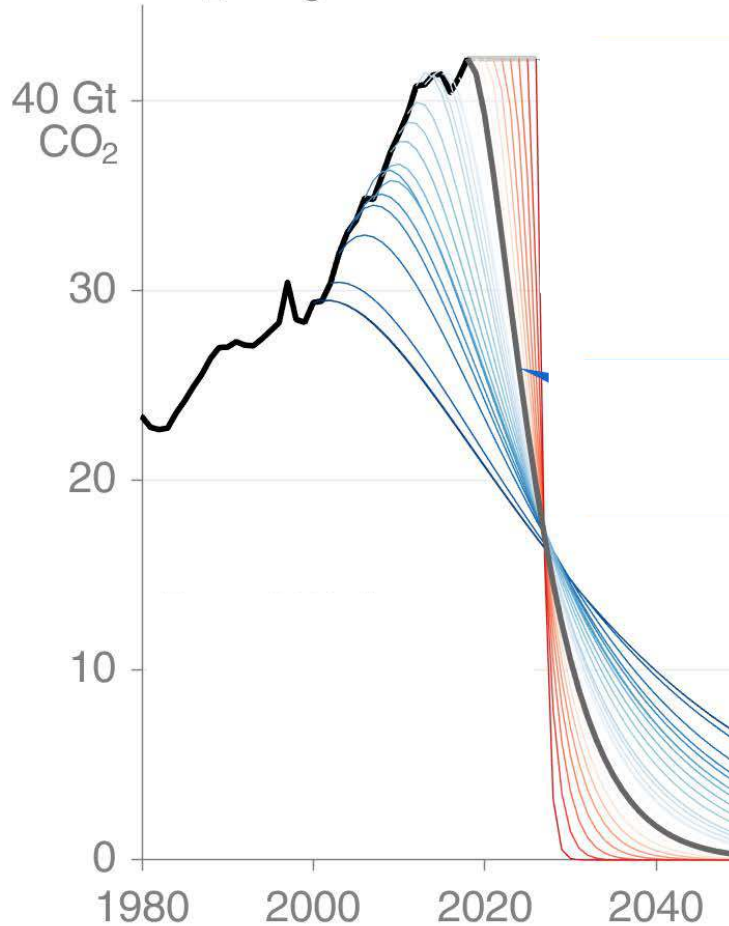


CO<sub>2</sub> mitigation curves: 1.5°C



# PATHWAYS TO A LOW CARBON FUTURE

MIKE O'BOYLE

CNEE CLEAN ENERGY  
*JULY 2020*

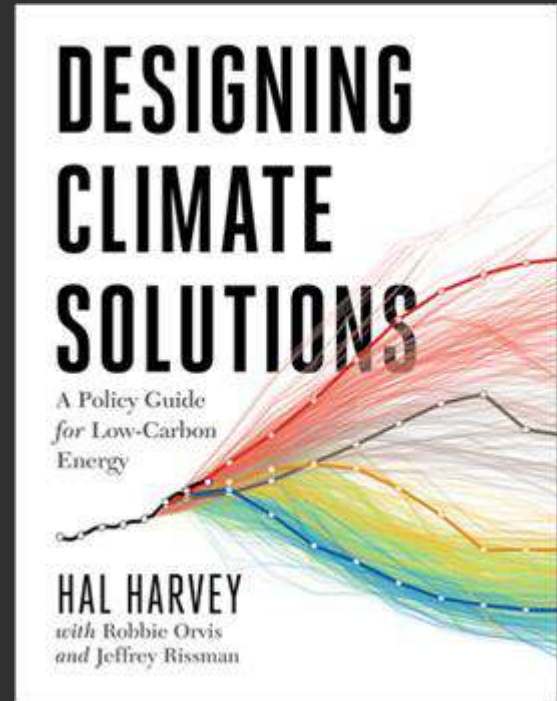
LEGISLATIVE ACADEMY

# ABOUT ENERGY INNOVATION

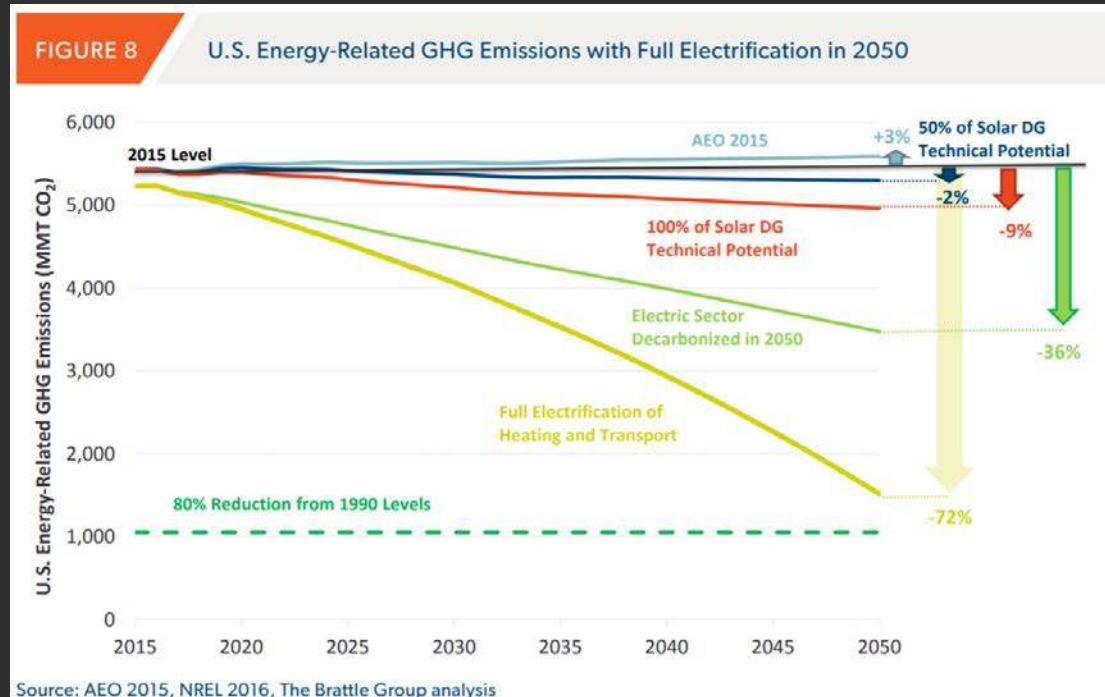
A nonpartisan energy and environmental policy firm based in San Francisco, CA. We deliver high -quality research and original analysis to policymakers to help them make informed choices on energy policy.

[www.energyinnovation.org](http://www.energyinnovation.org)

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# EMISSIONS PATHWAYS – CLEAN ELECTRICITY IS THE FOUNDATION

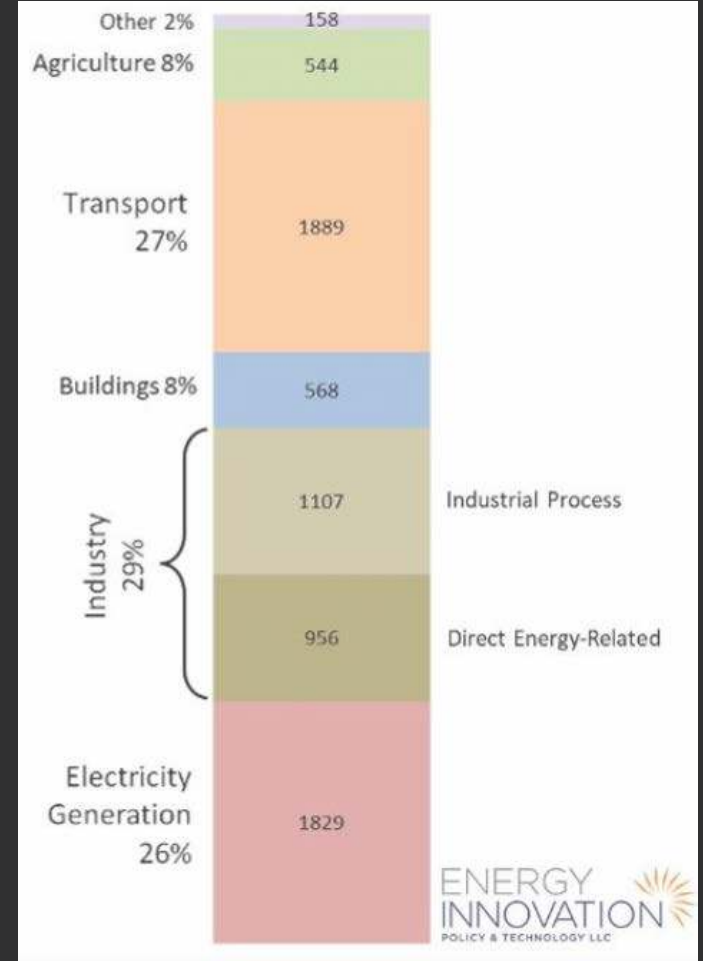


# 1. GHG

# ACCOUNTING

# 2. STATE POLICY

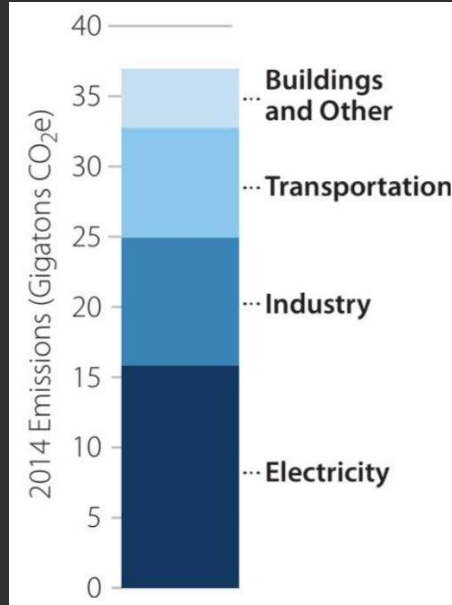
# 3. JOBS



# GREENHOUSE GAS ACCOUNTING

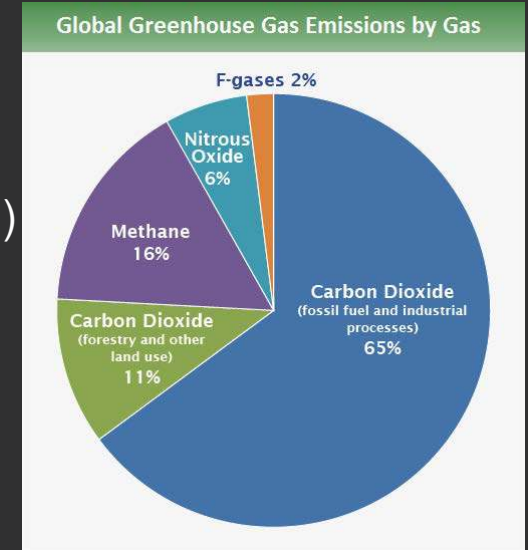
## Major Sectors

- Buildings
- Industry
- Transportation
- Electricity
- Agriculture



## Major Pollutants

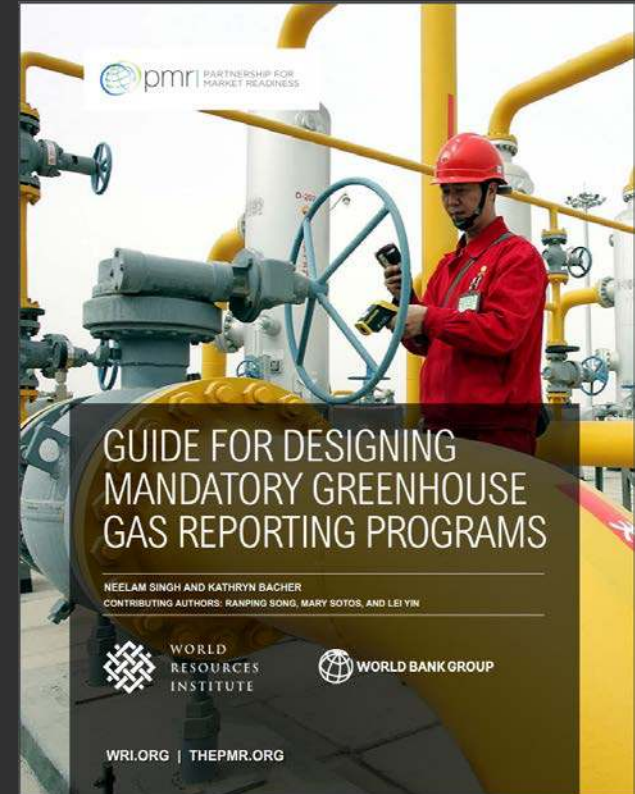
- CO<sub>2</sub>
- Methane (“natural gas”)
- N<sub>2</sub>O
- HFCs & SF<sub>6</sub>



# GREENHOUSE GAS ACCOUNTING – ROLE OF LEGISLATION

- Need a law that mandates entities to report
- Delegate authority to an agency to promulgate rules and regulations specifying the implementation of the law
- Provide adequate institutional, human, technical, and financial capacity
- Other design elements
  - Program coverage
  - Reporting procedures & schedules
  - Enforcement authority
  - Periodic review & stakeholder input

[https:// ww2.arb.ca.gov/mrr -data](https://ww2.arb.ca.gov/mrr-data)

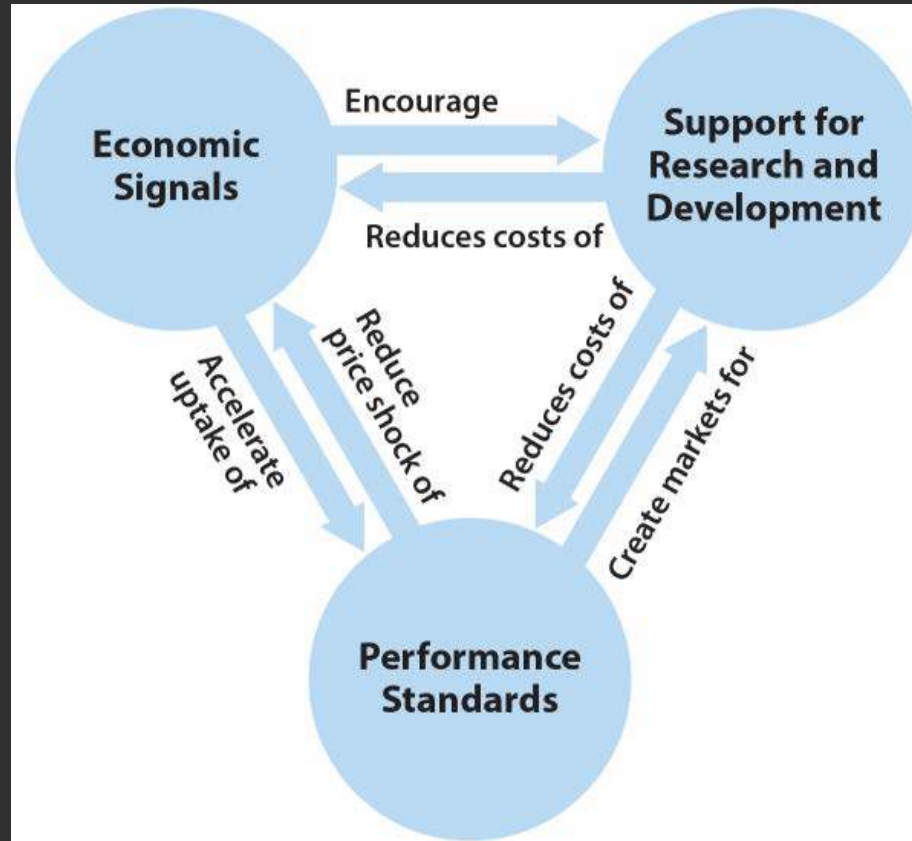


1. GHG ACCOUNTING

2. STATE SECTORAL POLICY

3. JOBS

# POLICY DESIGN CONSIDERATIONS

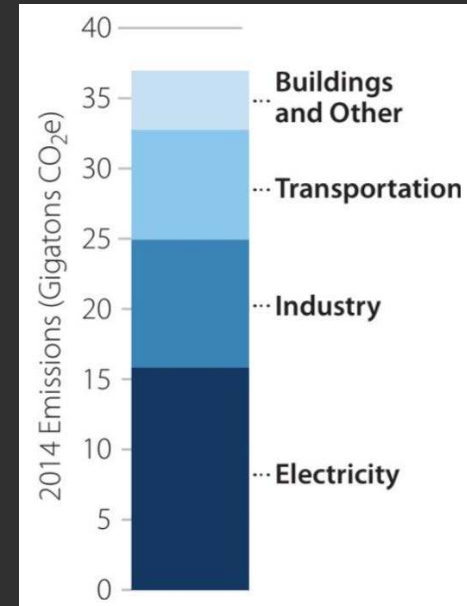




# TARGETING SECTORS WITH STATE POLICY

Cover the largest sectors:

1. Electricity
2. Transportation
3. Buildings
4. Industry
5. Super Pollutants



# ELECTRICITY

## Performance Standards

- Clean Electricity Standards
- Energy Efficiency Resource Standards
- Utility incentives

## R&D

- pilot new technologies, like storage, smart buildings, clean electricity portfolios, microgrids

## Economic Signals

- Time-varying electricity rates
- Customer choice programs
- Competitive electricity markets
- Low-cost financing to accelerate coal retirements; support community transition

# TRANSPORTATION

## **Performance Standards**

- Join other states in adopting California's tailpipe emissions standards and zero emission vehicle (ZEV) standard under CAA Sec. 177

## **R&D**

- Become the hub for the country's best smart-charging programs
- Create rules for vehicle-to-building interoperability

## **Economic Signals**

- Set goals and provide incentives for zero emission vehicles
- Establish a transportation infrastructure program to support ZEVs

# BUILDINGS

## Performance Standards

- Set quantitative targets for building sector decarbonization (emissions/buildings)
- Update state and local building codes to require high-efficiency, all-electric new construction; require retrofits for major construction
- Begin to electrify all state buildings

## R&D

- Smart building pilots with government buildings
- Create a plan for winding down the gas business

## Economic Signals

- Provide incentives for building component electrification
- Align customer electricity and gas rates with electrification

# INDUSTRY

## **Performance Standards**

- Create a “buy clean” program for state government infrastructure

## **R&D**

- Create R&D program with leading in-state companies to explore and refine high-efficiency and low-carbon industrial processes.
- Support public-private partnerships to develop green hydrogen-based solutions for industrial process heat

## **Economic Signals**

- Provide incentives for industrial cogeneration and waste heat recovery

# SUPER POLLUTANTS

## Performance Standards

- Adopt state-level regulations to transition away from **F-gases**
- Set a steadily declining requirement for **methane leakage** from oil and gas activity, and create new monitoring and reporting requirements

# AGRICULTURE

## Economic incentives

- Increase incentives for agricultural practices reducing GHGs
- Increase technical assistance for precision agriculture deployment

1. GHG ACCOUNTING

2. STATE SECTORAL POLICY

3. JOBS

**CHECK-IN QUESTION:** DO YOU SEE  
DECARBONIZATION AS A JOB CREATOR?





# CLEAN JOBS AMERICA

NEARLY 3.3 MILLION CLEAN ENERGY JOBS'

## INDUSTRY JOB TOPLINES

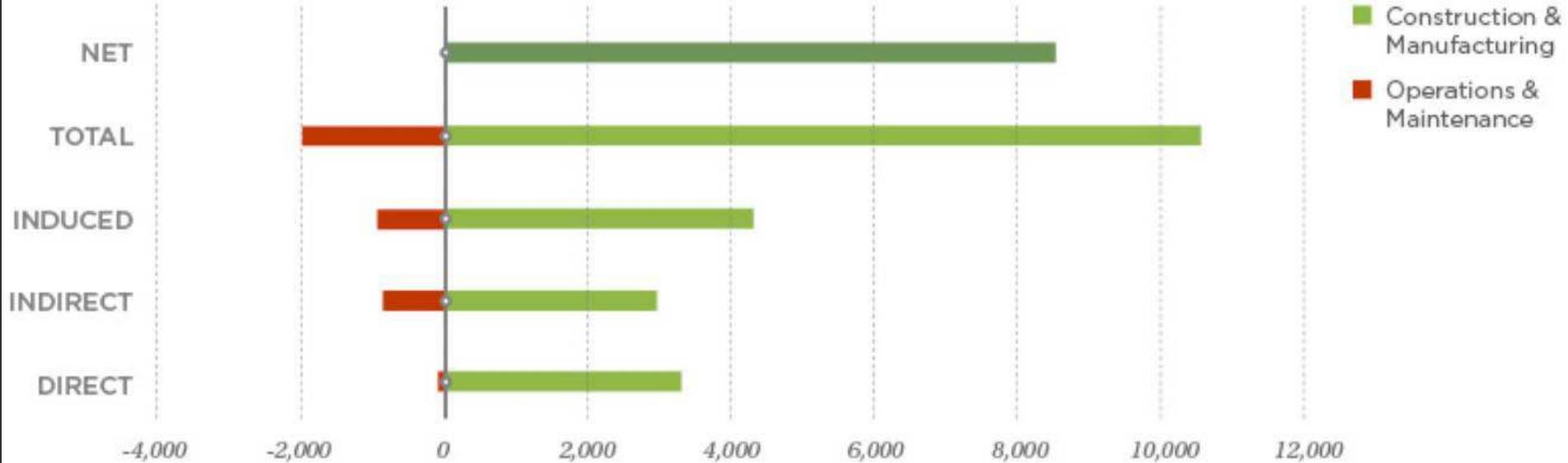
- Energy Efficiency – **2,324,865 jobs**
- Renewable Energy – **508,484 jobs**
- Solar Energy – **334,992 jobs**
- Wind Energy – **111,166 jobs**
- Clean Vehicles – **253,599 jobs**
- Clean Storage – **74,569 jobs**
- Grid Modernization – **64,377 jobs**
- ALL US Clean Energy Sectors – **3,264,383 jobs**

Clean jobs **outnumber fossil fuels jobs nearly three to one** (3.26M to 1.17M) and clean energy employers said they anticipate **6 percent job growth for 2019.**

<https://e2.org/reports/clean-jobs-america-2019/#:~:text=According%20to%20the%202019%20Clean,growth%20rate%20of%203.6%20percent.>

# 2035 REPORT – 90% CLEAN ELECTRICITY BY 2035

CUMULATIVE JOB YEARS ('000), 90% CLEAN COMPARED TO NO NEW POLICY



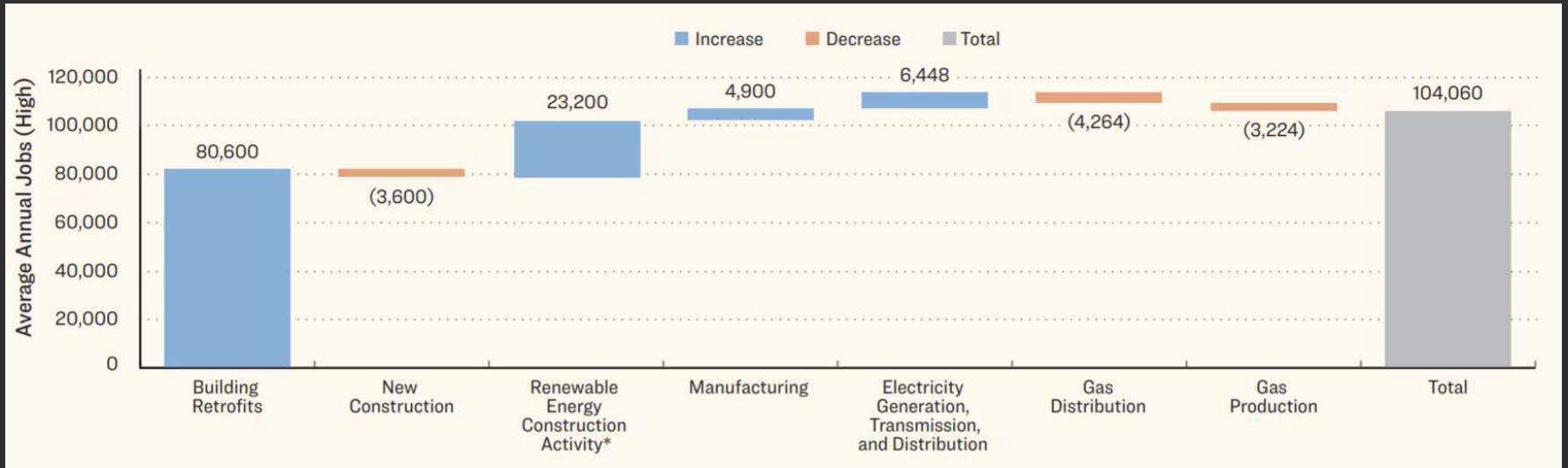
# EVS ARE A RAPIDLY GROWING FIELD

- Hybrids, plug-in hybrids, and all-electric vehicle production and sales supported 231,000 employees in 2018, **growing over 15% YOY.**

<https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5c7f3708fa0d6036d7120d8f/1551849054549/USEER+2019+US+Energy+Employment+Report.pdf>

- According to the National Renewable Energy Laboratory, the growth of electric vehicles **could lead** to an average net employment gain of up to 100,000 jobs per year through 2040, in an aggressive growth scenario.

# BUILDING ELECTRIFICATION IS A MASSIVE IN-STATE JOB CREATOR



Electrifying every building in California by 2045 would create 100,000 net jobs annually

THANK YOU!