

Owyhee County Energy Plan

Table of Contents

Owyhee County Energy Plan Summary	3
As further guidance for the county policy decisions will:	3
Encourage energy conservation in all areas of the County.....	3
Help strengthen new and existing small and medium sized family operations through diversification with alternative energy production. Including:.....	4
Encourage small and medium sized family operations to diversify with alternative energy projects by:	4
Reduce pollution from existing operations through development of clean energy projects wherever possible.....	5
Broaden and expand existing Owyhee County tax base by encouraging investment in renewable energy projects.	5
Global warming issues.....	6
Why renewable energy for Owyhee County?.....	6
Renewable Technologies	7
Energy Conservation and Environmental Awareness.....	7
Solar Thermal and Concentrated Solar Power.....	8
Biomass.....	8
Bio-Fuels.....	9
Bio-fuels caveats.....	9
Low head hydro	10
Solar Photovoltaic.....	10
Geothermal.....	10
Wind Energy	11
Large Wind Farm Caveats	11
Non-Renewable Energy Operations	13
County Policy enactments required.	14
Appendix A Concentrated Solar Power Technology.....	17
DOE's CSP Program.....	20
Appendix B.....	22
NREL Modeling on Potential Economic Impacts of Wind Power on Rural Communities	22
Appendix C Wind Power Information.....	23
Wind Facts	23
Appendix D Renewable Energy Resources Maps	25
Idaho Wind Resource Map.....	25

Owyhee County Energy Plan Summary

Owyhee County will pursue an energy policy for the benefit of all Owyhee County citizens. The County shall develop clear and consistent policies to encourage energy conservation, improved utilization, and development of additional renewable resources using existing and emerging renewable energy technologies. In so doing, the County will expand and diversify its current economy, expand and broaden the tax base, and improve long term economic stability of the County and its Citizens.

Owyhee County's goals include policies to encourage:

1. Energy conservation strategies on new and existing operations, existing buildings and new construction.
2. Preservation of existing natural resources,
3. Preservation of prime agricultural cropland,
4. Diversification of agricultural operations for small and medium sized family operations through development of alternative energy projects to help stabilize and improve the County's agricultural base,
5. Owyhee County should become both a user, and net exporter of, environmentally friendly, renewable energy for the long term benefit of its citizens, The State of Idaho, and the United States.
6. Improve the power delivery system.
7. Encourage tax incentives for development of new alternate energy sources and energy conservation.

As further guidance for the county policy decisions will:

Encourage energy conservation in all areas of the County.

1. Develop strategies for the County to conserve energy.
2. Develop a strategy to improve the energy efficiency in the construction throughout the County.
3. Develop strategies for energy efficiency in farm, ranch, industrial and business enterprises.
4. Work with existing State, and Federal Agencies to capitalize on available funding, technology and information programs to encourage energy conservation.

Help strengthen new and existing small and medium sized family operations through diversification with alternative energy production. Including:

1. Encourage more local diversification for crops and crop marketing opportunities,
2. Help develop environmentally sound renewable energy resources in a manner that benefits, and encourages family operated farms, ranches and businesses.
3. Encourage vertical integration opportunities through development of renewable energy projects. (Geothermal, Solar, Wind, Bio-mass, and Bio-fuels),
4. Encourage environmentally sensitive conservation, exploration, new development, and utilization of the County's substantial renewable resources including Wind, Solar, Geothermal, Bio-mass, Bio-fuels,
5. Through the newly formed County Energy Department recommended by this plan, actively attract and promote energy conservation and new renewable energy projects.
6. Help insure favorable utility energy purchase, sale, and net metering agreements with existing, or new utilities inside or outside the County by seeking legislation if necessary or County Energy Department assistance.
7. Enact favorable zoning ordinances, administrative procedures, and fee structures to actively attract and promote environmentally sound renewable energy projects.
8. Implement new energy development without taking large tracts of land out of agricultural production.
9. Seek to attract research projects both temporary and permanent.
10. Encourage production cost reductions through co-operative energy organizations to develop, generate, and market energy,
11. Actively pursue State or Federal legislation to encourage favorable taxing laws to encourage long term investment for renewable energy projects.
12. Encourage clean subsidiary development opportunities such as primary or secondary manufacturing opportunities.
13. Encourage and facilitate development and enhancement of carbon market and green tag markets for the benefit of renewable energy projects within the County.
14. Encourage all Cities within the county to adopt energy plans and actively pursue environmentally sound renewable energy projects.

Encourage small and medium sized family operations to diversify with alternative energy projects by:

1. Actively help operations seek funding opportunities for temporary and permanent developments for alternative energy projects.
2. Developing a program to actively support and encourage small and medium sized family operations to diversify existing operations to include alternative energy projects.
3. Implementing zoning regulations and procedures to make it easier to develop alternative energy projects for small to medium sized family operations.

Reduce pollution from existing operations through development of clean energy projects wherever possible.

1. It is paramount that any energy projects develop only clean environmentally friendly renewable resources which do not pose long term threats to the well being of the citizens of Owyhee County or the State of Idaho.
2. Implement environmental standards which insist on development and use of Biomass technology for all confined animal feeding operations (CAFOs).
3. Develop and implement zoning ordinances to ensure current, new, and expanding operations implement clean and renewable energy producing Biomass technology integrated with their operation.
4. Encourage environmentally friendly urban waste disposal options to include biomass energy technology.

Broaden and expand existing Owhyee County tax base by encouraging investment in renewable energy projects.

1. The County will actively seek tax incentives from the State Legislature to encourage long term investment in alternative energy projects adding new long term capital improvements to strengthen and broaden the County's tax base.

Global warming issues

For purposes of Owyhee County's energy policy, opinion on man caused global warming is not at issue. What matters is that most governments of the world, including the majority of the US government, feel it is a real issue. Therefore, there is a tremendous amount of interest and opportunities available involving the reduction of "Greenhouse gasses". Through the active development and encouragement of renewable energy projects Owyhee County should endeavor to capitalize on this opportunity to develop environmentally responsible clean, renewable energy projects to expand and diversify the County's economy. The emerging carbon and green tag market is also a closely allied subject which might, with further development, become an additional substantial source of income to Owyhee county residences through development of renewable energy projects.

What if man caused global warming turns out to be only a passing political situation? Since it is extremely unlikely that long term energy prices will reduce, the worst that Owyhee County would have done is strengthen the County's economy, improve the environment improve the financial welfare of its citizens, broaden and strengthen its tax base, and contribute to energy self sufficiency of the United States. This is a win-win opportunity that seldom presents itself.

Why renewable energy for Owyhee County?

Owyhee County has many sources of renewable energy. Renewable energy, contrary to other sources, is clean, non-polluting, and safe. In fact it can help improve some of the pollution sources currently in the county such as CAFO waste and urban waste. We can take existing resources and feed-stocks, convert them into energy and other saleable products, retaining more income within the County instead of sending our dollars out of the county and out of State to pay for energy generated elsewhere. Energy conservation and renewable energy development in Owyhee County will improve not only the county's financial well being, but also improve and preserve our substantial environmental assets. It will also improve the financial well being of the State of Idaho and the United States of America as being a step closer to energy independence.

Renewable energy is a long term County solution, not just for the short term.

Renewable Technologies

Energy Conservation and Environmental Awareness

Energy conservation and its associated environmental awareness is the best and least expensive way to improve Owyhee County's energy well being. It must be an integral part of our energy plan. Any alternative energy development must be sensitive to the impact conservation has on energy demand and our overall impact on the environment of Owyhee County. Every BTU or Kilowatt saved is one less that must be produced.

The impact of things such as high tech insulation, energy efficient appliances, HVAC systems, and irrigation pumps are many times under rated by consumers. Every attempt must be made to encourage new construction to become more energy efficient. Many state and federal programs should be accessed to accomplish this goal. The County will endeavor to become a model for other counties for energy conservation.

Energy conservation is not limited to buildings. It should be encouraged for farms, ranches, businesses, industrial and governmental operations wherever possible. The County should also encourage cities to implement energy conservation standards through active and positive support where possible. The County should take an educational, supportive, and cooperative approach in working with residents and businesses for the implementation of this plan.

Solar Thermal and Concentrated Solar Power

Solar thermal is sometimes considered, “Low-Tech” solar. However this technology presents some of the best potential for alternative energy, particularly when combined with conservation and energy conservation building methods. This consists of solar heating solutions using (or avoiding) direct rays of the sun in combination with reflective and storage technologies.

The many sunny days, low smog, and lack of air pollution in Owyhee County makes it one of the best solar areas in the country. Conversely, without proper building techniques solar thermal can also increase air conditioning costs and energy usage. Proper building methods allow better utilization of the sun's heat and avoid unnecessary energy usage for cooling.

One advantage of solar thermal technologies is it is relatively inexpensive to build. Once built, fuel is free thus the operating expense is extremely low. This technology is overall, one of the lowest costs to implement and maintain.

Owyhee County should endeavor to develop accurate and current information on what solar thermal technology is useful and cost effective, along with ways in which homeowners, farmers, and ranchers can take advantage of it. We should adopt County ordinances to facilitate and further develop these resources.

We should endeavor to attract development of these resources on marginal land which could enhance and diversify agricultural revenues. We should endeavor to attract research projects, or utility size projects when and where appropriate using the “High Tech” part of Solar thermal such as Concentrated Solar Power using solar concentrators, solar troughs, and solar towers with which to generate power or in combination with Bio-mass/Bio-fuel projects.

See Appendix A.

Biomass

It is estimated that Owyhee County has the ability to generate between 775,000 and 2,500,000 MMBTUs of energy from.¹ Current science exists to generate this energy, as well as many other products, from biomass. Bio-mass relies on large volumes of feed-stocks which may currently be either a non-income generating bi-product, or worse a very real contributor to negative environmental and economic issues, for Owyhee County. For example, it is estimated that up to 30 – 40% of grain or corn stubble can be

¹ www.energyatlas.org

collected for biomass energy development without depriving the soil of needed organic matter.

Numerous projects have been developed and have shown that responsible development of biomass facilities in combination with confined animal feeding operations solve many of the environmental and economic problems. Biomass projects have also been developed and are currently operating to solve urban waste problems in a profitable and environmentally friendly manner. They also generate substantial additional revenue for those who implement them and improve the County's tax base.

Technology has the potential to utilize new feed stocks not currently existing in the County. The potential exists to develop and grow cellulose crops not currently grown in the County. This potential should also be investigated.

Owyhee County should also endeavor to attract funding that might be available for research in this area.

Bio-Fuels

There are currently many opportunities for funding development of bio-fuel projects and plants. This opportunity should help provide our traditional agricultural base new market opportunities to diversify from the predominate CAFO based markets.

Bio-fuels certainly have been helping increase the value of agricultural crops grown in Owyhee County, primarily corn prices. However, it will likely push the price of other crops higher as well when farmers shift from other crops to corn. It is estimated that in the 2007 crop year there will be an additional 15% shift into corn in the Midwest away from Soy beans. This will invariably apply upward pressure on other crops including grain and hay.

Bio-fuels, including ethanol and bio-diesel also have proven environmental advantages over fossil fuels. Bio-Diesel is also better for mechanical equipment as well.

Bio-fuel production may be a very good opportunity for Owyhee County to develop several very beneficial things at one time including bringing good paying jobs and improved tax base to the County.

Bio-fuels caveats

Even though Bio-fuels are definitely one of the solutions to our foreign trade deficit and dependence on countries hostile to the United States for oil, current science suggests that without substantial technological improvements Bio-fuels, particularly ethanol, will come up short as the ultimate fuel solution because of the negligible net energy gain after considering all feed-stock energy inputs.

However, with Owyhee County's other renewable resources, one solution may be the integration with other environmentally friendly renewable energy sources such as solar, biomass, and geothermal combined with bio-fuel production. Owyhee County should investigate the possibility for a research grant to develop a solar, geothermal, or biomass enhanced ethanol facility.

Low head hydro

Low head hydro projects should be identified and attempts made to attract and develop projects which would benefit existing water projects. In addition, there is an opportunity to use new technologies to generate power without relying on dams.

We should endeavor to obtain grants to study the potential for technology currently being tested in other hydro projects (such as tidal power projects) in the rivers and streams in Owyhee County. We should encourage private development of these projects if they are deemed environmentally sound.

Solar Photovoltaic

Solar photovoltaic should be encouraged as one of the primary sources of power generation. The county should endeavor to attract even up to utility scale projects with new and emerging technology.

We should seek to attract long term investment in our county to increase the tax base and attract both temporary and permanent jobs using this technology. We should also endeavor the find grants for implementation of new technologies as research projects where and when possible.

The County should endeavor to develop and make available information on this technology to help people successfully implement solar projects.

Geothermal

It is estimated that Idaho has the ability to generate 5 Million MWhr/YR², and Owyhee County has some of the best geothermal resources in the State. We need to encourage further development. There are currently many known and established geothermal resources potentially capable of generating substantial power. Much of the existing geothermal is classified as low temperature (< 200 degrees). Low temperature is useful

² www.energyatlas.org

for a number of things including power generation. Currently water between 165 and 200 degrees now is used to generate power with new technology. In addition it can be used for many innovative agricultural and industrial endeavors (alligator farming for example). The County should encourage further creative development of these resources. Additional research needs to be done to further quantify the amount of geothermal resources available.

Owyhee County should encourage the development of both low temperature and high temperature geothermal and the potential benefits using modern equipment and techniques. We should endeavor to find grants to attract projects to the county to expand the County job and tax base as well as to diversify agricultural opportunities available with geothermal heating.

Owyhee County should also encourage the use of geo-thermal building heating as an efficient use of energy. We should find or develop information to provide, as part of the building permit process, to help prospective users successfully install these types of projects.

Wind Energy

Wind is currently one of the most economical renewable energy sources and we should actively encourage its development.

Idaho is ranked 13th in wind energy potential for the entire United States³. Owyhee County is ranked third in Idaho for wind potential. Though some wind project activity is developing in Idaho, there has been virtually no development in Owyhee County. The County should seek to attract wind development in such a way as to benefit the traditional agricultural base of the County as a diversification strategy for its historical agricultural base.

The County should encourage wind projects which benefits small to medium sized family agricultural enterprises not only through diversification, but also through production cost reduction strategies.

The County should encourage wind projects which attract quality jobs to the county in an environmentally sound manner.

Large Wind Farm Caveats

Large wind farm projects (over 100 KW in nameplate capacity) are usually large industrial developments and are not to be taken lightly by either planning and zoning, or

³ Idaho Energy Department

farmers, or ranchers contemplating such. These large developments take careful planning, financing, and construction management and takes substantial expertise to insure favorable outcomes for all involved, including residences of Owyhee County. Wind power is not without its detractors. Most of the detractors focus on large wind projects and large wind projects should be carefully considered. See Appendix C

Non-Renewable Energy Operations

Given Owyhee County's substantial natural resources and agricultural base, non-renewable forms of energy production are less attractive to Owyhee County. Since non-renewable energy is less environmentally friendly than most renewable forms of energy. All forms of non-renewable energy, including nuclear, and fossil fueled energy such as coal, natural gas, & oil production is less attractive to Owyhee County because of the risk of negative environmental impact. The specifics vary from technology to technology.

In general, if energy production is not sustainable and renewable and environmentally friendly, it is less likely to benefit the County and its residents in the future either in terms of environmental impacts which will inevitably result in a negative impact to our economy particularly to our agricultural based operations.

Of paramount importance is the protection of the above ground water resources and the Snake River Plain Aquifer, one of the largest in the country. Any energy development must consider and protect the aquifer. If the aquifer is damaged, it could decimate our entire county and beyond. It would also decimate our agricultural economy and other natural resources along with it. Of note on this subject is our substantial natural geothermal activity and documented large geothermal aquifer. Geothermal activity is dependent upon unstable geologic structures such as faults. These resources must be absolutely protected in any future development of power plants in Owyhee County.

County Policy enactments required.

The County will establish an Energy and Environment Department. The purpose of the department is to develop methods to encourage and monitor development of environmentally sound alternative energy developments.

The Department will seek grant funds for the purpose of funding activities described in this document. The department will also be responsible for commenting on Planning and Zoning applications from an energy and environmental impact perspective. It will develop and make recommendations to the Planning and Zoning applications from energy and environmental impacts. It will develop and make recommendations to the Planning and Zoning and Building inspection departments for ordinances and procedures involving energy and environmental issues. It will also track progress on this plan and report such to the county commissioners. The department will develop, coordinate, and recommend ordinances or legislative changes to further this energy plan and environmental issues affecting the county and its residents. It will also be responsible for coordinating energy policy with State, Federal, and Cities, and County organizations, Farms, Ranches, business and residents in a manner consistent with this plan

Index

<p>Agricultural base 9</p> <p>Alligator farm..... 11</p> <p>Aquifer 13</p> <p>Attract research projects 4</p> <p>Bio-diesel 9</p> <p>Bio-fuels..... 9</p> <p>Biomass..... 5, 8</p> <p>Building Department..... 14</p> <p>Building methods 8</p> <p>CAFO waste..... 6</p> <p>CAFOs 5</p> <p>Capital improvements 5</p> <p>Carbon credits 6</p> <p>Carbon markets 4</p> <p>Cellulose 9</p> <p>Cities 4, 14</p> <p>Coal 13</p> <p>Concentrated Solar Power (CSP).... 8, 16</p> <p>Conserve agricultural land 4</p> <p>Co-ops 4</p> <p>Corn prices 9</p> <p>County Energy Department 4</p> <p>County should become a net exporter of renewable energy 3</p> <p>County tax base..... 5, 9</p> <p>County’s economy 6</p> <p>County’s goals 3</p> <p>Develop environmentally sound renewable energy sources 4</p> <p>Diversification..... 11</p> <p>Diversify County’s economy 6</p> <p>Encourage conservation..... 4</p> <p>Encourage energy conservation 3</p> <p>Encourage new energy development ... 4</p> <p>Encourage small to medium sized family operations..... 5</p> <p>Encourage vertical integration 4</p> <p>Energy conservation..... 6</p> <p>Energy Conservation..... 7</p> <p>Energy Cooperatives..... 4</p> <p>Energy Department, County 4</p> <p>Energy Department, Owyhee County . 14</p>	<p>Energy development policy 8</p> <p>Energy efficiency in farm, ranch, and business 3</p> <p>Energy efficient appliances..... 7</p> <p>Energy integration, ethanol..... 10</p> <p>Energy purchase, sale, and net metering4</p> <p>Energy, Non-renewable 13</p> <p>Environmental assets 6</p> <p>Environmental Awareness 7</p> <p>Environmental impact, negative 13</p> <p>environmentally friendly..... 3</p> <p>Environmentally friendly resources..... 5</p> <p>ethanol..... 9</p> <p>Faults, geologic 13</p> <p>Favorable zoning ordinances 4</p> <p>Federal Organizations 14</p> <p>Feed-stock..... 9</p> <p>Fossil based energy 6</p> <p>Funding opportunities 5</p> <p>Geologic faults 13</p> <p>Geothermal..... 10</p> <p>Geothermal, Low Temperature..... 11</p> <p>Global warming 6</p> <p>Grant funds..... 14</p> <p>Green Tags 4, 6</p> <p>Greenhouse gasses 6</p> <p>guidance for the County policy decisions 3</p> <p>Hydro, Low head 10</p> <p>Improvement of construction energy efficiency..... 3</p> <p>Jobs 9</p> <p>Jobs, Wind Power 11</p> <p>Legislation State or Federal 4</p> <p>Local diversification for crops 4</p> <p>Long term solution..... 6</p> <p>Manufacturing Opportunities..... 4</p> <p>Midwest..... 9</p> <p>Natural Gas 13</p> <p>New construction 7</p> <p>Nuclear 13</p> <p>Nuclear energy 6</p>
---	---

Oil	13	Solar, Low-tech.....	8
Organic matter	9	Solar, photovoltaic	10
Owyhee County Energy Department ..	14	Solar, Utility Scale	16
Owyhee County Energy Plan Summary	3	stabilize the County’s agricultural base	3
Photovoltaic	10	State organizations	14
Planning & Zoning.....	14	strategies for the County to conserve	
Policy enactments	14	energy.....	3
Preservation of Existing natural		strengthen new and existing small and	
resources	3	medium sized family operations	4
Preservation of prime agricultural		Tax incentives	5
cropland.....	3	Trade deficit	9
Production cost reductions.....	4	Urban waste	6
Promote	4	Urban Waste.....	5
Research, Biomass	9	Wind Energy	11
Research, Solar	10	Wind Farms, Large	12
Sandia Labs	16	Wind potential.....	11
Solar Costs	16	Wind, BLM.....	25
Solar Thermal.....	8	Wind, Economic Impacts.....	23
Solar Tower.....	16	Wind, Facts	24
Solar Trough	16	Zoning Regulations.....	5

Appendix A: Concentrated Solar Power Technology

The following small sample of advanced Solar Thermal technology has been extracted from the department of energy's web site for Sandia labs. Additional information can be found at:

<http://www.energylan.sandia.gov/sunlab/overview.htm>

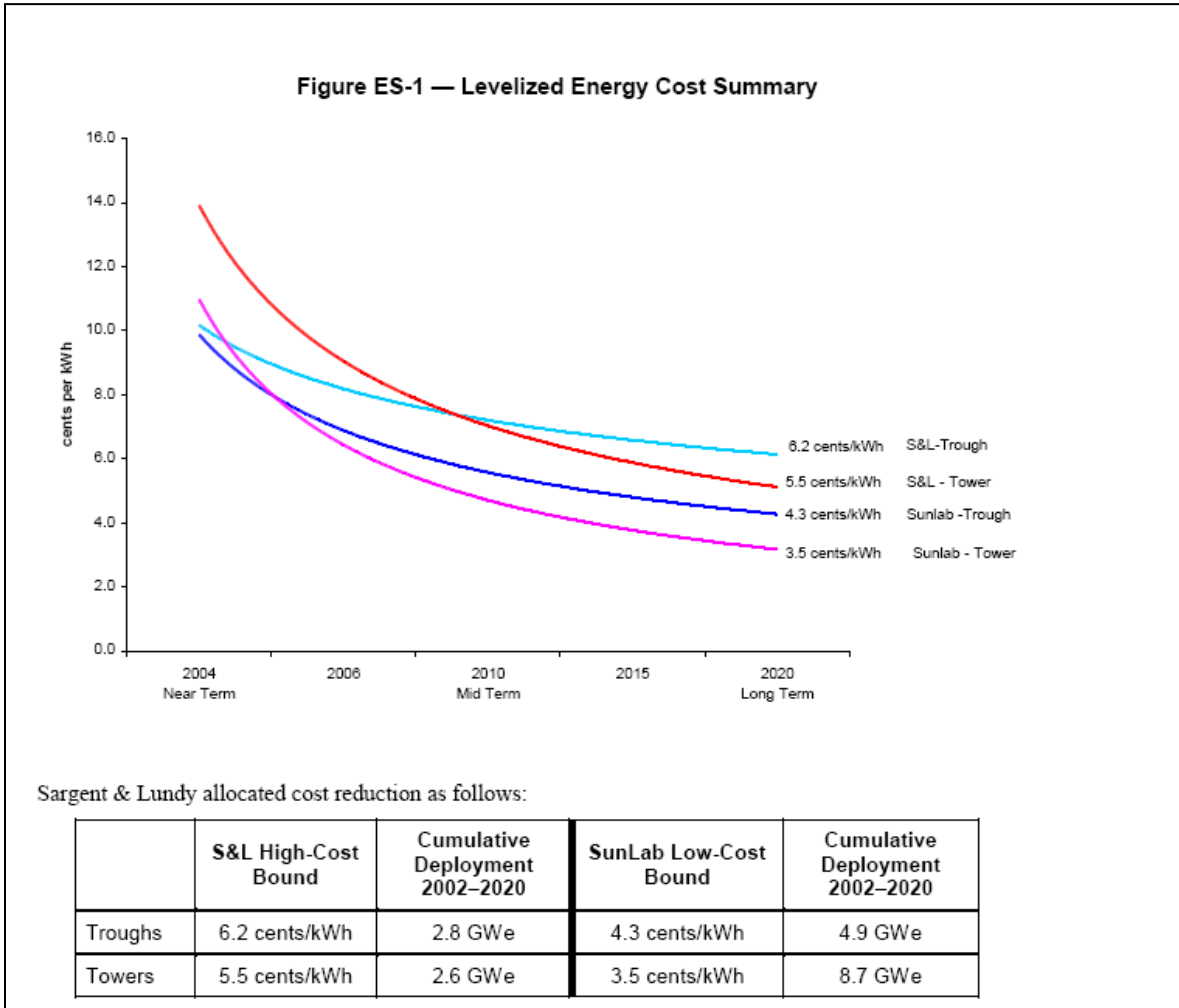
Assessment on Parabolic trough technology (345 pages) can be found at:

<http://www.energylan.sandia.gov/sunlab/PDFs/Assessment.pdf>

SARGENT & LUNDY CONCLUSIONS

Based on this review, it is S&L's opinion that CSP technology is a proven technology for energy production, there is a potential market for CSP technology, and that significant cost reductions are achievable assuming reasonable deployment of CSP technologies occurs. S&L independently projected capital and O&M costs, from which the levelized energy costs were derived, based on a conservative approach whereby the technology improvements are limited to current demonstrated or tested improvements and with a relatively low rate of deployment (this does not mean that there is no technology development, only that the technologies have been demonstrated or tested at some scale so that no breakthroughs are required; further scale-up and engineering are required with associated risks). The projections for electrical power consumption in the United States and worldwide vary depending on the study, but there will be a significant increase in installed capacity due to increased demand through 2020. Trough and tower solar power plants can compete with technologies that provide bulk power to the electric utility transmission and distribution systems if market entry barriers are overcome:

- Market expansion of trough and tower technology will require incentives to reach market acceptance (competitiveness). Both tower and trough technology currently produce electricity that is more expensive than conventional fossil-fueled technology. Analysis of incentives required to reach market acceptance is not within the scope of the report.
- Significant cost reductions will be required to reach market acceptance (competitiveness). S&L focused on the potential of cost reductions with the assumption that incentives will occur to support deployment through market expansion. For the more technically aggressive low-cost case, S&L found the National Laboratories' "SunLab" methodology and analysis to be credible. The projections by SunLab, developed in conjunction with industry, are considered by S&L to represent a "best-case analysis" in which the technology is optimized and a high deployment rate is achieved. The two sets of estimates, by SunLab and S&L, provide a band within which the costs can be expected to fall. The figure and table below highlight these results, with initial electricity costs in the range of 10 to 12.6 ¢/kWh and eventually achieving costs in the range of 3.5 to 6.2 ¢/kWh. The specific values will depend on total capacity of various technologies deployed and the extent of R&D program success. In the technically aggressive cases for troughs / towers, the S&L analysis found that cost reductions were due to volume production (26%/28%), plant scale-up (20%/48%), and technological advance (54%/24%).



Trough technology is further advanced than tower technology. Trough technology has 354 MW of commercial generation in operation in the southwestern United States. Tower technology has been successfully demonstrated with a conceptual and pilot plants (Solar One and Solar Two). Trough technology is a fully mature technology, and there is low technical and financial risk in developing near-term plants. The long-term projection has a higher risk due to technology advances needed in thermal storage. The tower technology needs to proceed from demonstration to commercial development. There is a higher technical and financial risk in developing a first-of-its-kind commercial plant. The advantage of tower technology is that if commercial development is successful (e.g., if expected cost and performance targets are achieved), then the levelized energy cost (LEC) for long-term deployment will be less than for trough technology.

TROUGH TECHNOLOGY
Trough Technology Summary

Owyhee County Energy Plan

The cost, performance, and risk of parabolic trough technology are fairly well established by the experience of the existing operating parabolic trough plants. Based on the data available to S&L, the analysis bounds the future potential cost of parabolic trough power.

- Assuming the technology improvements are limited to current demonstrated or tested improvements and a deployment of 2.8 GWe of installed capacity by the year 2020 and successful development of a thermal storage system, trough costs should be able to drop to approximately 6.2¢/kWh
- Assuming the projected technical improvements are achieved by an active R&D program combined with incentives and deployment of 4.9 GWe, the trough costs projected by Sunlab of about 4¢/kWh could be achieved.

NOTE: THE INFORMATION EXTRACTED HERE IS NOT SUFFICIENT TO MAKE DEFINITIVE DECISIONS REGARDING CONCENTRATED SOLAR POWER. It is included here for illustration and interest purposes. Please refer to complete report at site listed above.

DOE's CSP Program

BIG Solutions for BIG Problems...

Concentrating Solar Power

Recent electricity and gas shortages in California and other western states, along with an expanding recognition of environmental issues, have highlighted the need for clean, large-scale renewable power. Because of its low cost, ability to deliver power during periods of peak demand, and capability for large-scale and distributed deployment in the near-term, Concentrating Solar Power (CSP) can be a major contributor to solving our nation's energy problems now and in the future.



354 MW of SEGS plants continue to operate successfully on the California power grid. Annual output of the plants has increased by 35% as plant operations have improved over the past 10 years, and O&M costs have correspondingly dropped 40%. These plants have demonstrated the ability of CSP to meet utility requirements. Several domestic and international projects are currently being planned.

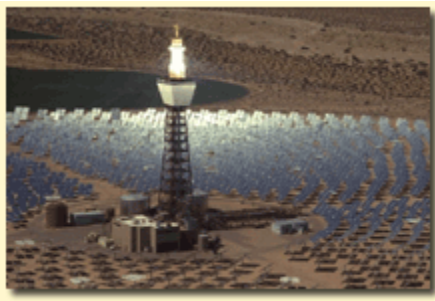
CSP is...

...proven, reliable technology.

354 MW (enough for 100,000 homes) of concentrating solar power systems have operated successfully in the Southern California desert for the past decade. These Solar Electric Generating System (SEGS) plants consistently operate as well as or better than when they were new.

...dispatchable.

CSP plants with cost-effective storage or natural gas hybridization can deliver power to the utility grid when that power is most needed, not just when the sun is shining. The SEGS plants peaking capacity routinely approaches 100%.



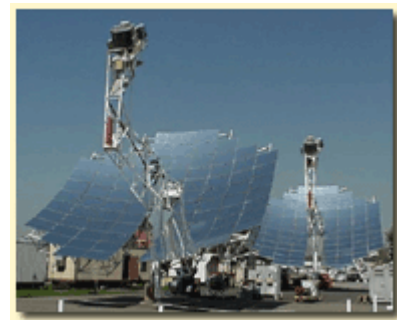
Solar Two successfully demonstrated the power tower concept, including the

capability to store energy economically for dispatch at periods of peak demand. U. S. industry is building the first commercial power tower using this technology in Spain and simultaneously investigating near-term opportunities in the U. S.

...competitively priced solar power.

These existing CSP plants produce power now for as low as 12¢/kWh (including both capital and operating costs), with costs dropping to as low as 5¢/kWh within ten years as technology refinements and economies of scale are implemented. Independent assessments by the World Bank, ADLittle, EPRI, and others have

confirmed these cost projections. While not currently the lowest cost electricity, CSP is already close to competitive in peaking markets, and there is significant demand for carbon-free electricity from green sources, even at above market prices, where utility customers have the option of choosing their energy supplier.



Solar dish systems are the most efficient solar systems in the world. They provide economical power for utility line support, distributed, and remote applications, and are capable of fully autonomous operation. Sized between 10 and 25 kW per dish, systems can be deployed individually for water pumping or village power applications or grouped to form megawatt-scale

Appendix B

NREL Modeling on Potential Economic Impacts of Wind Power on Rural Communities

Numerous economic studies have been done on the economic impact of wind power. They are too numerous and voluminous to include here. They can be found on the web at.
[http://www.eere.energy.gov/windandhydro/windpoweringamerica/econ_project_search.a
sp](http://www.eere.energy.gov/windandhydro/windpoweringamerica/econ_project_search.asp)

Appendix C Wind Power Information

Wind Facts

A typical wind turbine is generating some electricity 65% to 90% of the time, depending on the wind speeds at its location.

- American wind farms generated 13 billion kWh in 2003 (about 0.3% of U.S. electricity generation), enough to fully serve more than 1.3 million households.
- A single, one-megawatt wind turbine displaces 2,000 tons of carbon dioxide each year (equivalent to planting a square mile of forest), based on the current average U.S. utility fuel mix. (Source for emissions figures: U.S. Energy Information Agency)
- U.S. wind energy potential is estimated at over 10,000 billion kWh annually - more than twice the total electricity generated from all sources in America today. (Source: Pacific Northwest Laboratory)
- A modern, utility-scale wind turbine is about the size of a Boeing 747. It generates enough electricity to power over 300 average American homes. Forty thousand tons of coal or 131,000 barrels of oil would be needed to generate the same amount electricity as a single 1.5-MW wind turbine generates over 20 years.
- Only 3% to 5% of the land within the boundaries of a wind farm is needed for the generators and their service roads. The heat remains available for farming or ranching.
- A modern wind turbine 300 meters away is no noisier than the reading room of a library, and quieter than the sound of the blowing wind.
- Wind power generates no emissions and causes no pollution.
- Of all types of electricity generation, wind is one of the least harmful to birds and other wildlife.
- Modern turbines are equipped with power electronics that process over 200 types of data from wind speeds and oil temperature to voltage dips on the grid. An entire wind farm can be monitored from a laptop computer!

Link: http://www.idwr.idaho.gov/energy/wind/wind_facts.htm

BLM Approves wind power project in CASSIA County

Bureau of Land Management Announces Final Approval of Wind Energy Project in Idaho

Bureau of Land Management Announces Final Approval of Wind Energy Project in Idaho ▶

Date: 8/15/2006

Location: ID

The Bureau of Land Management announced completion of an environmental review for the Cotterel Wind Power Project. It will be the largest wind energy project on Federal land in the last 25 years with up to 98 turbines on a ridge in south-central Idaho five miles east of Albion in Cassia County. The 200 megawatt project will generate enough electricity to supply approximately 50,000 homes.

Construction activity is projected to generate up to \$12.5 million in local sales tax revenue and more than half a million dollars annually once operations are fully underway. Cassia County will also benefit from property taxes on the project's \$197 million in property improvements.

Promoting wind energy is a high priority for the Bureau in its efforts to enhance energy security by expanding opportunities for developing alternative, domestic sources.

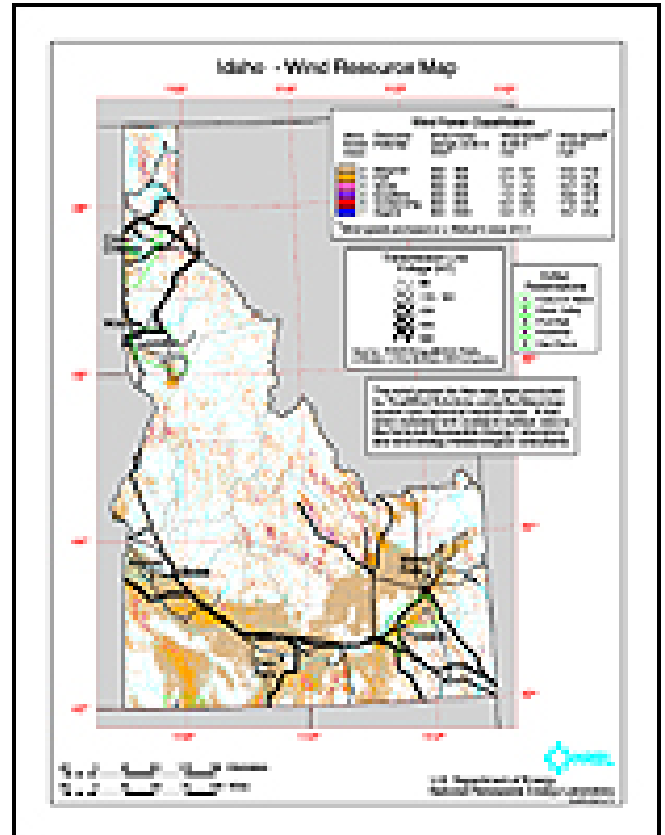
Appendix D Renewable Energy Resources Maps

Idaho Wind Resource Map

The Department of Energy's Wind Program and the National Renewable Energy Laboratory (NREL) published a new wind resource map for the state of Idaho. This resource map shows wind speed estimates at 50 meters above the ground and depicts the resource that could be used for utility-scale wind development. Future plans are to provide wind speed estimates at 30 meters, which are useful for identifying small wind turbine opportunities.

As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from Class 1 (the lowest) to Class 7 (the highest). In general, at 50 meters, wind power Class 4 or higher can be useful for generating wind power with large turbines. Class 4 and above are considered good resources. Particular locations in the Class 3 areas could have higher wind power class values at 80 meters than shown on the 50 meter map because of possible high wind shear. Given the advances in technology, a number of locations in the Class 3 areas may be suitable for utility-scale wind development.

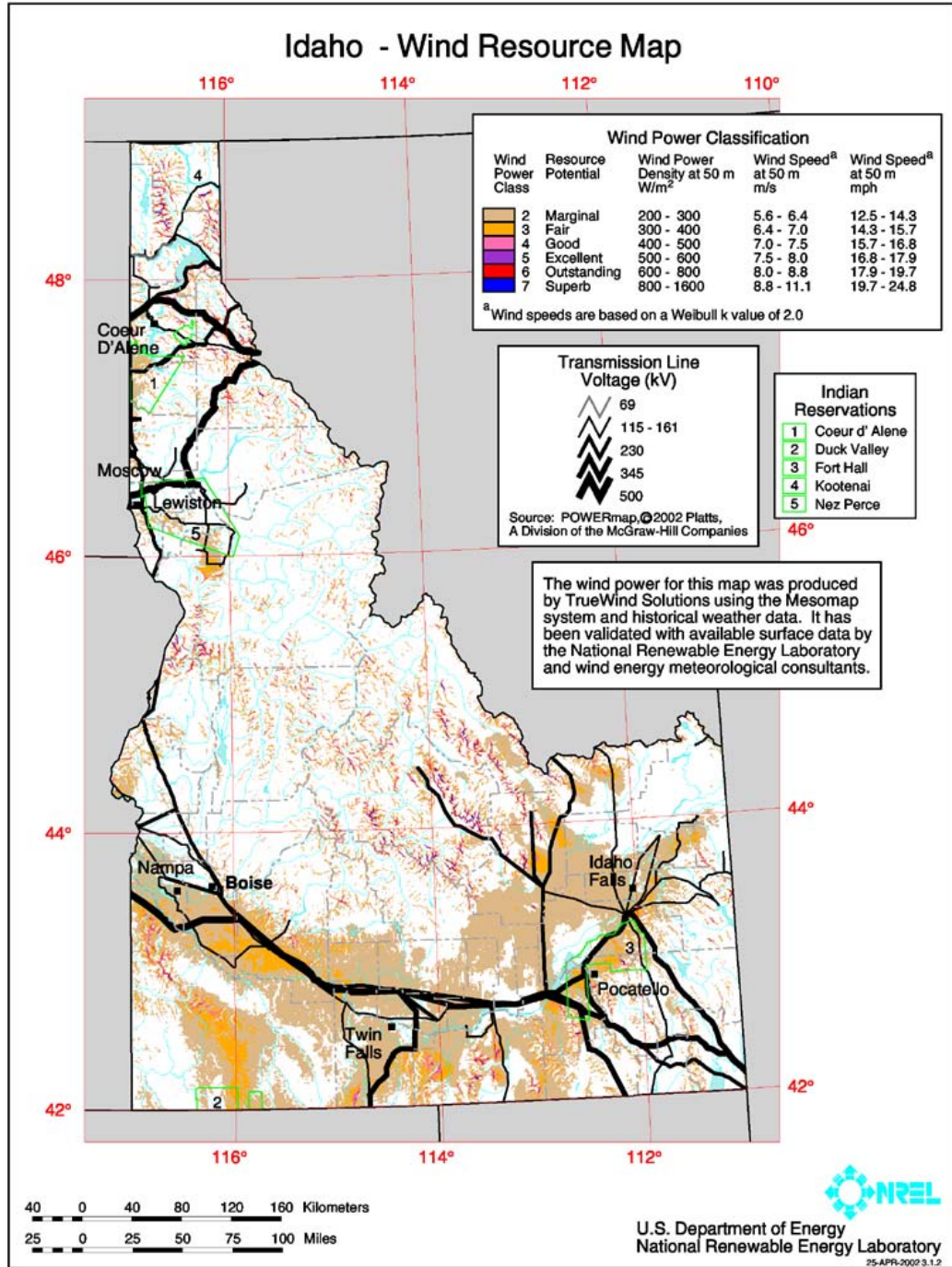
This map indicates that Idaho has wind resources consistent with utility-scale production. The contiguous areas of good-to-excellent resource are concentrated on the hills and ridges south of the Snake River Plain in southern Idaho, especially the area between Twin Falls and Pocatello. Other noteworthy resource areas are located in outflow valleys in northeastern Idaho and on the ridge crests throughout the state.



This map of Idaho shows the wind resource at 50 meters.

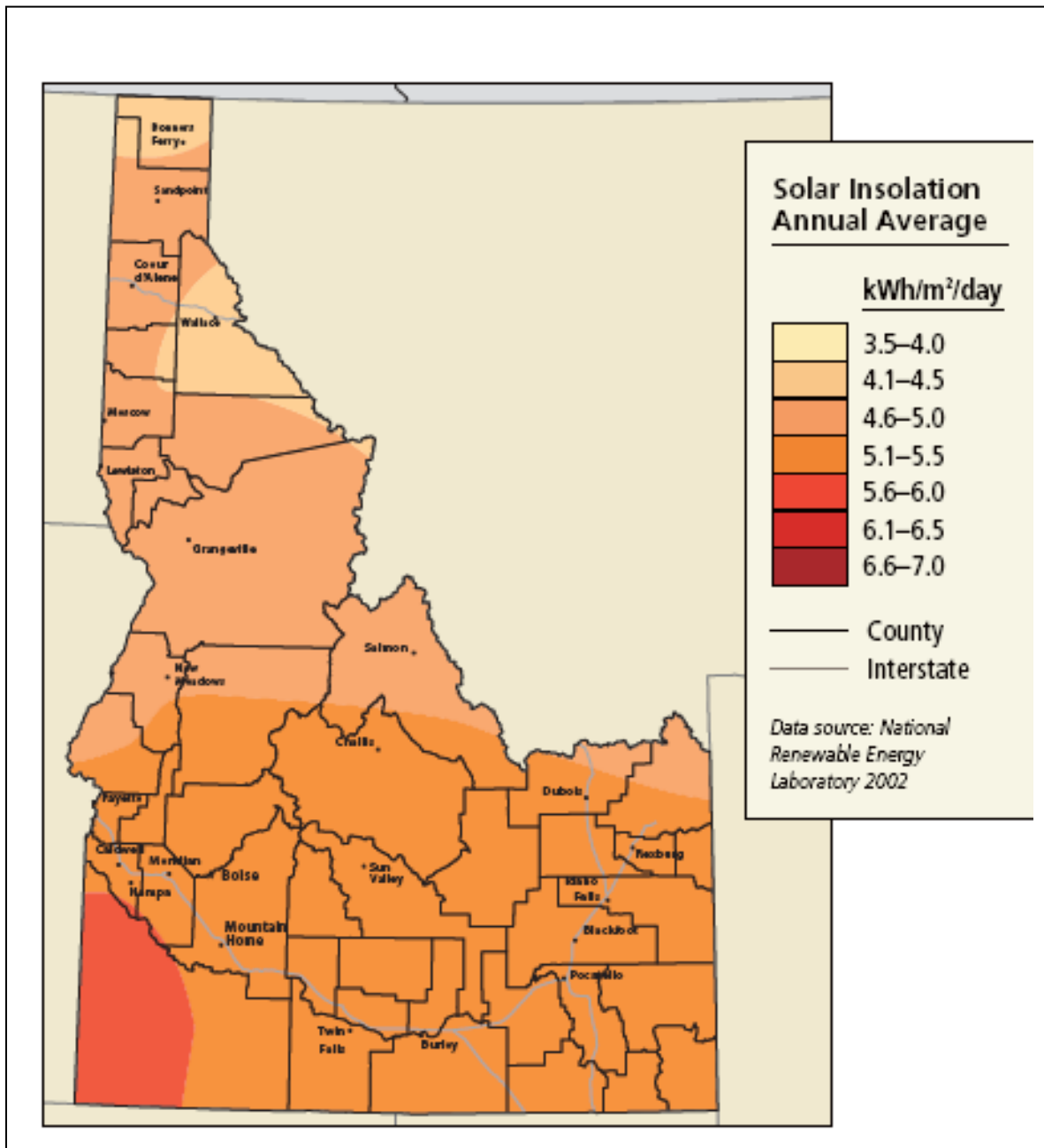
http://www.eere.energy.gov/windandhydro/windpoweringamerica/maps_template.asp?sta-teab=id

Idaho Wind Power Map

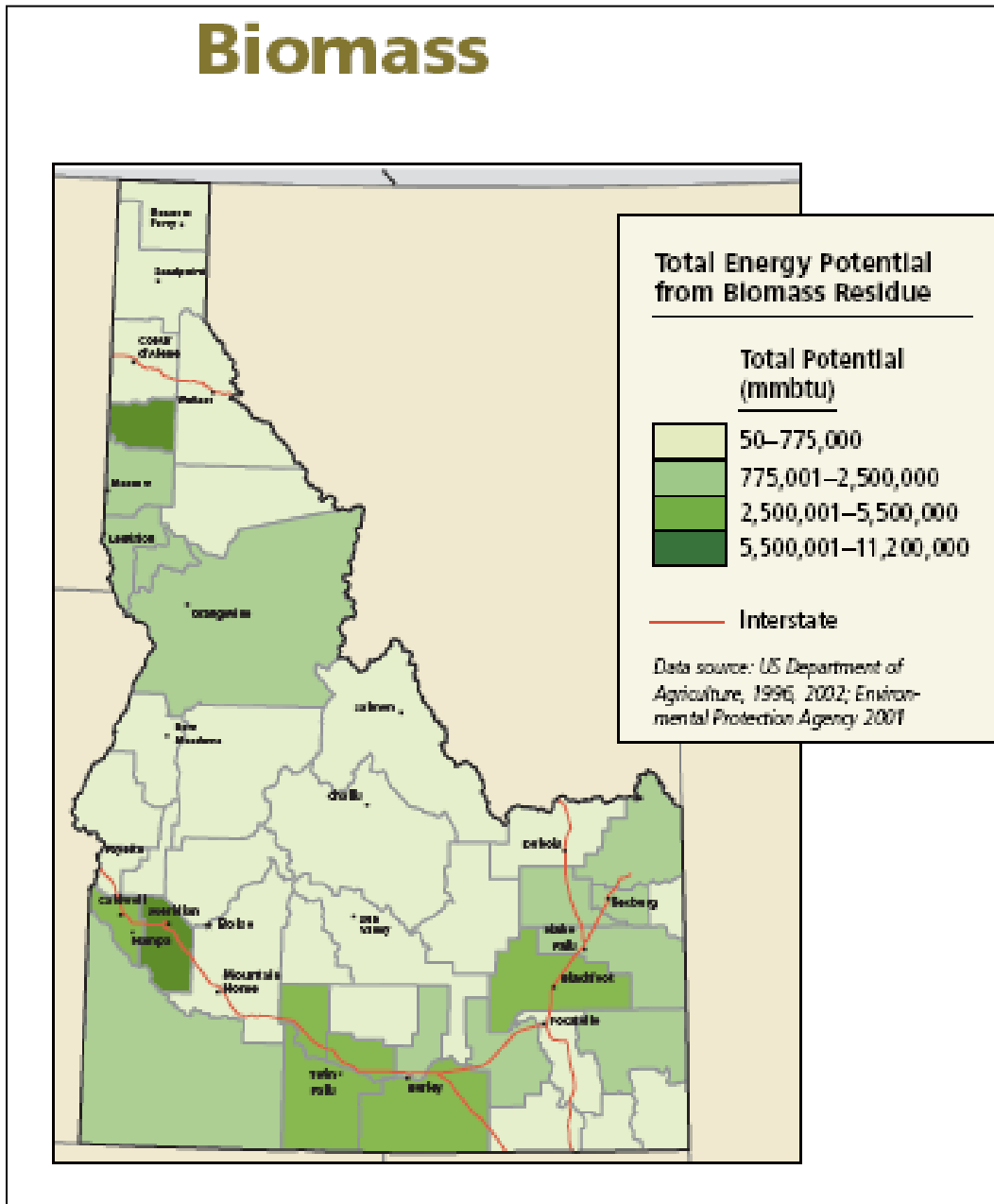


Owyhee County Energy Plan

Solar Insolation Map, Average Annual



The following map illustrates estimated energy potential from s.



Owyhee County Energy Plan

Geothermal potential map.

