

Utilization Technology Development NFP (UTD) is a not-for-profit, utility-directed scientific research organization established in 2004. Utilities participating in UTD serve more than 35 million gas customers in North America.



# SHAPING THE ENERGY FUTURE WITH CLEAN, EFFICIENT AND SAFE END-USE GAS TECHNOLOGIES

## Benefiting End Users and the Environment

### LOWER COSTS, ENERGY USE & GHG EMISSIONS

New high-efficiency gas technologies save money for ratepayers by reducing energy use/costs while reducing GHG emissions. More competing products reduce upfront costs.

### ENHANCE SAFETY, RESILIENCY & RELIABILITY

Self-powered and integrated systems fueled by underground gas delivery support 24/7 operation. Testing of hydrogen-rich or other fuels and products advance end user safety.

### INTEGRATE MORE RENEWABLE ENERGY

More RE is integrated via new technologies that increase use of Renewable Natural Gas or natural gas enriched with RE-derived hydrogen, and hybrid gas/electric systems.



Energy savings of about 1.5 billion therms/year (7.9 mtpa CO<sub>2eq</sub>/year) will occur if 10% of the estimated 53 million warm air furnaces in the U.S. are converted to gas-fired heat pumps. UTD's efforts to technically develop gas absorption heat pumps in partnership with OEMs, coupled with key laboratory and field testing, accelerated the introduction of residential GHPs in N.A.



UTD advanced the development of a unique new high temperature energy storage technology in partnership with U.S. DOE ARPA-E and others to capture, store and re-use renewable energy or waste heat. Recovering just 3% of the 41 quads of energy rejected to the environment by U.S. industrial, commercial and electric generation sectors would save 65 mtpa CO<sub>2eq</sub>/year.



Energy savings of about 1.1 billion therms/year (5.7 mtpa CO<sub>2eq</sub>/year) will occur if 10% of the estimated 15 million RTUs in the U.S. achieve condensing vs. non-condensing efficiency. UTD's efforts to technically develop condensing heating modules in partnership with OEMs, and early cRTU field trials, were foundational to cRTUs becoming available in N.A.



UTD's efforts to technically develop 6.7L, 9L and 12L natural gas engines with Cummins Inc. were key to enable the low-carbon renewable natural gas market to develop, achieve near-zero criteria air pollutant emissions, and reduce fuel costs. In 2023 alone, total NOx emissions were reduced by about 120,000 lbs, and RNG was used in 79% of all on-road NGV fuel.



Royal Range's high-efficiency RHEF-45 and RHEF-75 fryers were developed with technical support from UTD. Independent testing demonstrated 63% and 72% heavy-load cooking energy efficiency, respectively. Improving the efficiency of estimated 1.2 million gas-fired deep fryers in N.A. from 45% to 63% would save about 650 million therms/year (3.4 mtpa CO<sub>2eq</sub>/year).

## Benefiting Utilities

### SPEED MARKET TRANSFORMATION

Expand and diversify the range of new products and technologies offered to customers and supported by Energy Efficiency, Emerging Technology, and Market Transformation programs.

### ADVANCE A LOWER CARBON FUTURE

Bring new gas solutions to your customers in a lower-carbon future, including advancing Hydrogen and Renewable Natural Gas, to address GHG reduction and environmental goals.

### LEVERAGE COLLABORATIVE INSIGHTS

Gain insights, perspectives, ideas and contacts from other leading utilities by collaborating with them to address gas-focused technology developments and opportunities.

### SUPPORT LEADING CUSTOMERS

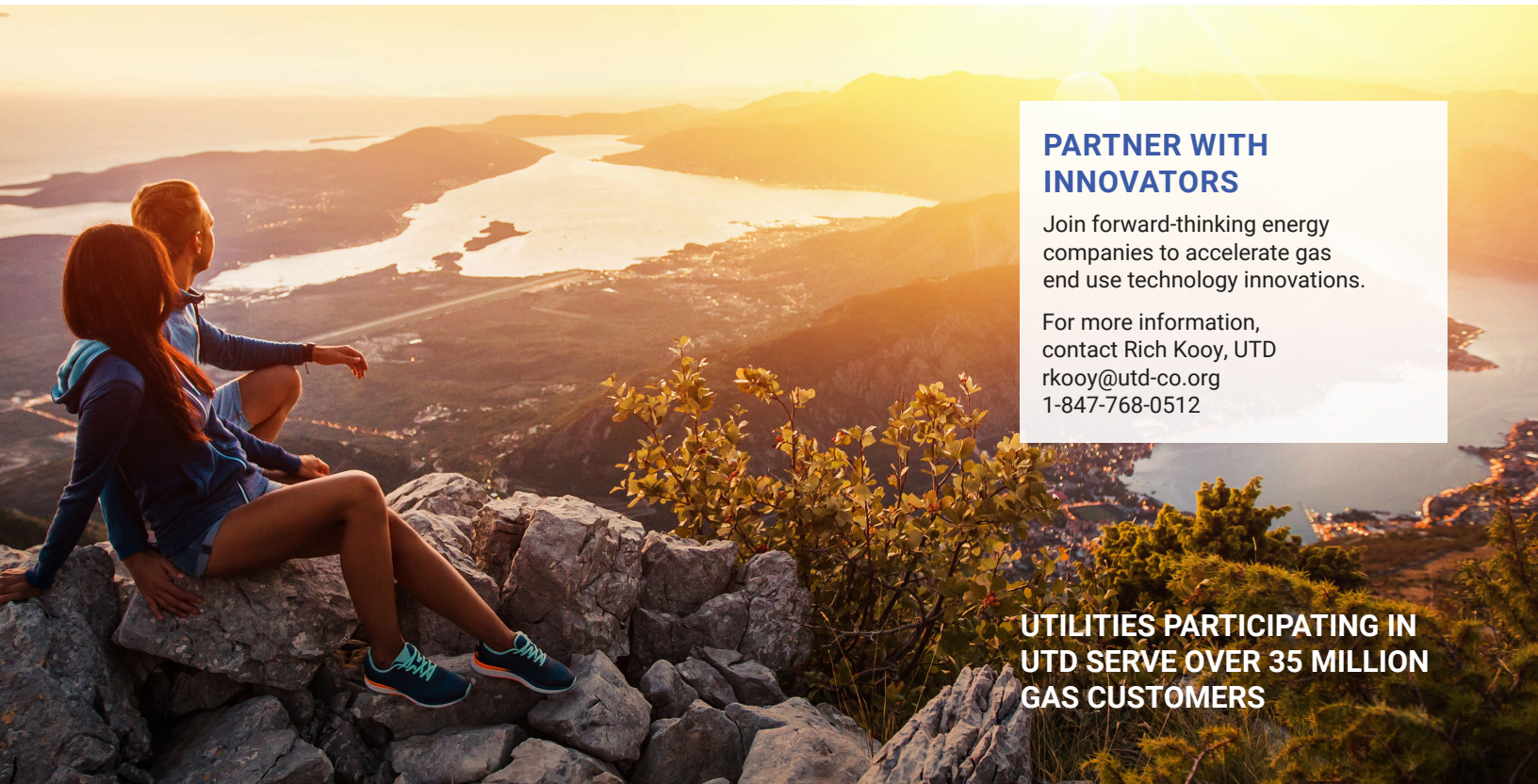
Position your customers to be early adopters of new technologies to address environmental challenges while retaining economy, resiliency and reliability.

### GAIN A DIVERSE R&D PORTFOLIO

Fund specific technology development efforts of greatest benefit to your customers and your service territory, but access all of UTD's research results to benefit all of your customers.

### MULTIPLY YOUR R&D RESOURCES

Allocate your own financial resources but combine them with other utilities to take on big challenges and reduce total R&D costs—often providing co-funding for government R&D grants.



### PARTNER WITH INNOVATORS

Join forward-thinking energy companies to accelerate gas end use technology innovations.

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**UTILITIES PARTICIPATING IN UTD SERVE OVER 35 MILLION GAS CUSTOMERS**