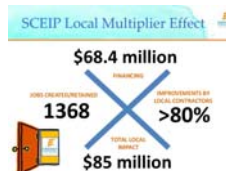


Sonoma County, California



Sonoma County Cultivating Energy

Sonoma County Energy
Independence
Program and PACE
Marketplace



Key Natural Asset
CalPine Geysers Facility



Sonoma Clean Power &
Community Choice
Aggregation (CCA)





Community Choice Aggregation (CCA)

CCA allows communities to buy and build electric generation to serve local residents, businesses, and municipal facilities.

CCAs in 6 States

- California
- Illinois
- Massachusetts
- New Jersey
- Ohio
- Rhode Island

Under Consideration:

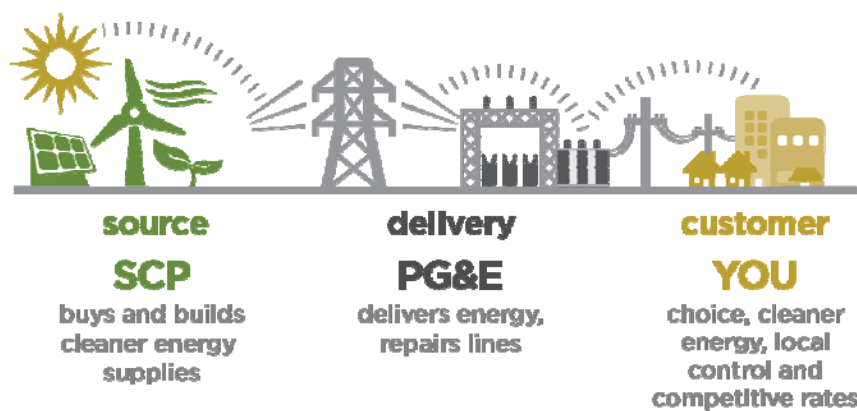
Utah, New York,
Delaware, Minnesota



3



What Community Choice Does



4



What is SCPA?

A joint powers authority of the cities and counties in Sonoma and Mendocino Counties

Governed by a 11-member Board of Directors, appointed by participating jurisdictions, plus staff of 17

Formed to introduce competition into the electricity market

- decrease customer costs
- cut greenhouse gas emissions
- increase local investment

5



First Three Years: Financial Performance

- \$70 million in customer bill savings (average of 5%)
- 88% customer participation
- Paid off all debt four years ahead of plan
- Established more than \$30 million in reserves
- Member cities are fully protected against all debts
- Expect to have bonding capability within two years

6



First Three Years: Environmental Performance

- Constructed 70,000 kW of new solar
- Constructed 46,000 kW of new wind power
- Cut total greenhouse gas emissions 48%
- Paid customers \$1.3 million in compensation for overgenerating solar on rooftops

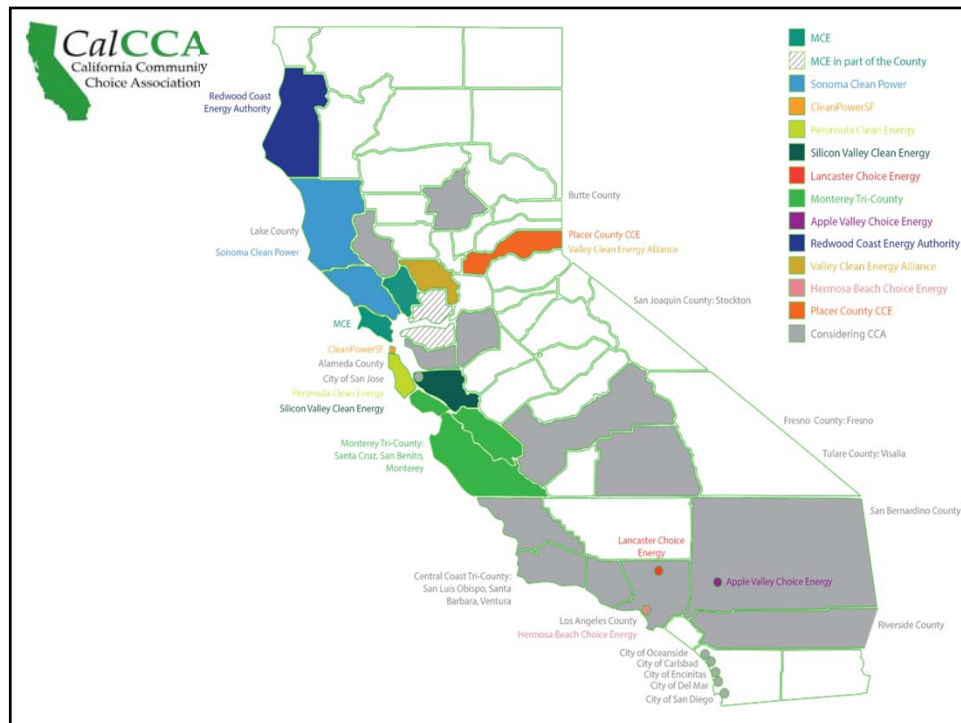
7



Building California Renewables

- About \$2 billion in construction to date
- Majority of spending on projects with project labor agreements
- Constructing renewables quickly
- Takes 3-5 years of operations to create a diverse long-term portfolio

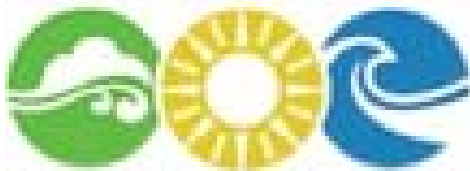




Cultivating Energy



A Touchstone Energy® Cooperative 

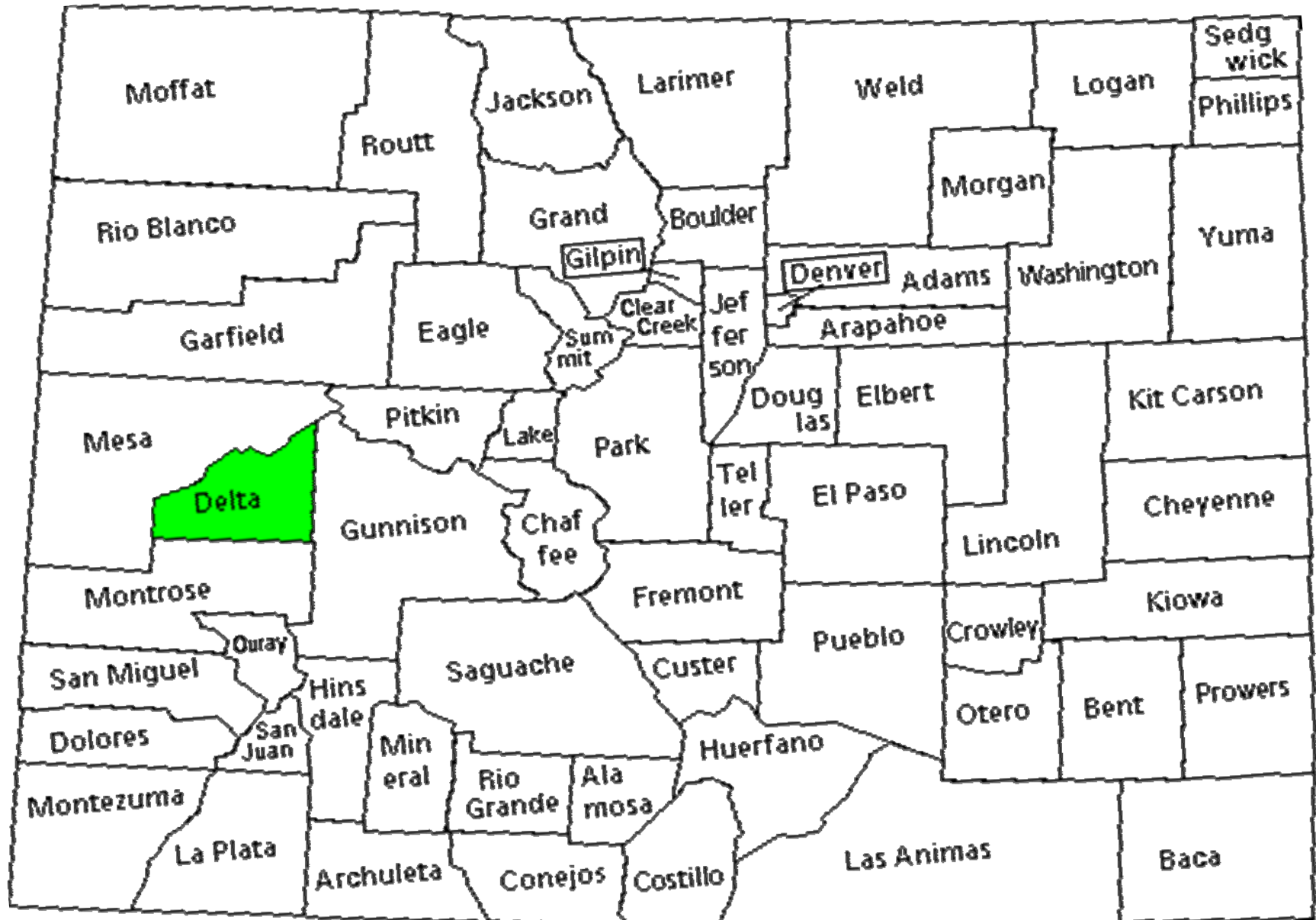


SOLAR ENERGY
INTERNATIONAL

Educate.
Engage.
Empower.



DELTA COUNTY
ECONOMIC DEVELOPMENT



Historic and Future Economy

- Delta County and the surrounding region are home to many fossil fuel and renewable projects as well as innovators in distribution and delivery.
- Coal mining and extraction have been an integral part of the region's' economy.
- With the recent loss of over 1000 well paying coal mining jobs, Delta County is taking this opportunity to refocus the economy to provide opportunities for the future.



County Assets

- Largest Flat Top Mountain and Mountains
- Sun - #2 in Colorado for Solar Insolation
- Delta Montrose Electric Association Member Co-op
- Solar Energy International
- ENGAGE Innovation Center – Energy Innovation



Growing Our Own Energy

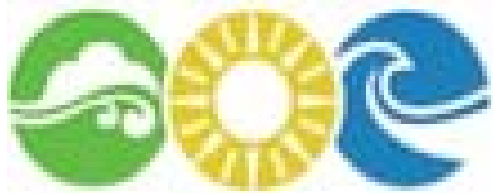


- Local Resources (solar, hydro, coal mine methane, biomass)
- Broadband & Grid Technologies
- 1 – 5 MW Solar
- Utility Scale Solar Projects (SLV at capacity)

All About Economics



- Members want renewables – its all about rate stabilization
- Responsive Member Driven Co-op Board
- Self generate and keep money in local economy (\$42mm leaving)



**SOLAR ENERGY
INTERNATIONAL**

Educate.
Engage.
Empower.

Renewables + Local Economic Development

- AmeriCorp Vistas
- Solarize Campaigns
- On-going education events
- Solar in the Schools



SOLARIZE
DELTA COUNTY FARMS

Community-Powered Renewable Energy
for Farms, Homes and Businesses



SOLARIZE
DELTA COUNTY

C O L O R A D O

Delta County: A Leader in Energy

- **ENGAGE Innovation Center**
- **E² ENGAGE 1st Energy Summit – Sep 2017**
- **Branding/Marketing**
- **50 x 25**



Solarize 2015 & 2016

42

New PV Systems

⚡ 272

KW of Solar installed

\$900,000

Invested in Solar



Photo by Ben Lehman



SOLAR ENERGY INTERNATIONAL



E² ENGAGE Energy Conference

September 29-30, 2017
ENGAGE Innovation Center
Delta, CO

The ENGAGE Energy Conference will bring senior multi-disciplinary energy experts and innovators from the fossil fuel and renewable energy sectors together to speak about the current state of our energy landscape in the West, and the opportunities offered by the future energy landscape. The Conference is a half day Friday event with keynote, panels and networking opportunities geared toward industry, policy makers, economic development and innovators.

Lessons Learned



- Determine your assets
- Energy Diversification
- It's the Economy
- Political Will
- Leadership from public and private sector



The Sun Valley Institute: A Center for Resilience



Advancing investment, public education and policy leadership to ensure economic prosperity, environmental protection and human wellbeing in its home community of the Wood River Valley and to serve as a model and resource to communities around the world.


Local
Address our risks
Capitalize on opportunities

Global
Convene
Research
Thought leadership



Building community resilience with global impact




Idaho




STATES AT RISK

HOME REPORT CARD BROWSE BY THREAT MEDIA ABOUT THE REPORT CARD






AMERICA'S PREPAREDNESS REPORT CARD

 **D+** IDAHO  Download Idaho Summary  VIEW MAP



Idaho is falling behind other states in preparing for increasing threats from extreme heat, drought, and wildfire between now and 2050. The state's low grade reflects the fact that it has taken almost no action to plan for its future climate risks or implement adaptation measures to improve the state's resilience.

Sun Valley

Acute Vulnerabilities



Isolation

- Imported energy & food
- Limited connectivity & access
 - Broadband, transmission, transportation

High desert ecosystem

- Dry, water constrained

Inequality

- Significant wealth inequality

Concentrated economy

- Hi-Moderate Correlation = \$1.2B (70%)
- Low-No Correlation = \$0.6B (30%)

Climate change = threat multiplier

5

Sun Valley's Climate Risk



Climate Risk: Fire



Wake Up Call



Acute
Vulnerabilities



Local Community Resilience



What Are Our Risks & Priorities

- Desk research: NSF, Rockefeller, etc.
- Community outreach: preliminary (40 people)
- Next Steps: Further community engagement

Fire Resilience

Building a Fire Resilient Community

- June 7-8 – Led by University of Idaho

9

Fire Resilience Workshop



University of Idaho

College of Natural Resources

Community, Science, Technology, June 7-8

- Goal = Create Fire Adapted Communities – here and beyond
- Day 1 = Model communities, new investment and business models
 - Economic Value of Big Wood – Liquid Assets
 - Blue Forest Conservation – Forest Resilience Bond
- Day 2 = Blaine County Fire as Adapted Community

10

Risk: Water



Risk: Food



12

Risk: Energy

Reliability

- 3 significant unplanned outages
- Christmas Eve, 2009

Economy

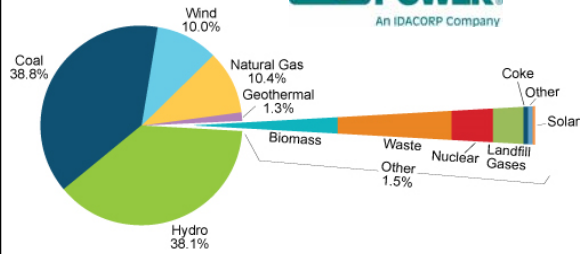
- \$80 million / year
- Rates increase 4% / year

Environment

- 35% coal
- 10% natural gas
- 50% hydro



Energy Risk: Environment



14

State of Coal & Oil

Coal

- Took **82 years** to reach peak value
- Took just **7.5 years** to lose 97% of that peak value
- US power plants are consuming 29% less coal for power generation today than they were in the peak days of 2007

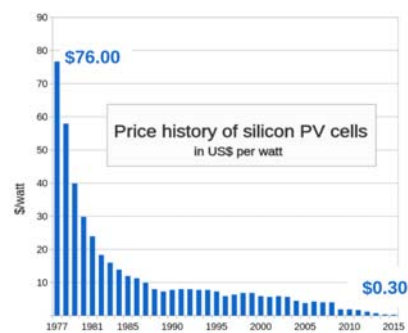
Oil

- \$380 billion in projects have been cancelled or deferred since late 2014
- Saudi Arabia, Venezuela

.....but there is opportunity



Solar Costs Reductions Continue



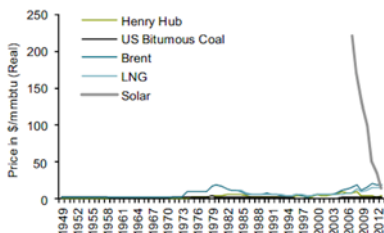
Source: Bloomberg New Energy Finance & pv.energytrend.com



Solar Costs

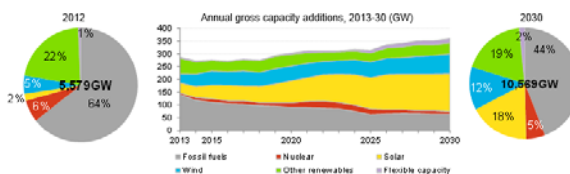
Exhibit 2

Welcome to the Terrordome... \$/MMBTU by Energy Type



Source: EIA, CIA, World Bank, Bernstein analysis

Bloomberg 2030 Energy Outlook



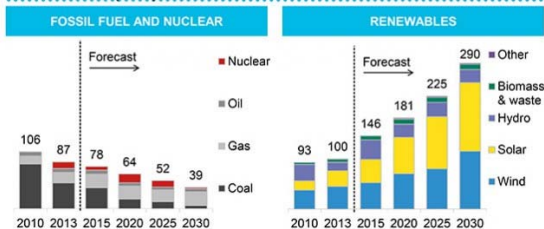
Source: Bloomberg New Energy Finance, July 1, 2014

Solar will grow 10x in the next 15-20 years.

Fossil fuels will fall to less than half of total power capacity globally, as they already have in the United States.

Bloomberg April 2015

GLOBAL POWER GENERATION CAPACITY ADDITIONS
2010 – 2030 (GW)



100% Renewable Energy

Google Apple Walmart
Save money. Live better.



Apple: 100% renewables GOAL – at 97%
Google: 100% renewables GOAL
Costa Rica: Carbon neutral by 2021
Dominica: 100% AND carbon negative by 2020
Sydney, Australia: 100% renewables by 2030
Schuette, MA: 100% renewables TODAY

Walmart: 100% renewables GOAL – largest solar buyer
Denmark: Fossil fuel free by 2050
Djibouti: 100% renewables by 2020
Scotland: 100% renewables by 2020
Reykjavik, Iceland: 100% renewables TODAY
Rural Bangladesh villages: 100% renewables TODAY

Energy as a Strategic Asset



Benefit landowners: farmers, ranchers
Hedge power price risk
Create jobs, build tax base
Value-added products
Corporate Power Purchases



Energy = Strategic Asset: Wyoming



Wyoming wind:



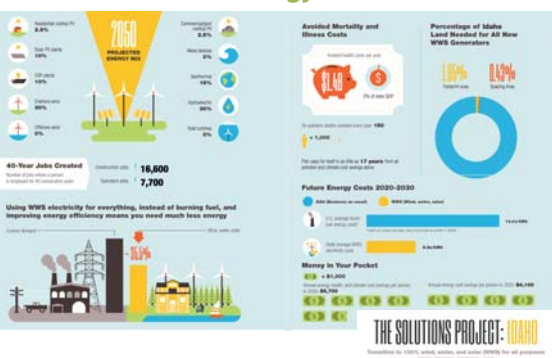
"We have procured 178 megawatts from the Bloom Wind Project in Kansas through Allianz Risk Transfer (ART) to help bring this new project online. We've also partnered with Black Hills Corp. to purchase wind power from the 59-megawatt Happy Jack and Silver Sage wind farms in Wyoming. The combined output of the Bloom and Happy Jack/Silver Sage projects will produce enough energy on an annual basis to cover the energy used at the datacenter."

Wyoming coal:

Carbon Capture & Sequestration
Carbon Capture & **Re-Use**



Idaho's Energy Opportunity: 100% Renewable Energy



Opportunity: Energy Resilience



Energy is a **RISK** that can be an **economic OPPORTUNITY**

Energy goal: transform our grid into a reliable, economically and environmentally sound energy system, providing:

- Reliability
- Protection of our natural environment
- Reduced power prices
- Local job creation – diversification of the economy

*A distributed, local, collaborative energy system
= Resilient*

How?

Opportunity: Solar

We have sun: 5.5 kWh per square meter per day
(10% less than Texas // Florida ~ 5 kWh/sq m/day)

Solar nearly matches daily peak power use

Prices and global growth

Already ~ 90 systems installed in the valley



Opportunity: Community Solar



Colorado Springs, CO



Rockford, MN



Boulder, CO



Paradox Valley, CO

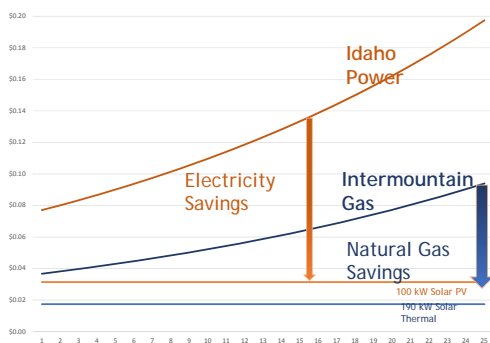


Ellensburg, WA



Putney, VT

Levelized Cost of Commercial Solar (\$/kWh)



Opportunity: Benefit our Brand

Visitors to Sun Valley Come From:

- Seattle
- Los Angeles
- San Francisco
- New York City
- Denver



*"Most of the visitors we target with our marketing come from cities where **environmental awareness and initiatives are part of day-to-day life.**"*

Sun Valley Marketing Alliance

Risk: Competition & Brand



- Approximately 25% of ski resorts in the Rocky Mountains generate alternative energy onsite
- LEED certified projects in Teton, Vail, Aspen/Snowmass, Snowbird and Telluride ski resorts
- LEED certified hotels by major chains including Marriott, Hyatt, Starwood, Hilton, Intercontinental, Fairmont...
- Vail, Aspen and Whistler market their green initiatives

Young, environmentally conscious resorts like Powder Mountain may steal this next generation of skiers from us — Powder Magazine

Opportunity: Energy Resilience



Energy is a **RISK** that can be an economic **OPPORTUNITY**

Energy goal: transform our grid into a reliable, economically and environmentally sound energy system, providing:

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- Reduced power prices
- Local job creation – diversification of the economy

A distributed, local, collaborative energy system

= Resilient

And benefit our brand

30

SVI's Energy Program



Building a resilient energy system in the Wood River Valley

Security, Economy, Environment. How?

1. Increase local energy from clean sources
2. Increase local storage
3. Secure critical loads



Solarize Blaine

- Limited-time program providing discounted solar
- 41 contracts = ~300 kW of new capacity
- 500% more solar in four months than all of 2015



Local People Know... it Works



"With solar you get an endless supply of free electricity and that priceless feeling of knowing you're producing clean energy."
- Scott Runkel, CS teacher, Northridge Neighborhood



"We were all in. We knew this was the place where we were going to raise our girls. When you look at your home over those long-term horizons, solar becomes increasingly viable. And on top of that, we're helping out the environment. How could we not do solar?"

-Julie and Traves Olson, homeowners and parents, Hulen Meadows



"We're not doing it just because of the economics. With the threat of climate change looming over us, we feel like it's an appropriate decision to make this day and age."

-Elizabeth Jeffery and Rob Lonning of Old Town Hailey



"I care about the philosophy of green investment. It's a way for me to be a stockholder for my community and the environment. Those are the two things that I care about more than anything else."

-Patrick Buchanan, State Farm Insurance, Hailey



"I've been thinking about it for a long time, just waiting for the price to make sense. With Solarize Blaine it finally did. The upfront cost of my 4.55 Kw system was about \$18,000, but with the Solarize price discount and tax deductions, I'll only end up paying about \$10,000."

-Joe Miczulski, Homeowner in Bellevue

Energy Resilience Projects

Solarize Blaine

20 weeks in 2016 =

- Nearly \$1M in new local investment
- 5x the solar installed in 2015

Energy Blueprint / Resilience Strategy



Nonprofit Solar Installations

- YMCA Community Solar – US DOE “Solar in Your Community”

37



RevUp Blaine



Rapid growth in EVs

Electric-Vehicle Sales On Course for Mainstream Adoption



The latest data on electric vehicles and plug-in hybrid electric vehicles sales shows continued strong progress toward mainstream adoption.

According to market research firm **EV-Analysis**, 190,000 electric vehicles, plug-in hybrids and battery electric vehicles were sold in the first four months of 2016, a 44 percent increase over 2015 levels.



2017 Is The Year The Electric Car Goes Mainstream

March 2016, 2017, The Electric Car



With about 100,000 EVs sold in 2016, the electric car is on the cusp of becoming a mainstream vehicle.

Having been a niche alternative since the 1990s, electric cars are now being sold in large numbers. In 2016, the U.S. saw more than 100,000 electric cars sold, a 44 percent increase over 2015 levels.

U.S. Electric Vehicle Sales Soared In 2016



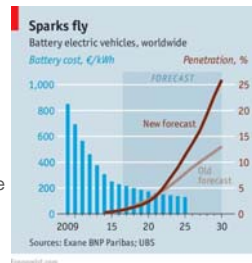
Robert Kaprielian, *Entrepreneur*

Following a slow decline in sales from 2014 to 2015, U.S. EV sales jumped 44% in 2016.



Why are EVs surging?

1. Plummeting battery prices
80% decrease in last 5 years
2. Rollout of charging infrastructure
<500 in 2008 to 16,000 in 2016
3. Regulations/targets on CO₂
4. Desire for better driving experience
5. More models available:
2 models in 2010. Now = 30+



What people are saying about EVs



"In 20 years, all cars on the road will be electric."

-Warren Buffet

"Our view is that global offerings of EVs will exceed gas-powered vehicles within the next 15 years."

-Ford CEO, Mark Fields

"By 2025 we will be selling about 2-3 million all-electric cars a year...we will unveil some 30 new EV models within 10 years."

-Matthias Mueller, VW CEO

"Some of the largest (manufacturers) in the world are investing heavily in this technology...we think EV penetration could rise to potentially 10-15% by 2025."

-Harald Hendrikse, Lead Analyst, Morgan Stanley

EVs are cleaner



Conventional vehicles burn fossil fuels and emit NOX, CO2, and other GHGs.

In Idaho, transportation is largest source of CO2 (same for the US).



BEVs: **no** direct emissions. Zero emissions if combined w/ home solar.

PHEVs: emissions when using ICE, but much more efficient than conventional.

"EVs are the only class of carbon-reduction technology making enough progress to keep global warming below the level of 2° celsius." – IEA Report

EVs save you money



1. Fuel costs are less
2. Maintenance is cheaper
3. Federal tax credit



It's cheaper to drive with electricity



DOE's eGallon tool: compares cost of driving with electricity

Find out how much it costs to fuel an electric vehicle in your state

Idaho

regular gasoline	2.30
electric eGallon	0.84

Cost (\$) of eGallon in Idaho

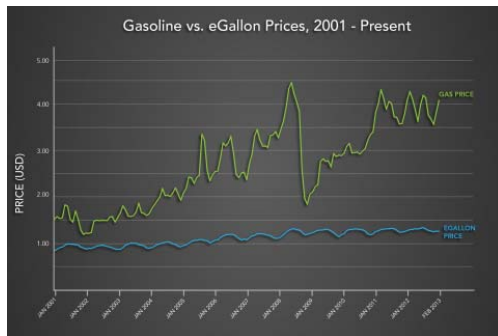
Find out how much it costs to fuel an electric vehicle in your state

Hawaii

regular gasoline	2.59
electric eGallon	2.58

Cost (\$) of eGallon in Hawaii

Electricity prices are more stable



Source: www.energy.gov

EVs are easier to maintain



"My EV may need window washer fluid and, eventually, tires."

- Brake wear is significantly reduced
- The battery and motor require little to no regular maintenance
- There are fewer fluids to change
- No exhaust or fuel system in BEVs (i.e., don't need oil changes)

BEVs contain 1 moving part vs. **400** in a typical ICE.

EVs have 20-40% **lower maintenance costs** over five years than their ICE counterparts.



EVs are more fun to drive



- Smoother: glide effortlessly (not shifting gears)
- Extra torque from electric motor: accelerates better
- Quieter because no engine noise
- Convenient to charge at home



EVs do fine in the snow



EVs handle surprisingly well in the snow because of smooth torque and balance from heavy batteries.

All can be equipped with snow tires.



Batteries & “Range Anxiety”



EVs meet daily travel requirements of **95% of drivers** in the US.
(U.S. Department of Transportation)

Nearly 90% of vehicles on the road could be replaced by a low-cost electric vehicle with only once-daily charging.
(MIT Report, 2016)

Battery **range** depends on:

- Driving speed and style
- Temperature
- Terrain



What is an EV group-purchase program?



- Community-based program to increase the adoption of EVs
- Competitive selection process to select dealerships and models
- Discounts on one or more EVs
- Open to a community for a limited time
- Our dealerships: Dennis Dillon Nissan, Audi Boise, Peterson Chevrolet, and Peterson BMW

Program model pioneered in Boulder in 2015



Led by Boulder County

\$8,500 discount on the 2015 Nissan Leaf

Community bought 248 Leafs in four months

Dealer **sold entire inventory in five days**; 5x as many EVs as average

Five other programs around the country



- Northern Colorado
- Austin
- Salt Lake City
- Minnesota
- San Francisco

RevUp Blaine







- Led by the **Sun Valley Institute** with support from **Idaho National Laboratory**
- Request for Proposals to dealers & HQ Nov 2016
- Negotiated discounts on 4 different models
- Open to residents of Blaine County until May 31
- 1% fee to dealers will fund Fairfield charging station



The discounts



NISSAN LEAF	BMW i3	CHEVY VOLT	AUDI A3
			
\$34,100 MSRP	\$50,945 MSRP	\$34,095 MSRP	\$38,900 MSRP
GROUP BUY DISCOUNT \$9,616	GROUP BUY DISCOUNT \$3,366	GROUP BUY DISCOUNT 7.3% (\$2,557 off base)	GROUP BUY DISCOUNT 8% (\$3,112 off base)
FEDERAL TAX CREDIT \$7,500	FEDERAL TAX CREDIT \$7,500	FEDERAL TAX CREDIT \$7,500	FEDERAL TAX CREDIT \$7,500
POTENTIAL COST \$16,984	POTENTIAL COST \$39,879	POTENTIAL COST \$24,038	POTENTIAL COST \$32,888

Leasing Options

The Nissan Leaf (\$17,616 total discount!)

- Two year lease - \$270/month
- Three year lease - \$250/month

The Chevrolet Volt

- Three year lease - \$348/month

Building Energy Resilience



Conclusion



Local

- Community Resilience
- Fire
- Energy
- Food
- Land Use

Global

- Forum
- Publications

Partnerships, Research, Publications

THE ROCKEFELLER FOUNDATION

INNOVATION & LEADERSHIP

- Collaboration on model community resilience
- New policies, investment models

RESEARCH

- Initiated collaboration on research and best practices with academic partners
 - ASU: Local energy system, local food systems
 - BSU: Local resilience metrics, local systems
 - U of I: Local land and economic data

PUBLICATIONS: Michael Shuman

- Self-directed IRA Handbook
- **Local Investment** state-by-state handbooks

ASU
University of Idaho

THE LOCAL ECONOMY SOLUTION

57





Sun Valley Institute's 3rd Annual

SUN VALLEY FORUM

*Resilient Prosperity:
The Power of Nature, Technology & Community in a Changing World*

JULY 5-8, 2017 • SUN VALLEY, IDAHO

SPEAKERS TO INCLUDE

		
ROB BERNARD Chief Environmental Strategist Microsoft	LILA PRESTON Partner, Generation Investment Management	MIKE BRUNE Executive Director Sierra Club
		
PETER HORTON Writer, Director, Actor and Producer	PAUL WALSH Director, Weather Strategy IBM Global Business Services / The Weather Company	JULIE SHAFER Head of Strategic Philanthropy & Purpose Investments Bank of the West

SCHEDULE & VENUE

The forum plenaries and breakout sessions will be complemented by opportunities for outdoor activities and networking. Stay and play packages are available for partners and families and to extend your trip!

July 5: Opening Reception & Dinner
July 6-7: Forum Sessions
July 8: Adventure Day

The Limelight Hotel
 151 Main Street S.
 Ketchum, Idaho



WHAT IS THE SUN VALLEY FORUM?

The premier event of the Sun Valley Institute, the annual Sun Valley Forum was first convened in 2015 to accelerate the transformation to sustainable, equitable, and secure—resilient—economies and communities.

In a time of great environmental, political, and economic change, resilience is vital. The Forum gathers 200 innovators from investment, policy, business, nonprofits, and academia, as well as local leaders, visitors, and residents, to share strategies, broaden thinking, and spark new partnerships at this groundbreaking event. With combined coverage of local and global topics, the Forum showcases cutting-edge, scalable solutions, in plenary addresses as well as interactive breakout sessions to help build relationships for ongoing support and collaboration. Nestled in the beautiful Wood River Valley and surrounded by five mountain ranges, attendees will learn and be inspired while connecting on nature trails, along the river and around the table for delicious local meals. Content and ideas will be shared with essential audiences via key media representatives' participation and by live streaming of the event.



U.S. Senator Cory Booker & Sun Valley Forum
Founder, Aimee Christensen

KEYNOTES & DISCUSSIONS

Leading for Resilient Prosperity

Insights from pioneering companies, governments, universities & faith institutions

Economy, Environment, & Security

Building resilient Energy, land & food systems

Nature is the Best Investment

Strategies for job creation, disaster prevention & recovery

Data & Technology to Benefit People & Planet

Empowering decision-making & growing impact

Communicating Complexity & Inspiring Action

The messages, messengers & avenues that work

Workforce Development on an Urgent Timeline

Training to build a sustainable & resilient world

Protecting Health

The importance of where we live, work & what we eat

Building Community

How personal wellbeing, social cohesion & trust underpin quality of place

Resilient Business

Corporate strategies building low-carbon, low-resource use, equitable economies

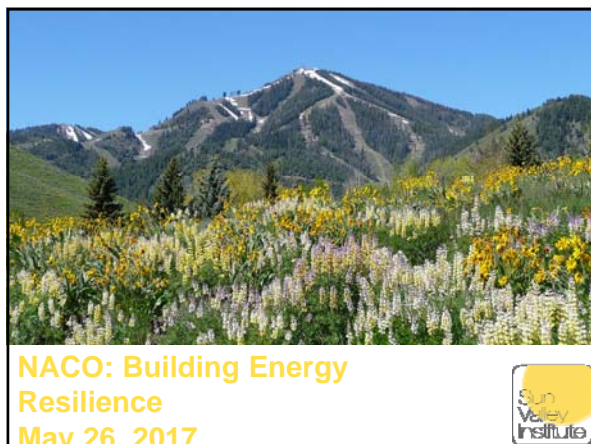
WHY SUN VALLEY?

The Sun Valley, Idaho area faces great risks from environmental changes and global economic shocks, both due to its isolated, high-desert location as well as its highly concentrated economy and income disparity—a ready petri dish for resilience and innovation. The Sun Valley Institute was formed to address local risks and turn them into opportunities through piloting innovative policies, investment models, and community building—as well as by serving as a resource, sharing innovations, and convening leaders to grow resilience far beyond Idaho: a think- and do-tank for our changing world.




LEARN MORE AT
WWW.SUNVALLEYFORUM.COM

Travel & Lodging Info
About Sun Valley Institute
Sponsorship Opportunities




Nissan Leaf




Type	BEV
MSRP	\$34,100
Federal tax credit	\$7,500
Range	107 mi
Battery	30 kWh
Warranty	3 yr/36,000 mi
FWD	

- First BEV on the market in 2010
- Best selling EV on the planet




BMW i3 w/ range extender



Type	BEV
MSRP	\$50,945
Federal tax credit	\$7,500
Range	180 mi
Battery	33 kWh
Warranty	4 yr/50,000 mi
RWD	

Range extender = small motorcycle engine (1.9 gallons) that provides extra range if battery runs out



Chevy Volt



Type PHEV
MSRP \$34,095
Federal tax credit \$7,500
Range 53 mi
Battery 18.4 kWh
Warranty 3 yr/36,000 mi
FWD



- First PHEV on the market in 2010
- Continuously **tops** *Consumer Reports* Owner Satisfaction Survey

Audi A3 e-tron



Type PHEV
MSRP \$38,900
Federal tax credit \$4,502
Range 16 mi
Battery 8.8 kWh
Warranty 4 yr/50,000 mi
FWD

- Sportback
- 16 mile range because average U.S. commute is 14 miles



Other EVs to note



Chevy Bolt
\$36,620 MSRP
238 mi range
Available in Idaho end of year



2nd Gen Nissan Leaf
More range (rumored over 200 mi)
More expensive
Maybe 2018?



Tesla Model 3
\$35,000 MSRP
215 mi range
Reserve for \$1,000; production mid 2017
Delivery estimate is mid 2018 or later

