

# ANNUAL REPORT



Colorado  
**Energy Office**



FISCAL YEAR 2012/13





Colorado  
Energy Office



# FISCAL YEAR 2012 / 2013 ANNUAL REPORT



## Content

---

Department Vision	4
Letter from the Director	5
Executive Summary	6
Key Initiatives	7
Residential Buildings Program	8
Energy Performance Contracting	10
Greening Government	12
Finance	14
Weatherization	16
2013 Legislative Summary	18
Energy Assurance Emergency Plan	19
The Year Ahead	20



# Department Vision

The vision of the Colorado Energy Office (CEO) is to promote sustainable economic development in Colorado through advancing the State's energy market and industry to create jobs, increase energy security, lower long-term consumer costs, and protect our environment.

# Letter from the Director

Welcome to the Colorado Energy Office's annual report for fiscal year 2013. Let me take this opportunity to introduce myself to you and acquaint you to what else is new at the Colorado Energy Office.

In April 2013, I stepped into the role of Executive Director of CEO. The Office and I both are anchored in energy efficiency, particularly delivering it into under-served segments such as public buildings and low-income residences. Enclosed you will find updates on our nationally recognized Energy Performance Contracting program targeting public buildings as well as our Weatherization Assistance Program (WAP).

The Colorado Energy Office is fortunate to have a clear and comprehensive mission, thanks to the efforts of the 2012 General Assembly in passing HB-1315. That law directs CEO to:

- Sustain the Colorado energy economy and promote all Colorado energy;
- Promote economic development in Colorado through energy-market advances that create jobs;
- Encourage Colorado-based clean and innovative energy solutions that include traditional, clean, and renewable energy sources in order to encourage a cleaner and balanced energy portfolio;
- Promote energy efficiency;
- Increase energy security;
- Lower long-term consumer costs; and
- Protect the environment.

The work of CEO is rooted in this mission, which we are actively pursuing through two channels:

- (1) Promoting innovative production across all resources, and
- (2) Pursuing all cost-effective energy efficiency in all sectors of the state's economy.

The enclosed information is our report on how we are progressing toward these objectives. We are building a foundation that supports an all-of-the-above approach to energy in the pursuit of a vision that well serves all of Colorado. Through our success, Coloradoans will experience increased economic prosperity and improved public health, while continuing to reside in a healthy natural environment.

Thanks for your interest,

*Jeffrey Ackermann*



# [Executive Summary]

The CEO was restructured under House Bill 12-1315 to enable the State's energy office to build on Colorado's national reputation as a leader in clean energy and energy innovation, and enhance the ability to support private sector job creation not only in the renewable energy sector but also in some traditional sectors like natural gas.

The office has been reorganized into four areas: Policy; Programs/Initiatives; Weatherization Assistance Program; and Communications.

The Policy area team conducts legislative analysis, facilitates regulatory reform, and engages in research initiatives in support of the CEO's mission. Often this work is the impetus for CEO's initiatives.

The Programs/Initiatives area manages programs and contracts in support of the CEO's mission - supporting residential, commercial, industrial and agricultural energy efficiency; improving the efficiency of State government operations; promoting Energy Performance Contracting (EPC) in the public and private sectors; reducing market barriers to energy investment; and partnering with the Office of Economic Development and International Trade (OEDIT) to improve the vitality of Colorado's energy market.

The Weatherization Assistance Program provides comprehensive energy efficiency retrofits aimed at reducing energy consumption and lowering energy costs for low-income households throughout all 64 counties of Colorado. The program utilizes a combination of Federal, State and utility funding to provide these no-cost retrofit services to households meeting an annual income requirement of 200% or less of the federal poverty level. The CEO delivers the program services through contracts with nine regional nonprofit and governmental weatherization service providers who conduct the actual energy retrofits. The CEO coordinates the funding sources, establishes the performance standards, conducts technical and administrative training and conducts compliance reviews of the service provider agencies.

The Communications area supports the CEO mission through strategic messaging by providing energy information to remove market barriers. These efforts help to narrow the energy knowledge gap through the timely management of two websites, social media and supporting the implementation of programs and initiatives.

# [ 2013 Key Initiatives ]

01

Supporting compressed natural gas (CNG) as an alternative transportation fuel with the signing of both a multi-state and intra-state MOU to support the purchase of CNG vehicles in fleets.

02

Expanding the electric vehicle charging infrastructure.

03

Commissioning market valuation studies to promote the inclusion of energy efficiency and renewable energy investments in residential real estate market transactions.

04

Expanding the EPC skills and knowledge into new market segments.

05

Continuing to promote sustainable business practices in state government through the Greening Government program.

06

Establishing a portfolio of Colorado-grown energy technology demonstration projects that promote all sectors of the state's advanced energy economy.

07

Continuing to reduce market barriers in the energy efficiency/renewable energy markets through Energy Star Mortgages, a Revolving Loan Fund and supporting implementation of the 2013 "Commercial Property Assessment for Clean Energy (C-PACE) legislation.



# Residential Buildings Program

The Residential Buildings Program promotes the importance of energy efficiency in residential properties and encourages Coloradans to reduce their energy consumption (and lower their utility bills) in both newly constructed and existing homes. In the past fiscal year significant progress was made in the home buying and selling process to identify the value of energy efficiency measures at the time of sale. The CEO has worked with industry partners to remove barriers that have prevented efficiency upgrades from being recognized as an important selling point in the real estate market.

## Residential Buildings Program Successes



**115**   
Appraisers Trained

**140**   
Home Inspectors Trained



The Multiple Listing Service (MLS) is a tool used by real estate brokers to assist clients in the buying and selling process of their homes. Information about the home is entered into the listing and until recently there have been no fields for renewable energy and energy efficiency upgrades. The CEO provided grant funding to improve the MLS database adding the energy upgrade fields. This phase of the Green MLS Initiative was completed in FY12/13 with over 95% of the homes statewide now covered. As part of implementing the fields, the Residential Buildings Program staff continued to educate all stakeholders in the real estate process - including but not limited to real estate brokers, appraisers, and home inspectors – on the benefits of adding these upgrades to a home's sale listing.

In FY23/13 the CEO spent \$19,150.00 on 8 training sessions for real estate stakeholders and organized 11 other training events for real estate stakeholders.

115 Appraisers were trained through the Appraisal Institute Green Building Valuation Development Program.

Trainings were held at 12 of the 37 Boards and Associations of Realtors throughout Colorado training a total of 324 stakeholders.

140 home inspectors participated in 3 training sessions that incorporated a 1st level energy report into the regular home buying inspection process.

To better understand the effect renewable energy and energy efficiency upgrades have on home buying and valuation, the CEO signed an MOU with the Appraisal Institute and Colorado Coalition of Appraisers to develop valuation studies and provide education. As a result of this effort, the CEO released the first of a series of valuation studies, *The Impact of Photovoltaic Systems on Market Value and Marketability*.

The CEO completed an Energy Code Compliance study that showed great progress in residential code compliance (above 90%). It did, however, highlight a need to continue to train contractors on right-sizing equipment and promote the HERS Index Rating as a measure of Energy Code Compliance.





## CASE STUDY: Energy Saving Mortgage Program

CEO played an important role in the development and passing of HB13-1105, known as the Energy Saving Mortgage Program. The program has two main goals:

1) educate private lenders to help them understand the role of energy efficiency within the home buying process

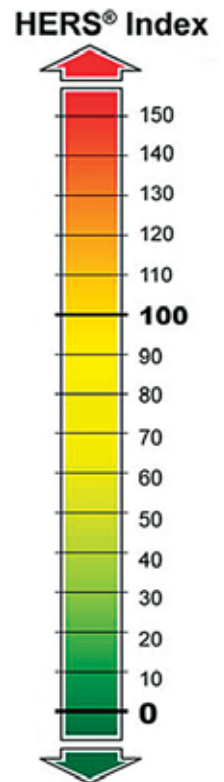
2) offer mortgage incentives for Colorado home buyers who purchase a high performing new home (homes that score 50 or below on the HERS Index's) and for home owners who retrofit their current home.

The Home Energy Rating System (HERS) Index is a measure of home energy use that was developed in conjunction with the mortgage industry and is similar to a mile per gallon rating on a car. The Index has a reference point of 100, which is a home built to the 2006 International energy conservation code. For every point reduced, energy use is reduced by 1%. So a home built to 50 on the HERS Index is 50% more efficient

than the reference home. A home that scores a 0 means they produce as much energy on-site as they use in a year and is generally called in the industry a net-zero home. For reference, 60% of all new homes in Colorado receive an average HERS Index score of 63 on the scale.

The Energy Savings Mortgage incentive is based on a tier where the lower the score, the greater the benefit. A homeowner can earn up to \$8,000 for a home that scores less than 10 on the HERS Index scale or a near net-zero home. The program's goal is to help people understand the HERS Index rating and to also encourage the construction of better performing homes.

For existing homes, the program concept is the same: the more efficient a home is the greater the incentive, except the maximum a homeowner can earn is \$6,000. The opportune time to retrofit a home and make it more comfortable, durable, healthier and less expensive to own is at the time of purchase.



# Energy Performance Contracting Program

Energy Performance Contracting (EPC) is a financing mechanism used to pay for energy and water efficiency improvements through a Energy Service Company (ESCO) that is then paid back through the annual energy and water savings realized by these upgrades. The CEO provides technical assistance to public agencies, helping them navigate the process and ensuring that the service providers maintain the highest level of quality. Furthermore, the CEO actively provides education and outreach on the components of EPC, works closely with our 17 Pre-Approved ESCOs, and sets industry standards on processes and contract documents.

## Private EPC Pilot

In FY12/13, the CEO received a grant award from the U.S. Department of Energy to take the lessons learned from the public sector EPC program and pilot a private sector program. The CEO signed contracts with seven private entities including banking, ski resorts, industrial and community associations. The program will run through June 2014 and will conclude with a series of recommendations on how to advance private sector EPC.

## EPC Program Successes

In FY12/13 the EPC program completed 16 projects in 13 different counties, totalling \$39,200,00 in construction costs. Those costs produced the following savings:

### COMPLETED CONSTRUCTION

- 16 projects in 13 different counties
- \$39,200,000 million in construction completed
- 426 job years\*\* created\*
- 17.6 million kwh saved and 12,500 therms of natural gas saved annually\*
- \$2.5 million in annual cost savings (energy, water, operations and maintenance)\*

### UNDER CONSTRUCTION (END OF FY 13')

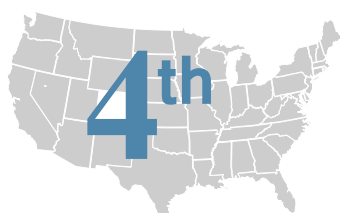
- 17 projects in 14 different Counties
- \$68 million in construction
- 740 job years\*\* created\*

\* (approx.)

\*\* (one job year equals enough work for one person to work full time for a year)



At the end of FY 12/13, the EPC program achieved a national ranking of 4th in the country for total construction completed at \$334 million and 7th in the country for construction completed per capita at \$66.41 per Coloradan.



TOTAL CONSTRUCTION COMPLETED



CONSTRUCTION COMPLETED PER CAPITA



## CASE STUDY: Durango School District 9-R

Durango School District 9-R pursued an energy performance contract to improve the energy efficiency of their buildings. Construction was completed in June 2013. The following are the metrics associated with the project.

### COST SAVINGS

- Annual utility savings (first year): **\$230,663**
- Annual O&M savings: **\$19,732**

### UTILITY SAVINGS AND ENVIRONMENTAL BENEFITS

- Annual electricity savings (kWh): **1,628,426**
- Annual electric demand savings (kW): **4,904**
- Annual natural gas savings (therms): **34,106**
- Annual water savings (kgal): **11,407**
- Propane savings (gallons): **2,052**
- Carbon dioxide reductions: **1,608** metric tons of CO<sub>2</sub> emissions per year
- Equals the annual GHG emissions from **335** passenger vehicles

### Financing

- Total installed cost: **\$3,147,515**
- Rebates: **\$95,212**
- Financed amount: **\$3,052,303**
- Term: **13.25 years**

### Facility Improvement Measures Installed:

- Staged boilers
- Pumps
- Upgraded building automation controls
- Retro-commissioned Durango High School
- Added freeze protection and control safeties
- Added variable frequency drive (VFD) to cooling tower fan
- Installed high efficiency T8 and T5HO lighting systems and lighting controls
- Scheduled DHW recirculation pumps
- Sealed, caulked and weather stripped to reduce infiltration in building envelope
- Installed vending machine controls
- Installed low-flow faucets, toilets, urinals and shower heads
- Installed a weather-based control system to reduce irrigation water usage



# Greening Government Program

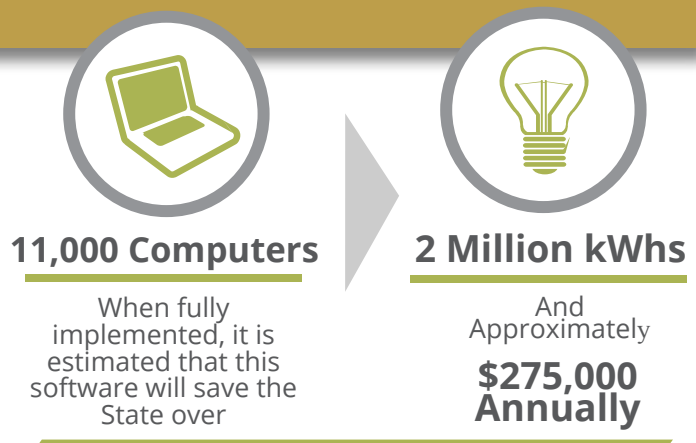
“The Greening Government Program reduces energy and water consumption in Colorado state government by administering effective energy efficiency programs that both save money and protect the environment.” - Governor John Hickenlooper

In 2005 the Greening Government Council was established to enhance energy efficiency and sustainability and save taxpayer dollars in state government. The Council includes representatives from State agencies and departments, each responsible for the oversight and management of a variety of programs that include reducing energy, water, paper, and petroleum consumption, and/or increasing the use of recycling, composting and renewable energy. The CEO provides leadership to the Council and Program and manages the program overall.

## GREENING GOVERNMENT PROGRAM HIGHLIGHTS

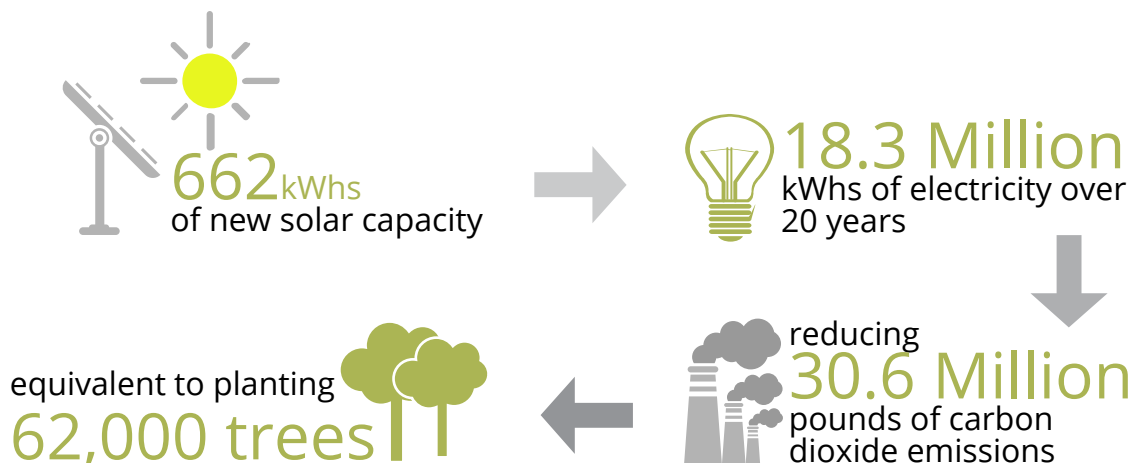
### The Big Fix

In FY12/13 the CEO provided a grant to the State’s Office of Information Technology (OIT) to install the Big Fix Power Management Software on approximately 11,000 state-owned computers. This software is a comprehensive power control tool designed to reduce energy use by turning off inactive computers, even for short periods of time. In the past most State computers were left on 24/7.



### Solar Benefits Colorado

The State partnered with the City and County of Denver and Colorado Federal employees on the *Solar Benefits Colorado*, a program designed to pool employee buying power for significant discounts (~25%) on the installation of solar energy systems on their homes. 119 public employees signed contracts totaling more than:

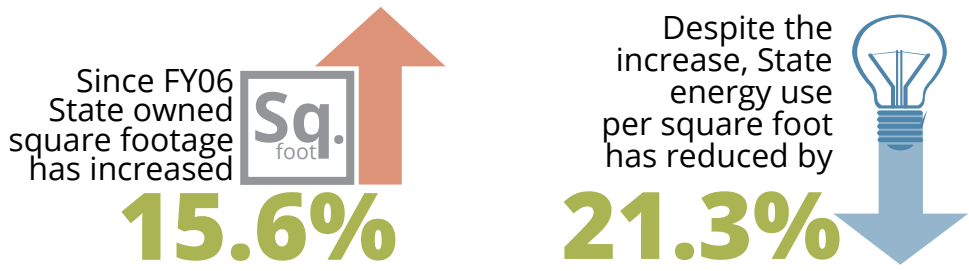




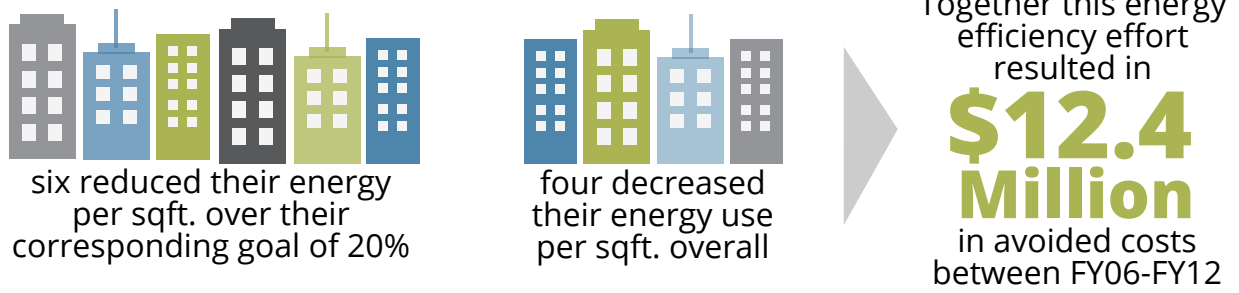
## CASE STUDY: Greening Government Annual Report

In FY12/13, the CEO led a full analysis of how each State agency performed towards the goals set from FY06 - FY12. The goals required a reduction of energy, water, paper, greenhouse gas emissions, and petroleum use between FY06 and FY12.

One notable example is the reduction in energy use:



Out of the 14 agencies and departments that own their buildings:



# Finance Program

The CEO Finance Program houses two financial assistance mechanisms designed to address one of the major barriers regarding energy efficiency and renewable energy adoption: access to capital. These mechanisms resulted in approximately \$20 million in capital being injected into Colorado's economy in FY12/13.

## REVOLVING LOAN FUND

The Revolving Loan Fund (RLF) is designed to provide essential capital to early-stage companies and commercial projects utilizing innovative energy technologies that are incapable of accessing capital from traditional sources. The idea is to provide these companies and projects the funding required to deploy and commercialize innovative energy technologies in an effort to create jobs and spur traditional lenders to fill these finance gaps in the future.



## QUALIFIED ENERGY CONSERVATION BONDS

Qualified Energy Conservation Bonds (QECBs), are a federally subsidized debt instrument that can be used to finance a wide array of energy related applications, such as green community programs, grants to support research in emerging energy technologies, and public education programs.

In FY 12/13 \$6.650 Million in QECBs were issued and closed out.

The CEO also allocated \$8.087 Million QECBs to support a variety of energy conservation projects, making Colorado top 3 in the country in terms of QECB utilization rates.







## CASE STUDY: Commercial PACE

Senate Bill 13-212, received bi-partisan support and was signed into law by Governor Hickenlooper on May 28, 2013. The bill which is referred to most commonly as Commercial PACE (C-PACE), is an innovative way to finance energy efficiency and renewable energy upgrades to commercial buildings. Property owners who are interested in C-PACE receive 100% financing up front and are given a longer duration for repayment compared to conventional financing options. By connecting energy improvement costs to a property assessment, C-PACE allows commercial building owners to pass the savings on to tenants who receive savings on their utility bills. C-PACE represents a valuable financing toolkit for commercial property owners, reducing a significant barrier for energy project implementation.

### How it Works

C-PACE uses the existing public-sector structures of improvement and assessment districts to create a voluntary statewide district for funding energy projects. If counties choose to opt-in to the district, commercial property owners will be able to access a valuable new tool that will improve access to financing in Colorado.

A commercial property owner will first allow a property assessment to be placed on a property in order to finance energy improvements. The debt that is then issued to finance the energy improvements is secured by a property lien that is senior to all commercial liens on the property, including mortgages. The existing property tax collection system is then used to collect the debt payments from the property owner and repay the project costs.

# Weatherization Assistance Program

In partnership with local agencies and the U.S. Department of Energy, CEO offers a free Weatherization Assistance Program to Colorado's low-income residents, giving them the opportunity to access cost-effective energy efficiency services through its Weatherization Program. This program gives eligible residents the ability to save money on their energy bills by implementing energy efficiency measures.

Weatherization is a blanket term for a variety of measures that improve the energy efficiency of your home. These cost-effective improvements and upgrades will reduce energy usage, saving money while improving the comfort of a home year round.

## Weatherization Assistance Program FY 12/13 Successes



**3,988**

homes were weatherized  
affecting over **8,808** individuals  
in all **64** counties

over 51,000 improvement measures were  
completed on those homes, including

**1,229**  
Furnaces  
Replaced

**884**  
Furnaces  
Repaired

**464**  
Water  
Heaters  
Repaired

**211**  
Water  
Heaters  
Replaced



Refrigerators  
Installed

**1,380**

**2,234**  
low flow  
shower heads  
installed in  
**1,965**  
homes

**44,737**  
CFL's  
Installed  
in  
**3,018**  
homes



## CASE STUDY: Weatherization Assistance Program

Even though David Holzworth didn't qualify for utility bill payment assistance from the Low-income Energy Assistance Program, he did qualify to receive free weatherization services through the CEO's Weatherization Program. "For people in the lower income bracket, the free services are a godsend" David said. "People can't afford to have this stuff done."

When David applied for the energy upgrades to his Westminster home, he was primarily interested in having new insulation installed in the attic, and wanted the walls to be inspected, too. "The insulation perked my interest the most. I figured the more insulation, the lower the utility bills would be in the future. My wages aren't going up," he says, estimating he's been paying an average of \$160 per month on the gas and electric bill.

The weatherization crew inspected the 1978 ranch home, insulated the attic and the crawlspace, and secured a vapor barrier throughout the crawlspace to keep moisture out. They also sealed the ductwork to help ensure proper heated air delivery and made adjustments to the furnace, installed smoke/carbon monoxide detectors, and mounted several CFL light bulbs.

Already David says he's noticed a difference. "The furnace is running differently – not as often or as long. And the insulation is keeping the cold air out." This summer, he says he expects the insulation to keep the cooler air in.



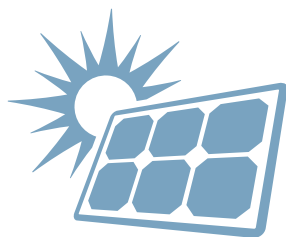
# 2013 Legislative Summary

The term policy refers to laws and regulations which can both encourage and impede the advancement and growth of a state's energy economy. The mission of the CEO as outlined in HB1315 is to promote all areas of the energy sectors and to be aware of opportunities and barriers that will effect its growth.

The CEO supported the 2013 legislative session by providing bill analysis and fiscal notes, conducting stakeholder meetings, and working closely with legislators to provide information and data on energy technologies and industries. The highlights of the 2013 session are as follows:



- Supported 13 Senate bills and 6 House bills,
- Monitored/analyzed 11 Senate bills and 13 House bills,
- Opposed 1 Senate bill,
- **15 bills passed resulting in:**



**500MW** of new renewable energy

4 bills improving energy efficiency of public buildings and vehicles



Lowered tax/regulatory/legal barriers to the adoption of at least **5** new technologies.



**3** innovative financing mechanisms

Improved tax credits & incentives resulting in nearly

**\$15 Million** in tax credits



## Colorado Energy Assurance Emergency Plan

The CEO, in conjunction with the Colorado Public Utilities Commission and the Colorado Division of Homeland Security and Emergency Management, released the Colorado Energy Assurance Emergency Plan (CEAEP), a resource for the State of Colorado in preparing for, responding to and recovering from an energy sector power failure or electric power outage event. With the growing importance of computerized communication, such outages have become more than an inconvenience; based off a Department of Energy study it is estimated that a statewide energy disruption could cost Colorado 19 to 49 million dollars of lost economic activity for every hour of outage.

Over the last two years the CEO and its partners convened stakeholders from all levels of government and the energy community to identify possible threats to energy production and delivery in Colorado.

The group developed a clearer understanding of the vulnerabilities and interdependencies across the energy sector and how they relate to emergency management preparedness, response and recovery. Special attention was paid to cyber networks, which remain especially vulnerable to outside manipulation, and geomagnetic storms.

CEAEP sets forth the roles and responsibilities of the various state agencies in responding to energy emergencies. Through preparation and testing this plan, Colorado is better prepared and more able to assist systems and communities in emergency recovery.

# In The Year Ahead (FY13/14)

The CEO continues to address the gaps in the market concerning the pursuit of cost-effective investments in energy efficiency and has targeted several priorities for FY14.

**We will continue to advance our mission by:**

- Assisting Coloradans in income-limited households through our Weatherization Assistance Program.
- Provide real estate professionals (realtors; appraisers; building code officials) the training, information and tools needed to fully incorporate the value of energy efficiency/renewable energy.
- Increase the availability of capital for energy improvements for residential and commercial properties.
- Diversify the transportation fuels available and in use in Colorado by:
  - Assessing and responding to issues impeding the market growth of electric vehicles.
  - Expand the CNG fueling infrastructure along interstate highways, and expand the availability and usage of CNG vehicles in the state fleet.
- Promote the further development of the state's energy economy, across all sectors
  - In partnership with the Office of Economic Development and International Trade (OEDIT) and Department of Natural Resources (DNR), we are engaging representatives of the energy industry in an analysis of the energy economy. From this work we will identify near-market ready energy technologies/innovations in Colorado, facilitate partnerships and promote their development.
- Provide leadership for the continuous improvement of Colorado's energy policies by:
  - Effectively engaging in Public Utilities Commission (PUC) proceedings, promoting decision making that promotes sustainable development of the state's energy economy, lowers long-term consumer energy costs and protects the environment.
- Deliver energy efficiency services into under-served parts of the State.



