holiday period when the demand is so high. The average winter peak load for the last three winters is:

07 - 08 47 MW 39.2% capacity

08 - 09	46MW	38.4% capacity
09 - 10	45MW	37.5% capacity

The WREP has projected the WRV growth by two means : Spatial Growth Approach and Population Growth Approach. Although their calculations make sense, they fail to distinguish the North Valley from the rest of the Wood River Valley which has much more land available for population growth at lower prices. This analysis "Wood River Valley Growth" is attached as **Exhibit 2**. For a full perspective on this issue of capacity IPCo should be required to detail the load for the North Valley so this material is documented as evidence that they are proposing to build a line that exceeds the current and projected load for the area. This material should be accessible to the public and regulatory bodies.

It is unusual to build a redundant line when the existing line is only 50 -60% loaded. There are certainly factors that will increase peak demand. They do not include the new River Run Gondola, the Sun Valley Golf Club Lodge and The Dollar Mountain Lodge with its new high speed lifts and snowmaking as they are already included in the figures for the peak load for 2009. What can be considered new and substantial pressures on demand are proposed hotels, Warm Springs Ranch, Sun Valley Company's development at the base of River Run, affordable housing units, new buildings and the increasing use in electronics - computers, flat screen televisions, cell phones, electronic or computer driven cash registers, as well some population growth.

Dave Angell, Manager, Delivery Planning stresses that the proposed line is "not a capacity issue. It is continuity and business driven." The information in this section on capacity serves to substantiate his comment. However, if this is not a capacity issue then IPCo should make that very clear in all its public presentations. If it is business driven, the IPCo should provide specific information about what businesses are pushing for this line. As this is not a normal "system expansion" addition to the IPCo system, it should therefore

undergo significantly more scrutiny from IPCo customers, regulators and public officials.

### **Sun Valley Company, the City of Sun Valley and Juniper Springs**

Currently, two employees of the SVCo sit on the community Advisory Committee. For at least 10 years SV Company has discussed burying the existing line through Sun Valley. The existing 138kV line does not actually go through Sun Valley Resort, but it does run from the Elkhorn Substation on the south side of Dollar Mountain Ski Area to the Ketchum Substation on Sun Valley Rd. It must be this stretch that SVCo would like to have buried. The Mayor of Sun Valley and councilman Nils Ribi have verified that even though comp plan mentions burying the existing transmission line, there is no plan to do so.

The Juniper Springs Homeowners Association has expressed interest in burying the portion (13,100' or about 2.5 miles) of the existing 138kV line that runs through Twin Creeks from Juniper Rd., across Elkhorn Rd to the Elkhorn Substation. The cost of burying this line would be the responsibility of the members of the Homeowners Association. There has been some question as to the relationship of this action to the building of a second transmission line. A number of years ago when Idaho Power was asked about burying this line, the company told the homeowners who were interested that it could not be done without a second line being built to act as backup in case problems arose which would leave the community without power. Currently, there are no efforts to having this line buried because of the high cost. The Mayor of Sun Valley confirmed this fact. IPCo should, in writing, confirm that this is not one of the reasons for adding the proposed line. To be noted: When Dave Angell of Idaho Power was asked recently if a new line needed to be built before the Twin Creeks section could be buried he responded by saying "We can bury a line without a backup line, but if there is a short circuit while burying there could be a one day outage or longer."

## **Need in Relation to Electrical Generation and Patterns of Use**

According to the company's Integrated Resource Plan (IRP), IPCo does not currently have enough electrical generation capacity, is importing out of state electricity and predicts rolling blackouts beginning this year as a result. It would, therefore, make sense for the company to be investing more heavily in power generation than building new transmission lines which will not have electricity to carry.

Throughout the WREP Idaho Power suggests that there are alternatives that could displace the need for new utility infrastructure by lowering peak demand which exists briefly during the important to the economy Christmas holidays. Average peak demand, however, is significantly lower than the winter peak. One way to effect peak demand is with Demand-side Management (DMS) or actions that influence the quantity or patterns of energy use consumed by end users, such as actions targeting reduction of peak demand. Peak demand management does not necessarily reduce total energy consumption but could be expected to reduce the need for investments in new infrastructure. Idaho Power estimates that DMS along with improved building standards, energy efficiency technology advancements and customer involvement will reduce new electrical load. Various programs underway are listed in Appendix C - PP. 3 & 4 of the WREP. These programs enacted en force would address the concerns of the Wood River Valley North as well as IPCO shareholders who voted in 2009 to reduce greenhouse gases and increase renewable energy production. Not mentioned in the WREP are advanced metering, energy conservation, local renewable energy generating facilities, the recommendations of the Northwest Power and Conservation Council which envisions meeting 85% of new electrical demand over the next twenty years to be met by energy efficiency, and finally Idaho Power's Smart Grid Investment Grant. One smart grid benefit is called "self healing" because it provides visualization and

control systems that allow operators to detect disturbances and take action before problems cascade into widespread outages like the 2009 Christmas outage. Smart grid technology applied to the existing line could eliminate arguments for an additional transmission line.

All of the above applications could dramatically reduce existing and future electrical load. All electrical users as well as Idaho Power should be making every effort in this respect to also reduce the impacts of climate change and increase energy security. It has been established in this study that capacity is not an issue for the existing 138kV line, therefore additional information concerning these efforts need not be addressed in this document. However, the following section addressing energy self-reliance and renewable energy are directly related to redundancy and the concern for reliability.

### **Energy Self Reliance and Renewable Alternatives**

As this paper is being written half a million gallons of oil are spilling uncontrollably every day into the Gulf Of Mexico causing catastrophic environmental devastation. This tragedy is hopefully going to strengthen the commitment of the Obama Administration to the immediate need for developing safe and renewable forms of energy production. As more emphasis is directed on a national level to the need for solar, wind, geothermal and biomass for electrical generation as well as alternative and non climate disruptive renewably powered automobiles, the state of Idaho, with its very abundant renewable resources, has the opportunity and responsibility to be a leader in renewable energy generation. Point in case: Midpoint Energy, a Jerome based company is applying for a permit to build a solar farm with 150,000 photovoltaic panels capable of producing 75 MW of electricity enough power 45,000 homes, according to IPCo officials. This unprecedented proposal in Idaho will compliment preexisting wind, biomass and geothermal generation in the southern part of the state. Although Idaho Power says in its Integrated Resource Plan (IRP) that the company is

aggressively pursuing renewable energy, its current portfolio does not reflect that position.

### **Distributed Power / The Microgrid / Micropower**

consumer-driven, small-scale power generation technologies (typically in the range of 3 to 10,000 kW ) located close to where electricity is used (e.g., a home or business ) to provide an alternative to or an enhancement of the traditional electric power system. Generating power on site, rather than centrally, eliminates the cost, complexity, interdependencies, and inefficiencies associated with centralized transmission and distribution. As of 2006, micropower was a third of the world's new electricity and one sixth of Distributed energy resources - what is being called the "microgrid" - are the world's total. Companies like GE and IBM are talking about up to half of American homes generating their own electricity, renewably, within a decade, and the evidence is growing that geographically distributed renewables could deliver a 100% green energy future faster and cheaper than big power projects alone. In his book, *Small is Profitable*", Amory Lovins writes "Distributed generation means a redundant, resilient, secure infrastructure - that's why military bases and hospitals have their own power plants. Micropower can be more reliable because 98% of blackouts originate in the grid." In the case of the Christmas outage, that is exactly what happened. If Sun Valley Company, homes and businesses had had solar PV installation on roof tops, the degree of electrical outage resulting from the failure of transmission lines outside the North Valley would have been substantially mitigated.

Currently, in accordance with Idaho Power's net metering program, small scale electrical generation systems without battery storage systems, send excess power back into the grid. In the North Valley, that means electricity would go into the North Valley electrical system to serve other customers who would pay for it. Although IPCo credits the on- site producer for excess power, the utility should be buying that power at the going rate it pays

larger producers and sending a check to the individual whose system is generating power. In the case of an outage similar to last Christmas, that electricity could have directly helped others in our community. As the cost of solar photovoltaic panels is rapidly declining concurrently with the increase in state and federal incentives along with business and residential tax credits, the future of small scale electrical generation is realistic. Fuel cells (although dependent on a small external fuel source like natural gas) are another source of relatively clean, on site power generation that can meter excess electricity back into the grid.

A major hindrance to micropower exists within the power structure of the utilities and the edict for corporations to maximize profits for the shareholders. Net metering puts utilities at a higher risk of losing revenue because the consumer basically has free access to the power source. The new energy world, where electrons are sourced locally, could be the answer to our energy crisis and why the big utilities are fighting hard to keep business as usual.

## **Alternative Energy Generating Technology**

### **Solar Farms**

Community based energy is electricity sourced from wind and solar generation where local ownership of turbines and photovoltaic systems by small groups of farmers, local governments and private individuals provides a sustainable and secure means of producing renewable electrons while addressing climate change and energy security. Regional energy production empowers communities because they have a significant stake in how that energy is owned and operated . Money spent on local energy stays in the community creating a ripple effect in the economy.

IPCo states in the WREP that "The number of sunny days that the Wood River Valley sees every year would seem to indicate that it would be an ideal

location for photovoltaic use.” The report goes on to say that on a large scale, however, solar energy sites would suffer from electrical transmission required to deliver energy to the end users and limited space for an solar farm. It safe to say that sub-transmission lines (138kV) would not be necessary to carry the load especially for a solar farm with an output of 20 – 50 MW which could be served from IPCo’s 12.5 and/or 34.5MW distributions systems. A solar farm could offer locally generated electrical availability and it could also provide a back up system for temporary outages. Distribution lines which have smaller capacity could disperse the load on a rotational basis during a North Valley outage.

A recent poll (March 2010) indicates that 75% of Americans approve of solar installations on public lands that are not set aside for parks and nature preserves. The Solar Energy Industries Association commissioned the poll from the Gotham Research Group. What these results indicate is that Americans see the necessity for developing domestic clean energy resources, and believe that solar farms on large tracts of uninhabited, sunny land make good business sense. With an abundance of public lands in the Wood River Valley it makes sense to use some of this land to provide electricity with one or more solar farms. Projects which are developed in the North Valley could use existing and future distribution lines to send their excess power directly into the North Valley system and could serve much of its electrical demand as backup electrical generating facilities. Sun Valley Co. could build a solar system out Trail Creek on Forest Service land. The City of Ketchum could provide land near its water storage tank just north of town. Rooftop solar farms could be constructed. Ohio Gulch with all the surrounding BLM land and proximity to the existing transmission line is another possibility. If 405 acres in Jerome are projected to produce 75MW of electricity and the North Wood River Valley is currently using 64MW or 53.5% of capacity at Christmas peak demand, it would seem logical that the North Valley could produce sufficient electricity with solar farms and distributed energy to act as a backup source of power. People might respond to the idea of solar generation in a snowy

climate as “pie in the sky” and these arguments need to be addressed with specific studies and research which must be addressed now. IF Idaho Power builds a new line up the valley floor, it could preclude efforts for a sustainable and resilient form of energy production. Ultimately, the proposed 138kV would assure that this community continues to get its electrical energy from non renewable sources (coal and natural gas) as well as hydroelectric.

### **Wind**

In 2006 a study by Gerald Fleishman of the Idaho Energy Division entitled “Blaine County Wind Farm Possibilities” stated that four mountain ridges within a short distance of Hailey could justify Blaine County’s investment in the investigation of wind power development. The study shows that wind power on the ridges east and west of Hailey ranges from class 3 – 5 and that 45 turbines could provide 110MW electricity. The system could also generate income to the county from \$36,854,625 to \$73,709,250 over the next 20 years. The county’s finance options for such a project include the Minnesota Flip model or clean renewable energy bonds.

This project would not be located in the North Valley so it could not serve as a redundant or backup system because it would rely on the existing 138kV to carry the load and it does present problems in relation to the Scenic Corridor Ordinance which has already blocked residential turbines. It is, nonetheless, an appealing possibility for renewable energy for the South Valley.

### **Commitment for a Sustainable Energy Future**

More than 50% of our electricity in the Wood River Valley is currently sourced from coal which is climate disruptive and imported from other states. Our community has an opportunity to explore abundant natural resources - wind, solar, geothermal and biomass to provide a sustainable means of producing renewable energy and energy security. Money spent on local energy stays in the community tax base as can be seen from Minnesota to Denmark to

Germany. Communities and countries developing renewable energy and manufacturing parts for the energy technology of the future are seeing the seeds of strength in their economy in a time of profound economic uncertainty. In the preparation of this study the following question has been asked: "What if we don't develop the technology of the future?" A response is that we have already crossed the threshold of certainly the biggest pivotal moment in technological history. Not only is sheer human ingenuity being challenged to create the new technology, but simultaneously our very survival is dependent upon it. So, logically, if we don't succeed, it really won't make any difference if we have built another power line or not. Our commitment as a community involves making every effort to create not only a sustainable, but a responsible energy future. To this end, the Dynamic Energy Systems Institute and the Environmental Resource Center have merged to create a strategic vision for a community-wide energy transformation.

## Winter Peak for the Ketchum and Elkhorn Substations

10/17/2016

### Ketchum

2010-11	49.4 Mw
2011-12	44.9 MW
2012-13	46.1 MW
2013-14	42.7 MW

### Elkhorn

2010-11	14.4
2011-12	12.3
2012-13	13.4
2013-2014	11.6

### Combined

2010-11	63.4
2011-12	57.20
2012-2013	59.50
2013-2014	54.30

**RECEIVED**

OCT 20 2013

BLAINE COUNTY  
LAND USE & BUILDING SERVICES

The power to operate the lifts comes from the Ketchum Substation  
The peaks are all either Christmas or New Years

Although the electrical supply must assure capacity for the highest use -  
Christmas and New Year's Eve - these are only two days during a two week  
holiday period when the demand is so high. The average winter peak load  
2007 -2010:

07 2008	47 MW	39.2% capacity
08 2009	46MW	38.4% capacity
09 2010	45MW	37.5% capacity

## Requested of Dave Angel on October 17, 2016

Hi Dave,

The Ketchum Energy Advisory Committee is requesting answers to the following:

1. The peak load at the Elkhorn and Ketchum Substations for winters 2014 - 2015 and 2015 - 2016

Hi Dave,

The Ketchum Energy Advisory Committee is requesting answers to the following:

1. The peak load at the Elkhorn and Ketchum Substations for winters 2014 - 2015 and 2015 - 2016

2. The average peak for winters 2010- 2011

2011- 2012

2012 - 2013

2013 - 2014

2014 - 2015

2015 - 2016

Thanks for your assistance,  
Kerrin

1995-2014

2 momentary outages less than one minute

2 sustained unplanned outages

8/14/98 5 minutes unknown

2/08/05 58 minutes equipment failure

3 maintenance outages

5/31/95 1 hour 44 minutes maintenance

10/11/04 1 hour 48 minutes / maintenance due to vandalism  
shot out conductor

9/27/11 5 hours 42 minutes maintenance

7.5 hours of planned maintenance

There were no outages from 2007 – 2010

I have requested the data for 2015 to present

Note that this data differs slightly from the outage data in my analysis as it was collected from IPCo from two different sources at different times

**RECEIVED**

OCT 20 2016

BLAINE COUNTY  
LAND USE & BUILDING SERVICES