

Individuals, small businesses, non-profit organizations, and government entities are eligible to apply for financial support for alternative energy systems through the Alternative Energy Revolving Loan Program. This program is managed by the Montana Energy Office at the Department of Environmental Quality (DEQ). Eligible alternative energy technologies include; solar PV or thermal, micro-hydro, wind, geothermal, and pellet or wood stoves. Energy conservation measures may be included in a loan when installed in conjunction with an alternative energy system.

case study: Zach and Jill Griffin had dreamed of building their own solar-powered home, but ended up buying and retrofitting a 1980s split-level home with great southern exposure instead. A loan from the Montana Energy Office allowed them to follow-through on their dream of going solar, while also tackling much-needed energy efficiency improvements. Zach runs a business from home sewing sheepskin slippers, with their two young kids in tow. Having a home-based business, it was especially important for the family to make responsible energy decisions that would also make their home more comfortable.



THE APPLICATION PROCESS: The Montana Energy Office is a resource to help applicants write successful loan applications and provides free technical consultations whether or not an application is completed. Application to qualification takes an average of two weeks. Applications are accepted on a rolling basis.



The application process was easy and DEQ employees were available in case we had any questions along the way.

- Zach Griffin, Homeowner

With their loan, the Griffins hired a local solar contractor to install a 30-panel, 8.7 kilowatt (kW) solar array on their south-facing roof. They brought insulation levels in the attic up to the current energy code requirements; replaced old wall-mounted electric furnaces with a high-efficiency ductless mini-split heat pump system, which also provides air conditioning in summer months; and upgraded their hot water heater to an Energy Star-rated heat pump model.

In terms of the loan process, Zach Griffin recommends applicants plan accordingly in order to get contractor bids in place before beginning the application. Once you have that in place, the application process is fairly simple.

LOAN PROGRAM TERMS*

- NO APPLICATION FEE
- \$0 DOWN PAYMENT
- CURRENT INTEREST RATE: 3.25%, FIXED
- MAXIMUM LOAN AMOUNT: \$40,000
- MAXIMUM LOAN TERM: 10 YEARS
- NO EARLY-PAYMENT PENALTY
- CLOSING COSTS INCLUDE ORIGINATION FEE OF \$250 OR 2% OF LOAN AMOUNT, WHICHEVER IS GREATER, AND OTHER FEES OF APPROXIMATELY \$200.

*Availability of funds, loan terms, and closing costs are subject to change without notice. Actual closing costs are set in the application review.

Have you installed an alternative energy system this year? State and federal tax credits may be available. Consult your tax professional.



BUILDING ENERGY CODE: IS YOUR HOME ENERGY SMART?

WHAT IS ENERGY CODE? Montana has adopted a statewide building energy code to ensure all new homes are comfortable, healthy, and energy efficient. Codes protect the homeowner and create a standard for insulation, heating, ventilation, and building tightness. Homes built to energy code standards provide increased utility cost savings and may be eligible for tax incentives.

NEW HOME BUYERS CHECKLIST:

- Visit the DEQ Energy Office website for more information at deq.mt.gov/energy
- Talk to your builder, lender, or realtor about the importance of energy code compliance



 Need a label? Contact the Montana Energy Office at (406) 444-0281

WHAT TO LOOK FOR: The top 10 items to look for when purchasing or building a home:

- 1. Insulation Insulation levels in walls, floor, and ceilings are measured in R-value which measures the ability of a material to reduce the transfer of heat. The higher the R-value, the greater the insulating power resulting in less heat lost and lower energy bills.
- 2. Windows and Exterior Doors U-Factor indicates how well the window or door insulates. The lower the U-Factor, the better the insulation, and the lower the energy bill.
- Lighting and Fixtures Code requires at least 75 percent of the permanent lighting fixtures to have high efficiency light bulbs.
- 4. Furnace Furnaces are rated by their Annual Fuel Utilization Efficiency (AFUE). New furnaces should have an AFUE of at least 95 percent and a programmable thermostat.

- 5. Air Conditioner Air conditioning has several ratings including Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER). SEER should be at least 16 and EER should be at least 13.
- 6. Hot Water Heater Energy factor (EF) ratings are used to determine the energy efficiency of hot water tanks. A gas water heater must have an EF of at least 0.82. An electric heat pump water heater must have an EF of at least 2.
- 7. Appliances Appliances account for up to one quarter of a home's energy consumption. Look for new appliances with an ENERGY STAR label for the most energy-efficient models.
- 8. Heat Recovery Ventilation System (HRV) An HRV is a system that brings fresh air into the house while recovering heat from the air being drawn out. An HRV can recover up to 5 times more energy than it costs to operate.
- 9. Blower Door Test This test temporarily places a large fan in an exterior doorway, drawing air out of the house to determine the air leakage rate of the house.
- 10. Energy Code
 Compliance
 Label If your
 home was
 built after
 1995, look for
 this completed
 and signed
 label inside the
 breaker box.



NEED A LABEL? CALL 444-0281

Address:		
Ceiling:	Flat	R
Walls:	Vaulted	R
Walis:	Above grade walls Basement walls	R-
		R
Floors:	Crawlspace walls Over unheated spaces	R
Floors:		R
	Perimeter slab for	feet R
Exterior doors:	Under siab forfcct	
Exterior doors: Windows:	Name of contractions	R
	NFRC unit rating	U
	Energy factor (EF) rating	
Heating system:		
C . I'	(AFUE for gas; HSPF heat pur	
Cooling system:	EERSEER	
Heating ducts:	Systems sealed: Y	
	In non-conditioned areas insula	
	Supply R Retur	n R-
	Leakage test at rough-in	or finished
	Leakage to outside or	
	results CFM 25 or N/A	per 100 sq. п.
A in Coolings	Blower door test results	ACH 50
Air Sealing:	Visual inspection:	Voc per code
Whole house me	chanical ventilation:	res per code
Other Ge radon	mitigation)	10s per conc
Offici (i.e., racon	mitigation)	
	Date:	
	Date	90



DIESEL EMISSIONS REDUCTION ACT

The Diesel Emissions Reduction Act (DERA) was enacted as part of the Federal Energy Policy Act of 2005. This law appropriates annual funding to federal and state loan programs to upgrade or replace diesel-powered vehicles or to install emission reduction systems. Funding is allocated through Congress and Montana receives approximately \$200,000 annually to fund eligible projects.

In Montana, the DERA program is administered by the Montana Energy Office at the Department of Environment Quality (DEQ). Using Environmental Protection Agency (EPA) guidelines, the Montana Energy Office selects projects for funding based on air quality benefits.

ASUM CASE STUDY: Founded in 1999, the Associated Students of the University of Montana (ASUM) Office of Transportation works with the University of Montana to meet its goal of carbon neutrality. ASUM is one of the few studentled agencies in the country and was created in response to limited parking on campus.

DID YOU KNOW? University of Montana has the first electric buses owned by students on a university campus in the United States.

In 2016, the ASUM Office of Transportation approached the Energy Office with an innovative idea — to use DERA funds for ASUM to purchase two electric buses for the University of Montana. After analyzing air quality and public health benefits, the Energy Office determined that due

to inversions and high levels of particulate air pollution, Missoula was an ideal place to fund clean electric buses.

With a \$169,000 DERA grant, and additional loan through the state's INTERCAP program, the ASUM Office of Transportation purchased two 40-foot electric buses.

The buses charge at docking stations along the route and recharge in 10 to 90 minutes, providing a range of 50 to 150 miles per charge. In 2018, ASUM electric buses provided over 252,449 free rides to students, faculty, and campus visitors. The ASUM electric bus project was the first non K-12 and the first DERA-funded electric bus project in Montana. The project demonstrated the economic, environmental, and public health benefits of zero-emissions buses and proved that electric buses can be used in areas with extremely cold temperatures. The City of Missoula's bus service, Mountain Line, has also begun trading out their diesel buses for electric buses starting with six zero-emissions buses in 2019.

ASUM ELECTRIC BUS STATISTICS OVER 12-YEAR LIFESPAN:



Saves more than 123,500 gallons of diesel fuel



Reduces carbon emissions by 1.392 tons



\$89,000 in Savings



HIGH PERFORMANCE BUILDINGS

Buildings have a substantial impact on the health and wellbeing of people and the planet. Buildings use resources, generate waste, and are costly to maintain and operate. In 2015, the Montana legislature approved High Performance Building Standards (HPBS) to decrease the environmental and social impacts of state-owned buildings. The goal of the HPBS is to improve how the state designs, builds, and operates high-performing buildings.

HIGH PERFORMANCE BUILDING CERTIFICATION STANDARDS There are a handful of certification standards used globally including LEED, Green Globes, Energy Star, and ISO 14001. The certification provides a framework for creating healthy, efficient, and cost-saving buildings and include standards for energy, water, waste, construction materials, indoor air quality, occupant comfort, and access to public or alternative transportation.



SILVER 50 - 59 POIN HIGH PERFORMING PUBLIC SCHOOLS The Montana Energy Office, in partnership with the Rocky Mountain Chapter of the U.S. Green Building Council (RM-USGBC), selected Gardiner Public Schools

for funding assistance to gain accreditation as Montana's first LEED certified public school. Funding allowed the school to procure an energy audit and develop an energy management system. The Gardiner Public School LEED project serves as a model for other rural public schools and received Silver LEED Certification in February 2019.

LEED Scorecard	Silver 54/110
▶ INTEGRATIVE PROCESS CREDITS	0 OF 2
▶ LOCATION & TRANSPORTATION	8 OF 18
► SUSTAINABLE SITES	5 OF 10
► WATER EFFICIENCY	5 OF 12
► ENERGY & ATMOSPHERE	19 OF 38
► MATERIAL & RESOURCES	2 OF 8
INDOOR ENVIRONMENTAL QUALITY	9 OF 17



PLATINIUM

HIGH PERFORMING LOCAL GOVERNMENT BUILDINGS

The Billings Public Library has served the City of Billings and Yellowstone County since 1901. A new 67,960 square foot library

building was completed in 2014 and included sustainable site design, energy-efficient strategies, and recycled materials. Sustainable measures included low-flow plumbing fixtures, water efficient landscaping and irrigation, and preferred parking spaces for fuel-efficient vehicles. The design is expected to save 46 percent in energy use and 41 percent in utility costs (\$47,800 per year) compared to standard practice design. Over 27 percent of the site's structural and architectural materials contain recycled content. The Billings Public Library received Platinum LEED Certification in December 2015.

40.9% ENERGY COST SAVINGS

39.0% WATER SAVINGS

97.5% CONSTRUCTION WASTE RECYCLED

100% GREEN POWER

7.80% RECYCLED CONTENT MATERIALS

24.1% REGIONALLY SOURCED PRODUCTS





PLATINIUM 80+ POINTS

HIGH PERFORMING COMMUNITY

COLLEGES Blackfeet Community College is a public two-year tribal community college located on the Blackfeet Indian Reservation in Browning, Montana. The college

campus houses thirteen buildings including the new 12,000 square foot Math/Science building. Prior to the addition of solar arrays to the roof, the new Math/Science building used 60 percent less energy than a conventional campus building of the same size. The Blackfeet Community College Math/Science building received Platinum LEED Certification in March 2011.

49.5% ENERGY COST SAVINGS

25.0% WATER SAVINGS

83.0% CONSTRUCTION WASTE RECYCLED

11.0% RECYCLED CONTENT MATERIALS

24.6% REGIONALLY SOURCED PRODUCTS

LEED Scorecard	Platinum 53/69
► SUSTAINABLE SITES	11 OF 14
► WATER EFFICIENCY	4 OF 5
▶ ENERGY & ATMOSPHERE	16 OF 17
MATERIAL & RESOURCES	5 OF 13
INDOOR ENVIRONMENTAL QUALITY	12 OF 15
► INNOVATION	5 OF 5



UNIVERSAL SYSTEMS BENEFITS FUND:

MILES COMMUNITY COLLEGE SOLAR PROJECT -

WHAT IS THE UNIVERSAL SYSTEMS BENEFITS FUND?

Funding for energy efficiency, renewable energy, and low-income energy assistance is supported by the Universal System Benefits (USB) fund. Passed by the legislature in 1997 to ensure continued funding for energy efficiency projects across the state, public utility customers, served by NorthWestern Energy and Montana-Dakota Utilities (MDU), contribute to the fund by paying a small fee on their monthly gas and electric bills. Since 2007, this fund has generated more than \$60 million in additional funding for energy efficiency projects in Montana. The Montana Energy Office has managed a portion of these funds from MDU to finance projects like the Miles Community College solar array.

CASE STUDY:

Installation at Miles Community College

The Montana Energy Office used Universal Systems Benefits (USB) funding from Montana-Dakota Utilities (MDU) to support a solar panel installation at the Miles Community College (MCC). In 2018, MCC installed a 20.5 kW solar panel system on campus at the Agricultural Advancement Center with USB funding. The total cost of installation was roughly \$50,000. Using USB funds from MDU, the Montana Energy Office granted MCC \$40,000 to support the project. MCC contracted with Bozeman based OnSite Energy to install the system. This was the first large solar project supported by USB funds in MDU's Montana service territory.





CO2 EMISSION REDUCTION: ~35,000 LBS/YEAR

Installing solar panels at the Agricultural Advancement Center was part of MCC's clean energy goals as well as a demonstration of what will become part of the college's energy training curriculum. MCC has a goal to shift ten percent of its energy consumption to renewable energy sources. The array is expected to produce nearly 28,000 kilowatt hours per year, roughly equal to the total amount of electricity consumed by three typical Montana households.

MCC students were able to help with the solar panel installation, providing an opportunity to learn about a commercial scale system first-hand. The college is using this installation to create a Solar Energy Certificate for their Associate of Applied Science Agriculture Production program. With training, agriculture students will learn creative ways to incorporate solar energy into agricultural production, offsetting energy consumption.

This project helped showcase MCC's Agricultural Advancement Center as a state-of-the-art facility, as well as providing cost savings and a unique educational opportunity for the Miles City community.





MONTANA ENERGY OFFICE REGIONAL COLLABORATIONS

Due to the large volume of energy produced in Montana and used within the region, it is crucial for the state to be represented in energy conversations nationwide. The Montana Energy Office at the Department of Environmental Quality (DEQ) creates and maintains strategic regional and national collaborations to influence decisions made about energy policy, funding, and projects. Key collaborations for the Montana Energy Office include the Northwest Energy Efficiency Alliance, the National Association of State Energy Officials, and the Regional Electric Vehicle West Plan.

NORTHWEST ENERGY EFFICIENCY ALLIANCE (NEEA)

In 1996, utilities and other energy efficiency stakeholders from Montana, Idaho, Oregon, and Washington established NEEA to pool costs, risks, and benefits of regional energy efficiency efforts through Market Transformation. Today NEEA represents more than 140 northwest utilities and energy efficiency organizations working on behalf of more than 13 million energy consumers. Through participation in NEEA, the Montana Energy Office advocates for rural Montana by driving adoption of energy code and availability of energy efficient products, services, and training.

DID YOU KNOW? Since 1996, the region has saved more than 1,720 average megawatts through Market Transformation – that's enough energy to power more than 1.2 million northwest homes annually.

NATIONAL ASSOCIATION OF STATE ENERGY OFFICIALS (NASEO)

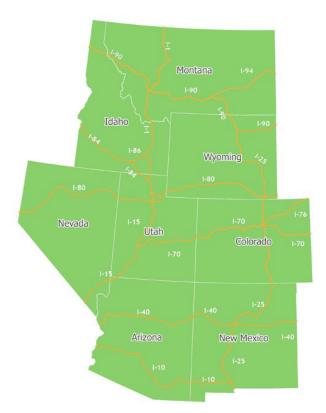
NASEO is the only national nonprofit association for the governor-designated energy officials from each state and territory. Formed in 1986, NASEO facilitates peer learning among state energy officials, serves as a resource for state energy offices, and advocates for the interests of the state energy offices to Congress and with federal agencies. Participation in NASEO provides

Montana the opportunity to connect to other state energy offices, and access funding and projects that might not otherwise be available.

REGIONAL ELECTRIC VEHICLE (REV) PLAN

In 2017, the Governors of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming signed a Memorandum of Understanding to create an Intermountain West Electric Vehicle Corridor — the Regional Electric Vehicle (REV) West Plan. This plan for electric vehicles targets tourism and travel to make it possible to seamlessly drive an electric vehicle across the major transportation corridors in the Intermountain west of the United States. As of October 2018, there were 233 fast charging locations in the REV West states, 8 located in Montana.

INTERMOUNTAIN WEST ELECTRIC VEHICLE CORRIDOR



Staying connected to nationwide issues gives the Montana Energy Office the opportunity to advocate on behalf of Montana's energy industry.



SMALL BUSINESS ENVIRONMENTAL ASSISTANCE PROGRAM

The Small Business Environmental Assistance Program (SBEAP) is a non-regulatory program within the Montana Department of Environmental Quality (DEQ). The SBEAP assists small businesses with environmental compliance and encourages businesses to move toward sustainable operations. The SBEAP assists small businesses with a wide range of environmental issues including water quality, solid waste, recycling, pollution prevention, sustainability, energy efficiency, permit acquisition, and advocacy. Assistance from the SBEAP is free and confidential for Montana businesses.

BREWERY CASE STUDY: The brewing industry continues to expand across Montana, which is no surprise considering that the state is the nation's second leading producer of malting barley. As of January 2019, there were 83 breweries in Montana. Statewide, the economic impact from breweries is about \$417 million annually including about 800 direct jobs.

83
BREWERIES
STATEWIDE

\$417
MILLION
IN ANNUAL
ECONOMIC
IMPACT

800 DIRECT JOBS

According to the Montana Brewers Association, Montana is ranked second nationwide for its number of breweries, around 9.6 per capita. With the growing industry, it is more important than ever for breweries to use sustainable measures to positively impact the planet.

BREWERY SUSTAINABILITY PROJECT: In 2016, the SBEAP initiated a brewery sustainability project to incentivize breweries to become more resource efficient. Nine breweries participated in the initial training on how to become more sustainable. The project included a free energy and water use audit and targeted reducing pollutants produced including waste water, carbon dioxide, and solid waste.



"We have to reduce the amount of stuff we are wasting, and learn how to be more efficient with things. It obviously saves money. When we implemented a program to reduce the amount of packaging we use, we reduced our cardboard use by 2.5 tons/year—probably close to a 40% reduction."

- Nolan Smith, Co-Owner Philipsburg Brewing Company

The project identified a variety of ways that breweries can increase sustainability including: installing motion sensors in coolers; installing LED lights; installing variable frequency drives (VFD) on the bottling line, process pumps, mash turn, and conveyors; installing a centrifuge to filter beer; installing an efficient heat exchanger; adding hot water tank jackets; insulating hot water piping; adding door strip curtains to drive-in cooler; and replacing windows and doors. If all nine initial breweries implemented the recommended changes, it would equate to over \$500,000 in energy cost savings.

Philipsburg Brewing Company was an early adopter of the brewery training project, which fits their sustainability missions. Nolan Smith, co-owner of Philipsburg Brewing Company, believes that sustainability is just the right thing to do.





For more information or assistance for your small business, contact John Podolinsky, Small Business Ombudsman at JPodolinsky@mt.gov or (406) 444-6592, or call the SBEAP toll-free hotline at (800) 433-8773.

SMART SCHOOLS CHALLENGE

GREENING MONTANA'S SCHOOLS -

The SMART Schools Challenge is a friendly competition to help Montana's K-12 public schools save money and resources. Schools compete by conserving energy, recycling waste, and implementing green practices that benefit student health.

Participating schools range from a one-room schoolhouse with 6 students in Brorson to Billings High School with over 1,800 students. At the end of the challenge the top 12 performing schools receive awards. Four champion schools are selected in each of the following categories: energy, recycling, and greening. The winners become a certified Montana SMART School, receive \$1,000, and statewide recognition from the Lieutenant Governor.

ENERGY: Plevna High School
In 2018-2019, the Plevna School District, located in Eastern Montana, installed energy efficient lighting. Students from the Family and Consumer Science and General Science classes helped track and calculate energy usage at their high school after upgrading 16 light fixtures to LED bulbs. Within 6 months of the SMART Schools Challenge, this simple change saved the district 7,552 kWh of energy and \$842. The initial cost of the LED bulbs was recovered within five months.

The city of Red Lodge funded and operated a community recycling center until it closed in October 2018. Students in the Red Lodge High School Green Team worked with the SMART Schools Program to help educate their community on the need for recycling. In response, locals created Red Lodge Recycling, a new nonprofit to support recycling. Through a collaboration of efforts, Red Lodge Recycling developed a sustainable business model funded by memberships. Students contributed to the efforts by selling recycling memberships and answering

RECYCLING: Red Lodge High School

PROGRAM IMPACT

5,200 STUDENTS PARTICIPATED

260 PROJECTS

133 SCHOOLS ENROLLED

\$350,000 DOLLARS SAVED

364,000 POUNDS OF WASTE DIVERTED

GREENING: Sleeping Giant Middle
School - Seventh graders at the Sleeping
Giant Middle School in Livingston
focused their project on the benefits of
alternative transportation. Weather permitting,

alternative transportation. Weather permitting, students ride bikes to their school field trip locations. Students without bikes can borrow one from the new "bike bank" at the school. In addition to supplying bikes and practicing healthy transportation habits, Sleeping Giant Middle School used their 2017-2018 SMART Schools award to help purchase "bike aid stations" supplying essential tools for students to properly maintain their bikes.





questions about the new recycling process.

Does your school want to take on the SMART Schools Challenge?

Contact Robyn Boyle, Energy Resource Professional at RBoyle@mt.gov or (406) 444-1842

STATE BUILDINGS ENERGY CONSERVATION PROGRAM

The State Buildings Energy Conservation
Program (SBECP) provides funding and expertise
to develop and implement energy saving
improvements at state-owned facilities. Energy
efficiency improvements include upgrading
inefficient lighting; replacing inefficient heating
ventilation and cooling systems; and providing
more effective temperature controls. Investments
are made in energy and water efficiency resulting
in reduced utility and operating costs. After an
energy installation upgrade, a state agency uses
utility savings to repay the program's investment.
The repayment is equal to or less than utility
savings resulting from the project.



Originally established in 1989, SBECP in its current structure formed in 2009 when federal funding was used to capitalize the existing state funded program allowing for a true revolving loan program. Since 2009, 133 energy efficiency projects have been funded through the State Building Energy Conservation Program with a program investment of \$32,118,817. Utility savings realized are 229,267 MMBTUs (67,243.37 MWh) resulting in financial savings to the state of \$2,684,177 per year.



PROGRAM UTILITY SAVINGS: 229,276 MMBTU



PROGRAM FINANCIAL SAVINGS: \$2,684,177/YEAR

CASE STUDY: Warm Springs State Hospital Campus Lighting Projects Warm Springs, MT

With \$678,000 of funding from SBECP, the State Hospital campus upgraded existing interior, exterior, and parking lot lighting to LED technology. The estimated investment payback is less than 10 years.



UTILITY SAVINGS: \$86,000/YEAR



ELECTRICAL SAVINGS: 900,000 KWH



GREENHOUSE GAS REDUCTION:636 METRIC TONS

CASE STUDY:
Montana Mental Health
Nursing Care Center
Lewistown, MT

\$550,000 of funding from the SBECP helped the Montana Mental Health Nursing Care Center to replace a failing steam heating system with a new highefficiency hot water heating system.



UTILITY SAVINGS: \$47,000/YEAR



GAS USE SAVINGS: 4.752 MMBTU



GREENHOUSE GAS REDUCTION:252 METRIC TONS

CASE STUDY: Miles City Data Center Miles City, MT

\$248,000 of energy funds and \$50,000 of Montana-Dakota Utilities funds were used to improve the operating efficiency of HVAC equipment in this facility in 2017.



UTILITY SAVINGS: \$28,300/YEAR



ELECTRICAL SAVINGS: 502,500 KWH



GREENHOUSE GAS REDUCTION:355 METRIC TONS

