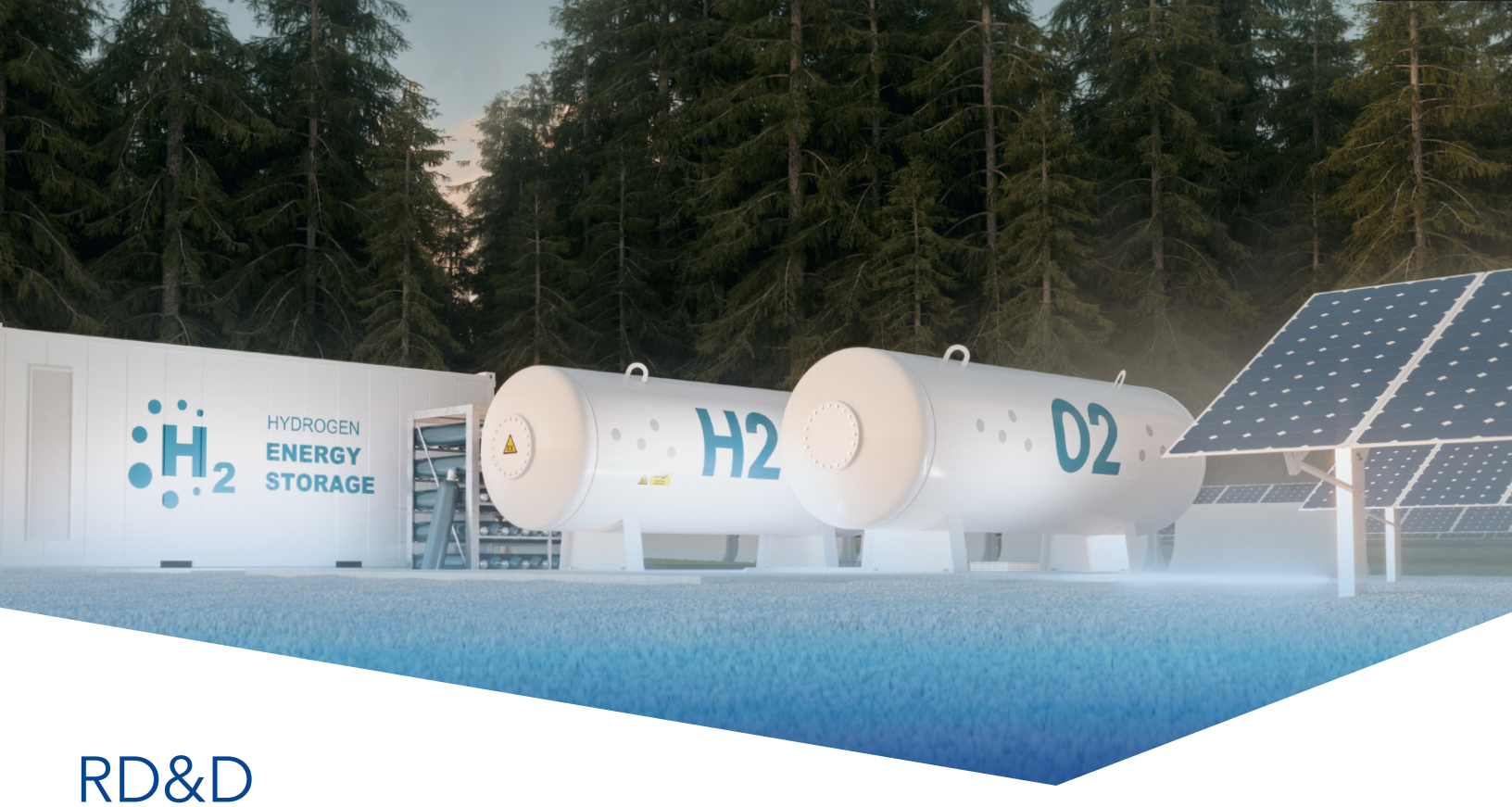

RD&D
COMPLETED PROJECTS

JULY 2023

SUMMARIES FOR ALL PROJECTS COMPLETED IN THE LAST QUARTER

Alternative Caps for PE Service Tees (5.16.b)

Program: Gas Operations
Sub-Program: System Design & Materials

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Improved Affordability, Operational Efficiency

Duration
February 15, 2016 to April 26, 2023

Total Project Cost
$112,400

Total SoCalGas Cost
$32,115

Total Co-Funding
$80,285 by OTD Members

The objective of this project was to develop an alternative cap design for polyethylene (PE) tapping tees. The alternate cap design enables the PE cap to be fused onto the tapping tee tower rather than having a cap that threads onto the tapping tee tower. A threaded cap has more potential for leakage due to inadequate O-ring seal engagement. A fused cap decreases the risk of leakage. Developing a fusion cap and tapping tee assembly has limitations, and the fitting developer requires alignment tools for performing socket fusion on the tee tower. Due to the cost of alignment tools needed for the operation, and the limitations in the original design, the project team decided to pursue a different design. The team developed a new concept involving electrofusion cap, but this design needs to be tested and verified. Due to limitations in the initial design aspect, sponsor needs, and manufacturers participating in the project, it was recommended to close out this project and start a new project to evaluate new designs with additional manufacturers. Therefore, this project concluded as a proof of concept for heat fusing a cap as an alternate method for installing service tees. SoCalGas can use the knowledge gained from the evaluations and concepts discussed in this project to determine the need for an alternate design option.

SoCalGas™

Arthur D Little Turning Ontario Airport into a Hydrogen Ecosystem Assessment

Program: Clean Transportation
Sub-Program: Off-Road

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Improved Affordability

Duration
August 31, 2021 to February 10, 2023

Total Project Cost
$409,500

Total SoCalGas Cost
$409,500

The assessment examined developing a hydrogen ecosystem at Ontario International Airport (OIA) to support the growth of zero-emission regional and shorter-range aviation and transportation from 2030. The project analyzed the total energy demand and fuel consumption to support zero-emission aviation and transportation, addressed opportunities and challenges for the deployment of electric and hydrogen aircraft and vehicles, and identified associated infrastructure needs to support the growth of zero-emission transportation (electric grid, hydrogen supply and storage, and distributed energy resources). By 2030, airports have the potential to become hydrogen hubs for zero-emission transportation and a supporting microgrid to provide reliable and resilient electricity for nearby airport facilities, EV charging, and battery electric aviation and transportation. The advent of hydrogen and its large-scale usage pose challenges for airports since it will revolutionize the way their infrastructures are designed and operated. Even though hydrogen for long haul aviation won't be on a significant scale before 2050, all new passenger cars and trucks, as well as all drayage/cargo trucks and off-road vehicles and equipment, sold in California, will be zero-emission by 2035. Zero-emission electric and hydrogen aircraft will be primarily focused on regional and shorter-range aircraft from 2035. Hydrogen can enable the next steps towards more sustainable transportation and aviation starting in 2035 and beyond. A technical advisory committee (TAC) was formed to coordinate among industry experts, utilities, city and community leaders, and local, state, and federal agencies. The final report was presented publicly at the 2023 Hydrogen and Fuel Cell Seminar in Long Beach, CA.

CALSTART Class 8 Hydrogen Fuel Cell Truck Commercialization Roadmap

Program: Clean Transportation
Sub-Program: Off-Road

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Improved Affordability, Operational Efficiency

Start Date
April 30, 2020 to March 31, 2023

Total Project Cost
$216,000

Total SoCalGas Cost
$216,000

The objective of this project was to develop two roadmaps to supplement and support the deployment and demonstration of a CEC-funded Cummins Hydrogen Fuel Cell Class 8 Truck for drayage and regional delivery. CALSTART worked with a technical advisory committee (TAC) to develop the roadmaps, including the Technology Commercialization Roadmap and the Medium- and Heavy-Duty (MD/HD) Hydrogen Fueling and Infrastructure Roadmap. The Technology Commercialization Roadmap provides market projections and describes market scenarios for the new truck technology. It also compares fuel cell trucks to equivalent battery-electric vehicles to explore differences in cost, emissions, performance, and operational success between these two zero-emission solutions. The MD/HD Hydrogen Refueling and Infrastructure Roadmap recommends strategically locating hydrogen fueling infrastructure and estimating future demand for the medium- and heavy-duty trucking industry. It also analyzes the viability of

various hydrogen production and delivery pathways to compare centralized production with trucked hydrogen, pipeline delivery of hydrogen, and distributed or onsite production. CALSTART published the final report in March 2023. The report can be found at the following link: https://calstart.org/roadmap-to-fcet-commercialization/

CEPM for Turbochargers (CPS-14B-08)

Program: Gas Operations
Sub-Program: Environmental & Safety

Benefits
Reduced Greenhouse Gas Emissions, Improved Affordability, Reliability

Duration
January 31, 2019 to March 31, 2023

Total Project Cost
$102,101

Total SoCalGas Cost
$8,653

Total Co-Funding
$93,448 by PRCI Members

This project developed turbocharger performance models from the data collected from a variety of past PRCI projects, as well as new data collected at two compressor stations. The model provides early detection of decreased natural gas engine turbocharger performance. This approach will enable Operations to schedule maintenance and repairs before the engine cannot meet emissions limits. The team completed model development in 2020, but due to closures related to the ongoing COVID-19 pandemic delayed the collection of additional data needed to refine the model and perform validation testing. Finally, In August 2021, the project team completed data collection and model validation was completed in 2022. The project team also looked at applying the models to turbines used to drive compressors, but further refinements would be needed to improve performance predictability for turbines. Therefore, the team decided to abandon further efforts on turbines and published the paper on the Pipeline Research Council International website in the first quarter of 2023 including three models developed for turbochargers. SoCalGas has plans to utilize the models to monitor turbocharger performance.

Data Logger Evaluation Project - Phase II

Program: Gas Operations
Sub-Program: Operations Technology

Benefits
Reduced Greenhouse Gas Emissions,Improved Air Quality, Public and Employee Safety

Duration
June 15, 2021 to March 31, 2023

Total Project Cost
$71,000

Total SoCalGas Cost
$71,000

The objective of this project was to evaluate a commercially available data logging technology for collecting data associated with the fusion joint process. Thermoplastic pipeline joints are produced in the field using a pipeline fusion processes (e.g., heat and pressure). High-quality joints are critical to the integrity (e.g., safety and reliability) of natural gas pipeline facilities. There is presently no automated data collection process for field fusion operations. This process has significant potential for errors and is not an efficient means of integrating the fusion data into company systems, thus encumbering review and analysis. Furthermore, in cases of failure, the fusion data is not readily available for review to aid the investigative process. During the project's first phase, the team performed a proof-of-concept evaluation for a commercially available data logger. In phase II, the team researched the process of data collection, storage, and integration into company systems. It was anticipated that the collected fusion data would allow real-time

evaluation of fusion parameters supporting consistent quality of fusion joints before they are placed into service. The project team met the objective of the project by collecting fusion data, understanding data formats generated by the logger software, developing software to validate work orders, and training welding instructors. Moreover, the SCG project team started developing a plan for the next steps of this project utilizing the knowledge gained from this project.

Eclipse Scientific Red/Green Light Tool for NDE of PE Pipe Butt Fusion Joints – Phase 1-a (M2019-010)

Program: Gas Operations
Sub-Program: System Inspection & Monitoring

Benefits
Reduced Greenhouse Gas Emissions,Improved Air Quality, Improved Affordability

Duration
January 31, 2020 to March 31, 2023

Total Project Cost
$153,790

Total SoCalGas Cost
$13,670

Total Co-Funding
$140,120 by NYSEARCH Members

The objective of this project was to develop an automated non-destructive examination (NDE) tool to inspect the integrity of butt-fusion (BF) joints, which does not require operators with specialized training in NDE. Pipe fusers can join polyethylene (PE) pipes by melting both ends and forcing the ends together to form a BF joint. The integrity of the BF joint is important for long-term performance. NYSEARCH members have invested considerable resources into NDE development for PE pipe through extensive testing with The Welding Institute. Eclipse Scientific has developed the automated NDE constructs of pass/fail (green/red) for performing PE pipe joint interrogation. This project received a portion of the defected BF joint samples developed under NYSEARCH Project M2019-009 and completed all scans of standard and defected joints to continue the integration of automated defect recognition. A comprehensive set of samples featuring simulated lack of fusion (aluminum disks), oil/grease contamination, coarse and fine particulate contamination, and cold fusion flaws were scanned and analyzed using an optimized projection focused phased array technique designed for inspection of MDPE and HDPE BF joints. The results indicated that all common joint flaws can be robustly detected using the prototype system and that features present in flawed samples can be readily isolated and used to train a machine learning algorithm to detect these defects. The development of this technology can improve the integrity of BF joints constructed by SoCalGas since any defect in the joint would be identified before placing the pipe into service. SoCalGas will utilize the knowledge gained in this project for possible in-house evaluations when a prototype is available in future.

GTI Doosan Hydrogen Drone Demonstration

Program: Clean Transportation
Sub-Program: Off-Road

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Operational Efficiency

The project's goal was to advance hydrogen use in aviation by demonstrating Doosan Mobility Innovation's (DMI) hydrogen fuel cell drones for various applications. Hydrogen drones offer significant benefits compared to their battery-electric counterparts. DMI's hydrogen fuel cell drones have longer flight times (2 hours) and drastically reduced refueling. Throughout the project, GTI Energy worked with DMI to

Duration
September 30, 2020 to
January 31, 2023

Total Project Cost
$250,000

Total SoCalGas Cost
$250,000

showcase the technology at various conferences, including ACT Expo and CES. The drone was also demonstrated at two SoCalGas facilities and in Austin, Texas, as part of H2@Scale. These demonstrations highlighted the drone's extended flight time, efficient fuel tank swapping procedure, package delivery, and ability to conduct various infrastructure inspections. In addition to the demonstrations, GTI Energy also worked with DMI to assess the product design and operational procedures. This analysis included a review of pertinent codes and standards for the safe operation of the drone. GTI Energy presented this project at the Hydrogen & Fuel Cell Seminar in February 2023. A video clip was also produced and can be found at the following link: https://www.youtube.com/watch?v=F2WQBHubNf8

Kore Biosolids Pyrolyzer Field Test

Program: Low Carbon Resources
Sub-Program: Renewable Gas Production

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality

Duration
February 13, 2017 to
March 31, 2023

Total Project Cost
$6,100,000

Total SoCalGas Cost
$1,500,000

Total Co-Funding
$4,600,000 by
Kore Infrastructure, SCAQMD

This project aimed to reduce risk and improve the potential for financing future commercial deployments by conducting field tests to verify component integrity at high temperatures, feedstock throughput, and gas product quality and composition. Kore Infrastructure developed a commercial-scale pyrolyzer that thermochemically converts biomass to syngas. The produced syngas—a mixture of methane, carbon monoxide, carbon dioxide, and hydrogen—can be converted to renewable natural gas or renewable hydrogen. The pyrolyzer also has the potential to accept and process waste streams, including forest thinning, municipal solid waste, and food waste. The project team demonstrated the operation of feedstock conveyance and drying, pyrolytic conversion, and gas cleanup and cooling. Construction at SoCalGas' Olympic Base concluded in late 2021. Commissioning activities for the pyrolyzer began immediately afterward. System operations and testing began in 2022. Using data gathered during the testing period, Kore gathered operation data on system performance to guide future development and deployment activities. The system was decommissioned in Q1 2023.

Low NOx Portable Analyzer

Program: Gas Operations
Sub-Program: Environmental & Safety

Benefits
Reliability

Duration
September 1, 2022 to
May 19, 2023

Total Project Cost
$75,000

The objective of this project was to investigate and experimentally determine the feasibility of an electrochemical portable analyzer test to measure NOx less than 5 ppm and CO less than 20 ppm. Recently, a PRCI project led EPA to accept new portable analyzer test methods down to typical compliance limits. However, as new combustion technologies reach lower emission levels, the need for even lower measurements is needed. Experiments were conducted to assess (1) limits of detection, (2) stability, and (3) measurement repeatability. This research showed that with lower concentration calibration gas and use of fresh electrochemical

Total SoCalGas Cost
$75,000

cells, detection limits of 0.5 ppm for NO and NO2, and 1.5 ppm CO are achievable. SoCalGas is now ready to take accurate low concentration measurements when new technologies are installed. The project also documented recommended changes to existing EPA test methods if that is needed in the future.

Modernize the Assessment of Pipeline Water Crossings (ENV-4-1A)

Program: Clean Transportation
Sub-Program: System Inspection & Monitoring

Benefits
Improved Air Quality, Improved Affordability

Duration
January 1, 2019 to April 17, 2023

Total Project Cost
$740,035

Total SoCalGas Cost
$24,119

Total Co-Funding
$715,916 by PRCI Members, PHMSA

The objective of this Pipeline Research Council International (PRCI) project was to improve the capabilities of existing streamflow monitoring techniques and engineering and risk assessment tools used for managing the integrity of pipeline crossings over waterways. The project tasks included field verification of scour and erosion prediction from hydrology hydraulics and fluvial geomorphology; field validation of Vortex-Induced Vibration (VIV) initiation within waterways to determine pipeline limitations and VIV avoidance criteria. The project provided benefits by allowing operators to identify crossings that require operational (e.g., monitoring) or engineering (e.g., mitigation) controls to lower the probability of flooding hazards that can lead to containment loss. A prototype website-based alert dashboard was developed and can be used as a screening tool to plan new waterway crossings. The results of this project could supplement the guidance provided in API RP 1133, Managing Hydrotechnical Hazards for Pipelines Located Onshore or Within Coastal Zone Areas. Overall, the project team delivered nine final reports to PRCI members which are available on the PRCI website. The final closeout webinar was held in April 2023 and a recording can also be found on PRCI's website. SoCalGas will use this information as a knowledge base for evaluating and maintaining pipeline water crossings.

Low NOx Portable Analyzer

Program: Gas Operations
Sub-Program: Environmental & Safety

Benefits
Reliability

Duration
September 1, 2022 to May 19, 2023

Total Project Cost
$75,000

Total SoCalGas Cost
$75,000

The objective of this project was to investigate and experimentally determine the feasibility of an electrochemical portable analyzer test to measure NOx less than 5 ppm and CO less than 20 ppm. Recently, a PRCI project led EPA to accept new portable analyzer test methods down to typical compliance limits. However, as new combustion technologies reach lower emission levels, the need for even lower measurements is needed. Experiments were conducted to assess (1) limits of detection, (2) stability, and (3) measurement repeatability. This research showed that with lower concentration calibration gas and use of fresh electrochemical cells, detection limits of 0.5 ppm for NO and NO2, and 1.5 ppm CO are achievable. SoCalGas is now ready to take accurate low concentration

measurements when new technologies are installed. The project also documented recommended changes to existing EPA test methods if that is needed in the future.

Study on Changing Accuracy and Variability of Therm Zones Affecting Metering of New Gas Supplies (M2022-002)

Program: Gas Operations
Sub-Program: System Design & Materials

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Operational Efficiency

Duration
April 22, 2023 to May 11, 2023

Total Project Cost
$367,250

Total SoCalGas Cost
$32,640

Total Co-Funding
$334,610 by NYSEARCH Members

The objective of this project was to characterize the impact of varying hydrogen blend contents up to 20% by volume with natural gas (NG) and renewable natural gas (RNG) on different types of residential and commercial NG meters. Blending hydrogen in NG and RNG will change gas properties. These altered gas properties may affect the flow measurement performance of NG flow meters and interfere with meeting the California Public Utilities Commission (CPUC) requirement of ±2% accuracy in gas delivery to customers. The project team gathered gas property data required to calculate a mass flow rate output from a gas flow meter, compared the results with existing equations of state (EOS), and provided recommendations for best practices and setting appropriate values of uncertainties with various EOS. The project team also evaluated the suitability and integrity of two residential-type and two commercial-type meters by determining measurement errors and trends when hydrogen content varies with NG and RNG. The results of these two tasks were communicated via a final report to project sponsors. One of the commercial flow meters accurately reported the measured blended flow rate within 1% relative error to the baseline. The remaining three meters underreported the total gas measurement. Further testing was recommended for Phase 2 to investigate variations in density at low temperatures and pressures and the source of the error in the underreporting meters. Once the data has been converted to therms, this project will inform SoCalGas and other gas utilities on determining an accurate and repeatable way to measure and bill the energy delivered to their customers with varying gas supplies.

Subsidence Study

Program: Gas Operations
Sub-Program: System Inspection & Monitoring

Benefits
Reduced Greenhouse Gas Emissions,Improved Air Quality

Duration
November 25, 2022 to May 19, 2023

Total Project Cost
$17,200

This project performed analytical modeling to estimate levels of relative displacement between a transmission pipeline and five tap locations, and compared the results of earlier studies. Buried natural gas pipelines can be damaged by soil displacement resulting from sudden extreme events, such as floods, landslides, earthquake fault rupture, and gradual ground deformations caused by land subsidence. Causes of vertical or horizontal land subsidence include extraction of water, oil, or gas; sinkholes; mining activities; and natural consolidation. A previous study evaluated the potential hazard to natural gas transmission pipelines from

Total SoCalGas Cost
$17,200

subsidence resulting from water withdrawal in the San Joaquin Valley. The results supported the conclusion that long-term subsidence from water withdrawal does not pose a significant threat to SCG's transmission pipelines at general locations, but recommended further study of tap points identified as having the largest relative axial displacements. This project tasks included modeling a section of transmission pipe and five tap locations and analyzing various scenarios affecting tensile and compressive strain as a function of axial displacement. The analyses used simulation software with typical pipe elements and non-linear springs to represent soil restraint. The current study concluded that the future impact of subsidence on the taps is negligible except for one tap location of concern, which is recommended to look at in more detail. The pre-emptive management of the subject tap location has the potential to significantly reduce the need for costly mitigative measures to repair or replace damaged pipeline sections due to subsidence displacements.

UTD CFS Burner Technology Carbon Reduction Including Hydrogen Blending (1.21.H)

Program: Customer End-Use Applications
Sub-Program: Commercial Food Service

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Public and Employee Safety, Improved Affordability, Operational Efficiency, Reliability

Duration
July 1, 2021 to April 4, 2023

Total Project Cost
$40,000

Total SoCalGas Cost
$40,000

In this project, the team aimed to determine the potential decarbonization of typical commercial food service appliances using improved burner technologies, control systems and blending with hydrogen. The project team tested existing commercial food service appliances with hydrogen and natural gas blends. Specific topics include decarbonization, hydrogen blending (0-30%), energy reduction technologies, and controls, including burner modulation. In 2021, a laboratory setup was designed and assembled to test commercial food service (CFS) burners. The project team tested a fryer pilot burner as part of the shakedown of the test stand and data-acquisition system. During the shakedown, the team identified a need for a different capture hood and a more accurate gas flow meter. The project team addressed both issues, and testing resumed. In 2022, the team completed testing with the fryer pilot burner. The project team is currently testing a tube burner.

UTD Energy Source Options for Industrial Users - Phase 2 (2.20.E.2)

Program: Customer End-Use Applications
Sub-Program: Industrial Process Heat

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Public and Employee Safety, Improved Affordability, Operational Efficiency, Reliability

The objective of this project was to provide a robust, user-friendly analytical tool that can help decision-making, which will drive decarbonization and achievement of local environmental targets. This approach will support industrial and large commercial sectors' reliable and cost-effective energy supply. The final product will be a roadmap for adopting natural gas and other energy options. This project aimed to expand and simplify the use of a detailed techno-economic analysis developed in a previous project phase. The analysis

Duration
July 1, 2021 to
April 6, 2023

Total Project Cost
$2,581

Total SoCalGas Cost
$2,581

considered fuel-switching and electrification scenarios for industrial and large commercial end users. The project team improved the prior study by transitioning the spreadsheet-based research to a convenient online tool that includes various applications beyond boilers. In 2021, the team analyzed a database of industrial energy consumption data for key end-use applications. The project group used it to prioritize the industrial technologies based on geographical locations that the team linked to individual funders' service territories. In 2022, the project team transitioned the spreadsheet-based tool to the online platform. The team identified several GHG reduction pathways for process-heating segments and evaluated preliminary, including net-zero carbon alternative fuels, renewable energy options, energy efficiency improvements (waste-heat recovery), electrification, hybrid energy sources, and system optimization and control.

UTD Investigating Multifamily Infrastructure Challenges - Phase 4 (1.14.J.4)

Program: Customer End-Use Applications
Sub-Program: Advanced Innovation

Benefits
Improved Affordability

Duration
July 1, 2019 to
March 22, 2023

Total Project Cost
$1,984

Total SoCalGas Cost
$1,984

The objectives of this project were to evaluate the current position of the natural gas industry in multifamily new construction and to develop recommendations for improvement. The goals were to establish concrete market transformation and implementation tools and action plans to properly connect with new development decision-makers to keep natural gas viable in new multifamily construction projects. In earlier research, the project team interviewed key national-level players active in the multifamily market, including representatives from industry associations, gas utilities, and the building and development community. In this project, the team continued dialogues with experts in the multifamily new construction market. It sought to create actionable tools for UTD members to serve multifamily homeowners, architects, and builders better. The project team identified important research to communicate quantifiable costs and benefits to key industry, regulatory, and construction-based stakeholders. The project team prepared three case studies and tangible market guidance tools for design and construction professionals, including a curriculum geared toward design professionals. The team completed the final case study and development guidance for the relevant low-rise multifamily construction project.

UTD Next Generation Residential Gas Dryer Development - Phase 2 (1.15.C.2)

Program: Customer End-Use Applications
Sub-Program: Residential Appliances

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality

Duration
July 1, 2018 to
February 22, 2023

The goal was to find a technology to achieve a 5-15% edge over standard efficiency gas dryers. In this project, researchers investigated next-generation gas dryer technologies to exceed EnergyStar efficiency levels. In 2021 under Phase 2, the project team developed a slightly modified test procedure to reduce the variability and provide repeatable results that will allow researchers to benchmark technology improvements. After

Total Project Cost
$24,706

Total SoCalGas Cost
$24,706

this modified procedure was adapted, the team completed baseline testing of the DOE test clothes and a real-world towel load baseline test. In Phase 2, researchers investigated additional heat-recovery options, modulation techniques, indirect-fired methods, direct venting, and alternative burners. Testing at four firing rates consistently showed around a 2% improvement with lower firing rates. The dryer was insulated and sealed to test potential boost from fewer leaks and allow heat recovery implementation. After several variations, technicians achieved a 5%-6% increase in insulation and sealing efficiency and a 6% reduction in drying time. The insulation and sealing also allowed researchers to implement an innovative heat-recovery design. Phase 3 testing is currently underway. Any proprietary technologies discovered during the project will result in a UTD invention disclosure.

UTD Robur and SMTI Low-Capacity Gas Absorption Heat Pump Laboratory Evaluation (1.20.A)

Program: Customer End-Use Applications
Sub-Program: Residential Appliances

Benefits
Reduced Greenhouse Gas Emissions, Improved Air Quality, Improved Affordability, Operational Efficiency, Reliability

Duration
July 1, 2020 to March 24, 2023

Total Project Cost
$24,000

Total SoCalGas Cost
$24,000

This project aimed to evaluate and optimize the performance of low-capacity gas absorption heat pumps (GAHPs). The units of interest in this project were the Robur K18 (60 MBH) and SMTI 40K (40 MBH). The team applied them to residential combination space and water heating systems (forced-air heating). These low-capacity GAHP systems, sized for residential homes in mild climates or with improved thermal envelopes, must be controlled optimally for comfort and efficiency. This experimental effort assessed how the GAHP performs and how system parameters are optimally controlled (system modulation, space vs. water heating modes, air handler operation, etc.). The team commissioned the K18 in the third quarter of 2022. The team will develop performance curves from the performance rating test plan results. The team will develop a simulated-use evaluation test plan to create integrated solutions for the K18 unit in the North American market using off-the-shelf components. The team expects the simulated-use evaluations to optimize controls, equipment sizing, and design guidelines.

Virtual Reality (VR) Training - Emergency Response Situations (5.18.t.2&3)

Program: Gas Operations
Sub-Program: Environmental & Safety

Benefits
Improved Air Quality, Public and Employee Safety, Improved Affordability

Duration
November 1, 2019 to June 21, 2023

This project developed a Virtual Reality (VR) content library and delivery system that utilities can use to assist in training their personnel on operation and maintenance procedures. In addition, an implementation guide was prepared to support deployment of the technology. The project team developed VR training modules that are realistic, interactive, and immersive, utilizing the latest technology improvements and the lessons learned from previous phases of the project. SoCalGas sees benefits with the use of VR technology supplementing its Training

Total Project Cost
$806,000

Total SoCalGas Cost
$80,000

Total Co-Funding
$726,000 by OTD Members

Program, which provides an option to enhance the consistency of training delivered, allow operations to conduct training on demand, increase the number of real-life training scenarios available for trainees to experience, and reduce the risk of injury to trainees. In 2020, the project team developed nine training modules. In 2023, these modules were re-developed and two new modules were developed on a new provider platform. Due to the pandemic, the technology demonstration to the SoCalGas Training Department was delayed until 2023. GTI Energy presented the VR training modules, the new VR Training module platform, the implementation plan, and a hands-on demonstration of the technology using the wired system and 3DI (three-dimensional interaction) or "laptop mode" environments. SoCalGas intends to incorporate this VR technology into its long-term plan for its Training program.