

# Ketchum Energy Advisory Committee

*Welcome to the second of the energy town hall series:*

KetchEmpower:

Taking Charge of our Energy Future

*Tonight!*

Got Energy?

Why It Matters to Your Home and Business!

# Agenda

- 5:30pm Welcome by Mayor Nina Jonas
- 5:35pm Panel
  - Sharon Patterson Grant, GreenSteps
  - John Reuter, GreenWorks
  - Billy Mann, Sagebrush Solar
  - Tim Cron, Sawtooth Hotel & Stanley Bakery
  - Rebecca Bundy, City of Ketchum
- 6:15pm Q&A

# Introduction: Community Goals

**Resilience:** reliability of power, ability to respond to emergencies, adaptable (water, new technologies)

**Economy:** reduce costs, create jobs, keep \$ in the valley

**Environment:** efficiency, renewables, transportation

# KEAC Members

Aimee Christensen

CEO, Christensen Global Strategies

Steve Cook

Architect and member of the Ketchum Planning & Zoning Commission

Molly Goodyear

Executive Director, Environmental Resource Center

Wendolyn Holland

Consultant to early state energy companies and formerly with U.S. Department of Energy

Dean Holter

CFO/General Counsel at Christensen Global Strategies

Rick LeFaivre

Investor and former senior executive at Apple and Pacific Northwest National Laboratory  
advisory board member

# KEAC Members

Bill Mann

Owner, Sagebrush Solar

Kerrin McCall

Writer, artist, environmental advocate

Alan Richardson

Former President & CEO, American Public Power Association

Josh Solly

Co-Founder, Ketchum Energy Company

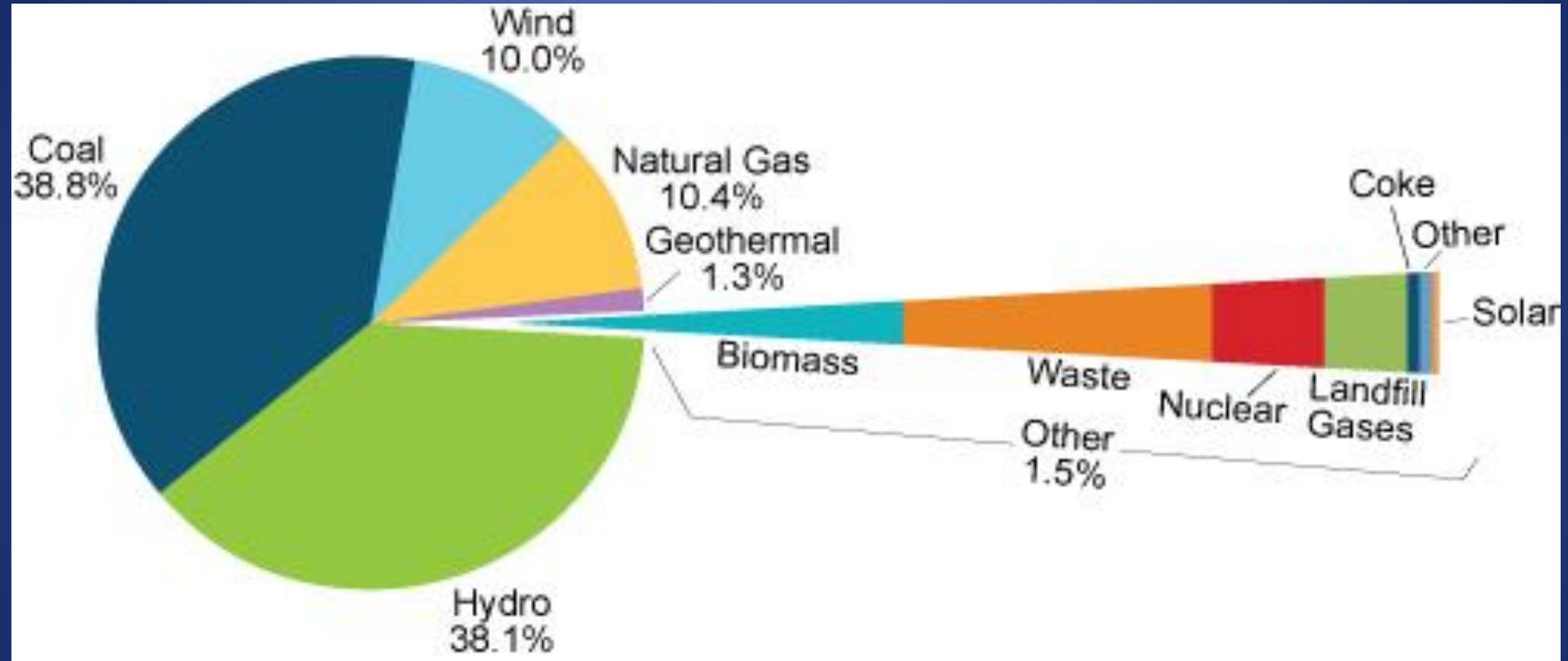
Deb Bohrer

Environmental Resource Center board member and Energy Summit founding member

Joyce Allgaier

Staff liaison for city of Ketchum

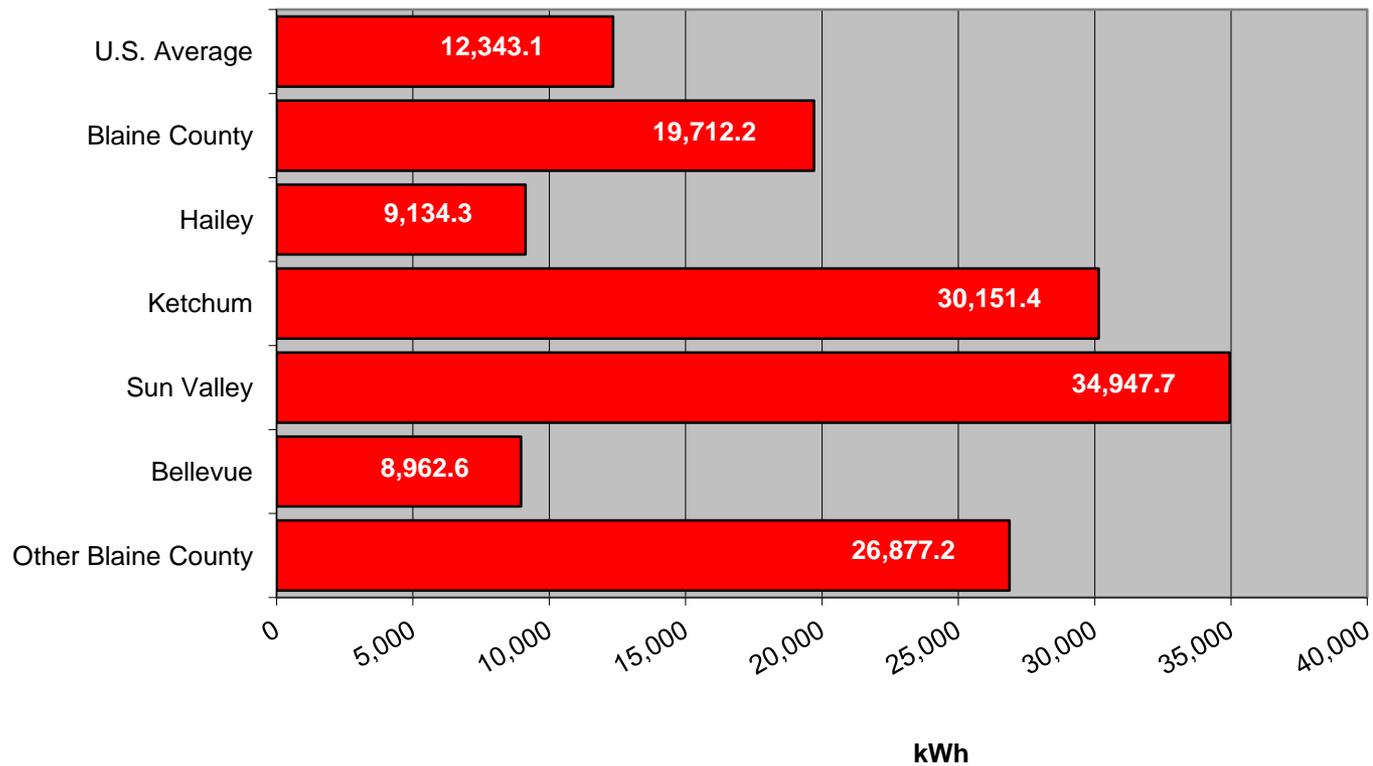
# Idaho Power Electricity Mix



Plus transportation fuels: almost entirely petroleum

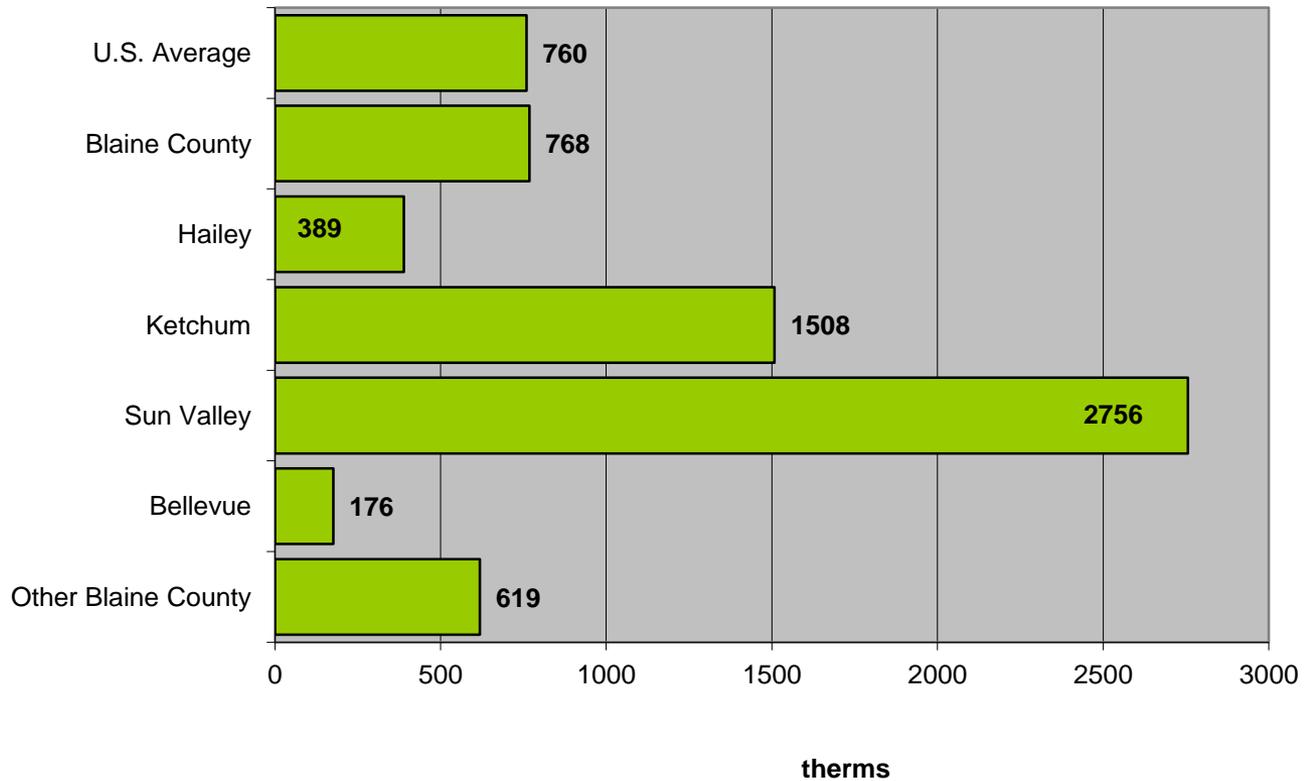
# Energy by Jurisdiction: Electricity

## 2007 Electricity Usage Per Capita



# Energy by Jurisdiction: Natural Gas

## 2007 Natural Gas Usage Per Capita



# Community Energy Summit

- April 27-28, 2011
- Approximately 60 Community leaders
- Blaine County, Camas County, Hailey, Ketchum, Sun Valley, Bellevue, Cary, Fairfield
- Idaho Power Company (our local utility)
- Comprehensive view of community energy
- Community discussion about opportunities



# Community Goals: Town Halls

**Resilience:** reliability of power, ability to respond to emergencies, adaptable (water, new technologies)

**Economy:** reduce costs, create jobs, keep \$ here

**Environment:** efficiency, renewables, transportation

First town hall = Redundant line, introduction to alternatives, to be explored more at future town hall

Second town hall = Introduction to individual opportunities for cost-savings, greater independence

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# What does energy mean to you and what are the means to do it?

**DIY:** value of efficiency, what to look for, easy upgrades

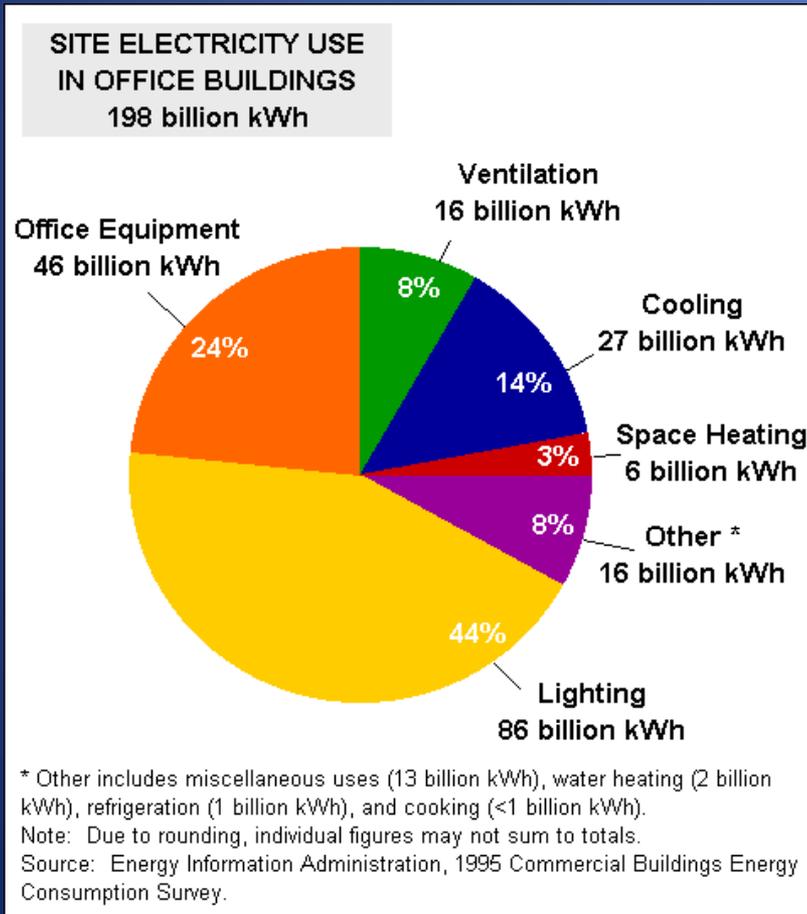
**Audits:** visual inspection, performance testing, HERS  
Index

**Getting the Work Done:** service providers, cost,  
incentives

**Local Sources of Energy:** electricity, gas, propane,  
renewables

**Incentives:** Utility, State and Federal

# Office Opportunities



Source: Center for Building Performance at Carnegie Mellon University

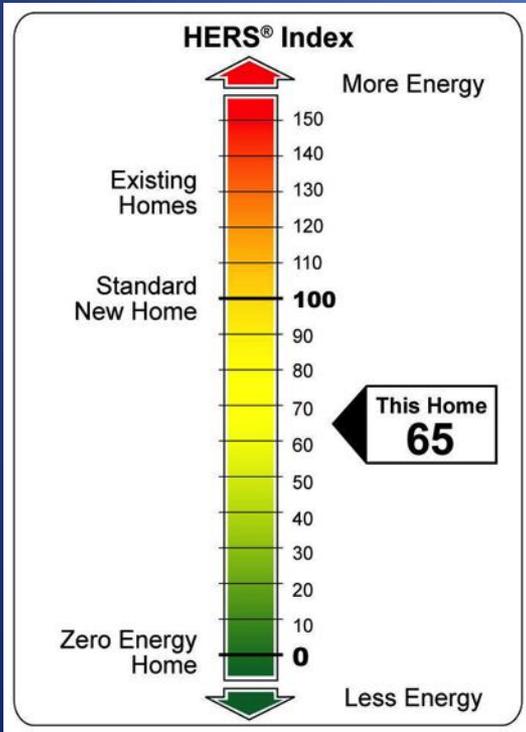
Source: U.S. Department of Energy

# DIY Opportunities

- Lighting – tipping point for LED? ROI, options
- Sweeps, caulking and weather stripping around doors
- ENERGY STAR appliances and equipment
- Set your water heater at 120°
- Program your thermostat – 68° in winter, 78° in summer. *Each degree can translate to 2% savings.*
- Shade in summer, not in winter
- Utilize power strips to reduce phantom loads
- Passive strategies such as air drying
- Low-flow showerheads

# When an Audit Makes Sense

- Visual Inspections
- Performance Testing
- HERS Index



# Getting the Work Done

- Air sealing (envelope and ducts)
- Adding insulation
- Sensors and timers
- Installing new equipment / windows
- Ventilation



# Sources of Energy

**Electric** : fuel mix, emissions, rates, green power  
– when is electric renewable?

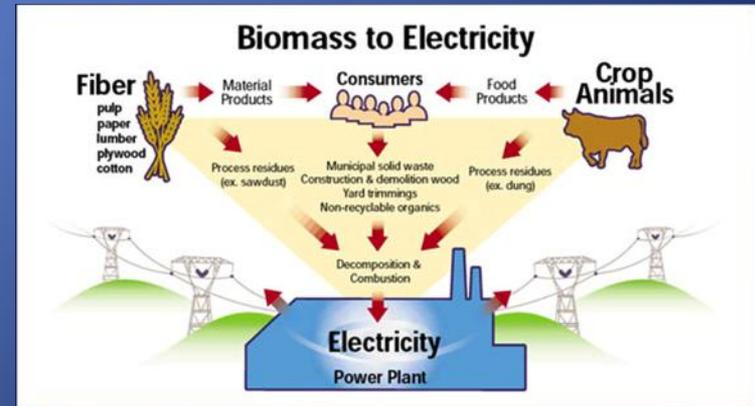
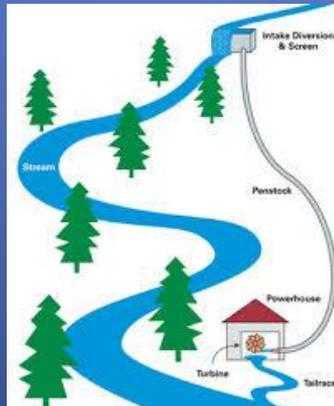
**Gas**: Rates set to increase by 2.64% on Oct 1, 2014, mostly residential (3.81% if hvac and dhw)

**Renewable**: passive solar, solar thermal, solar PV, wind, micro hydropower, biomass, geothermal

# Renewables

- Passive solar strategies and orientation
- Active solar: thermal and PV
- Wind
- Micro hydropower
- Biomass
- Geothermal

*Why would a hybrid system make sense?*



# Incentives

- \$750 for a ductless heat pump
- \$30 for fridge / \$20 for freezer
- \$99 Home Energy Audit
- Reduced retail price on lighting and showerheads
- \$0.18/sq ft for Custom Efficiency
- Building Efficiency / Easy Upgrades
- \$200 for gas furnace
- State – 40% deduction in Yr 1, 20% each in Yr 2-4
- State – Deduct 100% of cost of ee measures (pre 2002)
- Federal – 30% tax credit for solar, wind, geothermal



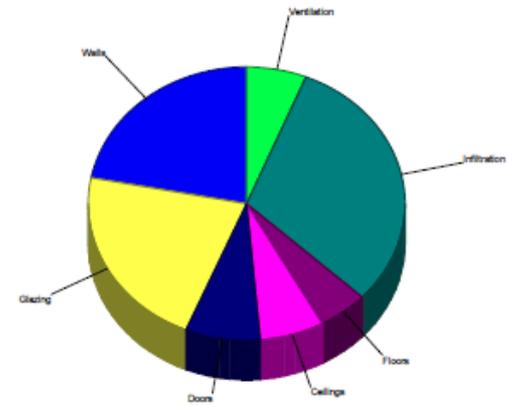
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# Building Energy Audit - Quantify Energy Use!

## Heating

Component	Btuh/ft <sup>2</sup>	Btuh	% of load
Walls	3.7	8498	21.9
Glazing	27.0	8440	21.8
Doors	35.1	2948	7.6
Ceilings	1.8	2555	6.6
Floors	0.6	1960	5.1
Infiltration	5.0	11947	30.9
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		2370	6.1
Adjustments		0	0
<b>Total</b>		<b>38719</b>	<b>100.0</b>



Residential Audit: 1st step - Look at the house  
Commercial Audit: 1<sup>st</sup> step - Look the data

# Residential - Look at the House!



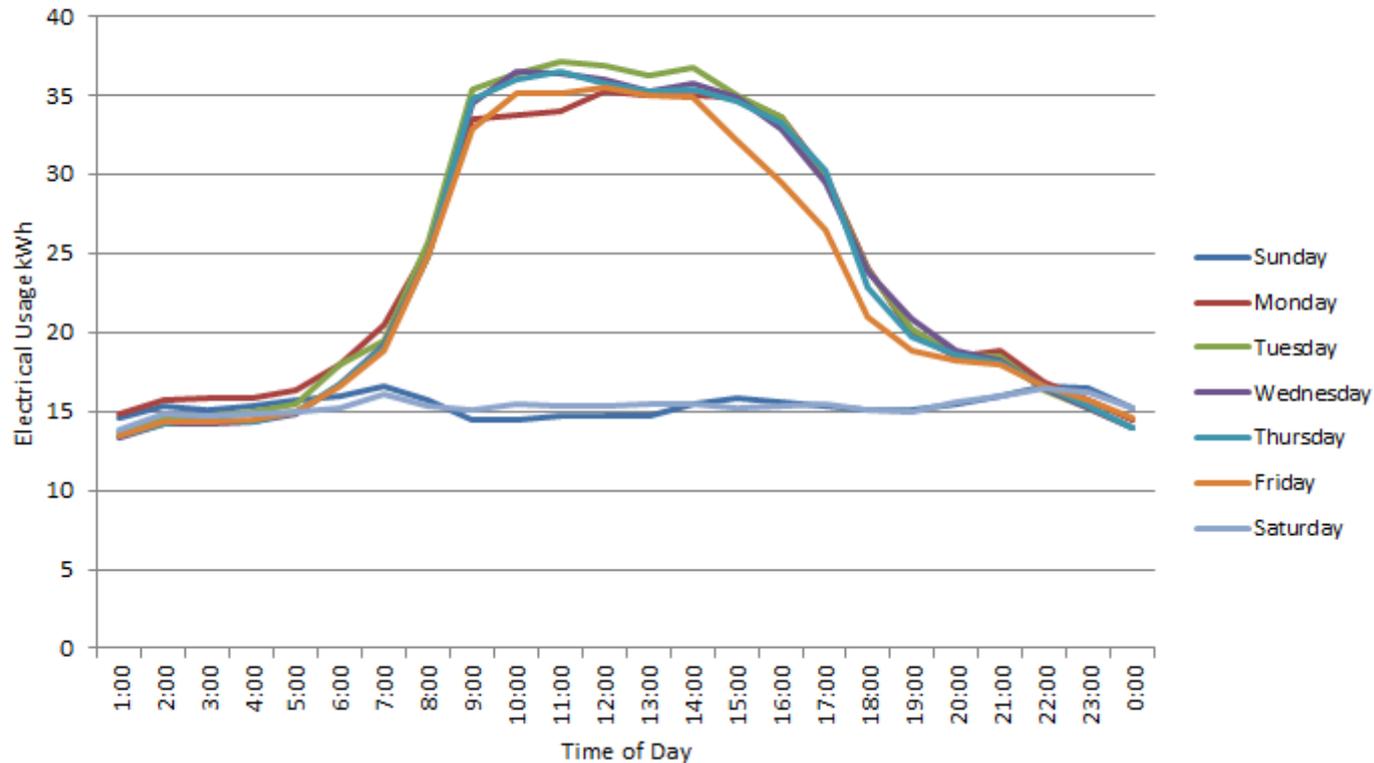
Air Infiltration Testing

# Infrared Analysis

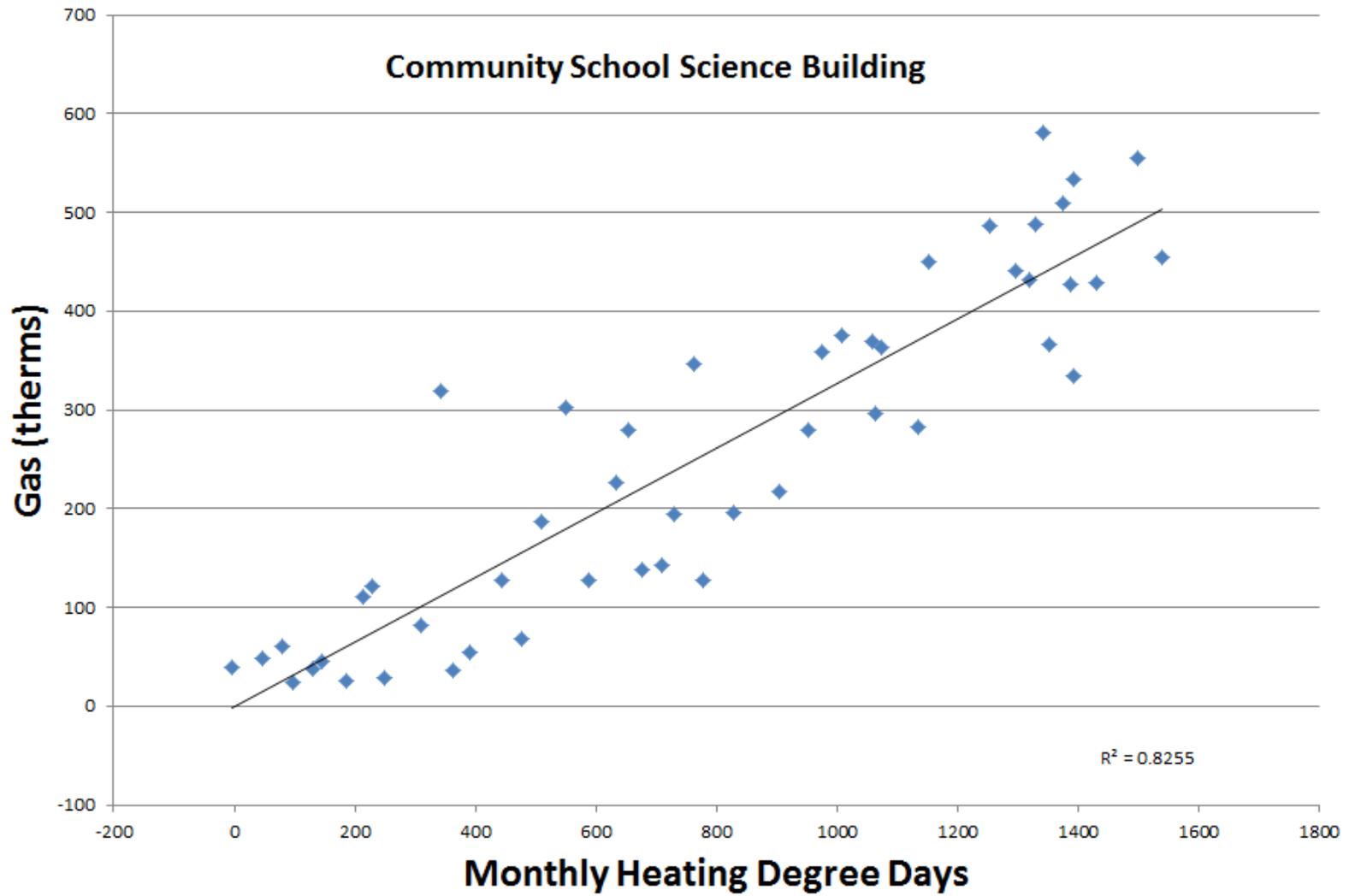


# Commercial - Look at the Data!

Community School Science Building Electrical Usage  
2013



Electrical Usage



Gas Usage

# Compare Reduction vs Production

## Local Office Building Example:

### Lighting Upgrade:

Project Cost: \$6,498

Annual kWh Savings:

18,570

1<sup>st</sup> year price per

kWh: \$0.35

### Solar PV Install:

Project Cost: \$39,515

Annual kWh

Production: 23,697

1<sup>st</sup> year price per kWh:

\$1.67

# YMCA Lighting Retrofit

## Lighting Upgrade:

Project Cost: \$115,000

Annual Savings: \$36,000

Payback: 3.1 years

Annual Energy Savings: 347,765 kWh

1<sup>st</sup> year price per kWh: \$0.33



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# Sagebrush Solar

Since 2007, over 60 systems installed, including:

- 100 KW solar hot water & heating system on Cold Springs Crossings Apartments
  - Offsetting half the complex's natural gas Demand
- 67 KW solar hot water on Blaine County Jail
  - Offsetting 75% the facility's hot water demand



Combined generation of all systems installed to date: 2.3 Mega-Watt hours per year

# Renewable Energy Economics 101

## Variables:

- Your energy demands
- The location and orientations of your home
- Shading
- Type of energy you're offsetting
- Your energy rate
- How the system is designed
- Etc.

# Renewable Energy Economics 101

When you know SAVINGS & COSTS through out the life of the system, it's easy to compare:

- Different quotes for different technologies  
e.g., Solar PV vs. Solar thermal vs. Geothermal vs. Wind
- Different quotes for the same technology  
e.g., PV vs. PV, Solar thermal vs. Solar thermal, etc.
- Renewable Investment vs. An Energy Efficiency Upgrade  
e.g., PV vs New window package
- Renewable Investment vs. Other Investment Opportunities  
e.g., PV vs Wall Street

Saving Money = Saving the Planet!

# Renewable Energy COSTS

Cumulative Costs include:

- Up-front Costs

Vary according to existing conditions

- Tax Incentives

30% Federal Tax Credit = 30% of Up-front Cost

40% State Deduction = ~ 8% of Up-front Cost

- Operations & Maintenance (O&M) Costs

Vary from tech to tech, from design to design, and from install to install

Generally, low for solar and high for geothermal

Cumulative Costs = Up-fronts Cost – Tax Incentives +  
Annual O&M Costs



**New Energy Cities**

Pioneering the Clean Energy Economy in the Northwest

# 3 Collector Solar Thermal: Annual & Cumulative COSTS

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24	\$60	\$12,287	\$2.74	\$3,754	\$46,612	31%	379%	\$34,324
<b>Avg</b>			<b>\$1.62</b>		<b>\$1,864</b>	<b>16%</b>		



# Renewable Energy SAVINGS

Depend on:

- System Performance

For solar, factors include type of technology, system design, site conditions, etc.

- Energy Rates

- Energy Rate Increases

For Natural Gas, 5.5% average annually

For Electricity, 5% average annually (14% July 2013)

# 3 Collector Solar Thermal: Annual & Cumulative SAVINGS

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**New Energy Group**  
Pioneering the Clean Energy Economy in the Northwest

# Renewable Energy RETURNS

To evaluate & compare potential investments:

- It's not just about costs—and it's not just about savings
- You've got to look at both simultaneously
  - At different times throughout the course of the investment
  - You don't want a system that costs less up-front with low long-term performance

You need Savings/Cost Ratio = Return on Investment

# 3 Collector Solar Thermal: Annual RETURNS

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# Local Economic RETURNS

When you invest in renewable energy,

- You keep money in your bank account AND
- You keep money in our Valley

Every year in our Valley, we spend

- \$30 million on electricity and
- \$50 million on natural gas and propane

Imagine the local economic benefits, if we kept more and more of those energy costs here!

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# Sawtooth Hotel & Stanley Bakery



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# Passive/Active Solar Home 2002

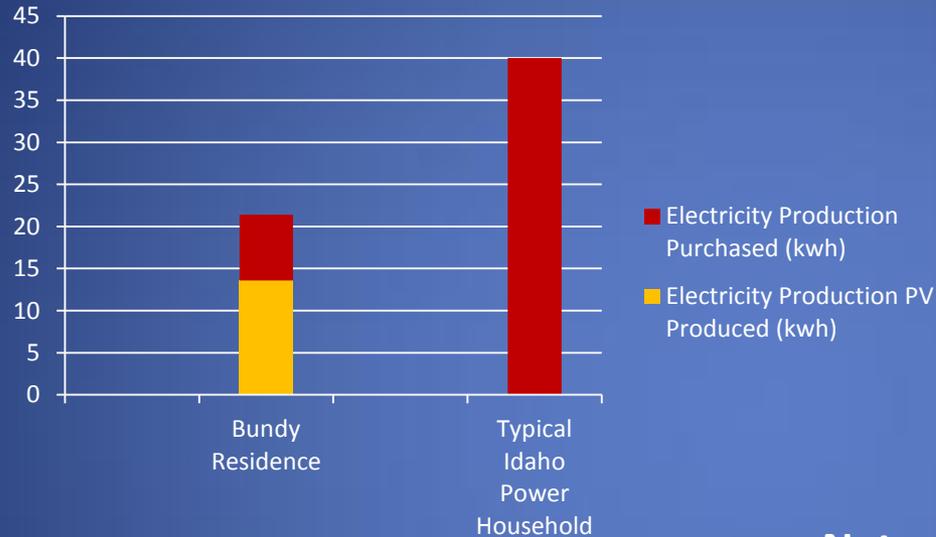


# Features

- Passive solar design.
- 3.2 kW photovoltaic system.
- Evacuated tube thermal hot water system.
- Energy Star appliances.
- 95% efficient boiler.
- 7 zones, radiant floor heat.
- Programmable thermostats.
- U - .30 glazing.
- Xeriscaped landscaping.

# Results

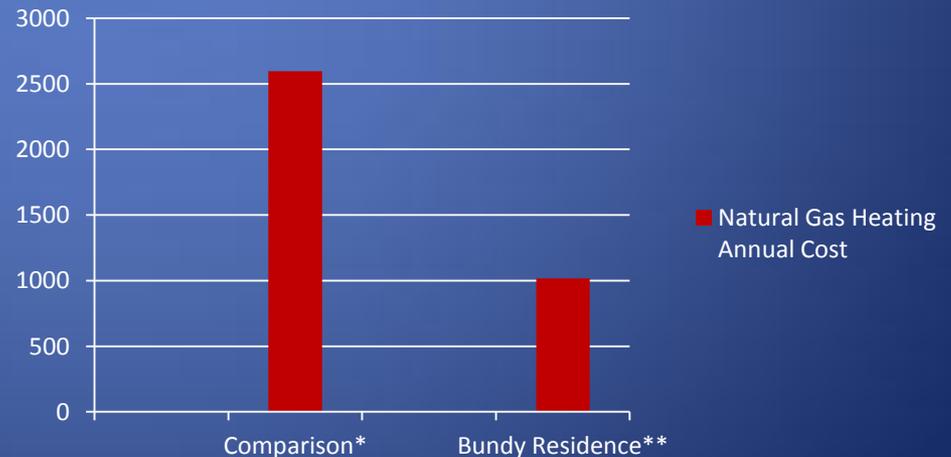
## Electricity Use & Production



Used 46% less electricity than typical Idaho Power customer and produced 64% of home's electricity.

Used 61% less natural gas than standard reference design.

## Natural Gas Heating Annual Cost



# Energy Improvements to 1984 Home

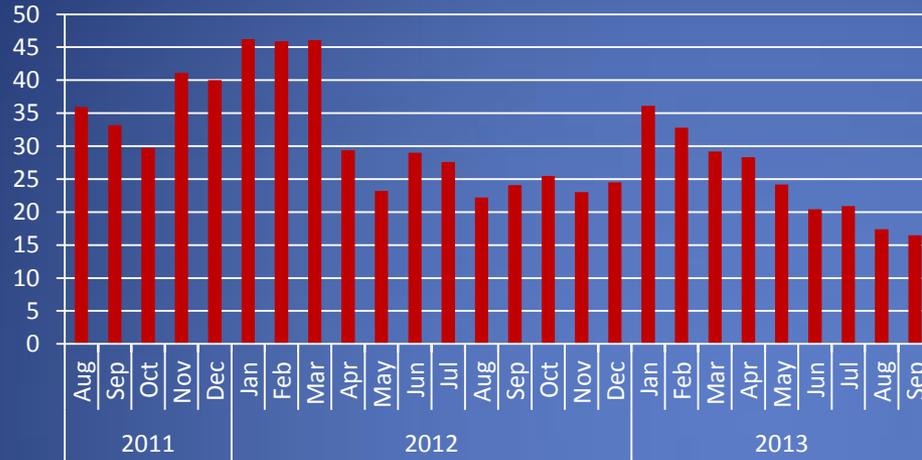


# Energy Audit Recommendations

- ✓ Reduce infiltration.
- ✓ Insulate rim joist in crawlspace.
- ✓ Replace refrigerator with Energy Star model.
- ✓ Add insulation in attic.
- ✓ Replace light bulbs with LED bulbs.
- Replace thermostat with newer programmable model.
- Replace windows.
- Upgrade faucets.

# Results

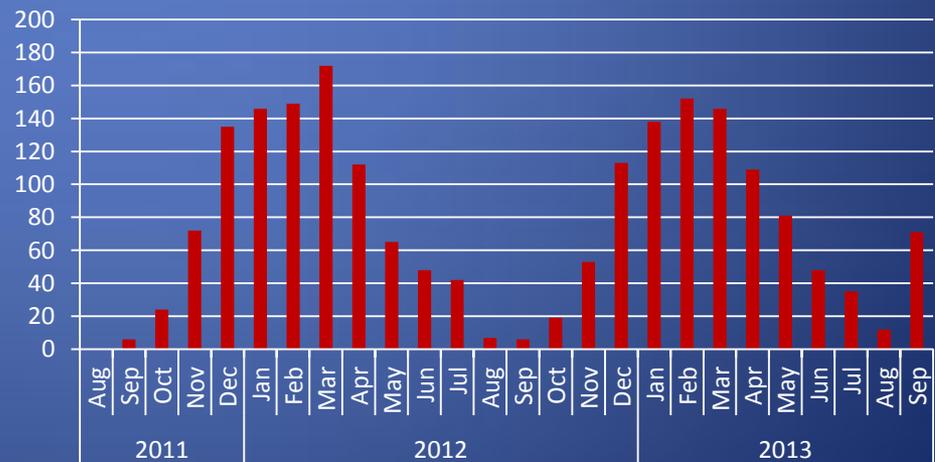
## Electrical Usage kWh/day



Used 27% less electricity after improvements.

Used 7% less natural gas after improvements. Still have further sealing to do.

## Natural Gas Usage Therms



# Conclusion

Let's put the sun in Sun Valley!



# Ketchum Energy Advisory Committee

KetchEmpower:

Taking Charge of our Energy Future

*Our Next Town Hall!*

Community Resilience:  
Case Studies and Options  
For Our Community