



California Center for
Sustainable Communities

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



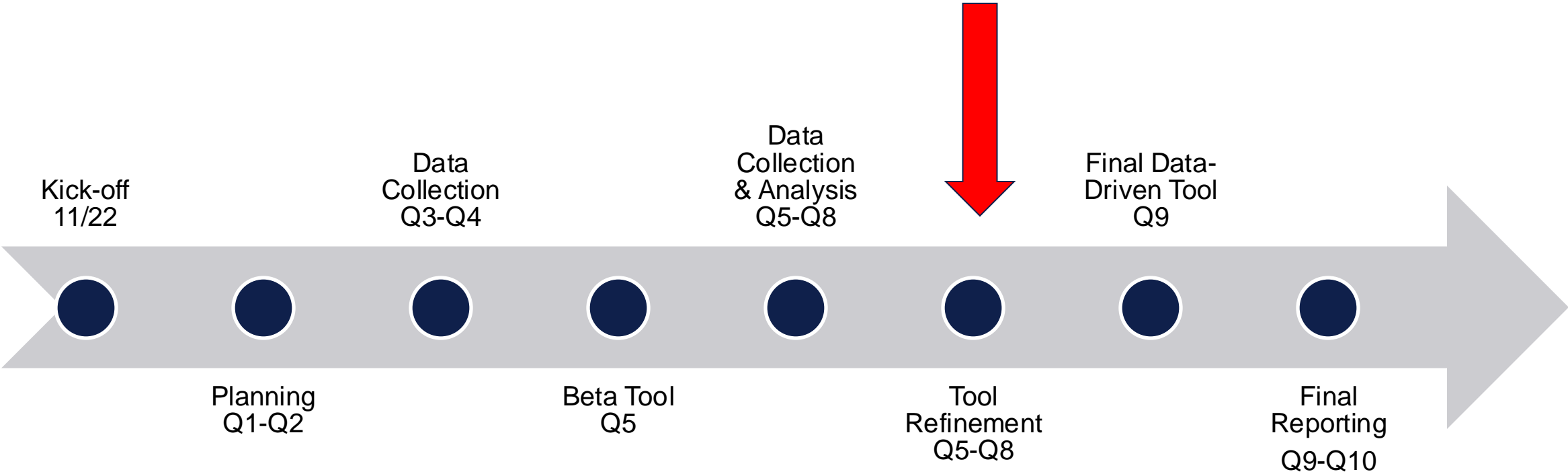
Quantify uncertainties



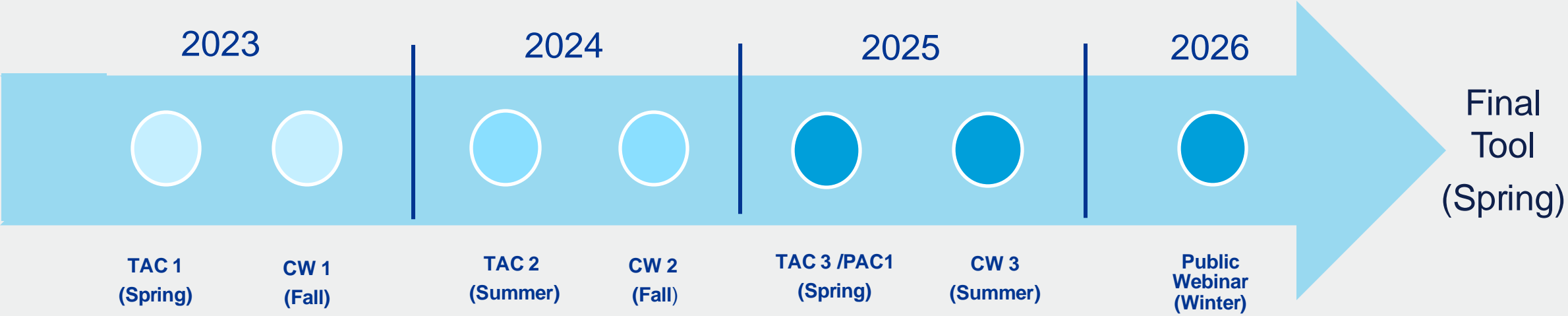
Research efforts to span three categories of:

- Gas assets
- Decommissioning readiness
- Community impacts

Pathway to Mindful Decommissioning



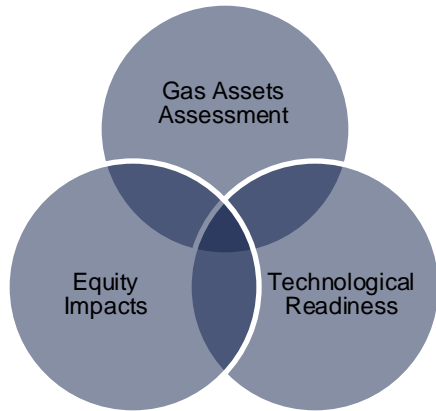
Community and Advisory Engagement Schedule



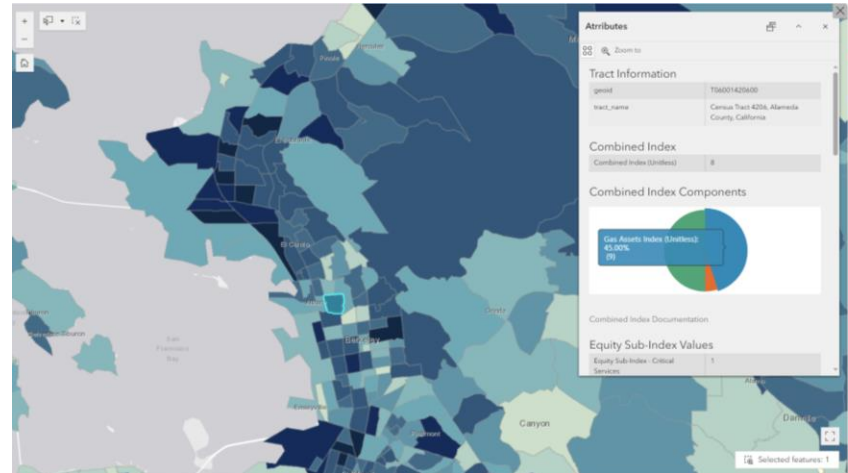
Resource Hub | Case Study Engagement

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

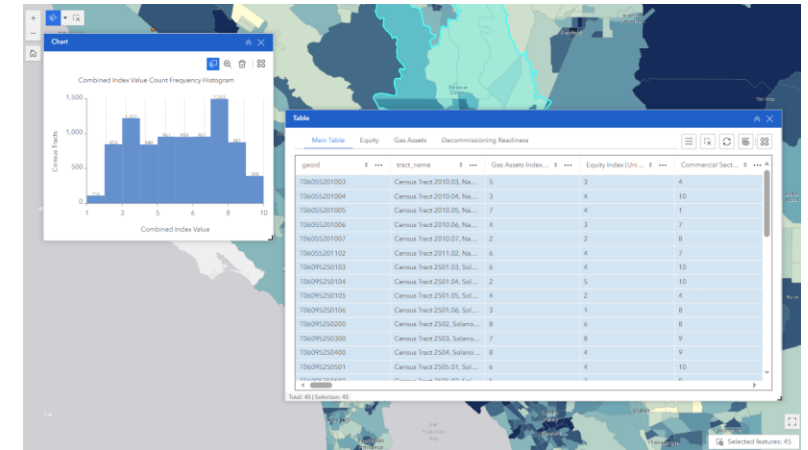
CEC PIR 22-002 Data-Driven Tool for Gas Decommissioning



Balancing Multiple-Criteria for Mapping Decommissioning Possibilities



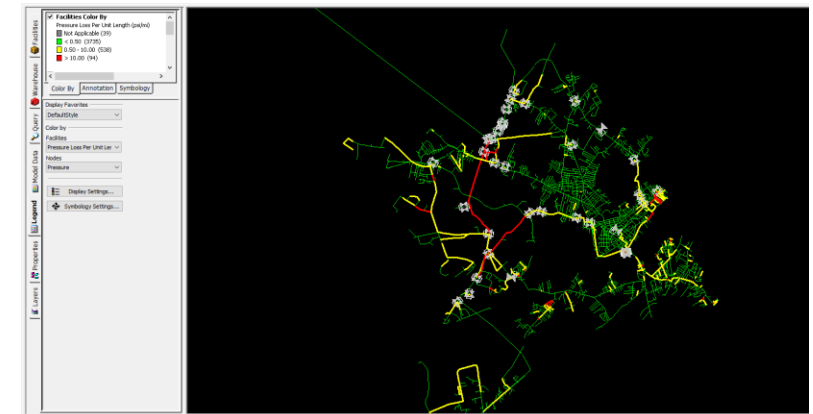
Web-based GIS tool for identifying promising decommissioning sites



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

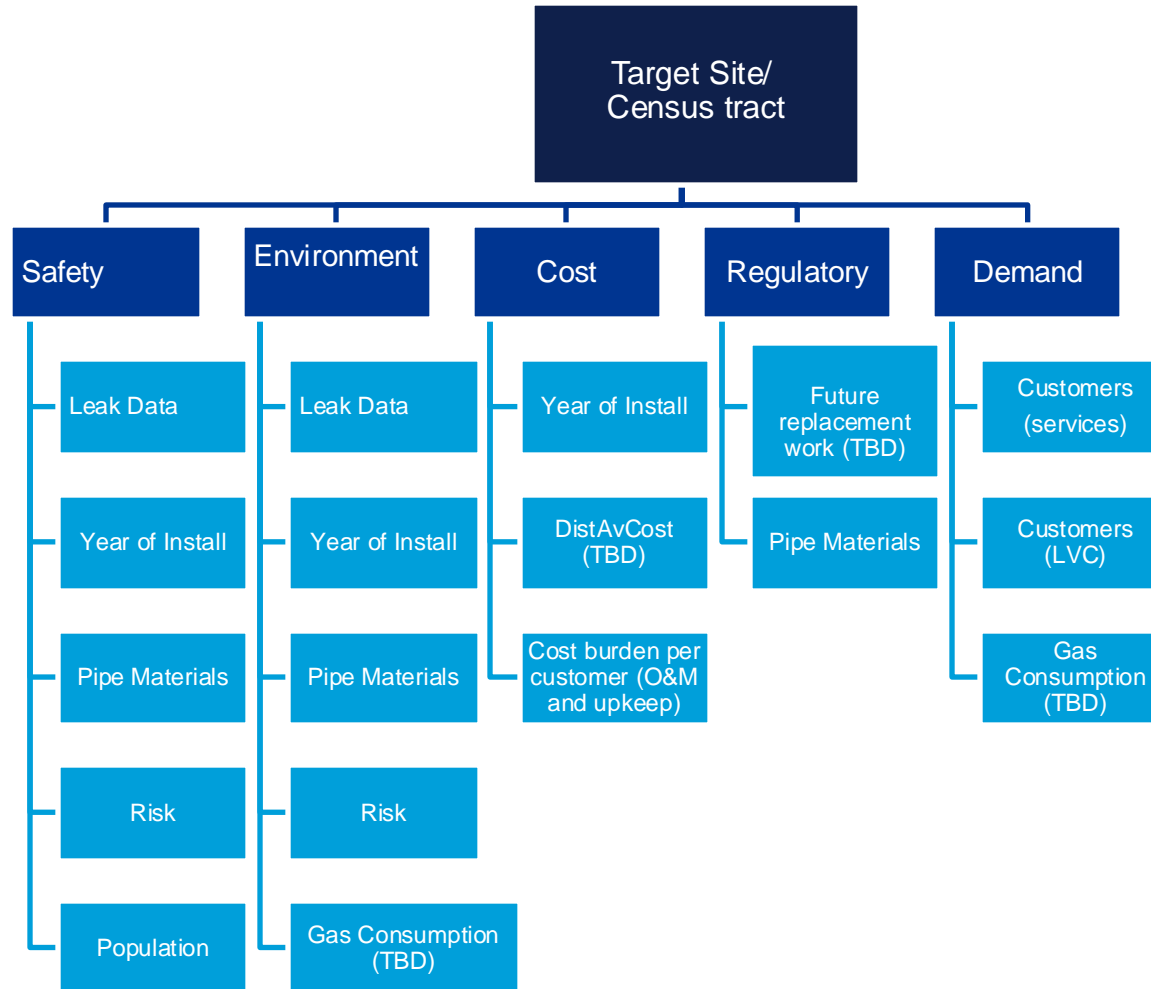


3. Equity Index

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)

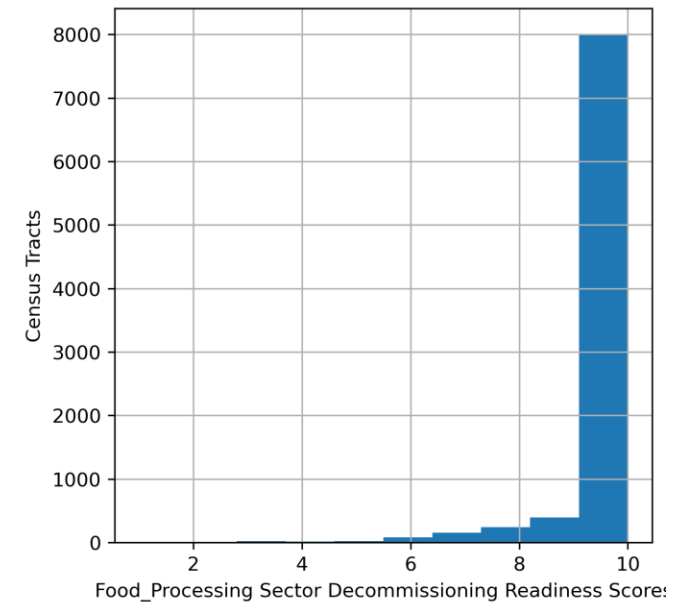
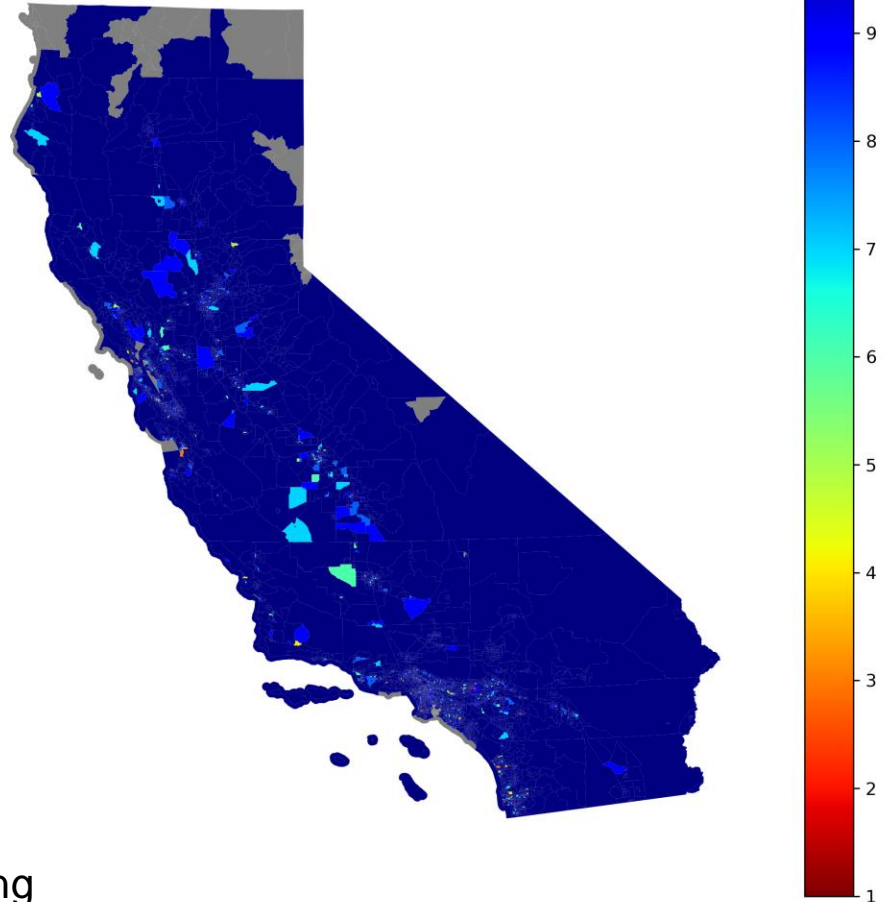
Commercial Sector

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

Industrial Sector

- Durable Goods Manufacturing
- Non-durable Goods Manufacturing

Food_Processing Sector Decommissioning Readiness Scores
(Low = Not Ready, High = Ready)



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

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

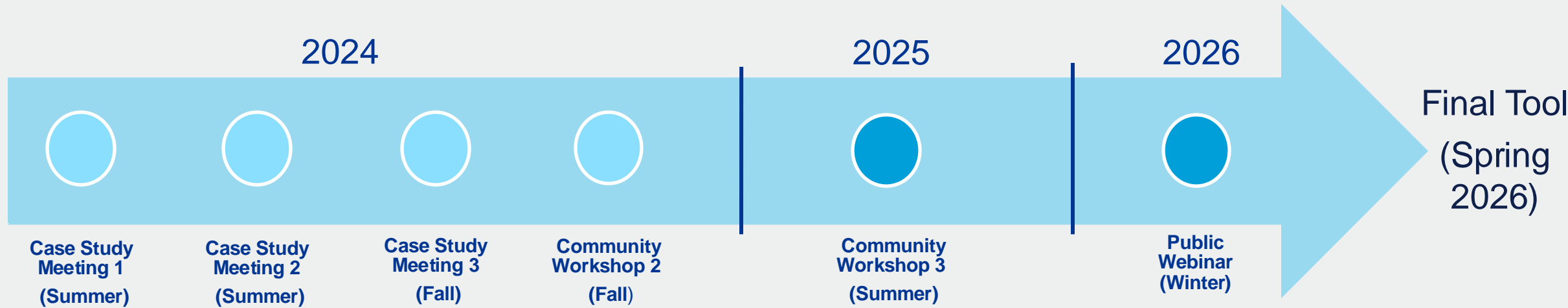
Meeting 1: provide an overview of the case study approach and update on the tool development

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)
 - SF Bay Area - urban
 - Tribal lands (North-Hoopa, Central-Tulle River, South-Cahuilla) – rural, desert
 - Stockton - valley
 - 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