



Mindful Gas Decommissioning Public Workshop Toolkit

A Data-Driven Tool for Exploring Gas Pipeline Decommissioning

2 October 2024

WHEN TRUST MATTERS



Mindful Decommissioning: A Data-Driven Tool for Exploring Gas Decommissioning

California Energy Commission PIR 22-002 **Beta-Tool Demonstration Meeting**

13 December 2023

Project Background

Decarbonization of Energy by 2045 requires strategic decommissioning of gas infrastructure

Gas transmission and distribution extends to >11M meters and 100k miles

Decommissioning must be:

- Safe
- Intentional
- Environmentally just
- Cost effective

To achieve these goals decision makers face challenges such as:

- Scope, diversity, security and processing of data
- Engaging SMEs across multiple stakeholders and domains of expertise
- Lack of quantitative, analytic approach to integrate disparate knowledge pools
- · Absence of summary metrics to quantify decommissioning impacts and scenarios





Mindful Decommissioning DNV's Proposed Solution



Engage with stakeholders to identify key variables and data types

Quantify variables using public data sources and private sources where necessary



Create a prioritization process using geospatial metrics



Quantify uncertainties



Research efforts to span three categories of:

Gas assets

Decommissioning readiness

Community impacts





Pathway to Mindful Decommissioning







Community and Advisory Engagement Schedule



TAC = Technical Advisory Committee PAC = Policy Advisory Committee CW = Community Workshop





CEC PIR 22-002 Data-Driven Tool for Gas Decommissioning



Balancing Multiple-Criteria for Mapping Decommissioning Possibilities



Web-based GIS tool for identifying promising decommissioning sites



Data transparency and export for further analysis by users

DNV Innovations:

- Hierarchical structure for evaluating gas assets for relative benefits for decommissioning
- Users can deep-dive into hierarchical model to understand underlying factors driving census tract scoring and export raw and aggregated data for further analysis
- Clustering algorithms used to normalize and rank by census tract
- Synergi Gas modeling to evaluate interconnectivity and hydraulic feasibility
- Gas-focused equity metric aggregates socioeconomic factors, air quality, climate risk, energy burden, environmental and pollution risks informed by extensive community engagement
- Decommissioning readiness for both commercial and residential customers based on usage patterns and types



Synergi Gas modelling for incorporating hydraulic impacts and identifying assets to decommission

Mindful Decommissioning uses Multilevel Composite Indices for Scoring Census Tracts







1. Gas Assets Index

Safety Benefits GHG Reductions Regulatory Drivers Gas Demand Rate-payer Costs IOU contributed data

10 = gas assets in this area most beneficial for decommissioning, 1 = gas assets in this area least beneficial for decommissioning

2. Decommissioning Readiness Index

Commercial sector capacity for fuel switching from NAICS codes

Residential preparedness for electrification from Census and Parcel level data

10 = users in this area can most readily switch away from gas, 1 = users in this area can least readily switch away from gas 3. Equity Index Socioeconomic vulnerability Pollution burden Climate Risk Sensitive Populations Energy Burden Access to Critical Services

10 = communities in this area would most readily benefit from decommissioning, 1 = users in this area have the least benefit



1. Gas Asset Index - Assessment Factors



2. Decommissioning Readiness Sector-Specific Scores (Sub-Indices)

Commercial Sector

- Colleges
- Food Processing
- Healthcare
- Hotels
- Mining
- Miscellaneous
- Offices
- Refrigerated Warehouses
- Restaurants
- Retail
- Schools
- Warehouses

Industrial Sector

- Durable Goods Manufacturing
- Non-durable Goods Manufacturing





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3. Equity Index - Assessment

Equity Goals:

- Develop contextual set of equity metrics to investigate pathways for prioritizing communities who are more vulnerable to costs, burdens and cumulative energy inequity impacts associated with early adoption/decommissioning
 - Uplift non-energy impacts and benefits (e.g., health, housing, jobs) that communities view as priority

Data Collection and Evaluation Goals:

- Most comprehensively *identify* publicly available equity metrics and potential community impacts relevant to gas pipeline decommissioning.
- Iteratively refine, select and prioritize/weight through team, stakeholder, and community engagement, workshops and input
- Research and co-develop case study profiles with communities to *apply, test and ground truth* metrics





3. Equity Index - Identified Equity Metrics and Sources within Context of Gas Decommissioning

Primary Metrics	Sub-Index	Data Source
Poverty line, disability, age, education, language, housing, rent burden, unemployment, mobile home, people of color, single parent, renter status	Socioeconomic Status	2021 5 Year ACS
% heated with non-grid fuels, energy burden ratio, number and duration of grid outages	Energy Burden	2021 5 Year ACS, DOE LEAD Tool
Pm 2.5 and ozone concentrations, particulate matters, air toxic respiratory and cancer risks, RMP proximity, diesel particulate matter	Pollution Burden	EPA EJ Screen
Hazardous waste and underground storage tanks proximity, waste water discharge, lead paint risk	Environmental Risk	EPA EJ Screen
Heart disease incidence, asthma incidence, cancer incidence, % low life expectancy, % babies low birth weight	Sensitive Populations	EPA EJ Screen, Cal Enviro Screen 4.0
Access to health insurance and broadband service	Access to Critical Services	EPA EJ Screen
Coastal flood, earthquake, heat wave, riverine flood, wildfire, winter weather risk	Climate Risk	FEMA National Risk Index

Sustainable Communities

3. Equity Index: Community Engagement Case Studies

- 1. Develop a comprehensive case study of identified community that accurately represents the lived experiences of its residents
- 2. Use feedback to refine equity metrics and fill in data gaps and ground truth metrics

3. Equity Index: Case Study Profile

Case Study Profiles are narratives developed for each location and will provide supporting details describing top scoring impacts and needs of selected communities representing various California populations (demographics), located in different geographic areas. These profiles will be developed as the selection process evolves and will include information as follows:

- Case Study Location description and visually represented by data on the beta tool.
- Population characteristics and demographics for communities in proximity of the location.
- Community characteristics (e.g., agriculture, fishing workforce, gas power plant locations, community activism around fossil fuel etc.)
- Applicable and top (3) scoring equity metrics and analysis of correlation, top scoring impact for region/area
- Applicable and top (3) scoring gas assets metrics (e.g., pipeline age, maintenance and repair schedule)
- Applicable and top (3) scoring readiness factors
- Equitability assessment and justification for identification as promising.
 - Incorporates qualitative input from communities, CBOs, RENs, CCAs, MUDs, TAC (technical and non-technical)

If applicable:

- Description of past or current decommission projects and sites, including:
 - process identifying and prioritizing location
 - equity metrics and indicators used
 - barriers, risks, costs, and other challenges
 - community response
 - mitigations or offsets provided
 - lessons learned
 - level of success
- Any future planned decommissioning





3. Equity Index: Case Study Engagement Plan

Meeting 1: provide an overview of the case study approach and update on the tool development

Meeting 2: deep dive into the data that we've collected on case study area to gain ground truthing information and feedback from you related to

- equity metrics (community impacts including socioeconomic status, climate risk, energy burden and others we shared at workshop 1),
- physical gas pipeline integrity (e.g., safety, maintenance, costs etc),
- decommissioning "readiness" related to commercial sectors (e.g, food processing, schools, hospitals etc.); we are starting to gather residential data but only at the beginning stages.

Meeting 3: present a final draft of the case study profile with feedback incorporated and make final revisions





3. Equity Case Study & Community Engagement







3. Equity Assessment – Community Workshop 2 Beta Tool Case Study Applications / October 2, 2024

- Report back from Workshop 1 how feedback was incorporated
- Project updates
- Workshop 2-3 Case Studies applying Beta Tool
 - place-based case studies selected through engagement process with community-based organizations (CBOs)
 - \circ SF Bay Area urban
 - Tribal lands (North-Hoopa, Central-Tulle River, South-Cahuilla) rural, desert
 - o Stockton valley
 - o Oxnard/Ventura coastal
 - Los Angeles urban, desert
 - San Diego suburban
- Solicit participant validation of top community impacts represented by equity metrics applied to case study locations and feedback on any gaps in data representation
- Use feedback to refine equity metrics and fill in data gaps







MINDFUL GAS DECOMMISSIONING

To most accurately represent the scope of this project and concepts related to a data-driven tool development for prioritizing gas pipeline decommissioning, this factsheet contains technical language that best characterizes the relevant scope and concepts. The project team members will make ourselves available to provide any clarification on information in this factsheet.

FACTSHEET

To help meet its clean energy goals, California is considering selective decommissioning of gas pipelines, prioritizing equity and community interests and needs.

A significant step towards realizing the State of California's goal of decarbonization of energy by 2045 is to strategically decommission natural gas distribution infrastructure. Many cities in California have already adopted building codes that limit the utilization of natural gas in new developments.

However, natural gas transmission and distribution lines presently provide service to more than 11 million meters and span more than 100,000 miles. The process of decommissioning must be safe, intentional, environmentally just, and cost-effective. At present there is no integrated decision-making tool that balances the concerns of the state's IOUs, cities and municipalities, community groups, developers, regulators, and technology vendors.

Tools need to be developed for collecting, analyzing, and integrating data required by decision-makers to bring about this energy transition efficiently, effectively, and equitably. This tool will need to be inherently interdisciplinary and have the ability to combine diverse data types and sources including technological, engineering, financial and social.



- Scope, diversity, security and processing of data
- Engaging subject matter experts from natural gas, grid services, and communities
- A lack of metrics that descriptively and evocatively capture total risks
- Methods to estimate the benefits related to economics, environment, health, safety and equity

Key priorities for the decommissioning process.





Cost-effective

California Natural Gas Pipelines

Oil Refineries and Terminal

The CEC has funded DNV and the UCLA's Center for Sustainable Communities to conduct a research project (Mindful Gas Decommissioning Project) and create a data-driven tool that can be used to screen for promising candidate decommissioning sites.

The DNV-UCLA team will conduct this research to collect and present critical information, focused on three decision-making areas to meet the key priorities of decommissioning: (a) assessment of gas assets (e.g., physical condition, age), (b) assessment of decommissioning readiness (e.g., how ready is the state's infrastructure for alternatives to gas such as clean energy, heat pumps), and (c) assessment of community impacts. Engagement with state agencies, IOUs, municipalities, and community stakeholders will ensure that costs and benefits are understood from these diverse points of view and the most critical elements prioritized. The tool will include the relevant data collected as layers on a map to show a comprehensive picture for the state to prioritize when, where and how to decommission gas distribution pipeline segments.

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UCLA



MINDFUL GAS DECOMMISSIONING

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FREQUENTLY ASKED QUESTIONS

1. What is the Mindful Gas Decommissioning project?

The California Energy Commission (CEC) has funded the DNV and UCLA teams to conduct this research project to collect and visualize data that can help to develop a scalable, systematic approach to screen for promising candidate decommissioning sites within the state's distribution gas pipelines. (The scope of this project does not include gas transmission pipelines nor production facilities or sites.)

2. What kind of data is being collected?

The Mindful Gas Decommissioning team is collecting data based on factors such as physical condition of pipelines, gas network characteristics, energy resilience, costs of decommissioning to customers, how energy, health and economically burdened communities will be affected, and how to decommission safely and equitably, among many others.

3. How will the data be used?

UCLA

The team will use the research data to build a mapping tool that can geospatially (visually) show the pros and cons of gas decommissioning across different geographical regions of the state.

4. Why include communities in this effort?

Engaging our communities and stakeholders to increase understanding of impacts and benefits of decommissioning on environmental justice and energy equity is a priority for this project. It is also very important to gain community and stakeholder feedback to validate the relevant data. The project is currently in progress and is set to end in 2025, at which time the goal is to deliver a final version of the tool to the state.

5. Why are we talking about strategic decommissioning of gas pipelines?

The role of natural gas in California's energy system is changing as the state strives toward a clean energy future. Over the next 25 years, state and municipal laws concerning greenhouse gas emission reductions will result in the replacement of gas-fueled technologies and will reduce the demand for fossil natural gas (CPUC, 2020). Without proper management, these transitions will impose challenges not only to customer affordability, but also to gas system planning, operations and maintenance, and safety.

6. What are the major concerns that are taken into consideration with gas line decommissioning?

"The prospect of significant reductions in retail customer demand for natural gas creates a planning imperative. With fewer customers and less natural gas demand, the cost of natural gas for remaining retail customers is expected to rise and could become unsustainable, particularly for low-income customers, unless system costs that are recovered through rates can also be reduced over time (Gridworks, 2019; Aas, et al. 2020)".

There are two critical concerns that disadvantaged communities may face as a consequence of decommissioning. First, gas appliances such as furnaces and stoves will in many cases have to be replaced with appliances that run on electricity if those customers choose to decommission. In some cases, older homes may also need upgrades to their electrical service to accommodate the increased load. Disadvantaged and lower-income households are typically less able to afford these replacements than higherincome households. Second, as the number of gas customers decreases, there will be fewer people paying to maintain the gas system. This could lead to increasing gas utility bills for customers who continue to use gas. These two risks combine to put disadvantaged and lower-income households at risk for



increasing gas utility bills because they may not be able to afford to replace their old gas appliances with electric appliances. These risks may be somewhat offset by home energy efficiency incentives and/or rebates. Other risks of decommissioning that will need to be managed during the transition include the impact of decommissioning lines on the gas network properties (how well the gas can flow through the pipeline to meet customer needs), and the impact on energy resilience (having access to energy in multiple forms).

7. How is the research team engaging communities about this project?

Community engagement is critical to ensure that the tool being developed with publicly available data that is ground-truthed by community knowledge and experiences. DNV will lead a Community Engagement and Energy Equity process that includes:

- Providing an online <u>Community Resource Hub</u> the Hub will be designed as a two-way communication tool between the DNV-UCLA team and community groups for purposes of this project. We are designing it to have: a resource library, a frequently asked questions (FAQ) section, a survey and response section, meeting and informational videos and notes, contact information and a help section. The site will have search and filter capabilities and a secure format to allow community groups to link to it on their own pages.
- Leading three community workshops to exchange ideas and develop a common understanding of impacts of gas pipeline decommissioning and gain informed community feedback on equity data.
- Leading "case study engagement" with various communities throughout California, applying the beta tool to explore and learn unique characteristics and community impacts and gain community insights, recommendations and validation on equity data identified.

8. How will decommissioning gas lines affect my household/business?

If your home or business currently relies on gas for heating, cooking, water heating, laundry, or other purposes, gas decommissioning would mean transitioning to alternative energy sources. This could involve converting your appliances to electric or switching to other delivered fuel sources. Some appliances may be adapted to work with alternative energy sources, while others may require full replacement. Fuels such as renewable natural gas or hydrogen may replace natural gas in difficult-to-decarbonize sectors, including some industries.

9. How will decommissioning gas pipelines impact energy prices in the area and my utility bill?

The decommissioning of gas lines in California could potentially have an impact on energy prices in the state, but the extent of this impact would depend on various factors and the broader energy landscape. These factors include supply and demand, negotiations between the utilities and regulatory agencies about what rates they can charge, and state and federal policy decisions that can make financial aid available for households and business to convert from gas-using to electricity-using appliances. Analysis of energy price impacts due to decommissioning is being considered as part of the DNV/UCLA Mindful Gas Decommissioning study.

10. What is "obligation to serve"?

Utility services such as gas and electric are considered a vital public need, and therefore utilities are obligated to provide service to any member of the community who requests it, without discrimination. For this reason, decommissioning is being considered within the context of communities seeking to accelerate their transition to clean energy. For as long as customers on the network are choosing to use gas, and the pipelines are still serving gas, there is, at the moment, an obligation for the utilities to provide that gas to the customer.

• Obtaining input from other stakeholders such as cities, Community Choice Aggregators (CCAs), Regional Energy Networks (RENs), Investor-Owned Utilities (IOUs) and others who may represent community interests.

You can learn more about the gas decommissioning effort in California through a short list of references below.

- The CEC's Gas R&D Program invests in technologies and solutions that help the gas sector support California's energy and environmental goals
- <u>Strategic Pathways and Analytics for Tactical Decommissioning of Portions of</u> <u>Natural Gas Infrastructure</u>
- <u>Strategic Pathways and Analytics for Tactical Decommissioning of Portions of</u> <u>Gas Infrastructure in Northern California</u>
- <u>Mindful Gas Decommissioning: A Data-Driven Tool for Prioritizing Strategic</u> <u>Gas</u> <u>Asset Decommissioning | Funded by CEC (energizeinnovation.fund)</u>
- <u>Staff Proposal on Gas Distribution Infrastructure Decommissioning</u> <u>Framework in Support of Climate Goals</u>
- California Natural Gas Pipelines (Detailed) Map
- <u>CPUC Gas Infrastructure Equity Workshop</u>
- <u>CPUC Webinar on Natural Gas 101 and Policies for a Just Transition</u>

Mindful Gas Decommissioning Community Resource Hub www.mindfuldecommissioning.dnv.com

**This Resource is here for you to access throughout the project. You can review information on the Project, including updates, workshop presentations, notes and recordings, links to related efforts in California. You can also provide feedback and request accommodations for any needs, such as language translation, technology, accessibility etc. If you require translation of any resource provided, please complete an Accommodations Request.





CONNECT

Cici Vu Associate Director Energy and Climate Equity Email: cici.vu@dnv.com Phone: (415) 385-6242 Hari Polaki Project Manager Email: hari.polaki@dnv.com Phone: (925) 771-0845



To form an understanding of communities needs and interests beyond the statistical data and ensure that they have a meaningful voice in the gas decommissioning decision-making process, the DNV-UCLA team is conducting community and stakeholder engagement process to include as much representation of California communities as feasible. To meet the challenge of reaching California communities and stakeholders, and recognizing how overstretched community serving organizations currently are, we are planning a multi-layered outreach and engagement process that tailors to busy schedules, lack of resourcing and accessibility needs. Since October 2022, we have been having one-on-one informational conversations and briefings with community-based organizations, faithbased organizations, school districts, local governments, and other groups representing community interests. We have also formed technical and policy advisory groups to discuss gas decommissioning in those respective contexts.

Mindful Gas Decommissioning Community Engagement Schedule 2023 2024 2025 2026 Final Tool (Spring) TAC 1 TAC 2 CW 2 TAC 3 /PAC1 CW 1 Resource Hub | Case Study Engagement TAC = Technical Advisory Committee PAC - Policy Advisory Commit CW - Community Workshop UCLA California Center for Sustainable Communities DNV

We are conducting a series of community workshops over the next two years focused on hearing and including community concerns, the energy and financial resources available in communities, and how to accurately measure energy security and burdens. The information gathered in these workshops will help put the technical, socioeconomic and non-energy (e.g., housing, health, jobs) metrics into a real-life context and identify which metrics are more or less relevant to a particular area. We plan to demonstrate several versions of the tool to confirm with communities that we heard and incorporated your feedback accurately.

Mindful Gas Decommissioning Resource Hub and Accommodations. The DNV-UCLA team is also setting up an online resource hub to provide a central place where all project information can be found and where communities can access a team member for questions and to hear feedback, for the duration of this project (expected until mid-2025). We strive to make this hub useful and accessible, considering language, disability, technology and other needs.

Distant Commence UCLA

We need your partnership and support to ensure equitable and informed participation and feedback. A small budget (commensurate with the research funding) is set aside to compensate community-based organizations that partner with us to support and deepen our outreach and engagement efforts. To ensure meaningful participation at the community workshops and engagement broadly, we are hoping organizations can spare a few hours to host satellite gatherings, get the word out and conduct grassroots community outreach for each round of workshops and at other project milestones. We can in turn facilitate community participation by accommodating basic accessibility needs, and any unique needs upon request.

Some key benefits and risks of gas pipeline decommissioning are listed below. Learn more as you participate in the process.

Benefits	Concerns
Decrease greenhouse gas pollution that is contributing to poor air quality and climate change	Requires replacement of gas appliances (e.g., stoves, ovens, furnaces, fireplaces, water heaters, laundry machines) and possible electrical panel upgrades
Improved indoor air quality with replacement of gas appliances	Could increase energy costs and impact energy resilience
Less risk of pipeline ruptures due to earthquakes and leaks due to pipeline ageing or third party damage (e.g. construction works)	Households that cannot afford to replace gas-using appliances could face higher and higher gas utility bills

Cost savings to gas users as the net size of the pipeline network will adapt to only the sections of pipe still being used

You can learn more about the gas decommissioning effort in California through a short list of references below.

- The CEC's Gas R&D Program invests in technologies and solutions that help gas sector support California's energy and environmental goals
- Staff Proposal on Gas Distribution Infrastructure Decommissioning the Framework in Support of Climate Goals
- Strategic Pathways and Analytics for Tactical Decommissioning of Portions of Natural Gas Infrastructure
- Strategic Pathways and Analytics for Tactical Decommissioning of Portions of • Gas Infrastructure in Northern California

Mindful Gas Decommissioning: A Data-Driven Tool for

Prioritizing Strategic Gas Asset Decommissioning Funded by CEC (energizeinnovation.fund)

- California Natural Gas Pipelines (Detailed) Map
- CPUC Gas Infrastructure Equity Workshop
- <u>CPUC Webinar on Natural Gas 101 and Policies for a Just Transition</u>
- Mindful Gas Decommissioning Community Resource Hub
 - www.mindfuldecommissioning.dnv.com

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Cici Vu Associate Director Energy and Climate Equity Email: cici.vu@dnv.com Phone: (415) 385-6242

CONNECT

Hari Polaki Project Manager Email: hari.polaki@dnv.com Phone: (925) 771-0845





Agenda

Mindful Decommissioning Virtual Community Workshop 2

Wednesday, October 2, 2024 6:00 – 8:00 pm

Register Here

Join by phone: (669) 900-6833 *621398# Zoom Meeting ID: 850 5827 8341

Meeting Objectives:

- Report back on how community feedback has been incorporated into the beta tool development
- Update on the research project and where we are in the beta tool.
- Receive input from community participants on the place-based case studies.

6:00 pm – 6:20 pm	Welcome and Project Refresher
6:20 pm – 6:40 pm	High-level Overview of Beta Tool and Demonstration
6:50 pm -7:40 pm	Break Out Discussions: Workshop Draft Case Studies
7:40 pm -7:55 pm	Reflection Session: Q & A and Feedback
7:55 pm - 8:00 pm	Closing Remarks <u>and Next Steps</u>





[October 2, 2024] Join us for a virtual community workshop on Mindful Gas Decommissioning!

Join us virtually for a community workshop on October 2, 2024, 6-8 pm!

Provide input to the Mindful Gas Decommissioning Project!

This workshop brings together community members and leaders, energy experts, and other interested parties from across the state to learn about and provide feedback on the use of the draft mapping tool in assessing case study areas for gas distribution pipeline decommissioning in California.

Gas pipeline decommissioning means shutting down parts of the gas distribution pipeline network in areas where energy services can be switched to electricity or alternative energy sources. The cost to upgrade aging pipelines is considerable and requires a process of "Mindful Gas Decommissioning" to investigate sites that meet both cost and technical goals, that also align with community needs.

What You Can Expect at the Upcoming Workshop

- How community feedback has been incorporated into the beta tool development
- Project updates and beta tool development. Explore draft place-based equity case studies and share input

6:00 pm – 6:20 pm	Welcome and Project Refresher
6:20 pm – 6:40 pm	High-level Overview of Beta Tool and Demonstration
6:50 pm -7:40 pm	Break Out Discussions: Workshop Draft Case Studies
7:40 pm -7:55 pm	Reflection Session: Q & A and Feedback
7:55 pm - 8:00 pm	Closing and Next Steps

Join Us on Wednesday, October 2, 2024, 6-8 pm

- **Register HERE** to confirm attendance.
- For more information on Mindful Gas Decommissioning, visit our Community Resource Hub.
- Your Perspective Matters: Take a moment to fill out our brief pre-workshop input form to help our Project Team build a more comprehensive data-driven tool that reflects priority community concerns.

Need Accommodations? Please fill out this Accommodation Form to let us know if having interpretation, translated materials, closed captions, or other accessibility needs would support your participation.

For any technical support, contact Sharon Kang at <u>sharon@intetethnica.com</u>.

We value your participation and contributions and are excited to see you there!