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Gas RD&D Administrator 2026 Plan Proposals

Funded by California Gas Ratepayers

Disadvantaged Communities Advisory Group (DACAG)

March 20, 2026

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Gas RD&D Program Lead

CPUC Energy Division

California Public Utilities Commission

DACAG Feedback to Promote Gas RD&D Benefits to ESJ + Tribal Communities

- Opportunity for the DACAG to inform annual Gas Research, Development, & Demonstration (RD&D) investments amounting to $50 million in ratepayer funds.
- CPUC staff and Gas RD&D administrators seek DACAG feedback on proposed Annual Gas RD&D Investment Plans.
- Administrators have received feedback on proposals to be presented today from CPUC Subject Matter Experts (SMEs) and the public via a coordinated workshop.
- CPUC staff will ensure administrators document, respond to, and incorporate DACAG feedback as required in proposed Plans due by June 1, 2026.

Ratepayer-Funded Gas Research, Development, and Demonstration (RD&D)

- Innovative investments promote new and emerging technologies and solutions to support meeting California's climate, energy, and equity policy goals.
- Administrators must conduct and document consultation with DACs and demonstrate ratepayer benefits, particularly for affordability and equity.
- CPUC guides and approves via Tier 3 advice letters Gas RD&D Program administrators' proposed Investment Plans to utilize authorized annual funding levels:

Administrator	Authorized Budget	Funding Source
California Energy Commission (CEC)	$24M	Public Purpose Program (PPP)
Southern California Gas (SoCalGas)	$18M	General Rate Case (GRC)
Pacific Gas & Electric (PG&E)	$8M	General Rate Case (GRC)

CPUC's Role in Ensuring the Prudent Use of Gas Ratepayer Funds

- CPUC staff established Initiative Criteria for evaluating Plans:
  1. **POLICY PRIORITY**: Alignment with and prioritization of critical gaps and needs identified in State goals and specific CPUC policies and proceedings by CPUC SMEs and DACs.
  2. **IDENTIFIED NEED**: Demonstration that RD&D complements but does not duplicate existing efforts, including electric RD&D funded via the Electric Program Investment Charge (EPIC).
  3. **PROPOSED SOLUTION**: Clear outputs (pilots, studies, etc.) and pathways to scale results.
  4. **ANTICIPATED IMPACTS**: Impacts analyses to demonstrate ratepayer benefit, particularly to promote affordability.
- CPUC Subject Matter Experts (SMEs) established program priorities:
  - Ensuring gas system integrity and strategic decommissioning
  - Decarbonizing the gas system via alternative energy sources

Early Coordination Promotes Alignment with CPUC Proceedings and Ratepayer Benefits

- Administrators coordinated with one another on proposed investment plans to prevent duplication of efforts
- Administrators consulted CPUC Subject Matter Experts (SMEs) to align with proceedings and coordinate with EPIC per the Coordinated Role of Gas Goal
- Administrators hosted a joint public workshop with focused Equity Panels
- **Administrators consult the DACAG on Plan proposals informed by CPUC SMEs and the public to ensure ratepayer benefit, particularly for disadvantaged communities**
- Administrators submit proposed investment plans by June 1, 2026
- CPUC evaluates proposed investment plans based on Initiative Criteria

Coordinated Public Workshop Equity Panelists

Carmelita Miller

Energy Equity Strategist

The Greenlining Institute

Alex Jasset

Director of Energy Justice

Physicians for Social Responsibility-Los Angeles (PSRLA)

***Sarah Sharpe**

Deputy Executive Director

Central California Asthma Collaborative (CCAC)

Key Insights from Public Workshop Equity Panels

- **PROGRAM INVESTMENT PRIORITIES**
  - Affordability concerns in the gas transition but decommissioning (as opposed to O&M) should be prioritized so RD&D does not sustain/reinforce the existing gas system.
- **NEED FOR TRANSPARENCY & ACCESSIBILITY**
  - Public access to information on program outputs and impacts.
  - IOUs issue competitive solicitations rather than seeking specific awardees.
- **PROTECTION & PRIORITIZATION OF DACs**
  - Vulnerable communities, such as workers, tenants, & frontline communities near gas facilities, should be consulted on project siting to prevent exacerbating existing issues and inequities, particularly from projects with unknown impacts.
  - Targeting structural obstacles to reducing energy usage rather than behavioral change is more appropriate for many vulnerable populations.

CPUC Gas RD&D Program Contact

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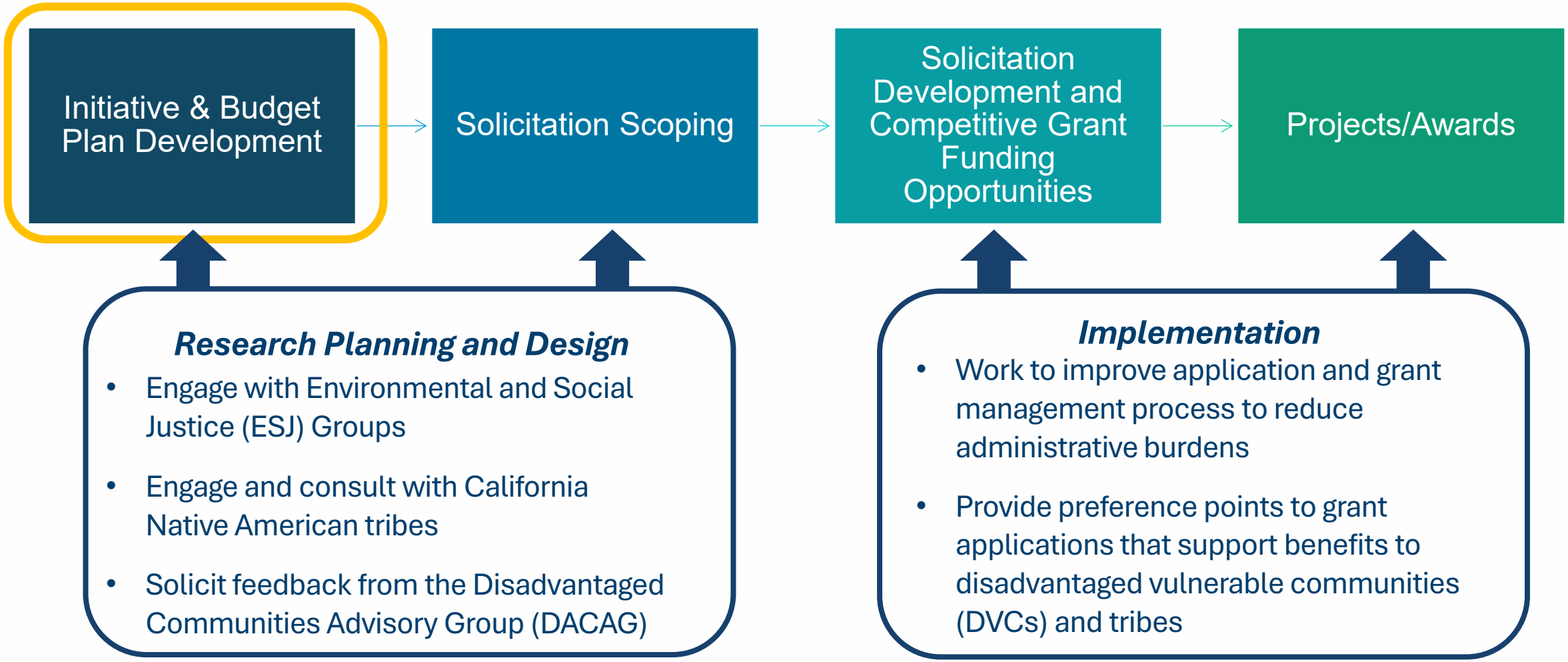
2026-2027 Gas Research and Development Budget Plan

Overview of Draft Initiatives – DACAG Briefing
March 20, 2026

Embedding Equity Across Program Administration



Coordination Across Gas Program Administrators

California Energy Commission – Pacific Gas & Electric Company – Southern California Gas Company

Planning

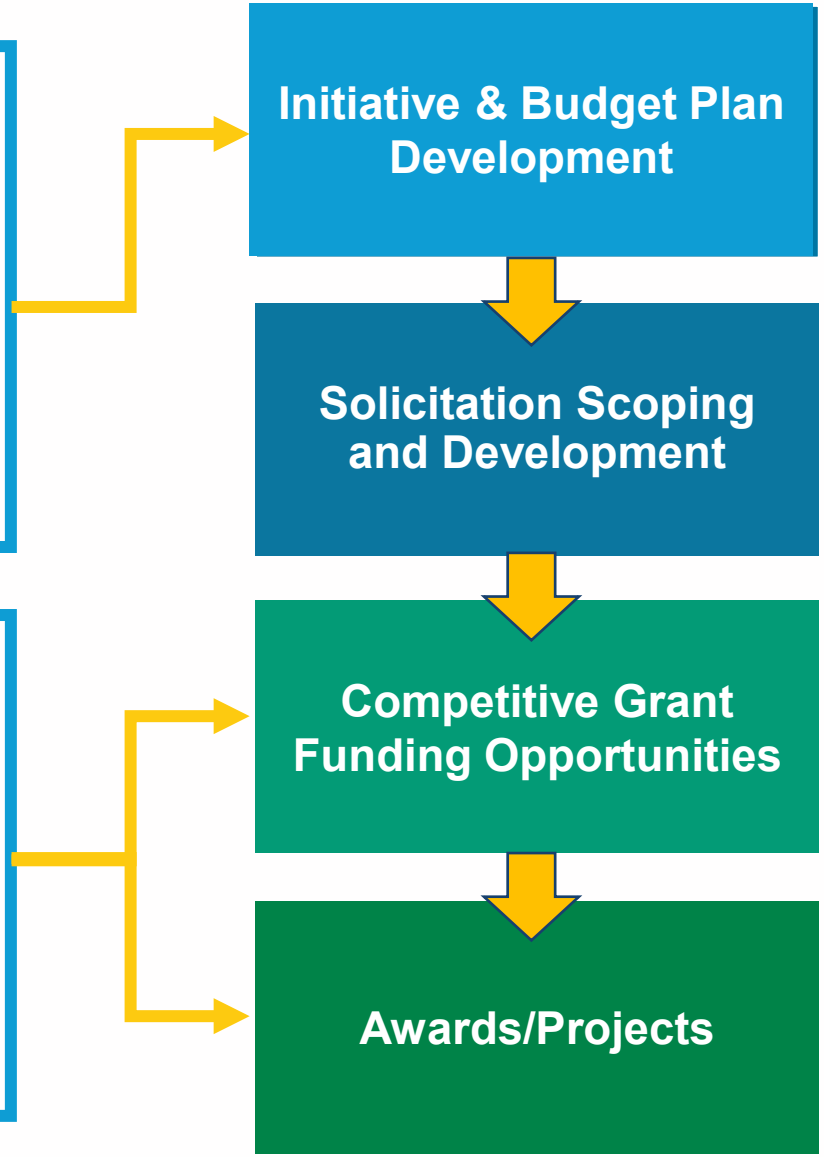
Early coordination among administrators on initiative development and alignment throughout the year:

- Bimonthly Administrative Coordination Meetings
- PICG Workshop
- Joint Public Workshop
- Topical SME discussions

Implementation

Gas investor-owned utilities often serve on CEC-funded projects as:

- Project partners
- Demonstration site hosts
- Technical Advisory Committee members
- Match share contributors



Draft Gas R&D Initiatives

Draft Initiatives

Initiative Theme	Initiative Title	Proposed Allocation*	Budget
Gas System Integrity	1. Gas Network Decommissioning Pathways to Scale Infrastructure Retirement	$2-3M	
Decarbonization	2. Advancing Health and Equity in California's Gas Transition	$10-12M	
	3. Strategic Assessment of Cost-Effective Seasonal Energy Storage Pathways	$1-1.5M	
	4. Optimizing Thermal Energy Networks for Decarbonization	$1-2M	
	5. Cleaner Industry, Healthier Communities	$5-8M	
	6. Studying Industrial Process Heat Decarbonization Pathways	$1M	
		Total Plan Budget	$21.6M

*Proposed allocations are estimates and will be finalized following further refinement and prioritization of initiatives.

Gas Network Decommissioning Pathways to Scale Infrastructure Retirement

Identified Need: It is critical to ensure data from decommissioning pilots is systematically captured and used to inform future large-scale decommissioning.

Proposed Solution: Assess research data and insights from neighborhood-scale pilots to develop strategic plans and technological pathways to accelerate and scale safe, efficient, and cost-effective gas decommissioning.

Anticipated Impacts:

- Improve long-term cost savings, reliability, and safety through coordinated gas system retirement.
- Accelerate GHG reductions from decreased fossil gas use.
- Inform equitable scaling strategies.

Decommissioned segment of pipeline removed by PG&E.
Credit: The Mercury News

Gas Network Decommissioning Pathways to Scale Infrastructure Retirement

Feedback:

- General support and interest in seeing this initiative proceed. (***DACAG SME, ESJ Panel***)
- Interest in clearer distinction on how research complements existing work and ratepayer funding rationale. (***CPUC SMEs***)
    - → Research will comprehensively synthesize and assess data from across funded zonal pilots to connect analyses and update protocols into a scalable and actionable framework.
- Gap in affordability and impact metrics. (***CPUC SMEs***)
    - → Strengthened justification for having more efficient financial and operational implementation approaches to improve the cost and affordability for gas ratepayers.
- Will be important to understand impact of escalating costs on shrinking gas ratepayer base. (***ESJ Panel***)

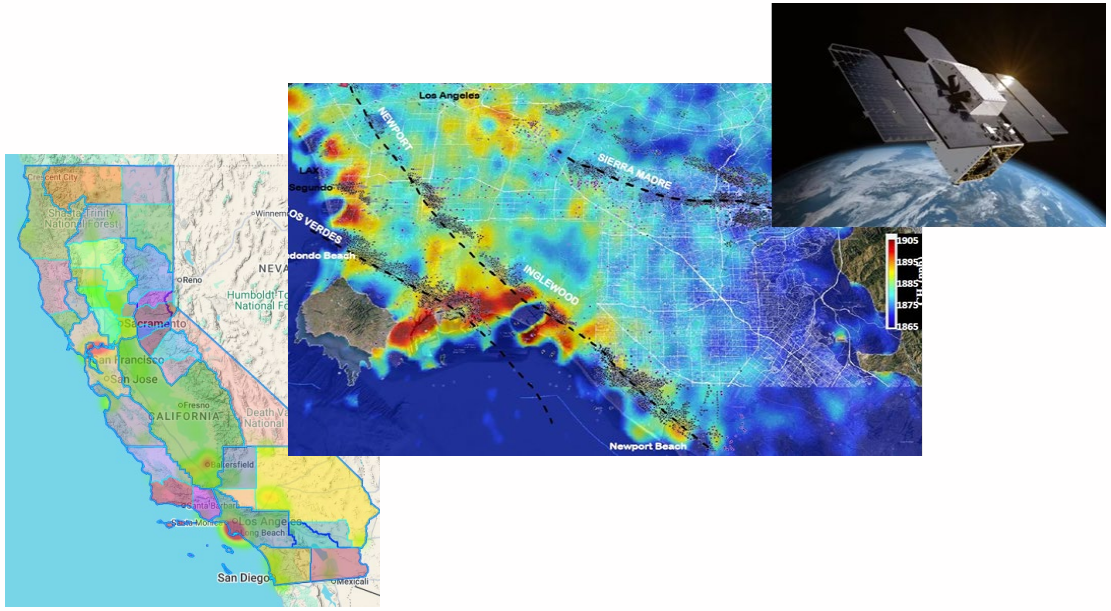
Advancing Health and Equity in California's Gas Transition

Identified Need: Equitable decarbonization requires insight into localized emissions and community-level impacts, but limited high-resolution data and a lack of accessible tools hinder coordinated planning and targeted activities.

Proposed Solution: 1) Develop interactive tools that illuminate non-energy benefits of residential decarbonization and 2) Enable high-resolution monitoring and quantification of climate, health, and equity impacts from gas system emissions to inform targeted mitigation efforts.

Anticipated Impacts:

- Address environmental justice and affordability impacts of gas system decarbonization across California demographics.
- Improve environmental health, air quality, and public health outcomes by enabling data-informed strategies to reduce reliance on fossil gas.



Interactive Tools. Satellite Data. Credit: CEC, PIR-17-011 and Carbon Mapper

Advancing Health and Equity in California's Gas Transition

Feedback:

- General support and interest in seeing this initiative proceed. (***DACAG SME, ESJ Panel***)
- Consider including both indoor and outdoor air quality. (***DACAG SME***)
  - → Tool will include both indoor and outdoor air quality.
- Need to articulate the CPUC's goal of removing the last 10% and unclear on how non-energy benefits will be tracked to show impacts and improve cost effectiveness. (***CPUC SMEs***)
  - → Clarified focus on where gas persists, who is most affected, and what mitigation strategies are most cost-effective and equitable.
  - → Non-energy benefits are embedded in the decision-support tools and environmental justice scoring frameworks.
- Appreciation for exploring non-energy benefits. (***ESJ Panel***)

Cleaner Industry, Healthier Communities

Identified Need: Reducing harmful criteria air pollutants from the hardest to electrify industrial facilities is needed for improving local air quality and public health and addressing climate impacts.

Proposed Solution: Advance deployable co-pollutant removal technologies and generate data to inform industrial gas transition and regulatory decisions.

Anticipated Impacts:

- Reduce harmful industrial emissions to improve air quality and protect public health in disadvantaged vulnerable communities.
- Enable cost-effective, near-term mitigations for industries that are difficult to electrify.

Credit: Global CCS Institute

Cleaner Industry, Healthier Communities

Feedback:

- Industries without alternative solutions should look at opportunities to reduce emissions. Concerns about refineries prolonging fossil fuel use in environmentally overrun communities. (***DACAG SME***)
    - → This initiative supports decarbonization pathways that currently lack near-term electrification solutions and excludes refineries from the scope.
- Misaligned with using ratepayer funds for direct air capture. ***(CPUC SMEs)***
    - → The initiative does not include direct air capture in the scope. Clarified that the primary focus is on demonstrating removal of criteria air pollutants, such as particulate matter and oxides of sulfur and nitrogen.
- Research should not be investing in carbon dioxide removal. (***ESJ Panel***)
    - → This initiative does not propose any work on carbon dioxide removal. The CARB Scoping Plan indicates a clear need for point source carbon capture for the hardest to abate industrial emissions, and this research proposes to develop technology to reduce air pollution from facilities that do use carbon capture.

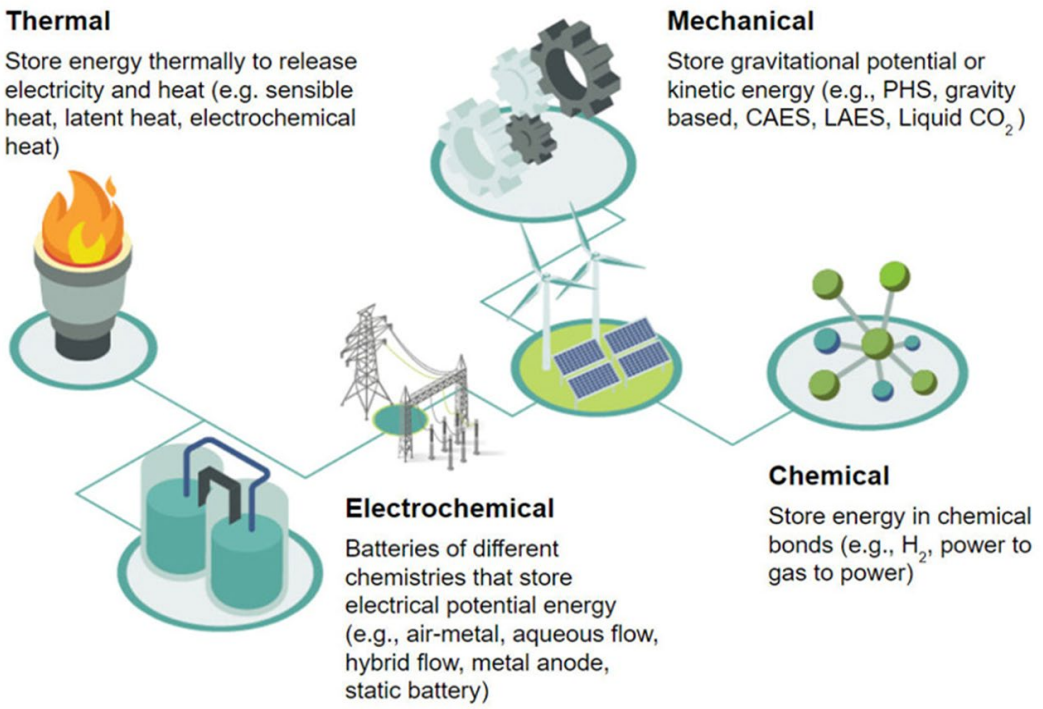
Strategic Assessment of Cost-Effective Seasonal Energy Storage Pathways

Identified Need: As renewable generation increases, multiday/seasonal energy storage will be critical in addressing spring/summer oversupply and winter shortfalls.

Proposed Solution: Conduct a comprehensive system-level analysis of an infrastructure-integrated approach for seasonal storage technologies as alternatives to gas for seasonal reliability.

Anticipated Impacts:

- Establish a clean, affordable, and equitable pathway to replace gas's seasonal reliability role, supporting electric–gas coordination and managed gas decommissioning.
- Reduce long-term system costs by avoiding stranded gas assets and disproportionate rate impacts.
- Prioritize impacts on DVCs and tribes while protecting ratepayers from inequitable transition costs.



Credit: LDES Council

Strategic Assessment of Cost-Effective Seasonal Energy Storage Pathways

Feedback:

- Earlier draft initiative proposed a focus on reversible methanation; concerns raised about low round-trip efficiency, how its use of renewables compares to other end-use options, and continued use of combustion. (***DACAG SME***)
  - → Focused initiative on the study and identification of the most practical and cost-effective seasonal storage technologies to support equity, reliability, and re-use of existing infrastructure.

- Research should align with current Integrated Resource Planning and CPUC guidance, clearly define technologies and scope, complement other efforts. (***CPUC SMEs***)
  - → Research scope will be designed to align with Integrated Resource Planning, including applicable definitions, assumptions, and performance metrics.
  - → Hydrogen will be excluded from the scope.

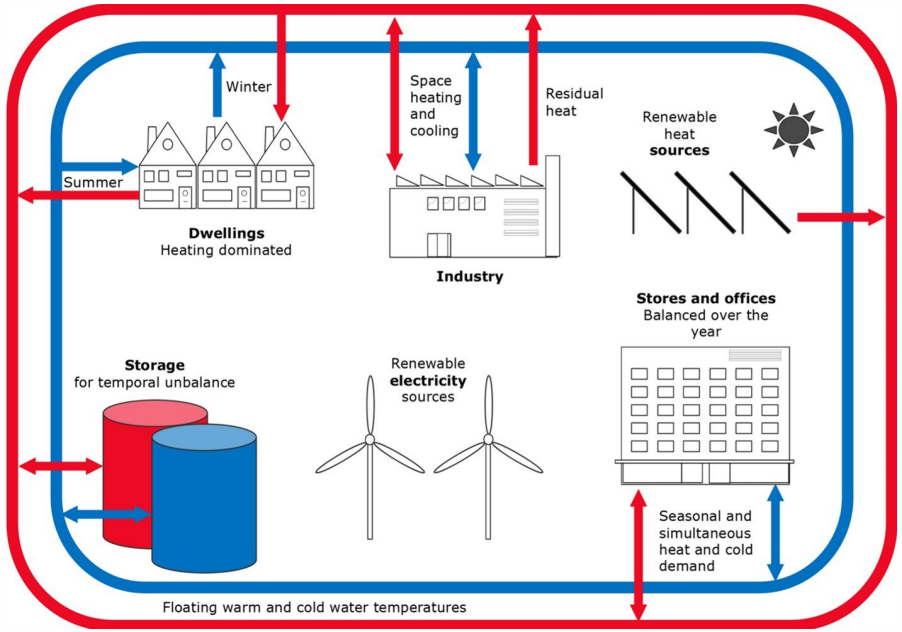
Optimizing Thermal Energy Networks for Decarbonization

Identified Need: Waste energy from large facilities is typically lost into the atmosphere, missing an opportunity to reuse it for heating, cooling, and hot water at both building and community scales.

Proposed Solution: Study feasibility and evaluate the technoeconomic advantages of modular Thermal Energy Networks for thermal storage and waste heat reuse from large facilities for surrounding communities.

Anticipated Impacts:

- Reduce energy costs for nearby communities with the reuse of waste heat for heating, cooling, and hot water.
- Decrease GHG and criteria air pollutant emissions from heating, cooling, and hot water use.
- Increase demand-side efficiency for host facilities and nearby communities.
- Avoid overburdening electric and water infrastructure while supporting community growth.



Two-pipe thermal energy network with storage. Credit: Boesten et al.

Optimizing Thermal Energy Networks for Decarbonization

Feedback:

- General support and interest in seeing this initiative proceed. (***DACAG SME***)
- Important to track challenges and lessons learned coming out of similar efforts in other states (e.g., challenges with older building stocks). (***DACAG SME***)
- Lacks alignment with Gas R&D priorities and need to demonstrate how research will build from past initiatives. (***CPUC SMEs)***
  - → Uplifted the alignment with CPUC SME-identified Gas R&D priorities including addressing water heating and HVAC.
  - → Clarified how proposed research is complementary to, but distinct from, prior Gas R&D initiatives proposed by the CEC.

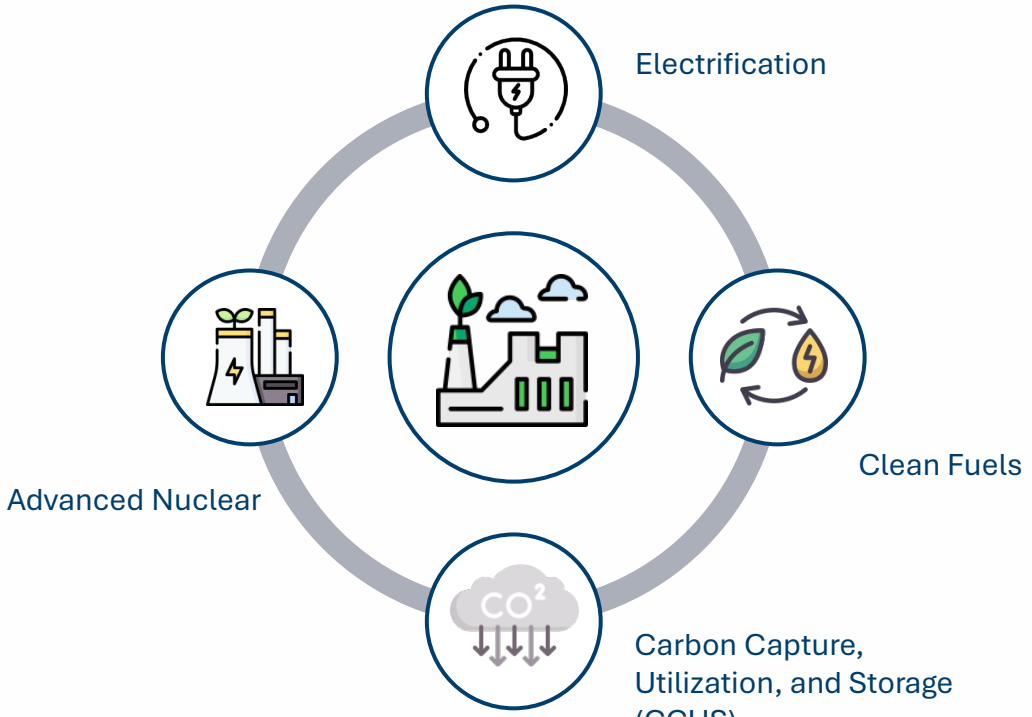
Studying Industrial Process Heat Decarbonization Pathways

Identified Need: Electrifying high-temperature industrial processes is technically challenging and often not cost-effective, particularly for activities that rely on fossil gas, creating a need to explore alternative decarbonization pathways.

Proposed Solution: Conduct a comparative study of high-temperature industrial heat pathways, including electrification; clean fuels; advanced nuclear reactors; carbon capture, utilization, and storage; etc.

Anticipated Impacts:

- Inform coordinated gas system transition planning.
- Investigate potential localized benefits, including improved air quality and public health impacts.
- Evaluate economic and infrastructure impacts across decarbonization pathways.



Studying Industrial Process Heat Decarbonization Pathways

Feedback:

Initial concept focused on a paper study of advanced nuclear technologies' potential role in industrial heat decarbonization compared to other technologies.

- Concerns that nuclear focus is not well aligned with CPUC or broader state policies, may not represent cost-effective use of ratepayer funds, and too nascent for near-term applicability (***CPUC SMEs***)
- Reservations regarding nuclear-specific risks, community impacts, and benefits. (***DACAG SME***)

  → Revised scope to compare costs and benefits of multiple industrial decarbonization pathways across equity, emissions, reliability, public health, and community outcomes.

  → Supports CPUC Long-Term Gas Planning and Integrated Resource Planning by evaluating non-pipeline industrial heating alternatives that are reliable and cost-effective.

- Concerns about nuclear in broader scope, e.g., waste, safety, equity impacts. (***ESJ Panel***)

  → Scope is limited to a paper research study, not deployment, and would evaluate nuclear-related risks and requirements, including waste management, safety, and equity considerations, to better inform potential decision-making.

Thank You

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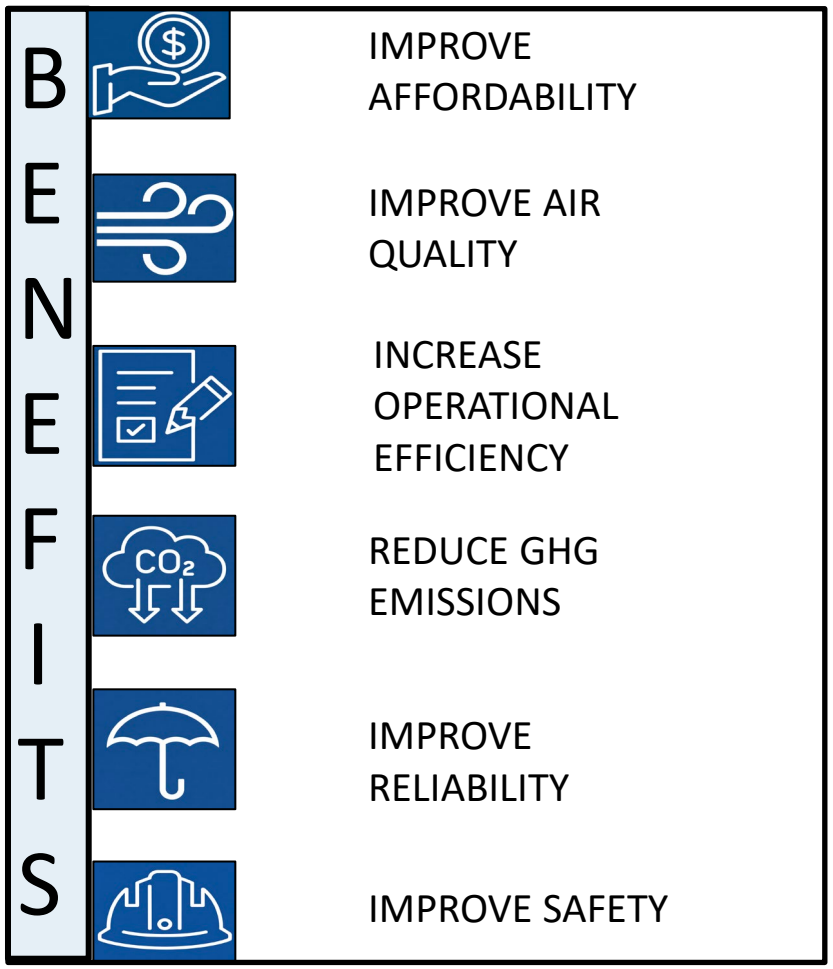
GAS RESEARCH, DEVELOPMENT, & DEMONSTRATION (RD&D)

2026 & 2027 Research Plans

SoCalGas™

SoCalGas RD&D Program Overview



Focus on Practical Innovation

Emphasizes RD&D on technologies that are deployable and practical instead of experimental concepts.

Commitment to Safety and Reliability

Focuses on improving safety and enhancing infrastructure integrity for California customers.

Environmental Stewardship and Decarbonization

Focuses on reducing methane emissions and supporting renewable gas integration to support decarbonization of the gas system.

Equity and Disadvantaged Communities

Prioritizes development of tools to reduce energy burdens in disadvantaged communities for equitable benefits.

Proposed Theme Budget Allocations

Theme	Initiatives	Theme Allocations	Budget (2026)	Budget (2027)
Gas System Integrity	Environmental & Safety	15%	$10,227,550	$10,534,377
	System Inspection & Monitoring	15%		
	Community Impact & Energy Conservation	10%		
	System Design & Materials*	5%		
	Renewable Natural Gas (RNG) Infrastructure Optimization*	15%		
Decarbonization	Low-Carbon Fuel Technologies	15%	$6,818,367	$7,022,918
	Energy Reliability and Resilience	15%		
	Building and Facility Systems	10%		
Program Administration			$1,893,991	$1,950,810
TOTAL 2024 GENERAL RATE CASE AUTHORIZED BUDGET			**$18,939,908**	**$19,508,105**

*Initiatives not presented during the Policies + Innovation Coordination Group

Gas System Integrity: Environmental & Safety Initiative

RD&D Landscape & Proposal

Funding Amount: 15%

Identified Need	Proposed Solution	Anticipated Impacts
Enhanced leak detection and prevention at residential meter set assemblies 1. The success of the NGLAP research program enabled SoCalGas to achieve the ~40% reduction target ahead of schedule, but more work is needed to achieve NZE. 2. Distribution Main & Services and Customer Meters represent 80% of the remaining emissions. These emissions come from tens of thousands of leaks spread over 6 million meters and 100,000 miles of pipeline. 3. Cost-effective system survey and leak prevention methods are needed to achieve safety and environmental goals while reducing ratepayer costs.	1. Evaluate advanced leak detection technologies capable of rapidly and frequently covering the vast territory at lower overall cost. 2. Integrate and analyze existing data from siloed systems to uncover prominent failure modes. 3. Leverage failure mode data and lessons learned from prior research to identify and validate cost-effective leak prevention solutions.	**Reduced Green House Gas Emissions:** Decrease in greenhouse gas emissions, measured in metric tons of carbon dioxide equivalent. **Improved Safety:** Reduction in probability of incident occurrence. **Improved Affordability:** Reduction in inspection, maintenance and repair costs.

Stakeholder Feedback – Environmental & Safety Initiative

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) - Stressed the need for clear coordination among administrators, including alignment across leak detection efforts using AI, LiDAR, and other technologies, and clearer articulation of core research questions, data integration, and roles. **Environmental Social Justice** (ESJ) panel recommends collaboration across the California Energy Commission, California Public Utilities Commission (CPUC), and California Air Resources Board to streamline community feedback	SoCalGas supports this and follows a “braided” approach, testing similar foundational technologies but applying them to its own system conditions. The 2026 plan shifts focus from evaluating inspection tools to integrating and leveraging data across multiple platforms to provide insights into SoCalGas specific infrastructure.

Gas System Integrity: System Inspection & Monitoring

RD&D Landscape & Proposal

Funding Amount: 15%

Identified Need	Proposed Solution	Anticipated Impacts
Advance inspection and monitoring capabilities while reducing inspection costs and increasing infrastructure availability. 1. Robotic ILI tools can be pre-calibrated; free-swimming tools are not. 2. IMU, satellite, and strain/fiber inspection data are disparate. 3. Current Research under SB 1371 Tablet Based Electronic Survey.	Adopt techniques from adjacent technologies to increase operational efficiencies, leverage AI to connect disparate data sources, improve access and usability of real time information for field employees. 1. Develop Alternate In-Line Inspection Tool Calibration Methods. 2. Develop tool to analyze and model geohazard impacts, machine learning (ML) or artificial intelligence (AI) assisted 3. Develop tools to streamline system inspections, including augmented reality tools.	**Increased Operational Efficiency:** Improvement in operational efficiency metrics such as maintenance costs. **Improved Affordability:** Reduction in inspection, maintenance and repair costs. **Improved Reliability:** Reduce out of service time for infrastructure and increase energy availability.

Stakeholder Feedback – System Inspection & Monitoring

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) - Need more clarity on how this relates to the PG&E geohazard activities.	SoCalGas agrees and is focusing proposed research on leveraging and integrating existing internal infrastructure-specific data sources to develop a more comprehensive view of system risk. This enhanced risk perspective will inform targeted mitigation decisions, such as Climate Adaptation and Vulnerability Assessments (CAVA.) The proposed efforts emphasize improved data integration across platforms to support informed decision-making and deliver direct value to ratepayers.

Gas System Integrity: Community Impact & Energy Conservation

RD&D Landscape & Proposal

Funding Amount: 10%

Identified Need	Proposed Solution	Anticipated Impacts
Development of Customer facing tools utilizing existing company data to identify unintended usage of gas. 1. Monetary impact of excess usage disproportionately effects disadvantaged communities. 2. Algorithms utilizing Advanced Meter (AM) data detect some, but not all usage anomalies. 3. False positive indications from AM algorithms increase operational costs.	1. Prior research showed aerial leak survey data could be used to enhance AM algorithms, improving gas leak and hot water leak detection. 2. Further refinement of this approach is needed to reduce false positive rate. 3. Accurate identification of these anomalies can reduce ratepayer costs while enhancing safety. 4. Data insights into areas of frequent or unresolved gas and hot water leaks could support efforts to address systemic maintenance challenges in disadvantaged communities.	**Improved Affordability:** Reduction in energy usage for ratepayers. **Improved Operational Efficiency:** Reduction in maintenance and repair costs. **Reduced Greenhouse Gas Emissions**: measured in metric tons of CO2e.

Stakeholder Feedback – Community Impact & Energy Conservation

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) - Emphasized that the proposal should explicitly build on prior research and investments, particularly given SoCalGas' progress under the NGLA program, and focus any additional work on improving cost effectiveness rather than duplicating existing capabilities. **Environmental Social Justice** panel recommends adding transparent scoring criteria for affordability and local air quality impacts.	SoCalGas agrees and is focusing on leveraging existing technologies and data sources to improve affordability. The proposed efforts will integrate data across platforms to produce direct ratepayer savings. For example, the Community Impact and Energy Conservation initiative will use Aerial Methane Mapping and Advanced Meter data to identify unintentional gas use, such as appliances with incomplete combustion.

Gas System Integrity: System Design & Materials

RD&D Landscape & Proposal

Funding Amount: 5%

Identified Need	Proposed Solution	Anticipated Impacts
Exploration of alternative repair methods to increase longevity of the existing infrastructure. 1. A probabilistic fracture mechanics model for metal pipelines is in progress, but polyethylene (PE) pipe lifetime-prediction models need to be enhanced. 2. Risk Model to identify Well Barrier Flow Path issues for potential failure modes. 3. Replacement alternatives to increase longevity of existing infrastructure. 4. Alternative technologies for infrastructure protection.	1. Develop robust PE pipe lifetime prediction models supported by field sampling and material aging data. 2. Establish integrity values and thresholds with barrier evaluation and analysis of flow paths. 3. Evaluate non-traditional repair methods for safety and reliability. 4. Enhance breakaway fitting capabilities to facilitate technology adoption.	**Improved Safety**: Increase safety during well operations through failure mode analysis. **Improved Reliability**: Increase lifetime of existing assets and end of life predictions. **Improved Affordability**: Reduction in capital replacement costs.

Stakeholder Feedback – System Design & Materials*

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) -CPUC SMEs needs to see the bigger picture. Administrators might have had conversations and know how they are not duplicating efforts but it is very unclear to the CPUC SMEs right now. Want to see this articulated and focus on any areas of potential overlap and highlight how the initiatives are complementary to each other and not duplicative. **Environmental Social Justice** (ESJ) panel recommends collaboration across the California Energy Commission, California Public Utilities Commission (CPUC), and California Air Resources Board to streamline community feedback	SoCalGas supports this and follows a "braided" approach, testing similar foundational technologies but applying them to its own system conditions. The 2026 plan shifts its focus to risk identification and repair alternatives, with an emphasis on evaluating compatibility with existing SCG infrastructure. The intent is to manage and maintain the current system to support safe and reliable operations during the energy transition

*System Design & Materials was not presented at the PICG.

Gas System Integrity: RNG Infrastructure Optimization

RD&D Landscape & Proposal

Funding Amount: 15%

Identified Need	Proposed Solution	Anticipated Impacts
Optimization and standardization of RNG interconnection designs can lower costs. 1. Lower the cost and timeline of RNG interconnections by standardizing engineering design and reducing construction complexity 2. Increase the supply of affordable, safe, and reliable RNG by unlocking more feasible injection points for small and medium-sized projects. 3. Address cost drivers for RNG to reach the pipeline, such as post-processing, compressing, measurement, and other system related elements.	Optimizing technology integration and interconnection costs by: 1. Developing advanced interconnection designs with standard and modular interconnect skids, commissioning packages and SCADA/cybersecurity profiles. 2. Developing reverse flow/bidirectional pipeline demonstrations with operational controls and localized pressure management to open space in constrained or lower-pressure segments while validating safety and reliability. 3. Improve systemic efficiency: wide-turndown efficient compression; continuous gas-quality monitoring; buffering storage solutions; autonomous operational frameworks.	**Improved Affordability:** Lower fabrication, interconnection and O&M costs, brought by fewer change orders, shorter schedules and standardization, reduce delivered RNG cost, especially for small/medium projects. **Improved Safety:** Studies that evaluate and test compatibility of new RNG technologies with the gas system enhance safety for end-users and utility employees **Improved Air Quality:** Eliminate/reduce flaring from biogas production facilities such as wastewater treatment plants, and emissions of criteria pollutants.

Stakeholder Feedback – RNG Infrastructure Optimization

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) -emphasized that renewable natural gas (RNG) is a priority focus area for the Commission, given clear problem statements and established Commission direction.	This initiative was developed in response to CPUC SME feedback, with the intent to focus on RNG interconnections targeting new technologies and new approaches to lower costs.

Decarbonization: Low-Carbon Fuel Technologies

RD&D Landscape & Proposal

Funding Amount: 15%

Identified Need	Proposed Solution	Anticipated Impacts
Improve affordability and emissions performance by addressing RNG production and upgrading bottlenecks: 1. Improved capability to process diverse feedstocks (manure, food waste, biosolids, organics, woody biomass) while maintaining stable operations. 2. Lower cost of upgrading raw biogas to pipeline quality, contaminant removal and upgrading efficiency. 3. Increase RNG production reliability with improved uptime and yields. 4. Expand supply of low-carbon fuels by improving the cost and efficiency of production pathways, including RNG and other low-carbon options.	1. Develop technologies that increase RNG yield and reduce upgrading cost through biologic and/or synthetic methanation of CO_2 in biogas. 2. Improve biogas gathering and RNG throughput by developing advanced monitoring and predictive controls to reduce flaring and enable higher loading rates. 3. Develop alternative separation/purification processes to reduce parasitic load; and simplified, modular, high-efficiency upgrading systems for small and mid-scale projects. 4. Research emerging RNG production technologies and cost optimization opportunities through added-value coproduction strategies, including water reutilization, digestate and fiber applications, siloxane recovery, high-fat residues valorization, CO2 off-gas conversion, among others.	**Improved Affordability:** Reduce capital, O&M, and fuel costs by improving yield, uptime, and upgrading efficiency. Expanded feedstock flexibility and reduced downtime increase total RNG supply available, which can lower the costs to reach SB 1440 biomethane procurement goals. **Reduced GHG Emissions:** Reduce GHG emissions by increasing capture and productive use of methane, reusing process effluents, and improving efficiency of fuel production. **Improved Reliability:** Enable fuel production technologies that can support intermittent operations and integrate with variable renewable energy resources.

Stakeholder Feedback – Low-Carbon Fuel Technologies

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) - CPUC SMEs recommended that this initiative should be reframed to align with Commission priorities by removing hydrogen related elements and refocusing on clearly defined problem statements associated with renewable natural gas. CPUC SMEs emphasized that RNG presents more immediate and well articulated challenges relevant to gas system planning, ratepayer impacts, and decarbonization objectives. **Environmental Social Justice** panel recommends prioritizing non-combustion and decommissioning research over RNG/Hydrogen.	SoCalGas adjusted this initiative to exclude hydrogen focused research areas. For example, the focus is now on emerging RNG production technologies and cost reduction opportunities and excludes new RD&D research on hydrogen technologies such as electrolyzers and fuel cell stack manufacturing.

Decarbonization: Energy Reliability and Resilience

RD&D Landscape & Proposal

Funding Amount: 15%

Identified Need	Proposed Solution	Anticipated Impacts
Diverse, affordable and decarbonized energy resources to support customer reliability and resiliency. Lower emission backup generation options that rely less on diesel usage. Enable a gradual to full transition to decarbonized systems while keeping ratepayer investments reliably powered. 1. No CARB certified generation systems under 50kW are commercially available. 2. Current control systems lack the ability to adapt and achieve interoperability to changing real world conditions. 3. Limited integration of affordable onsite fuel conversion, fuel flexible retrofits, and CO2 mitigation technologies for existing customer assets.	Research, development and demonstrations of advanced energy management system controls and integration, optimization of Combined Heat and Power (CHP) systems, and scalable microgrid control systems. Additional examples include: 1. Demonstrate broader generation technologies, efficiency optimization, and integration. 2. Use AI to improve controls system and optimize power generation systems. 3. Develop and integrate point-of-use decarbonization technologies (e.g., onsite fuel conversion, fuel flexible retrofits, CO2 mitigation technologies).	**Improved Reliability:** Support electric grid reliability with diverse energy resources to prevent grid strain and disruptions. **Improved Air Quality:** Reduce criteria pollutant emissions. **Improved Affordability:** Lower energy cost low carbon technologies.

Stakeholder Feedback – Energy Reliability and Resilience

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) - CPUC SMEs noted potential overlap with CEC's EPIC cost effective industrial decarbonization efforts and previous CEC Gas RD&D projects from 2024 and emphasized the need to clearly demonstrate how this initiative avoids duplication and instead targets the most pressing challenges through complementary, enhanced research.	This initiative complements EPIC by focusing on decarbonizing existing distributed energy assets and avoiding stranded investments. It targets system-level challenges (advanced controls, integration of fuel flexible, lower emission generation across sectors) supporting reliable, cost- effective transitions aligned with CPUC priorities.

Decarbonization: Building and Facility Systems

RD&D Landscape & Proposal

Funding Amount: 10%

Identified Need	Proposed Solution	Anticipated Impacts
Lower-cost and reduced emission commercial and industrial heating technologies, advanced energy management systems, waste heat recovery, and smart building controls for buildings and facilities. 1. Advanced window retrofits and other novel building materials need additional development and demonstration. 2. The use of AI for energy management within commercial and industrial facilities and equipment is relatively new. 3. Industrial processes are complex, diverse, and often unique, requiring tailored solutions reduce energy utilization and emissions.	Research, development, and demonstration of a wide range of heating equipment, energy management, thermal energy recovery and storage, and novel building technologies. 1. Developing advanced building envelope materials. 2. Demonstrations of advanced energy management and smart building controls that reduce gas use and optimize the operation of electric and gas equipment. 3. Cutting direct emissions from boilers, water heaters, commercial cooking appliances, and industrial process equipment.	**Improved Affordability:** Customer bill savings, avoided customer energy used (kWh saved), maintained or reduced capital, operations and maintenance costs. **Improved Air Quality**: Reduce criteria pollutant emissions. **Reduced GHG Emissions**

Stakeholder Feedback – Building and Facility Systems

Stakeholder Feedback	Response
California Public Utilities Commission (CPUC) Subject Matter Experts (SMEs) -CPUC SMEs recommended that this initiative would require significant refinement before moving forward. CPUC SMEs emphasized that EPIC and Gas RD&D investments should be tightly focused on aggressively reducing the size of the gas system and prioritizing electrification across the building sector and other end use sectors, particularly where electrification can deliver the greatest system and ratepayer benefits	This initiative is intended to support targeted, strategic decarbonization in buildings and facilities. The RD&D scope evaluates whole-building measures such as envelope improvements, advanced controls, load flexibility, thermal energy storage, and related system strategies that can reduce emissions, lower gas demand, and help de-risk electrification where implementation constraints remain. This work is complementary to electrification because it helps identify transition pathways that are technically feasible, equitable, and cost-effective, while also informing longer-term planning around affordability, customer impacts, ratepayer exposure, and opportunities for more strategic reductions in gas system reliance.

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DACAG 2026

PG&E Research Plan

March 20, 2026

Together, Building
a Better California

Proposed Focus Areas Shaping the 2026 Gas RD&D Plan

System Risk & Uncertainty	Visibility & Decision-Quality Data	System Options & Pathways	Clean Fuels Integration	Affordability & Long-Term Cost Risk
Identifying near-term safety, reliability, and climate-driven risks on the existing gas system that 2026 research is focused on better understanding.	Improving inspection, monitoring, and analytics such that near-term integrity and emissions decisions are informed by better data.	Evaluating technical approaches within the existing gas system to improve safety, reliability, and performance in the near term.	Reducing cost and uncertainty for renewable natural gas use by improving interconnection, measurement, and system performances.	Using 2026 research to help avoid unnecessary costs, reduce emergency response spending, and support protection of customers from future rate impacts.

Proposed Budget Allocations

Theme	Initiative	Allocations	2026 Plan Budget
Gas System Integrity	Proactive Geohazard Risk Management	$0.74 (10%)	$5.18M (70%)
	Innovative and Cost-Effective Integrity Management	$1.48M (20%)	
	Advanced Leak Detection and Repair	$1.48M (20%)	
	Emission Reduction Activities and Refined Reporting	$1.48M (20%)	
Decarbonization	Clean Fuels Integration	$2.22M (30%)	$2.22M (30%)
		TOTAL PLAN BUDGET*	**$7.4M**

*The stated amount excludes an administration fee of $826,700. When administration costs are included, the total program budget amounts to $8.27 million. The 2026 theme budget is derived from the 2025 Plan allocation.

GSI: Proactive Geohazard Risk Management

RD&D Landscape & Proposal $0.74 (10%)

Identified Need	Proposed Solution	Anticipated Impacts
• Climate-driven ground movement and extreme conditions are increasing risk to certain gas assets, with potential for disruptive and costly events. • Current monitoring can lack the timeliness and resolution needed to spot early warning signals and prioritize where to focus attention. • PG&E needs field-validated approaches that work in real conditions and produce decision-quality outputs.	• Test and validate continuous sensing and targeted monitoring approaches that improve early detection of geohazard-related risk. • Combine field measurements with asset context to improve prioritization and reduce uncertainty in where to focus mitigation. • Translate observations into practical decision outputs (screening thresholds, indicators, and performance evidence).	• Affordability: Reduce avoidable emergency response and remediation costs through earlier identification and better targeting. • Safety & reliability: Lower the likelihood and consequences of geohazard-driven failures and service disruptions. • Equity: Shorter disruption windows and fewer repeat mobilizations where issues recur.

GSI: Proactive Geohazard Risk Management Cont.

RD&D Landscape & Proposal $0.74 (10%)

CPUC SME Feedback	Public Feedback
• CPUC SMEs consistently emphasized that initiatives should lead with a clear and stable problem statement—encouraging administrators to “fall in love with the problem,” not a specific technology or solution.	• None

GSI: Innovative and Cost-Effective Integrity Management:
RD&D Landscape & Proposal $1.48M (20%)

Identified Need	Proposed Solution	Anticipated Impacts
• Integrity assessment can be costly and disruptive, especially where assets are hard to access or conditions are complex. • Traditional approaches can require repeated field mobilizations and high-disruption activities to confirm conditions. • PG&E needs validated, lower-disruption methods that improve confidence in asset condition and reduce uncertainty.	• Validate non-intrusive / minimally intrusive approaches for locating, screening, and assessing asset condition. • Test emerging methods under PG&E field conditions to understand accuracy, limits, and where each method is appropriate. • Produce transferable learnings that help choose the right tool for the right conditions—consistently.	• Affordability: Reduce assessment costs by limiting unnecessary excavation, repeat visits, and disruptive work. • Safety & reliability: Earlier, better assessment improves prioritization and reduces risk of unexpected events. • Equity: Less neighborhood disruption from repeated field work and prolonged work windows.

GSI: Innovative and Cost-Effective Integrity Management:
RD&D Landscape & Proposal $1.48M (20%)

CPUC SME Feedback	Public Feedback
• CPUC SMEs consistently emphasized that initiatives should lead with a clear and stable problem statement—encouraging administrators to “fall in love with the problem,” not a specific technology or solution.	• Some of these projects sound like things I assumed that investor-owned utilities would be covering as part of their standard maintenance and asset protection process. And so I had a question about how the determination is made that something is appropriate for research and development funding versus something that utilities should already be investing in as part of their core responsibilities.

GSI: Advanced Leak Detection and Repair (LDAR)

RD&D Landscape & Proposal $1.48M (20%)

Identified Need	Proposed Solution	Anticipated Impacts
• Leak detection and localization can be time- and labor-intensive, which can extend disruption and increase total cost. • New detection technologies are emerging, but need validation in PG&E operating conditions to confirm performance and fit at scale. • Faster localization can reduce repeat dispatch and shorten time to repair.	• Validate a portfolio of detection approaches appropriate to different asset types (facility monitoring, aerial platforms, mobile detection). • Generate evidence on detection sensitivity, false positives, and operational fit to support consistent use at scale. • Focus on what RD&D uniquely adds: credible field learning on performance, limitations, and best uses.	• Affordability: Lower total survey and repair cost by reducing repeat dispatch and improving localization. • Safety & reliability: Earlier detection and faster response reduce the chance of escalation. • Equity: Shorter disruption windows during detection and repair activity.

GSI: Advanced Leak Detection and Repair (LDAR)

RD&D Landscape & Proposal $1.48M (20%)

CPUC SME Feedback	Public Feedback
• CPUC SMEs consistently emphasized that initiatives should lead with a clear and stable problem statement—encouraging administrators to "fall in love with the problem," not a specific technology or solution. • Further study should be focused on improving cost effectiveness and reporting accuracy, rather than marginal emissions reductions.	• Earth Justice: I was really disappointed to hear that some folks had given PG&E feedback recommending shifting money away from projects that are intended to reduce leakage and methane system emissions. That's difficult to square with California's statutory mandates for deep decarbonization, and it's also difficult to square with affordability imperatives, because it's ratepayers who wind up paying for all of that gas that is lost when utilities don't control their leaks.

GSI: Emission Reduction Activities and Refined Reporting

RD&D Landscape & Proposal $1.48M (20%)

Identified Need	Proposed Solution	Anticipated Impacts
• As PG&E continues emissions reduction progress, remaining emissions require better targeting and more reliable measurement. • Decisions about what to pursue next depend on accurate, comparable emissions information—not assumptions. • PG&E needs evidence on which methods perform effectively under real field conditions and how results should be interpreted.	• Validate measurement and quantification approaches that improve confidence in emissions estimates and trends. • Test and document performance of reduction approaches where field learning can clarify “what works where,” and why. • Use results to improve targeting—so future effort focuses on high-value approaches and avoids low-yield activity.	• Affordability: Better targeting reduces wasted effort and supports cost-effective prioritization. • Environmental & air quality: Improved visibility supports more credible reduction pathways and accountability. • Equity: Helps ensure attention is focused where cumulative burden and exposure concerns are greatest.

GSI: Emission Reduction Activities and Refined Reporting
RD&D Landscape & Proposal $1.48M (20%)

CPUC SME Feedback	Public Feedback
• CPUC SMEs consistently emphasized that initiatives should lead with a clear and stable problem statement—encouraging administrators to "fall in love with the problem," not a specific technology or solution.	• Earth Justice: I was really disappointed to hear that some folks had given PG&E feedback recommending shifting money away from projects that are intended to reduce leakage and methane system emissions. That's difficult to square with California's statutory mandates for deep decarbonization, and it's also difficult to square with affordability imperatives, because it's ratepayers who wind up paying for all of that gas that is lost when utilities don't control their leaks.

Decarbonization: Clean Fuels Integration
RD&D Landscape & Proposal $2.22M (30%)

Identified Need	Proposed Solution	Anticipated Impacts
• Reduce cost and time to interconnect renewable natural gas (RNG) projects where they are being pursued. • As RNG feedstocks vary, trace constituents can affect system performance and downstream equipment—requiring better measurement and understanding. • PG&E needs near-term, practical approaches that manage uncertainty and protect customers from avoidable costs.	• Validate more standardized, cost-effective interconnection approaches suitable to PG&E conditions (including modular / flexible designs). • Test gas quality measurement and monitoring approaches that can detect key trace constituents and support practical operations. • Focus RD&D on questions that unlock safe, cost-effective integration—grounded in field performance evidence.	• Affordability: Lower interconnection and monitoring costs where renewable natural gas is used. • Safety & system performance: Better gas quality insight reduces operational uncertainty and protects equipment. • Air quality / Equity: Trace constituent monitoring helps manage potential air-quality risks.

Decarbonization: Clean Fuels Integration
RD&D Landscape & Proposal $2.22M (30%)

CPUC SME Feedback	Public Feedback
• CPUC SMEs consistently emphasized that initiatives should lead with a clear and stable problem statement—encouraging administrators to "fall in love with the problem," not a specific technology or solution. • CPUC SMEs indicated that hydrogen blending into gas pipelines is not supported. • CPUC SMEs emphasized that renewable natural gas (RNG) is a priority focus area for the Commission.	• Physicians for Social Responsibility LA: And then, just a note that I would probably discourage the RNG infrastructure optimization, because as we're thinking about broader equity and public health concerns, I don't think RNG is necessarily the best approach to solving some of those challenges. • Earth Justice: The second issue I wanted to touch on was all of the investments for biomethane integration. That does not seem like a responsible use of ratepayer funds. It does not seem like a use of ratepayer funds that is consistent with ESJ priorities at the Commission. The Commission has heard for years from communities on the front lines of pollution from the dairies that are benefiting from that funding, asking to not have ratepayer funds exacerbate the harm from biomethane production and use. • SoCalGas Ratepayer: I fully support RNG integration, particularly in light of SB 1371, which is trying to divert organic material from landfills and reduce greenhouse gas and local air quality pollutant emissions.

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Feedback and Discussion

- Program Investment Themes:
  - Ensuring gas system integrity and strategic decommissioning
  - Decarbonizing the gas system via alternative energy sources
- CPUC Initiative Criteria:
  1. POLICY PRIORITY: Do proposals appear to align with CPUC proceedings?
  2. **IDENTIFIED NEED**: Are investments clearly innovative and coordinated to leverage existing RD&D and avoid duplication?
  3. **PROPOSED SOLUTION**: Are outputs and pathways to utilize results clear and appropriate?
  4. **ANTICIPATED IMPACTS**: Do proposals appear to provide clear ratepayer benefits, particularly to affordability and equity?