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Office of Governor Jared Polis

Dominique Gómez | Dominique.Gomez@state.co.us | 720-751-1179

Colorado Energy Office Releases Research Findings on Impacts of Community Scale Residential Energy Retrofits

DENVER – Wednesday Apr. 6, 2022 - The Colorado Energy Office (CEO) today announced the release of phase one research results from the Colorado Residential Retrofit Energy District (CoRRED) project, funded by a U.S. Department of Energy (DOE) State Energy Program competitive award. CoRRED is led by the CEO in collaboration with DOE's National Renewable Energy Laboratory (NREL), RMI (formerly Rocky Mountain Institute), and Xcel Energy.

In phase one of the project, the CoRRED team created a model for evaluating the potential of integrating energy efficiency retrofit measures, distributed energy resources (DERs), and electrification at a community scale, in an existing residential neighborhood. The goal was to explore the benefits to both customers and the grid in an effort to provide greater affordability, resilience and reliability to meet Colorado's energy and climate goals.

CoRRED used the Central Park neighborhood in Denver, Colo. as the basis for district-scale modeling, and looked at three scenarios:

- Mixed (electric and gas) energy sources with conventional energy efficiency retrofits.
- Electrification and energy efficiency retrofits with and without DERs (i.e. battery systems, solar power).
- Electrification without energy efficiency retrofits.

Highlights of the results include:

- Combining electrification with DERs and energy efficiency lowers carbon emissions and the monthly utility bill.
- Community-level electrification increases the electric distribution system load and stress unless distribution feeders are designed to handle proper loads.
- Additional analysis and simulation, with field demonstration projects, are needed.

The full CoRRED phase one report can be found [here](#), and a webinar summarizing results can be found [here](#).

Governor Polis is addressing Colorado’s climate crisis through a **[bold vision to reach 100 percent renewable energy by 2040](#)** and meet science-based targets for reducing GHG pollution. These aggressive goals include a reduction of greenhouse gas (GHG) emissions by 50% by 2030 and 90% by 2050 (relative to 2005 levels). In addition, Xcel Energy has committed to an 80% carbon-free electricity system by 2030 and 100% by 2050.

To meet these goals, emissions generated by the buildings sector must be addressed. Buildings are a huge contributor to GHG and energy use in the U.S. with 21% of energy use originating from homes. The average single-family house emits 17,000 pounds of CO2 emissions per year, comparatively 70% more than the annual emissions of an average passenger vehicle.

Buildings—especially when considered as whole communities or “energy districts” instead of individually—present a significant opportunity for GHG and energy use reductions to contribute to Colorado’s energy and climate goals. District-scale reductions are more cost-effective for utility programs and consumers, and provide better energy reliability and affordability to our communities.

As the electricity sector makes major strides toward high levels of renewable energy generation, beneficial electrification of buildings will play a key role in reducing fossil fuel consumption and its associated GHG emissions. Replacing equipment and appliances that burn natural gas, propane, fuel oil, gasoline or diesel fuels with energy-efficient electric technologies reduces GHG emissions in the near term. However, this transition also raises new technical, regulatory and financial questions for policy makers, and utility energy efficiency program operators. CoRRED was funded to address these issues.

In phase two, CoRRED will conduct a field demonstration in an existing neighborhood and will refine these models using data from actual homes and the electrical infrastructure that serves them.

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About the Colorado Energy Office

To deliver on the vision of a prosperous, clean energy future for Colorado, the Colorado Energy Office works to reduce greenhouse gas emissions and consumer energy costs by advancing clean energy, energy efficiency and zero emission vehicles to benefit all Coloradans. Go to colorado.gov/energyoffice to learn more.