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IDAHO PUBLIC
UTILITIES COMMISSION

TO: Idaho Public Utilities Commission

FROM: Kiki Tidwell

I request that the Idaho PUC deny Idaho Power's request for a new 'redundant' transmission line in Blaine County until a third party cost benefit analysis of alternatives has been completed.

Dear Idaho PUC:

Idaho Power will be applying to the Idaho PUC in September for a 'redundant' transmission line from the Hailey substation north to Ketchum on Buttercup Rd along Hwy 75 where existing distribution line is, crossing from east side to west side of Hwy at East Fork Rd. The height of Poles 56'6" high, 24" base metal transmission poles with a distribution line on as well as transmission. The line is proposed to underground at Elkhorn Rd to Ketchum substation at no additional cost to Ketchum residents, although undergrounding costs 10 times as much as an overhead line. The cost to ratepayers will be \$30 million.

The existing transmission line during the 30 years from 1980-2010 has only had 8 outages, 4 for less than 5 minutes, the longest being 148 minutes. The existing line has spare capacity for anticipated growth.

The proposed second transmission line does not provide backup power. During the Christmas 2009 outage two lines failed south of Hailey substation, no power was coming into Hailey. The proposed line would have not brought any power north, would not have helped at all.

IPCo considers it redundant, even though The Valley Club, the Heatherlands, and Buttercup Road were all evacuated during the last fire, so if two lines are located in that corridor, there is not true redundancy. On the proposed route, the two lines cross at the Peregrine Ranch/Sagebrush Arena corner. If true transmission line redundancy is to be achieved, at the bare minimum, the new line should be buried in this corridor, rather than in Ketchum.

IPCo believes undergrounding the existing transmission line would be too expensive. However, they have not explored undergrounding only the part of it that is difficult to access – over the Elkhorn hill to Ohio Gulch- approximately 3.5 – 4 miles. Potentially, a \$5-6 million cost to bury just this portion. The rest of the line is accessible easily to repair.

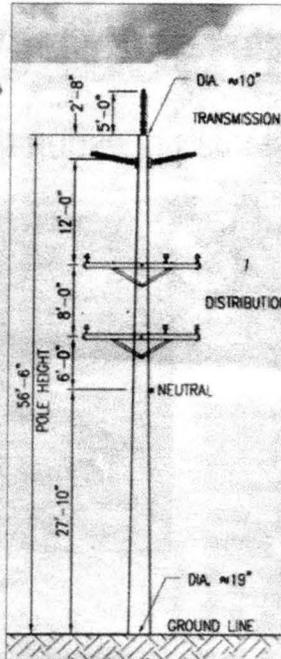
IPCo has not hired a qualified third party to fully explore improving the north county with a microgrid, backup storage, and solar, diesel, and geothermal distributed generation, which would provide emergency power. Potentially for 1/10th of the cost of the proposed transmission line, a backup diesel generator could be installed now at Ketchum and SV substations within a matter of weeks or months and provide backup emergency power. Microgrids and distributed generation with storage are working all over the world today, including Navy installations.

I request that the Idaho PUC deny the proposed second transmission line request until a third party cost benefit analysis for alternatives to the proposed line is developed.

Thank you,

A handwritten signature in black ink, appearing to read "Kiki Tidwell". The signature is fluid and cursive, with the first name "Kiki" written in a larger, more prominent script than the last name "Tidwell".

Kiki Tidwell
300 Let'Er Buck Rd.
Hailey, ID 83333
208-578-7769



**New 138-kV transmission (no shield)
Double circuit distribution
Looking north along SH 75 at Ohio Gulch**



Courtesy graphic

This rendering shows what the planned power line would look like adjacent to state Highway 75 at Ohio Gulch, north of Hailey.

Idaho Power Co. pitches case for 2nd Hailey-Ketchum line

Undergrounding work could cost \$2.6M to \$5.5M, depending on project

By **PETER JENSEN**
Express Staff Writer

A second Idaho Power transmission line running between Ketchum and Hailey will be an insurance policy in case the existing line fails, but is it worth the cost?

That's a snapshot of the debate that occurred in a town hall meeting at the Community Library in Ketchum on Thursday afternoon.

Aimee Christensen, executive director of the Sun Valley Institute for Resilience, said Idaho Power should provide independent analysis on an alternative that would include local renewable energy production, a microgrid and storage.

She said the costs of producing

has stated that it's company policy to get those certificates for this kind of transmission line project, even if it's not legally required.

The PUC would open up a public comment period before deciding if it should hold hearings on the request. It would make a ruling after a period of several months.

The need for a second transmission line running up the Wood River Valley has been debated for several years, and Thursday's meeting proved the debate is far from settled, even with the project moving toward regulatory review.

Idaho Power provided a series of cost estimates, depending on how far south of Ketchum the line would go underground.

Ketchum residents, and that it pay the city of Sun Valley a franchise fee of 3 percent, which would be covered by Sun Valley ratepayers. Unlike Ketchum, Sun Valley does not currently assess a franchise fee on Idaho Power.

If the line goes underground at Owl Rock Road, Idaho Power proposes a local improvement district. A surcharge would need PUC approval, while the LID could be created with City Council approval.

Valley resident Lara McLean accused Idaho Power of being stuck in old habits in how it was delivering electricity to the Wood River Valley.

"You are doing business as usual," McLean said. "What I want to know is why."

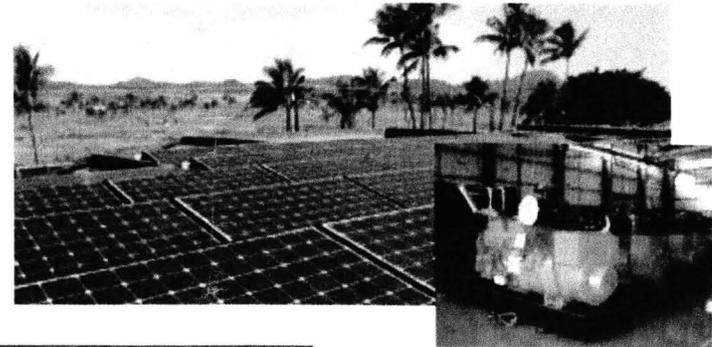
Idaho Power representatives responded that the costs of

Use Case – Island Grid

PV + STORAGE OFFERS BENEFITS IN REPLACING DIESEL GENSETS FOR ISLAND APPLICATIONS

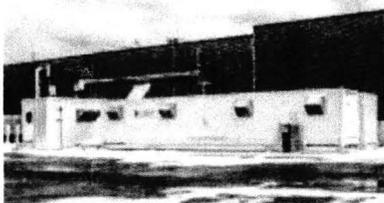
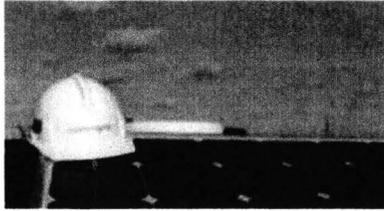
Assumptions:

- Load** • 11MW peak power, 150MWh energy demand
- Application** • PV & storage replacement for DG, ancillary services, environmental, grid reliability and resiliency, diesel generator retained for backup.
- Existing Generation** • 11MW DG, 15,000 gallons diesel per day
- PV required** • 30MW array generating 150MWh per day
- Storage requirement** • 10MW, 80MWh Vanadium Flow Battery



| | Current costs | PV & Storage solution |
|--------------|----------------------------------|-----------------------|
| Generation | 3 x 2.2MW and 1 x 4.5MW gen-sets | 30MW PV array |
| Storage | none | 10MW, 80MWh VRB |
| Capital cost | \$3M | \$85M |
| Running Cost | \$22M per year diesel fuel | \$0.425M O&M per year |
| Payback | n/a | 4 years |

Vionx Demonstration Projects

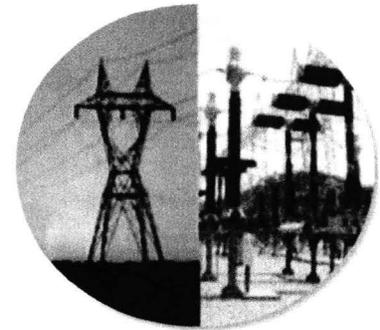
| | Project Overview | Deployment | Value | Offtaker |
|---|--|---|--|---|
| 1 | <p>MICROGRID</p> <p>Fort Devens, MA COD: 2015</p> | <p>160kW 4-hour VNX-C Series</p>  | <p>Benefits:</p> <ul style="list-style-type: none"> ✓ Micro-grid Control Compatibility ✓ Time-of-Use Rate Reduction ✓ Demand Charge Reduction |  |
| 2 | <p>WIND INTEGRATION</p> <p>Worcester, MA COD: Q2 2016</p> | <p>500 kW 6-hour VNX-C Series</p>  | <p>Benefits:</p> <ul style="list-style-type: none"> ✓ Wind Integration (600 kW Wind) ✓ Time-of-Use Rate Reduction ✓ Demand Charge Reduction | <p>nationalgrid</p> |
| 3 | <p>SOLAR INTEGRATION</p> <p>Everett, MA COD: Q2 2016</p> | <p>500 kW 6-hour VNX-C Series</p>  | <p>Benefits:</p> <ul style="list-style-type: none"> ✓ PV Integration (605 kW Solar) ✓ Voltage Support ✓ Load Following | <p>nationalgrid</p> |

Opportunity Overview

Energy Storage:

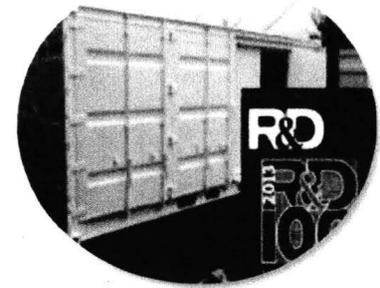
A Rapidly Growing Power Infrastructure Asset Class

- Approaching a commercial tipping point: Renewable energy deployments have accelerated driving need for efficient and cost effective grid-scale storage
- Navigant predicts > \$20 billion annual market by 2020

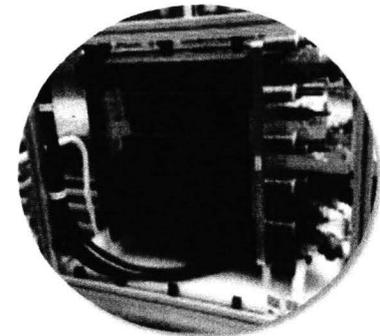


Vionx Long-Energy Duration Battery Systems

- Global, exclusive license from United Technologies Corp.
 - Filed for over 30 patents
 - Based on over 50 years of research in fuel cells
- Design basis up to 10 hours energy storage dispatch per day
- 20-year asset life
- Commercial system operational on US Army base; Solar and wind integration projects under construction



Experienced Senior Management Team and Partners
Prepared to Ramp Commercial Production



Jean Jewell

From: secretary
Sent: Wednesday, August 31, 2016 10:14 AM
To: Jean Jewell; Diane Holt
Subject: FW: Addition to my written submission
Attachments: KMcCall Analysis of Power Line.doc

From: Kiki Tidwell
Sent: Wednesday, August 31, 2016 10:13:53 AM (UTC-07:00) Mountain Time (US & Canada)
To: secretary
Subject: Addition to my written submission

Dear Idaho PUC,

Please find attached more information about the Blaine County transmission line background to be attached to my written submission, which you should have received by mail. Please note this analysis was completed in 2010 and needs to be updated as to the current proposal, but gives you quite a bit of historical information.

Thank you,
Kiki

Kiki Tidwell
300 Let Er Buck Rd
Hailey, ID 83333
208-578-7769

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

An Investigative Analysis (May 2010)

by

Kerrin McCall

Introduction

The Wood River Electrical Plan (WREP) completed in 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. [Show map from EST presentation. Exhibit 1](#) The following document only 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. [Show map when available Exhibit 2.](#) 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 the 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. **Show map form EST presentation Exhibit 3.** 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. " (Amendment to Certificate July 14, 1995 p. 1)

At the time of the application, Dan Olmstead, IPCo district manger in 1995, 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 mountain Express, February 15, 1995.

IPCo performed an extensive study for the feasibility and need for an additional 138kV line which reviewed capacity and reliability 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 maximum buildout for the North Valley. It also stated that the line had "an excellent record of reliability (only 3 unplanned outages in the past 14 years, 1981 - 1995, for a total duration of three minutes)", and that the "Company had taken a number of steps to further improve the line's reliability". (Application for Ammendment Case IPC-E-95-6 June 22, 1995 Page 1) 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.

(Application for Amendment to Certificate June 2, 1995 pp 4-6)

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 reported to the Idaho Public Utilities Commission 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). (Above 2 quotes from Application for Amendment to Certificate June 2, 1995, p.6) The cost in 1995 of an overhead line could have been \$3 - \$4 million dollars and as much as \$14 million to bury. IPUC concluded in their comments to the Application for Amendment July 14, 1995 p. 1, 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 has occurred.) Sun Valley Company, Idaho Power's biggest customer in Blaine County favored maintenance of the existing line over building a redundant line. (ties News, Twin Falls, February 15, 1995) In August 1995, the IPUC " removed the authority for the construction of a second 138kV line

Current Transmission Line Proposal

Visual Impact (current pole height plan not presented here)

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 60" tall much taller than 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. **Show photos Exhibit # 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" would 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 (final route not presented here)

Currently, IPCo has not yet provided a **final** 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 be buried as the City of Ketchum's height restrictions would not allow poles of the proposed height. Each block the line passes through would be disrupted for two weeks. Additionally, Ketchum will not allow any new overhead infrastructure within the city limits and the existing poles are already maxed out. (verbal communication to me from Randy Hall, December 2011). 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 100th 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 2013 dollars depending on route, overhead and underground segments, and distribution line treatment, will be approximately \$23 million. The cost of new overhead infrastructure would be paid for by ratepayers statewide. In 2007, when the WREP was completed, 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 LID, suggested by IPCo, would to pay for the buried line at a cost of \$250 per \$100,000 property value

Permits, Process, Timelines (current timelines not included)

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 August 15, 2010, there is no specific timeline for this public education as engineering and cost analysis need 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 and they feed the existing Hailey to Ketchum line. 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.

The Midpoint and King Transmission lines

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) 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 IPCo 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 and was not attended to. Even now, after the Christmas outage, IPCo still prioritizes building a redundant line from Hailey to Ketchum, where minimal outages have occurred, an intensive maintenance schedule exists and reliability is excellent, before addressing a poorly maintained and faulty system to the south.

The WREP Implementation Plan p. 16 states "The recommendations of the CAC cover infrastructure improvements to the Idaho Power system that will deliver sufficient power at the Wood River Valley's buildout. Not all facilities are needed in the near term and will be phased in as the Valley's load increases. " The first improvement in the five year plan is to " Build second 138,000-volt transmission line between the Wood River Transmission Station in Hailey and the Ketchum Substation. This is the top priority project." After that, in the 5 year plan comes the configuration of new 138kV lines to improve the Midpoint system south of Hailey, including a new substation south of Timmerman Hill. The questions raised here are: 1. If IPCo is attempting to provide sufficient (adequate, enough) power, then why are they prioritizing a redundant H – K line when the existing line is reliable with sufficient capacity for North Valley buildout yet dependent upon an inadequate southern system? 2. What are the criteria for sufficient power?

Before the Christmas outage IPCo knew the Midpoint line was inadequate so 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. State of the art technology should be a mandate by the IPUC. Instead, antiquated and slow methods of surveillance seem to be the accepted standard that ultimately lead to spending millions of ratepayer dollars to build redundant transmission lines as backups rather than maintaining to the highest standard existing lines as in the attention given to the Hailey to Ketchum 138kV.

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. Recent charts from IPCo (Bryan Hobson's WREP presentation to Ketchum's Energy Solutions Team shows the two south lines combined sustained outages from 1996-2006 as 44 sustained outages and 56 momentary outages and 4 of each for the Hailey to Ketchum line. However, Table 5 Appendix B p. 8 of the WREP shows that from 1996-2006 there were 37 sustained outages and 72 momentary outages for the two south lines and 4 of each for the Hailey to Ketchum Line. There is certainly some discrepancy with IPCo's outage figures, but what is significant is here is that the figures justify giving infrastructure priority to the Midpoint and the King lines over the Hailey-Ketchum Line. (See Exhibit 6). 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. The two south lines need to be infallible if reliability is the primary concern for our community and IPCo. It must be reiterated that two faulty

lines feeding the reliable existing North Valley line and a proposed new North Valley line will not give this community reliable power.

IPCo Mandates and Criteria for Reliable Power

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.*" Simply put, a redundant line is a backup line. Its connotation is "unnecessary".

The issue of redundancy is the same now as it was in 1995 when IPCo Regional Manager Dan Olmstead 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." (Idaho Mountain Express, January 1995) It is suggested that all the same studies, enhanced maintenance and emergency action plans continue to 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 (a total of ten in 29.5 years). 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 3.5 years (2007-10). 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 (resulting from vandalism) and 58 minutes. There have been **no outages in the last 3.5 years** (no data from 2010 to present) This can be considered proof that the line's excellent maintenance program has paid off.

Bryan Hobson, Transmission and Delivery Planning 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 line'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 runs along the steep uphill side of the road. Finally, there are 3.5 to 4 miles which 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 Hailey to Ketchum line are well maintained and given priority upgrading. It will serve the community well to review the reasons why a proposed 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 (SVCo). There is the fear that another 24 hour outage is possible, even though ***the Christmas outage did not occur as a result of the failure of the Hailey to Ketchum line, but as the result of the failure of the two south lines feeding the H-K 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. SVCo 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 the line is permitted. In conversation with a SVCo representative, there was no explicit effort in this respect, but the company does support a redundant transmission line and is represented on the CAC. IPCo is certainly a driving force in pushing through a new transmission line. IPCo is guaranteed a profit on capital investment. The more that IPCo invests in infrastructure the higher their gross and net profit, thus higher dividends to stockholders and higher compensation to executives. As discussed in the section of this analysis titled “ **Distributed Power/ Microgrid / Micropower**, consumer controlled energy production, by means of solar PVs, residential wind turbines and fuel cells, 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. Uninformed residents in the North Valley believe that a redundant line is needed to assure enough electrical power for the future

even though IPCo stresses that there is plenty of electrical capacity for North Valley buildout. The existing Hailey to Ketchum 138kV line has a 120-130MW capacity in winter when the demand is the highest (Application for Amendment to Certificate, p.4 June 2, 1995). Powerlines are capable of carrying more electricity in colder conditions. 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.

In 1995 IPCo stated in its Application for an Amendment to Certificate that IPCo's "current projections of electric demand in the Ketchum - Sun Valley area indicate that the existing 138kV transmission line has sufficient capacity to meet the area's electric needs for the foreseeable future". IPCo projected that the winter peak load in 2005-2006 at 73MW. That is 9MW more than the 2007 peak of 64MW, and only 8.5MW higher than 1994-1995. The point being that electric use is actually far less than projected. This and other extensive calculations, available upon request, substantiate IPCo's 1995 report and IPCo Manager Delivery Systems, Dave Angell, who stresses that the proposed line is "not a capacity issue. It is continuity and business driven." The proposed line is not needed to provide additional capacity is and IPCo should make that very clear to the media and in all its public presentations. Unfortunately, IPCo presentations are currently misleading in that they do not distinguish between the North Valley, and the rest of the Wood River Valley, the South Valley, which will require more capacity and where IPCo has made their calculations. An example of this is from a presentation made to Ketchum Community Development Energy Solutions team:

Future: Capacity and Reliability (Explanation available upon request)

- Existing system can serve 15-20 years of growth
- Load growth will make existing reliability problems worse

- Additional transmission and substation capability likely required.

Capacity Details

To understand the distinction of capacity needs between the north and south county we can take IPCo's figures for the south valley growth and extrapolate them to the north valley. 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 and the shut down of coal-fired plants 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 winters 2007 -2010 is as follows:

| | | |
|---------|-------|----------------|
| 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. (not included here)** 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.

If the line is business driven, then IPCo should provide specific information about what businesses are pushing for this line, or if it is IPCo influencing businesses that the redundant line is necessary. This is not a normal "system expansion" addition to the IPCo system because it is unusual to build a redundant line when the existing line is only 50 -60% loaded. It should therefore undergo significantly more scrutiny from IPCo customers, regulators and public officials.

Need in Relation to Electrical Generation, Energy Efficiency, Smart Grid

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 peak hour planning graphs indicate the very real possibility of rolling blackouts in the coming years. Section 8. Planning and Portfolio Selection, Peak Hour Planning, Figure 8.4 illustrates considerable peak hour deficits reaching in excess of 500MW by 2012 and continuing to grow through the remainder of the 20 year planning period. It would, therefore, make sense for IPCo to be investing more heavily in power generation than building new transmission lines that will not have adequate electrons 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. (In reiteration of previous statements in this report, the proposed Hailey to Ketchum powerline is not needed for additional capacity. However, for the purpose of education about responsible awareness of energy use as a community goal, and in relation to climate change and increased energy security, the following material is applicable.) 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.

Of all the efforts to reduce peak demand, the Smart Grid is the one technology that also has the capability to dismiss the need for a redundant line. If reliability is what our community and IPCo are looking for IPCo's Smart Grid Investment Grant will initiate the application of this technology. 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

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

Distributed energy resources – what is being called the “microgrid” – are 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 four years ago, micropower was a third of the world’s new electricity and one sixth of 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. That is not to say that distributed power is a solution for energy reliability for an entire community, because energy self-reliance is a matter of both choice and sufficient finances to purchase the energy systems. It is most certainly one of the solutions. However, the **Smart Grid**, mentioned earlier in this report, is a technology IPCo is implementing which can be a real and very imminent solution for reliability.

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 excess 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. As battery storage technology increases and the cost of solar photovoltaic panels declines 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 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 one of the answers 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. Building another power line from Hailey to Ketchum might insure us with a redundant line and it would also assure continued supply of electricity from coal. A renewed interest in nuclear energy could be a future source for our electrical power, electricity that the public would pay for twice -- in taxes to pay for federal loan guarantees necessary for the development of a nuclear plant and in the rate consumers pay IPCo. There are alternatives. Our community has an opportunity to explore abundant natural resources - wind, solar, geothermal and biomass to provide a sustainable and secure 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.