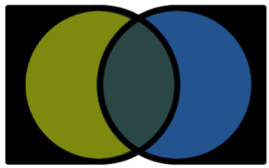


Jobs Impact Analysis for San Diego's Building Decarbonization Policies

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**INCLUSIVE
ECONOMICS**



Building
Electrification
Institute

CITIES DRIVING CHANGE

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Job Impact Categories for Building Decarbonization

Categories included in this analysis



Existing Building
Retrofits
(Municipal
Buildings only)



New Building
Construction



Gas
Infrastructure



Gas Utility



Electric Utility



Electricity
Infrastructure

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Gas Utility

The City of San Diego has proposed **two initial policies** to begin its transition to building decarbonization:

- 1) The Municipal Energy Implementation Plan
- 2) A potential “all-electric” Reach Code

This team assessed the near-term, direct impacts of these two policies on building construction, building retrofit, gas utility, and broader gas infrastructure jobs in San Diego.

Job Impact Categories for Building Decarbonization

Categories included in this analysis



Existing Building
Retrofits
(Municipal
Buildings only)



New Building
Construction



Gas
Infrastructure



Gas Utility

Additionally, the team considered the potential **longer-term impacts on the countywide gas infrastructure and gas utility workforce** that would result from a regional building decarbonization effort and implementation of the City's Climate Action Plan.

Types of Jobs Assessed

Sector	Types of Workers Included
Building Construction and Retrofit Jobs	Jobs associated with the direct construction of new buildings and retrofits within existing buildings. Includes general construction laborers, HVAC technicians, electrical workers, plumbers, carpenters, insulators, engineers, management jobs, and others.
Gas Utility Jobs	Jobs that are directly employed by the local utility (San Diego Gas & Electric, or SDG&E). Includes pipe trades, operations and maintenance workers, general construction laborers, management jobs, service and sales occupations, and others.
Gas Infrastructure Jobs	All other jobs in the maintenance and expansion of countywide natural gas infrastructure. Includes jobs contracted out by SDG&E to work on pipefitting, trenching, and excavation.

Existing Building Retrofits - Municipal Buildings

City of San Diego's Municipal Energy Implementation Plan

Overview of Near-Term Analysis



Existing Building
Retrofits

**(Municipal Buildings
only)**

Scenario:

- Near-term job impacts from the City of San Diego's Municipal Energy Implementation Plan, assuming retrofits achieve 15-30% efficiency improvements and full electrification for all municipal buildings from 2022-2035.

Municipal Building Totals:*

- Small: 250 buildings, 2 million sq. ft.
- Large: 50 buildings, 4.5 million sq. ft.

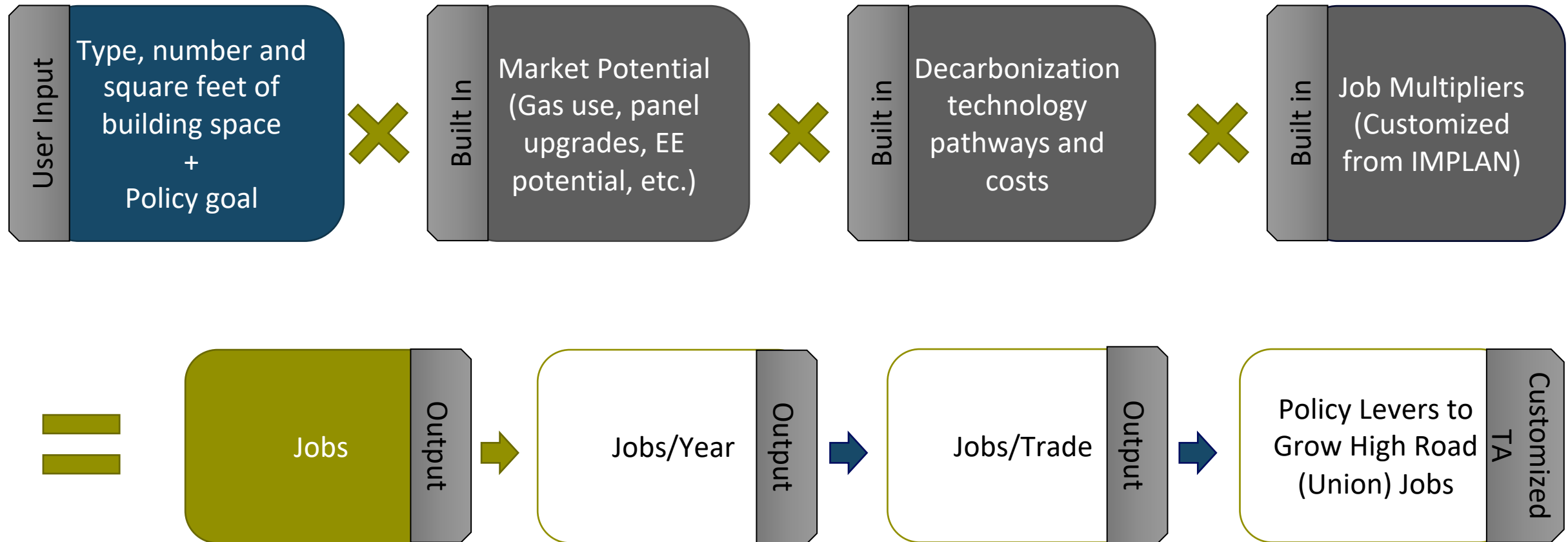
Job Impact Findings:

- **Net job gains for building retrofit workers**, particularly for HVAC technicians, electrical workers, and general construction laborers and carpenters.
- **No expected near-term impacts on gas utility or gas infrastructure workers.**

Recommendations:

- Ensure jobs gains go to unions and higher skilled workers for fair compensation.

Methodology for Municipal Retrofit Job Impacts



Job Impact Results

San Diego Municipal Energy Implementation Plan

Building Retrofit Job Impacts

Average Annual Retrofit Jobs Gained (2022-2035)	60-90 jobs/year*
Small Municipal Buildings (250 total buildings, <25,000 sq ft)	15-25 jobs/year
Large Municipal Buildings (50 total buildings, >25,000 sq ft)	45-65 jobs/year
Total Upfront Investment Required	\$170M - \$255M

Potential Gas Utility and Gas Infrastructure Job Impacts

Because municipal buildings account for only 1.3% of citywide gas usage, there are no expected near-term impacts to gas utility and gas infrastructure jobs from San Diego's Municipal Energy Implementation Plan.

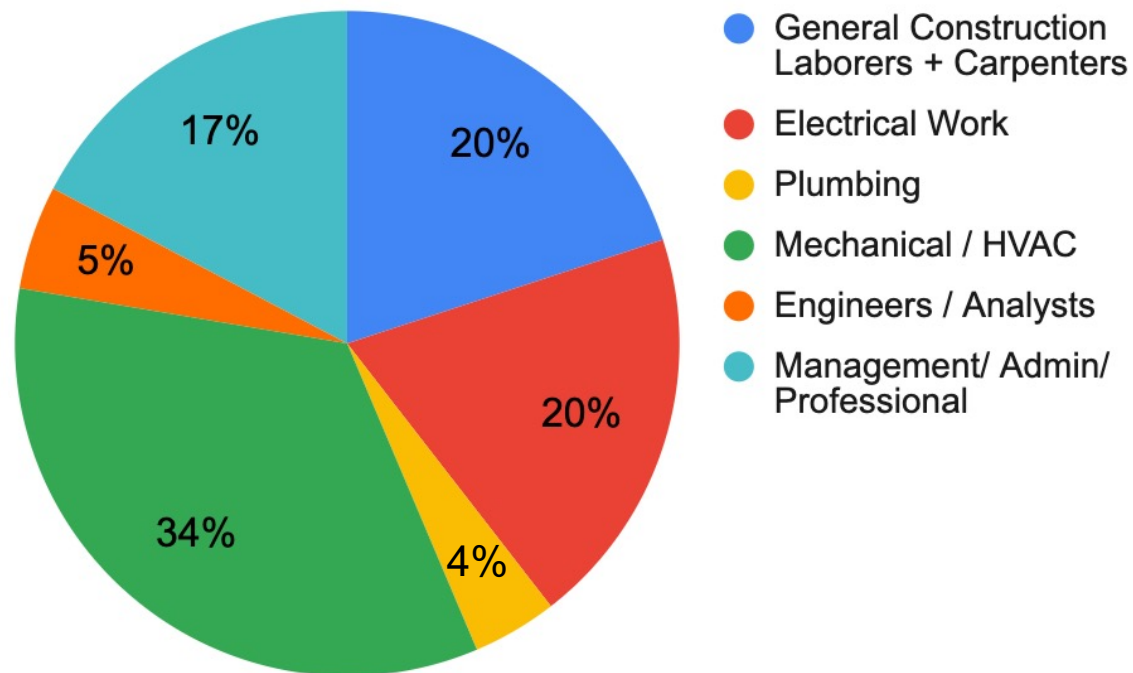
*This methodology assumes 1,800 annual work hours for an FTE worker for retrofits, totaling roughly 1,410,000 – 2,100,000 work hours over 13 years.

Job Impact Results (Cont.)

San Diego Municipal Energy Implementation Plan

Building Retrofit Job Impact Results By Trade (2022-2035)

TOTAL JOBS GAINED: 60-90 Jobs/Year



Takeaways:

- **There are net gains of 60-90 annual jobs projected for building retrofit workers,** particularly for HVAC technicians, electrical workers, and general construction laborers and carpenters. There are no projected impacts to gas utility or gas infrastructure workers.
- **The City can incorporate skilled and trained labor standards into its municipal retrofit projects,** which can help ensure that the jobs created are good quality jobs and that these upgrades deliver the projected energy benefits.

New Building Construction

Potential All-Electric Reach Code

Overview of Near-Term Analysis for Residential Buildings



New Building Construction

Scenario:

- Near-term job impacts of a potential city-level all-electric Reach Code policy, assuming that all new residential buildings are required to be built all-electric from 2023-2035.

Building Projection Totals from 2023-2035:*

- Single Family Homes: ~5,200 homes
- Multifamily Units: ~92,000 units

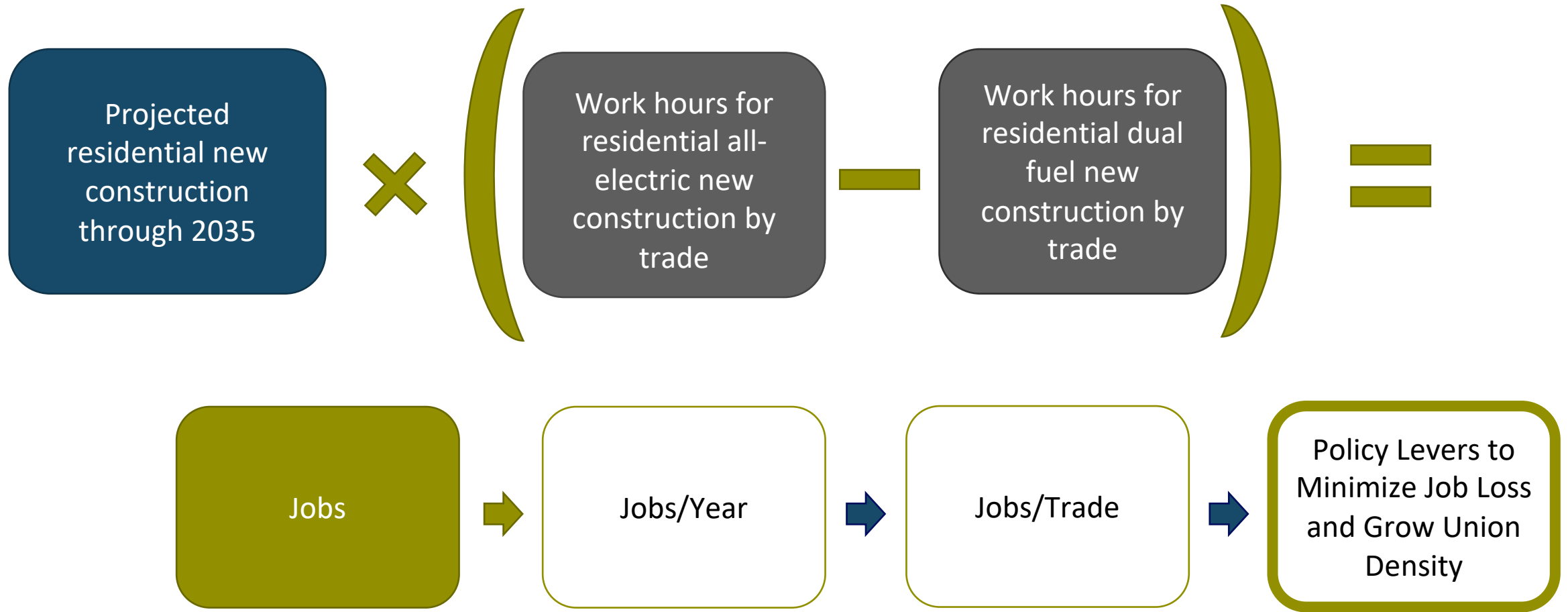
Job Impact Findings:

- **Net job losses for residential building construction workers**, primarily for plumbers.
- **Minimal near-term impacts for gas utility and gas infrastructure workers associated with expanding the gas system**, although more research is needed to understand the full potential impacts to these workers.

Recommendations:

- City can pursue policies to create job gains for impacted trades (through, for example, water reuse requirements for new construction and citywide water and sewer investments).

Methodology for Residential Construction Job Impacts



Job Impact Results

Potential All-Electric Reach Code (2023 - 2035)

Residential Building Construction Job Impact Results*

Average Annual Job Reductions (2023-2035)	Single Family Homes	Small Multifamily	Large Multifamily	Totals
General Construction Labor	(0-5)	(0-5)	(10-15))	(10-20)
Electrical Work	0-5	0-5	0-5	5-10
Plumbing	(5-10)	(10-15)	(25-30)	(45-50)
HVAC/Mechanical	0	(0-5)	(0-5)	(0-5)
Totals	(5-10)	(15-20)	(35-40)	(60-65)

*Results are presented as a range and rounded to the nearest 5. This methodology assumes 2,000 annual work hours for an FTE new construction worker, totaling roughly 1,450,000 work hours over 12 years.

Potential Gas Utility and Gas Infrastructure Job Impacts

Certain gas industry workers could face minimal near-term negative impacts as a result of reduced demand for gas infrastructure expansion. While these impacts would be small relative to the overall gas workforce, planning should begin now to protect workers.*

*Assessment based on SDG&E and IBEW 465 data. Impacted workers could include: Gas underground technicians, service technicians, laborer underground technicians, working foremen, gas pipe welders, and pipefitters and construction laborers who work on pipefitting, trenching, and excavation.

Takeaways:

- **There will be 60-65 fewer residential construction jobs created as a result of an all-electric Reach Code**, with impacts primarily for plumbers and within large multifamily building construction.
- **However, this does not necessarily equate to immediate construction job losses**, due to strong projected new construction in San Diego County over the next decade that will increase the overall construction workforce.
- **Additionally, there could be minimal negative impacts to gas utility and gas infrastructure workers.**

Gas Utility and Gas Infrastructure Jobs

Overview of Long-term Analysis



Gas
Infrastructure



Gas Utility

Scenarios:

- Quantitative assessment of the current total countywide gas infrastructure and gas utility jobs.
- Qualitative analysis of long-term impacts from a regional building decarbonization effort.

Job Totals:

- **Total Countywide Gas Infrastructure Jobs: 6,200 jobs***
 - Countywide SDG&E gas utility jobs (union represented + non-union represented): **800 jobs****
 - Estimated SDG&E contracted-out workers: **700-900 jobs****

Job Impact Qualitative Analysis:

- As the City implements its Climate Action Plan, along with the current trajectory of state and regional policy, gas infrastructure jobs across the county will almost certainly be negatively impacted over the long-term.
- Many occupations are represented across other industries, indicating they can likely find employment in non-gas related sectors, however there are certain occupations that will likely face real barriers to re-employment.

Recommendations:

- The City can make public investments beyond the building decarbonization sector to create new jobs to mitigate projected job losses and can work to ensure that these are high-quality, family-sustaining jobs.
- Advanced planning is necessary and should start now to identify these investments and to provide re-training, re-employment, and worker protections for at-risk gas workers who face barriers to re-employment.

*Source: IMPLAN 2019

**Source: SDG&E and IBEW 465 worker data

Gas Infrastructure Jobs

Total Jobs and Occupations Most At-risk over the Long-term

Most At-Risk Gas Occupations of Countywide Gas Infrastructure Sector

Total Gas Infrastructure Industry Jobs*	6,200 jobs
Installation, Maintenance, and Repair Occupations	1,100 jobs
Production Occupations	400 jobs
Construction + Extraction and Transportation Occupations	400 jobs
Total Most At-Risk Natural Gas Distribution Jobs	1,900 jobs

*Source: IMPLAN 2019. Results are rounded to the nearest 100

Takeaways:

- There is a subset of roughly 1,900 gas industry workers (out of a total of 6,200) **who would likely face the most barriers to finding re-employment over the long-term** within the total gas infrastructure industry in San Diego County.
- Occupations that are most likely to be at-risk over the long term from a larger building decarbonization effort include gas plant operators, pipefitters, steamfitters, pipelayers, roustabouts, gas compressor and pumping station operators, and others.

Gas Utility and Gas Infrastructure Jobs

Potential Impacts for Workers Employed or Contracted out by SDG&E

SDG&E-Employed Gas Utility Workers*

Union Represented Gas Utility Jobs (Source: IBEW 465)	600 jobs
Non-Union Represented Gas Utility Jobs (Source: SDG&E)	200 jobs
Total SDG&E-Employed Gas Utility Jobs	800 Jobs

SDG&E Contracted-Out Workers*

Estimated SDG&E Contracted-Out Jobs (Source: SDG&E)	700-900 jobs
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*Rounded to the nearest 100.

Findings:

- Gas utility workers employed directly by SDG&E include pipe trades, operations and maintenance workers, general construction laborers, management jobs, service and sales occupations, and others.
 - There is also a subset of workers within the gas industry who are contracted out by SDG&E. Many of these workers are union-represented pipefitters and construction laborers who work on pipefitting, trenching, and excavation.
-
- Many gas utility and infrastructure workers will have the necessary skills and training to transition to electric utility and infrastructure jobs, or jobs in other sectors. However, the broader effort to decarbonize could put some of these workers at risk of job loss over the long-term.
 - **A critical next step for the City is to work with its labor partners to more clearly identify at-risk workers, assess the near-term and long-term risks, and collaborate on solutions to protect workers and mitigate possible job losses.**

Key Opportunities to Mitigate Job Losses

To mitigate potential job losses, it can be helpful to look beyond building decarbonization policies and into other sectors where investments are needed. The City can also include skill and labor standards on projects to ensure high-quality work.

Potential opportunities could include, but are not limited to:

- Invest in higher-density housing construction and transit-oriented development.
- Accelerate existing building retrofits and ensure there is a high-skilled workforce to complete this work.
- Encourage or require onsite water reuse for buildings.
- Continue to invest in needed citywide water and sewer upgrades.
- Continue enabling in utility-scale renewable energy and energy storage projects.
- Accelerate investments in electric vehicle (EV) charging infrastructure.
- Pilot renewable district thermal energy systems and/or microgrids.
- Deploy appropriate labor and skills standards across all city capital projects.

San Diego's workforce and labor partners should be at the table every step of the way to help develop these policies to ensure they benefit workers and that appropriate plans are in place to protect against any potential negative impacts.

Components of a Just Transition

- Where new climate and resiliency investments cannot mitigate negative direct job impacts to certain workers, just transition policies may be also needed to protect these workers.
- Understanding these options now can help the City be in a strong position for potential future state and federal funding.

Just transition policies can include:



Long-term planning to avoid worker layoffs



Worker retention to manage decommissioning



Pension security



Salary bridges to retirement



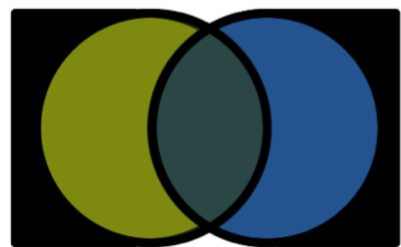
Wage guarantees for workers seeking new employment



Training and education support



New investment and economic development with job placement/priority hire for displaced workers



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