PG&E's Alternative Energy Program

PG&E Strategy to Retire Gas Infrastructure via Electrification

[redacted] *PG&E Alternative Energy*

September 15, 2021

PG&E's Long-Term Planning for Decarbonization

This team works on the Gas Roadmap and helps guide policy to enable IIP to expand their reach of electrifying customers

This team works to pursue customer opportunities to electrify in place of transmission mitigation options and/or challenging construction projects

PG&E Gas Strategy

Integrated Investment Plan Objective

Explore and implement alternative ways to execute work including downrates, retirements and alternative energy to increase safety by reducing the risk of operation while meeting compliance and reliability

Alternative Energy Objective

Bring forward electrification as a construction solution for challenging projects(railroad, rivers, canal, shallow pipe, remediation sites, Cal Trans right-a-way, newly paved, moratoriums, erosion, etc.)

Electrification Process Flow

Electrification opportunity identified	PG&E checks customer usage	PG&E contacts the customer to go over Electrification options	Customer gathers vendor bids to go all-electric	PG&E pays incentive and communicates with Construction that service is no longer needed
This can come from any part of the company that identifies Electrification as a solution	PG&E checks when gas was last used at this site as well as volume of gas	PG&E goes over the background of IIP, risk reduction, safety, etc. An in-person visit is also made an option to the customer	This part of the process can be prolonged and a lot of follow up with updates to the customer is needed	After the incentive check is issued, notifications to Construction on retiring gas assets is communicated by the Alt Energy PgM

Alternative Energy Program Accomplishments

From 2019-2021, IIP has spent $3.1M reaching agreements with 68 customers to convert to options other than natural gas resulting in our ability to decommission gas assets. With a total of 124 customers approached to participate in Alterative Energy, this brings a success rate of 55%.

- Transmission
  - Hydrotest Projects
  - 5 Casing Projects
  - 62 miles of Transmission Retirement
- Distribution
  - 354 HPRS - Avg cost $170K/ unit
  - 4 Copper Service Projects
  - 2 miles of new Distribution Main avoided

- Average cost per Residential conversion is $38K
- Average cost per Commercial/Ag/Industrial conversion is $78K

Alternative Energy Program Criteria for Conversion Projects

PG&E explores and implements alternative ways to execute work including downrates, retirements and alternative energy to increase safety by reducing the risk of operation while meeting compliance and reliability.

Potential Alternative Energy Strategies

- Near-constrained systems
- Low pressure systems
- Systems with high M&O costs
- Systems with high M&O cost per customer – HPRs, long radial feed systems
- Systems with integrity concerns – aldyl A, LT pipe difficult to inspect
- Systems that can be downrated and/or facilities eliminated with load reduction
- Reduce gas load to perform safety work without risking outages

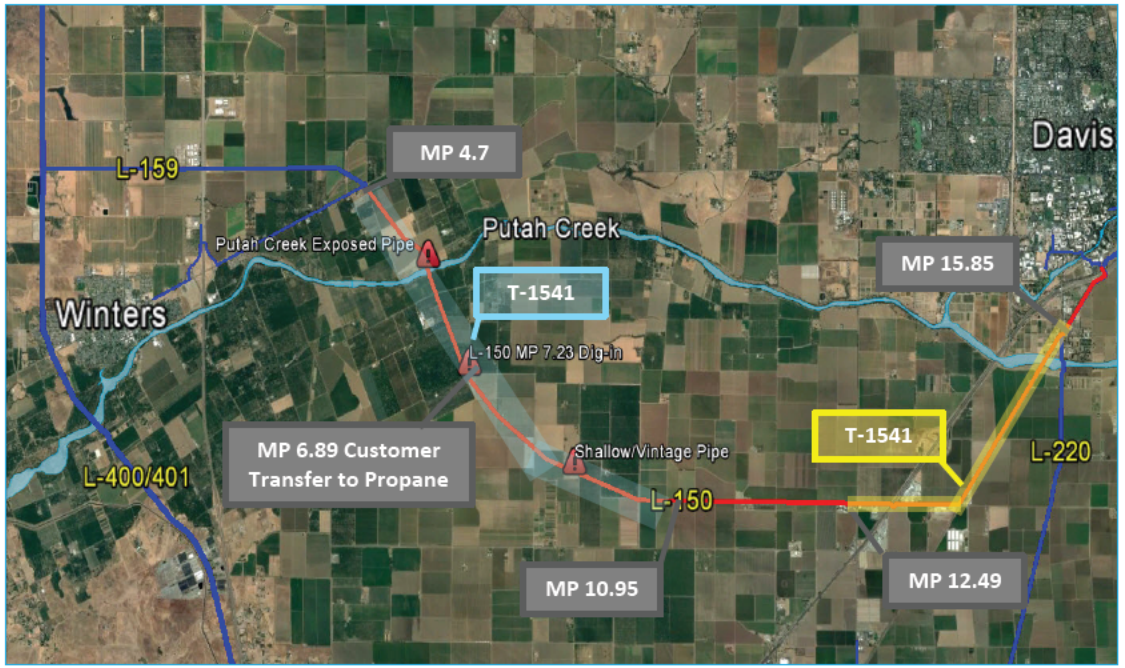
Alternative Energy Example – L-150 Putah Creek

Conversion in lieu of Transmission Strength Test Project

L-150 is a 6” Transmission pipe installed in 1949 operating at 125 psig MAOP. The majority of pipe has no strength test records with exposed, and vintage pipe.

Alternative Energy Program was able to convert customer at MP 6.89. Advantages to this alternative:

- Avoided HPR rebuild
- Retire 4.5 miles of L-150 (expanded existing project)
- Avoided future Strength Test and O&M costs
- Avoided 2,500 shallow pipe rebuild




L-150 MP 7.23 Dig-in – October 2015


Putah Creek Crossing Exposed Pipe

Creek Crossing with Debris

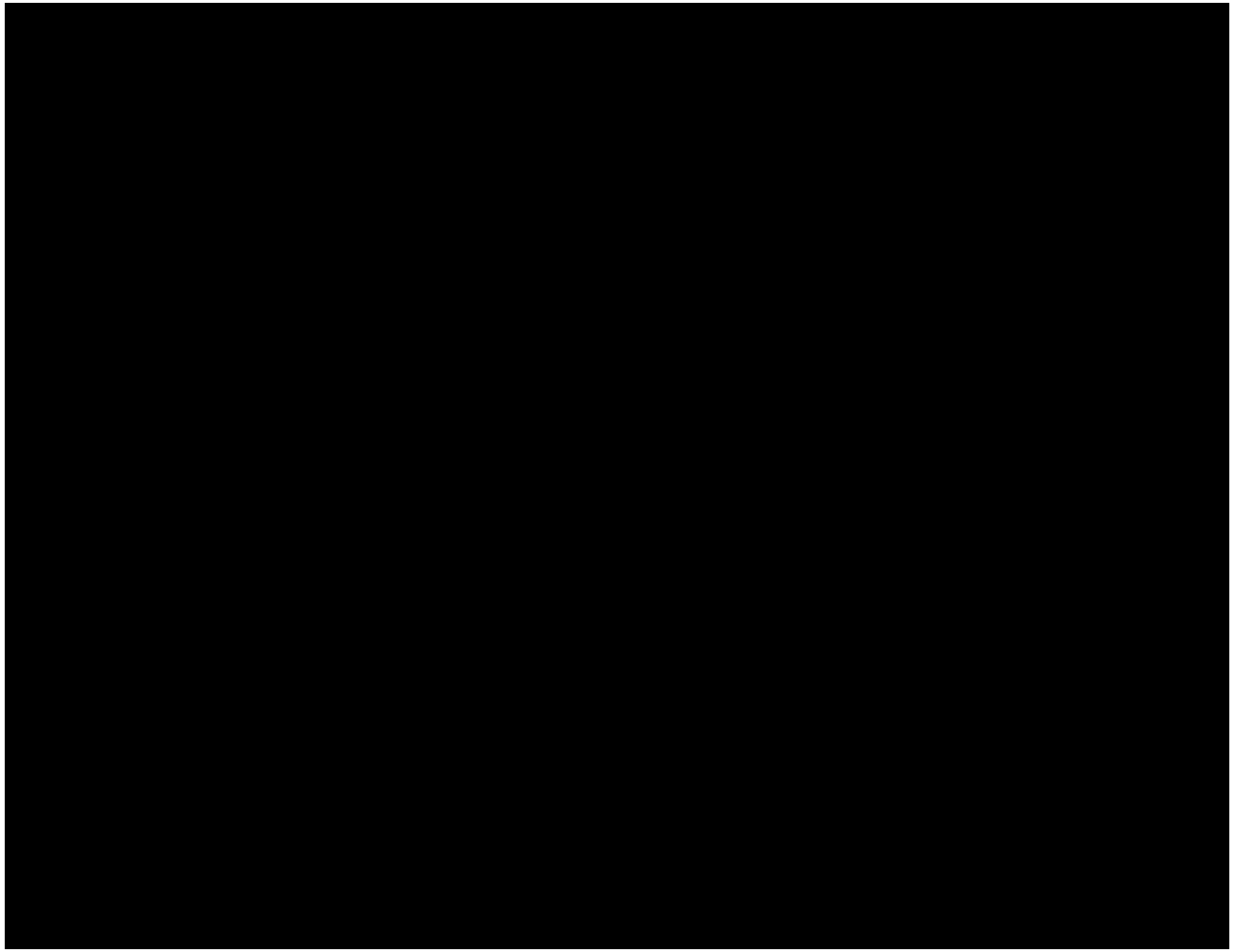
Alt Energy Example – Customer Conversion DFM 1205-02

DFM 1205-02 is 1.2 miles of transmission pipe installed in 1980 that fed a High-Pressure Regulator (HPR) at Large Customer site on [redacted] W Kamm Avenue in Helm, CA

This DFM has an Integrity management manufacturing compliance driver due in 2022 with a planned strength test on 60 feet of pipe.

Status Quo	Costs
Strength Test	$884K
HPR Rebuild	$170K
TOTAL	**$1.05M**

Alternative	Costs
1.2 mile Retirement	$1.175M
Customer Conversion	$100K
HPR Retirement	$30K
TOTAL	**$1.3M**



Alt Energy Example – Moss Landing GPRP Distribution

PG&E replaces distribution pipe such as Aldyl-A pipe through their Gas Pipeline Replacement Program. This conversion avoided 2,140' of new distribution main installation within GPRP.

The conversion reduced added risk of performing night work along Highway 1. This conversion helped PG&E avoid 2,675 hours of work, approximately 13 weeks of construction, that would require PG&E reducing Highway 1 to a single lane each work night.

Example 1

Status Quo	Costs
Pipeline Replacement	$1.2M
TOTAL	**$1.2M**

Alternative	Costs
Pipeline Retirement	$20K
Customer Conversion	$130K
(2) Idle Service Retirement	$6K
TOTAL	**$156K**

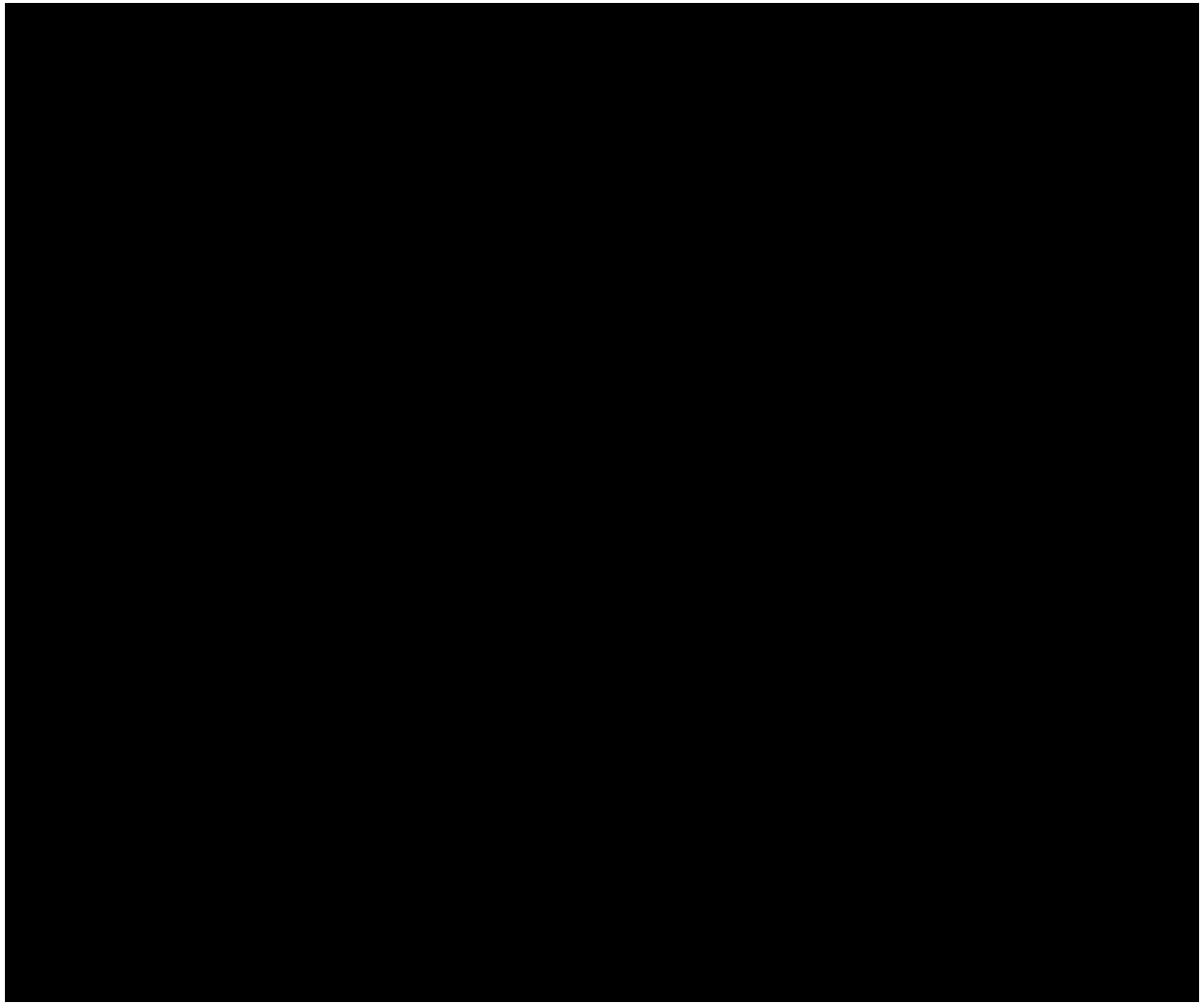
Alt Energy Missed Opportunity – L 168-01-03 Obligation to Serve

In April 2021, a third-party operating farming equipment reported a potential leak near L 168-01-03 in Isleton.

PG&E isolated approximately 2.5 miles of Tx pipe between Lopes Ranch (gas gathering meter) and Tyler Island Valve Lot. The repair plan was to cut and cap damaged section to isolate downstream section impacts.

PG&E identified additional damage when completing extent of condition assessment. There was opportunity to avoid millions on repairs by converting one landowner. The landowner declined PG&E's Alternative Energy Program and wanted to continue receiving gas service.

Repairs will continue on L 168-01-03 to serve one customer on a 3.5-mile radial feed of transmission line.



10

Consistent Obstacles Limit Scale and Replicability

PG&E has successfully avoided gas projects by deploying electrification via conversions through incentivizing customers. Use of propane and idle facility identification are other solutions identified.

Most significant barriers:

Consensus

100% of impacted customers must agree to terminate gas service. Through Rule 16, PG&E has an obligation to provide gas and electric to our customers

Cost

Expense spend needed for electrification option must be competitive with capital or expense required for gas project.

Funding

Little flexibility around use of rate case funds. Limited pool of expense dollars that could be used for conversions.

- These barriers can occur at even the most promising locations
- Without addressing these barriers, targeted electrification will remain unpredictable, costly, and rare
- Why do customers decline electrification opportunities?
  - Affinity with their gas-appliances
  - Not familiar with alternative energy options such as electrification
  - Concerns with dependency on having dual commodities (wildfires)