

TECHNOLOGY BRIEF ►►► DEEP RETROFIT OF MULTIFAMILY HOUSING*

By Justin Brant



* Funding for the preparation of this Technology Brief was provided by the U.S. Department of Energy through Contract No. 388283 between SWEEP and the Pacific Northwest National Laboratory.

Multifamily housing has long been identified as a challenging market for energy efficiency with numerous barriers, including split incentives between the building owner and tenant, lack of access to financing, and dispersed and/or complex building ownership. In addition, to meet long-term greenhouse gas reduction targets, substantial improvements in the energy efficiency of both new and existing buildings are needed. A new SWEEP technology brief provides a case study of a Deep Retrofit of Multifamily Housing program in Utah. This program is achieving significant reductions in energy usage in multifamily housing while promoting the large-scale adoption of high efficiency heat pumps and heat pump water heaters (HPWHs). Over 4,000 heat pumps and HPWHs were installed as of October 2019.

To meet long-term greenhouse gas reduction targets, substantial improvements in the energy efficiency of both new and existing buildings are needed. While end uses, such as heating, hot water, and cooking, which have traditionally been fueled with natural gas, must be converted to run on electricity and powered with clean energy sources.¹ Since 2018, Rocky Mountain Power in Utah has implemented a Custom Multifamily program to incentivize deep energy retrofits in both market-rate and low-income multifamily properties, while providing opportunities to electrify these properties.

PROGRAM OVERVIEW The Custom Multifamily program provides energy efficiency services for entire buildings both new and existing. The program serves low-income and market rate market segments. Multifamily properties with four or more units receive incentives for energy-efficiency upgrades for appliances, building shell, HVAC, lighting, weatherization, and water heating. Lighting must account for less than 30% of total energy savings for each project. Rocky Mountain Power provides an incentive of \$0.25/kWh saved (first year energy savings) for market rate properties and \$0.30/kWh for low-income properties. Incentives are paid using a pay-for-savings approach where projected savings serve as the basis for incentive payments.

PROGRAM DELIVERY Rocky Mountain Power's program contractor, ICAST², provides a one-stop shop for building owners. ICAST's engineers look at the whole property and provide property owners with a comprehensive list of energy efficiency upgrades. ICAST provides financing options for building owners, can lead to a positive cash flow, and the company has a team of contractors to ready to install upgrades in new and existing buildings. ICAST works with building owners throughout the process, including coordinating rebate payments.

ELECTRIFICATION As of October 2019, the program has installed heat pumps for heating and cooling in approximately 3,200 housing units, with a pipeline to more than double that number. The program has also installed heat pump water heaters in approximately 1,000 units of new construction.³ In Utah, electrification has become standard practice in new multifamily buildings to avoid natural gas access fees, the relatively high cost of natural gas appliances and venting infrastructure, and in some cases ductwork. For existing buildings, the program has incentivized the replacement of electric resistance heating with heat pumps and the replacement of aging natural gas boilers and air conditioners with heat pumps.

PROGRAM PERFORMANCE

Year	Program Savings (MWh/yr)			Benefit/Cost Ratio (UCT)
	New Construction	Retrofit	Total	
2018	2,208	2,154	4,362	1.96
2019 (est)	4,800	3,800	8,600	NA

¹ Williams, J.H. et. al. Pathways to deep decarbonization in the United States. Revision with technical supplement, Nov 2015. Available at: <http://usddpp.org/downloads/2014-technical-report.pdf>

² ICAST is a non-profit organization based in Colorado. www.icastusa.org.

³ Ravi Malhotra, President of ICAST, personal communication.

CASE STUDY: STANSBURY CONDOS

PROPERTY Market-rate owner-occupied property with 72 units.

PROJECT DESCRIPTION Replaced natural gas fired central boilers and chillers with 75 cold climate heat pumps. This old and inefficient system had high repair and utility costs. Project financing was provided by ICAST.

ANNUAL ELECTRICITY SAVINGS 299,581 kWh

ANNUAL UTILITY COST SAVINGS \$35,950

PROJECT COST \$399,800

PROJECT PAYBACK 9 Years (after rebate)

UTILITY CASH REBATE \$75,895



CASE STUDY: 556 23RD APARTMENTS

PROPERTY 28-unit affordable housing property

PROJECT DESCRIPTION Replaced electric resistance heating with ductless heat pumps while upgrading insulation, installing LED lighting and adding programmable thermostats. As a result, the comfort and health of tenants improved.

ANNUAL ELECTRICITY SAVINGS 130,926 kWh

ANNUAL UTILITY SAVINGS \$15,056

PROJECT COST \$119,596

PROJECT PAYBACK 5 Years (after rebate)

UTILITY CASH REBATE \$39,278



For more information contact Justin Brant: jbrant@swenergy.org

Justin Brant is a Senior Associate in SWEEP's Utility Program, where he works with utilities and consumer groups to advance energy efficiency in SWEEP's six-state region.