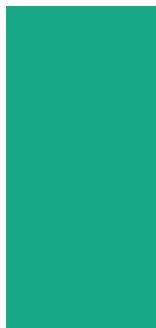


COLORADO'S CLEAN ENERGY FUTURE

How renewables, energy efficiency, and
electric vehicles can expand our economy



Environmental Entrepreneurs



ACKNOWLEDGEMENTS

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ABOUT E2

Environmental Entrepreneurs (E2) is a national, nonpartisan group of business leaders, investors, and professionals from every sector of the economy who advocate for smart policies that are good for the economy and good for the environment. Our members have founded or funded more than 2,500 companies, created more than 600,000 jobs, and manage more than \$100 billion in venture and private equity capital.

For more information, see www.e2.org, follow us on Twitter at [@e2org](https://twitter.com/e2org), or contact Susan Nedell at susan@e2.org.

INTRODUCTION

COLORADO HAS SOME OF THE NATION'S RICHEST RENEWABLE ENERGY RESOURCES.¹

It is fourth in the nation for workers employed in wind energy manufacturing,² has a robust clean energy economy in the Front Range,³ and according to E2's "Q4 and Year-End 2015 Jobs Report," Colorado was in the top 10 for clean energy jobs for four consecutive quarters in 2015.⁴ All this adds up to a big opportunity to increase renewable energy and save more energy.

Yet with states from California to New York pushing hard to expand renewable energy, Colorado needs to update its clean energy policies to maintain its leadership, as some of its important laws will soon no longer drive development and do not reflect technological and cost advances.

This report describes recent developments in **renewable energy, energy efficiency, and electric vehicles** and how Colorado can improve its current clean energy policies to take advantage of new technological and market developments.

WE RECOMMEND THAT TO MAINTAIN COLORADO'S CLEAN ENERGY LEADERSHIP, LAWMAKERS SHOULD:

- Increase the state's Renewable Portfolio Standard — the minimum amount of renewable energy electric utilities are required to purchase.
- Increase utilities' energy efficiency targets, set LED-specific energy rates, and require all utilities to do more to help customers save energy.
- Eliminate the preclusion to utility investment and instead require electric utilities to identify and invest in cost-effective electric vehicle (EV) charging infrastructure and ensure that electricity rates encourage customers to charge EVs at appropriate days and times.

RENEWABLES

LOWER PRICES, BETTER PERFORMANCE



There has never been a better time for Colorado to strengthen its Renewable Portfolio Standard to take advantage of abundant wind and solar resources. Xcel Energy, Black Hills Energy, and other electricity providers can purchase renewable energy at a lower cost than ever before. In December 2015, Congress passed a multi-year extension of federal tax credits for wind and solar, providing near-term certainty for the renewable energy industry and making renewable energy sources cost-competitive with fossil fuels.^{5, 6}

The cost of building a new wind farm is falling as the technology improves, allowing developers to take advantage of higher-speed, more regular wind at higher turbine heights. Utilities purchased wind

power at an average price of \$20–30 per-MWh in 2015, the lowest ever. Most are in the low-cost Interior region, where Colorado is located.⁷

With prices this low, wind power is the cheapest source of new electricity generation and can save money for customers, compared to buying electricity from existing, fossil-fuel fired power plants. Wind power costs are expected to continue to steadily decline over the next decade.⁸ In fact, according to Xcel Energy in E2's "Winds of Change" report, wind energy now costs less than natural gas and will likely save Colorado \$231 million in energy costs from 2015 to 2035.^{9, 10}

The cost of solar has also declined dramatically in recent years, while technology has improved substantially. **According to the investment firm**

Lazard, the cost to generate electricity from solar has decreased 78 percent since 2009,¹¹ and many analysts believe costs will continue to fall over the next several years. In 2010, the U.S. Department of Energy (DOE) started its Sunshot program, with an ambitious goal to help the solar industry reach the low cost of \$1 per watt by 2020. In some markets, solar directly competes with coal and natural gas.¹² This year, DOE released a progress report, concluding the industry is already three-quarters of the way toward reaching the goal,¹³ and a recent industry

report concluded that it will hit the target by 2020.¹⁴

Colorado is already reaping the benefits of its thriving clean energy economy. In 2015, Colorado's wind and solar industries supported between 11,000 and 12,000 jobs.^{15, 16} (Nationally,

clean energy employs 2.5 million Americans, according to E2's "Clean Jobs America".) As of 2014, the wind industry had injected more than \$4.8 billion in the Colorado economy, and generates an estimated \$7.8 million in annual lease payments to ranchers, farmers, and other landowners.¹⁷ Colorado's existing wind fleet has already saved customers more than \$20 million in fuel and powers nearly 700,000 homes.¹⁸

Xcel estimates the new 600 MW Rush Creek wind project, which was recently approved by the Public Utilities Commission, will save its electricity customers more than \$400 million over the 25-year life of the project.¹⁹ After putting this project into service in late 2018, it will adjust the performance metrics, given the 25-year useful life.²⁰


MORE THAN 2.5 MILLION
AMERICANS WORK IN THE CLEAN
ENERGY INDUSTRY; 414,000
IN RENEWABLES ALONE.

RENEWABLES RECOMMENDATION: INCREASE THE RPS

Updating and strengthening the state's renewable portfolio standard (RPS) offers a clear pathway for Colorado to take advantage of its low-cost wind and solar resources and seize this economic growth opportunity. Twenty-nine states — including Colorado — and the District of Columbia currently have RPS policies. Oregon, California, New York, and Hawaii have all recently increased their RPS targets, partially to ensure the state captures the benefit of the wind and solar tax credit extension.²¹ **A recent report from DOE and Lawrence Berkeley National Laboratory found that Renewable Portfolio Standards provide myriad economic, health, and climate benefits.** In 2013 alone, RPSs across the country saved customers up to \$1.2 billion from reduced wholesale electric prices and \$1.3 to \$3.7 billion from lower natural gas prices, as a result of lower demand for natural gas across the power sector. Additionally, the non-market benefits of renewable energy are substantial: **RPSs supported nearly 200,000 renewable energy-related jobs, provided \$5.2 billion worth of health benefits through improved air quality, and resulted in global climate benefits of \$2.2 billion.**²²

Colorado can be confident in expanding its commitment to renewable energy: recent studies have demonstrated incorporating significant amounts of renewables into the grid is feasible

AS OF 2014, THE WIND INDUSTRY HAD INJECTED MORE THAN \$4.8 BILLION IN THE COLORADO ECONOMY, AND GENERATES AN ESTIMATED \$7.8 MILLION IN ANNUAL LEASE PAYMENTS TO RANCHERS, FARMERS, AND OTHER LANDOWNERS.



and can be accomplished at low costs.^{23, 24, 25} Grid operators around the country are also gaining experience preparing for and managing high penetrations of variable renewable generation.²⁶ For example, in Texas, wind has now surpassed 45 percent of hourly load on multiple occasions,²⁷ and Iowa now generates 31 percent of its total annual power from wind.²⁸ **Detailed analysis performed on the Western Interconnect has found that variable renewables can provide up to 30 percent of total annual generation with proper system planning and only minor adjustments to the existing grid.**²⁹

IN 2013 ALONE, RPSs ACROSS THE COUNTRY SAVED CUSTOMERS UP TO \$1.2 BILLION FROM REDUCED WHOLESALE ELECTRIC PRICES AND \$1.3 TO \$3.7 BILLION FROM LOWER NATURAL GAS PRICES, AS A RESULT OF LOWER DEMAND FOR NATURAL GAS ACROSS THE POWER SECTOR.

One-sixth of Colorado's electricity came from renewable energy sources like wind, solar, and hydropower in 2014, three times more than in 2007.³⁰ Investor-owned utilities like Xcel Energy and Black Hills Energy must get 30 percent of their electricity from renewable sources by 2020. Electric cooperatives and municipal utilities have lower standards: large electric co-ops must get 20 percent of their electricity from renewable sources by 2020; small co-ops and municipal utilities must get at least 10 percent.³¹ Because co-ops and municipal utilities deliver 41 percent of electricity in Colorado (24 percent and 17 percent respectively) these lower standards have a significant impact on the total amount of renewable energy acquired in Colorado.³² The amount of renewable energy all utilities are required to purchase under the RPS does not increase after 2020, meaning **without changes RPS-driven growth will stop.**

Recognizing its good wind and solar resources, recent cost declines, and favorable federal tax policy, Colorado should increase its renewable portfolio standard across the state — and do so now, before projects begin to tail off in advance of the 2020 sunset of the current RPS. Increasing the state's RPS would encourage utilities to purchase more electricity from wind and solar each year. It also would help drive new jobs and investment in solar, wind and other renewable sources in the state. **While New York and California now lead the country on renewable energy with 50-percent renewable standards, Colorado should be a leader in the interior United States.**



Denver-based Ecosystems recently remodeled a facility used by Food Bank of the Rockies, saving \$27,500 in energy costs annually.

Photo courtesy of Ecosystems



COLORADO CASE STUDY — *ECOSYSTEMS GROUP INC.*

Ecosystems Group Inc. has steadily grown beyond Colorado's Front Range into a leading provider of energy-saving services, with more than 400 clients spanning eight states. The Denver-based company helps owners, managers, and tenants of commercial buildings improve their energy efficiency and save money through upgrading their lighting, improving HVAC and control systems, retrofitting and replacing window film, adding renewable energy systems, and advising on energy efficiency rebates and tax incentives.

For example, the nonprofit Food Bank of the Rockies wanted to improve its energy efficiency as part of a remodeling of its facility. Ecosystems upgraded Food Bank's lighting and added electrical controls. It also managed all rebates and incentives, which covered 38 percent of the lighting project. As a result, Food Bank is expected to save \$27,500 in energy costs annually.



RJ Mastic founded Ecosystems in Colorado in 2010. The company now has 400 clients across eight states.

Photo courtesy of Ecosystems

RJ Mastic founded Ecosystems in 2010, combining his family background in construction, an entrepreneurial spirit and his desire to create a positive impact for people and the planet. To date, the company has won awards as a top Xcel trade partner for energy efficient lighting two consecutive years — 2014 and 2015.

Ecosystems is helping Colorado transition to a clean energy economy. It recognizes the importance — and supports the strengthening — of smart policies like the state's Renewable Portfolio Standard and the 2007 law establishing energy-savings goals for investor-owned utilities. Ecosystems puts these policies into action, securing more than \$1.2 million in rebates for its clients, which translates into a reduction of 11 million pounds of carbon pollution and substantial energy savings.

— *Environmental Entrepreneurs*

ENERGY EFFICIENCY

TECHNOLOGIES, PROGRAMS SAVE UTILITIES ENERGY



Since the 1970s, electric utilities have helped customers save energy. Many states and utilities have expanded these efforts in the last decade, helping consumers save money and avoiding the high costs and pollution that come with building new power plants. In 2006, spending on customer-funded electric energy efficiency programs was \$1.6 billion, and only three states achieved first-year savings of greater than 0.8

percent of retail sales. By 2014, program spending quadrupled to \$5.9 billion and 18 states achieved first-year savings of greater than 0.8 percent of retail sales.³³ These increases were driven by several factors, including the spread of

Energy Efficiency Resource Standards (EERS) — policies analogous to Renewable Portfolio Standards that require utilities to save a certain amount of electricity each year — to more states. Additionally, there were program expansions in the Midwest and Mid-Atlantic, and consumers also switched from older lighting technologies like metal halide and incandescent light bulbs to fluorescents or LEDs.

A 2007 law requires the Colorado PUC to establish energy-savings goals for the investor-owned utilities,³⁴ which helped Xcel and Black Hills scale up efficiency savings. These statutory goals end in 2018. Municipal utilities and electric cooperatives do not yet have to meet annual efficiency targets nor do

most set their own goals. Although Colorado's investor-owned utilities expanded their energy savings and energy efficiency program spending between 2009 and 2012, overall savings have been about the same since 2012. Xcel increased its annual energy savings from 0.75 percent of sales in 2009 to 1.27 percent in 2015, and Black Hills Energy saved 0.25 percent of sales in 2009, and also reached about 1.25 percent in 2015.³⁵

ACROSS THE UNITED STATES,
1.9 MILLION PEOPLE WORK
IN THE ENERGY EFFICIENCY
INDUSTRY.

Municipal utilities and electric cooperatives do not yet have to meet annual efficiency targets, nor do most set their own goals. However, Fort Collins Utilities is the leader in energy efficiency programs among Colorado municipal utilities. In 2009, the city council adopted an energy policy

that includes a goal of 1.5 percent savings from energy efficiency and conservation programs annually.³⁶

Energy efficiency is still the most cost-effective method for providing power to consumers and businesses in a cost effective manner, according to E2's "Plugged into Efficiency: Saving Money, Creating Jobs and Driving Economic Growth Through Energy Efficiency."³⁷ Investing in energy efficiency benefits the economy directly through increasing jobs in efficiency research and development, manufacturing, and building efficiency upgrades; and indirectly through energy cost savings that can be reinvested into the state's economy, creating new jobs.

By using modular construction practices at a new project in Denver, iUnit said it is able to create a tighter building envelope, which saves energy and lowers carbon pollution.

Photo courtesy of iUnit



COLORADO CASE STUDY — *iUNIT TECHNOLOGIES LLC*

Buildings consume 70 percent of our electricity, and they are responsible for nearly half of all greenhouse gas emissions. iUnit Technologies LLC's mission is to be part of the solution to reduce those emissions. The Denver-based company uses cutting-edge technology and sustainable building practices to create sustainable communities.

A lifelong entrepreneur, Brice Leconte founded iUnit as a result of his passions for real estate development, sustainability and technology. Leconte is involved in every aspect of iUnit, from land acquisition to conceptual design, technology integration, sustainability integration and daily construction and management oversight. Leconte is an Entrepreneur in Residence at the University of Maryland as well as an advisor and mentor at Georgetown University.



Brice Leconte founded iUnit as a way to combine several of his passions, including real estate and sustainability.

Photo courtesy of iUnit

Eliot Flats is iUnit's first multifamily development, providing a baseline project for its commercial modular building. A 40-unit rental community in the heart of the popular Lower Highlands neighborhood in Denver, the building features 30 studios and 10 one-bedroom units. It offers high walkability to restaurants, bars, running and biking trails.

Over the course of construction, more than 100 people were employed and working on the Eliot Flats project. Energy-efficient modules were constructed in a factory, shipped to the site and stacked during final construction.

The company believes the volumetric modular construction method provided a more sustainable product due to the lack of material exposure to the elements, factory-controlled construction, and use of construction materials and methods focused on achieving a tight building envelope.

iUnit is also developing the first version of its software application which will allow tenants to engage in informed energy efficiency decisions and more closely control their living environment.

Champa Flats, in downtown Denver, will be iUnit's next project. The company will introduce its first MicroGrid system, allowing the community to generate as much energy as residents use, store it and distribute as needed. Leconte feels energy efficient and sustainable housing developments will become more widespread and common with stronger clean energy policies.



More than 100 workers were involved in the construction of iUnit's Eliot Flats project in Denver.

Photo courtesy of iUnit

— *Environmental Entrepreneurs*



EFFICIENCY RECOMMENDATIONS: INCREASE AND EXTEND STANDARDS; INCENTIVIZE LEDs

Colorado lags leaders like Massachusetts, Rhode Island and Arizona in energy efficiency policies and programs. Though Colorado has a good policy framework, the ambitions of its policies could be higher, and efficiency savings goals could be extended across the state. For example, the energy efficiency targets adopted by the Utility Commission require the main investor-owned utility in the

state to save about 1.4 percent of load each year. That's well below the 2.5 percent minimum that other states require. Arizona and Utah spent around \$20 per-person on electric utility energy efficiency programs in 2014; Colorado spent around \$12.³⁸

Furthermore, the PUC has established energy savings goals for the investor owned utilities only through 2020.

There are no energy savings goals or other efficiency policies affecting Colorado's rural co-ops and municipal utilities. If Colorado lawmakers would ensure these customers also have access to efficiency programs and investments, it would further increase savings throughout the state.

Rural cooperatives in leading states are already saving about 1–1.2 percent of their retail energy sales through efficiency programs implemented each year.³⁹

Colorado has made strides in improving energy efficiency, but additional efficiency savings can and should be realized to save businesses and residential consumers money, create new jobs, and to minimize greenhouse gas and other emissions. For example: Southwest Energy Efficiency Project estimates consumers and businesses served by co-ops alone would realize \$500 million in net economic benefits as a result of efficiency measures installed between 2018–2030.⁴⁰ And in its analysis of the Clean Power Plan, MJ Bradley & Associates (MJB&A) found that Colorado households could save nearly 3 percent on their monthly electric bills if the state strengthened its efficiency programs and investments.⁴¹

COLORADO SHOULD INCREASE
ITS ENERGY SAVINGS GOALS
FOR ALL UTILITIES TO AT
LEAST 2 PERCENT ANNUALLY.

The state should build on its current set of cost-effective energy efficiency policies and programs. Similar to the RPS, Colorado should increase its energy savings goals for all utilities to at least 2 percent annually, and extend the goals beyond 2020.

LED street lighting is another technology that can save large amounts of electricity. Based on Colorado's climate, LED street lighting could save more than 60 percent of the electricity now wasted on older technologies. Additionally, **utilities or municipalities own the majority of streetlights. As such, only a small group of entities need to make the decision to switch to LED street lights**, as opposed to a very large number of customers. By setting LED specific energy rates, Colorado lawmakers can help facilitate this transition by making it economically attractive to municipalities.

WHAT DOES ENERGY EFFICIENCY LOOK LIKE?



BETTER, CHEAPER LIGHT EMITTING DIODE (LED) LIGHTS

An LED replacement for an old 60-watt incandescent bulb only needs 10 watts to produce the same amount of light, and lasts 10 to 25 years instead of one. Customers are noticing these advantages, and the market is changing quickly — with significant price drops and quality improvements in recent years. **LEDs grew from 5.7 percent of lamp shipments in the first quarter of 2015 to 26.1 percent one year later**, but this growth has mainly come at the expense of Compact Fluorescent Lightbulbs (CFLs). Overall efficient lamp sales have stagnated: CFLs and LEDs together accounted for 45 percent of lamp sales in the first quarter of 2015, and 45.3% of lamp sales one year later.⁴² This indicates that only some customers are taking advantage of efficient lighting options — while many others remain unaware of the advantages. Inefficient incandescent and halogen lamps still account for the majority of lamp shipments today, meaning there is still room for utility energy efficiency programs that reduce the price of LEDs, improve customer awareness, and help retailers sell more.

LED lighting fixtures are becoming a good option for business lighting needs as well: with better LED technology it can be cost effective to change even efficient linear fluorescent fixtures to LEDs.⁴³



OPTIMIZING VOLTAGE

Utilities must supply power to end-users within power quality standards set by the American National Standards Institute. These include standards for voltage — analogous to water pressure in a pipe — the “pressure” at which electrons move through a power line and into a device. Because of losses that occur as power flows to the edge of the distribution system, utilities generally over-supply voltage to customers, using engineering rules-of-thumb to ensure customers at the end-of-the-line get acceptable voltage.

To save energy, utilities are increasingly deploying Conservation Voltage Reduction (CVR) programs, a strategy that reduces voltages where the electricity is used (e.g., outlets) in order to achieve a corresponding reduction in energy consumption. Better-dispersed voltage sensors allow utilities to see voltage in real-time and ensure customers receive the minimum amount of voltage necessary for safe and efficient operation of electricity-consuming devices. These CVR programs are often implemented system-wide or on large portions of a utility’s distribution grid, saving up to 4 percent on individual feeders and between 2 percent and 3 percent when implemented system wide.⁴⁴ In 2014, the Public Utilities Commission approved a Distribution Voltage Optimization (DVO) plan within Xcel Energy’s 2015–16 Demand Side Management Programs plan.⁴⁵



KEEP IMPROVING

Even energy-intensive businesses often treat their energy bill as a fixed cost, rather than something that can be changed. Continuous Energy Improvement (CEI) programs, also known as Strategic Energy Management (SEM) programs, help businesses implement a process to continually reduce energy use, akin to quality improvement programs like Six Sigma or ISO 50001. Such programs require a business to recruit an executive-level sponsor, develop an energy baseline and reduction goal, and put in place an energy team.⁴⁶ The business then gets help from a utility to implement a plan to reach the goal. Xcel Energy Process offers a sustainable energy management plan through its Process Efficiency program, which focuses on continuous energy improvement. They provide technical and financial resources to help integrate sustainable energy efficiency into your manufacturing and business processes.⁴⁷

CEI programs work well with “deep dive” programs, because they help build trust and relationships between utility and businesses. These relationships are useful to better understand a business’ objectives and upcoming capital investments. A knowledgeable utility can then help the business add energy efficiency features to these investments.

ELECTRIC VEHICLES

CHARGING AHEAD



Transitioning the consumer auto fleet to electric vehicles (EVs) is critical to addressing climate change: the transportation sector was responsible for 26 percent of U.S. greenhouse gas emissions in 2012.⁴⁸ Transportation has been responsible for a growing share of emissions in the United States, overtaking electricity generation as the largest source in 2016.⁴⁹ It is much easier to reduce carbon emissions from electricity production by using more renewable energy than it is to make gasoline — almost all from fossil fuels — less carbon-intensive.⁵⁰ Currently, electric vehicles using the average Colorado grid mix generate about 30 percent lower GHG emissions than a comparable new gasoline vehicle — and emissions will decline over time, as the electricity mix gets cleaner. **Electric vehicles — cars and trucks — can use cheap wind and solar electricity to charge their batteries.**

Starting this year, automakers are releasing EVs better and more affordable than their predecessors, due to cheaper batteries, economies of scale, and more competition. These models include the Chevrolet Bolt EV, Tesla Model 3, BMW i3, Nissan Leaf, Volkswagen e-Golf, and Ford Model E. These updated vehicles have better range (200 miles) and prices (less than \$37,500) than previous models.⁵¹

As a source of demand for electricity, EVs can help a high-renewables grid work better. **Customer-owned EVs, like all cars, are mainly parked — and thus can be charged — at times of highest renewable energy production: at night when the wind is blowing the car is parked in the driveway or garage; in the midday when the sun is shining the car is often parked at work.** Electric utility “smart charging” programs can automate this process: ensuring the car is charging in a manner that meets its

owner’s driving needs while also helping to make use of intermittent renewable generation. Over the longer term, it may be possible to make use of the batteries of parked electric vehicles as a source of energy storage, further enabling higher levels of renewables in the generation mix.

EV RECOMMENDATIONS: INCENTIVIZE RATES, EXPAND EV INFRASTRUCTURE, OPT INTO ‘ZEV’ STANDARD

Electric vehicles make up a small portion of new car sales in Colorado. Between June 2015 and May 2016, EVs (including plug-in hybrid EVs) made up less than 1 percent of all light-duty vehicles sold.⁵² However, EV sales in Colorado have been growing rapidly, with double-digit annual percentage increases each of the last three years.⁵³

Colorado provides up to a \$6,000 tax credit for purchasing or leasing an EV, depending on the battery size and vehicle price,⁵⁴ which customers



can take with the \$7,500 federal tax credit, depending on individual tax circumstances. The state also provides grant funding to public entities to purchase EVs, and to both public entities and apartment building owners to install EV charging infrastructure.⁵⁵ In 2016, the legislature simplified this, so that starting in 2017 the tax credit will be a flat \$5,000 for purchasing an EV, and \$2,500 for leasing an EV. In addition, the credit will be assignable, allowing it to function as a point of sale incentive.⁵⁶ The tax credits phase out in 2021.

Currently, a Colorado law, “HB 12-1258:

Alternative Fuel Vehicle Charging Facilities,”

prohibits investor-owned utilities from recovering the cost of EV infrastructure in their rate base, which is discouraging them from investing in this area.⁵⁷ Xcel Energy and Black Hills Energy also do not offer time of use rates for EV owners, which would encourage them to charge their cars at optimal times.

To encourage EV growth, Colorado should require investor-owned utilities to offer EV customers’ rates that encourage off-peak charging of electric vehicles, and encourage utilities to put in place charging infrastructure in important-but-underserved market segments.

Xcel Energy is already moving in the right direction: the recent settlement of its Phase II Electric Rate Case included a pilot of time-varying energy rates for up to 18,000 customers. These options should be available to all, however.

The state should encourage urban utilities to invest in EV charging infrastructure in underseved apartment buildings and workplaces, and allow Xcel to recover the costs of this infrastructure through its rates.

Expanding charging infrastructure is critical to increasing EV adoption. As explained by the “network effect” of market diffusion, consumer

valuation of EVs increases with the number of charging stations, but investors are less willing to build stations when the EV market is small. Researchers from Cornell University analyzed network effects associated with quarterly EV sales in 353 metro areas and found “availability of public charging stations has a statistically and economically significant impact on EV adoption decisions.”⁵⁸

This does not mean utilities should fund residential charging stations, but building a public infrastructure is necessary to give customers the confidence to purchase electric vehicles.

ABOUT ONE THIRD OF THE
170,000 ADVANCED VEHICLE
WORKERS IN THE U.S. WORK
IN THE EV INDUSTRY.

Colorado will receive more than \$60 million through the environmental remediation fund portion of the settlement of civil suits over the VW emissions cheating scandal. The allowable uses of these funds include light duty

vehicle charging and heavy-duty vehicle electrification.⁵⁹ Colorado should commit these funds to building out the same infrastructure, in partnership with utilities.

In addition, the Denver metropolitan area faces significant challenges in meeting the new federal ozone standard of 70 parts per billion. Electric vehicles are needed to meet clean air standards in the most polluted areas of the country.

Nationally, it is estimated that traffic pollution causes more than 50,000 premature deaths in the lower 48 states every year, more than 1.5 times the deaths caused by traffic accidents per year.⁶⁰ To help cities like Denver meet federal ozone standards, Colorado should consider adopting the Zero Emission Vehicles standard,⁶¹ which would require automakers to ensure that a minimum percentage of vehicles sold in the state be electric or hydrogen vehicles. The ZEV standard was developed by the State of California; federal law allows other states to opt into the standard.

COLORADO CASE STUDY — *NATIONAL CAR CHARGING*

National Car Charging, with headquarters in Denver, is one of the nation's leading providers of electric vehicle (EV) charging equipment, along with consulting and station management services. Its mission is to offer a variety of top-quality EV charging products and services at reasonable prices. Whenever possible, it integrates on-site renewable electrical generation (primarily solar) to power the charging stations.

In Colorado, the company is helping expand the availability of EV charging sources in many public and private locations, including at Ball Aerospace & Technologies Corp., University of Denver, City of Aurora, Boulder Valley School District, Greystar Properties and Colorado State University. The Regional Air Quality Council and the Colorado Energy Office offer grants to help offset the cost of EV charging stations, in addition to federal tax credits for private and commercial charging infrastructure.



RJ Harrington is the business development director at National Car Charging, which has helped install EV infrastructure at major Colorado institutions.

Photo courtesy of RJ Harrington

RJ Harrington is business development director for National Car Charging. He was raised on a dairy farm in Central Pennsylvania where the sun, wind and earth sustained the family business.

According to Harrington, widespread electric vehicle adoption will be possible only when EV infrastructure is expanded throughout Colorado and the country. In order to encourage expansion of charging stations, however, the right policies are needed.

Among other steps, Colorado lawmakers can eliminate the current preclusion to utility investment and instead require electric utilities identify and invest in cost-effective EV charging infrastructure and ensure that electricity rates encourage customers to charge EVs at appropriate days and times.

— *Environmental Entrepreneurs*



CONCLUSION

Colorado has been a national leader in clean energy policies, which have supported a robust and diverse economy, while also reducing carbon and other emissions. The state should build on its current cost-effective renewable energy, energy efficiency and electric vehicle policies. Now is the time.

By working together Colorado lawmakers and policymakers can keep the state's clean energy industry growing, helping improve the state's economy — and its environment — along the way.

ENDNOTES

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- ⁴ E2, "Clean Energy Works for Us: Q4 and Year-End 2015 Jobs Report", 2016, available at: https://www.e2.org/wp-content/uploads/2016/02/Q4-2015_End-of-Year-Report.pdf
- ⁵ Congress extended tax credits for wind and solar as part of the Consolidated Appropriations Act of 2016. The Production Tax Credit (PTC) for onshore wind projects was extended at its previous rate of 2.3 cents per-kWh through the end of 2016, and will decrease to 80% of that value in 2017, 60% in 2018, and 40% in 2019. The Investment Tax Credit (ITC) for solar projects has been extended at its previous value of 30% of project investment costs through the end of 2019, and will decrease to 26% in 2020 and 22% in 2021. Without additional legislation: the PTC will expire after 2019, the ITC will decline to 10% of investment costs for utility-scale and commercial projects after 2022, and the ITC will expire for residential projects.
- ⁶ Rhodium Group, "Renewable Tax Extenders: The Bridge to the Clean Power Plan," January 2016, available at: <http://rhg.com/notes/renewable-tax-extendors-the-bridge-to-the-clean-power-plan>.
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