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# Building Electrification and the CPUC

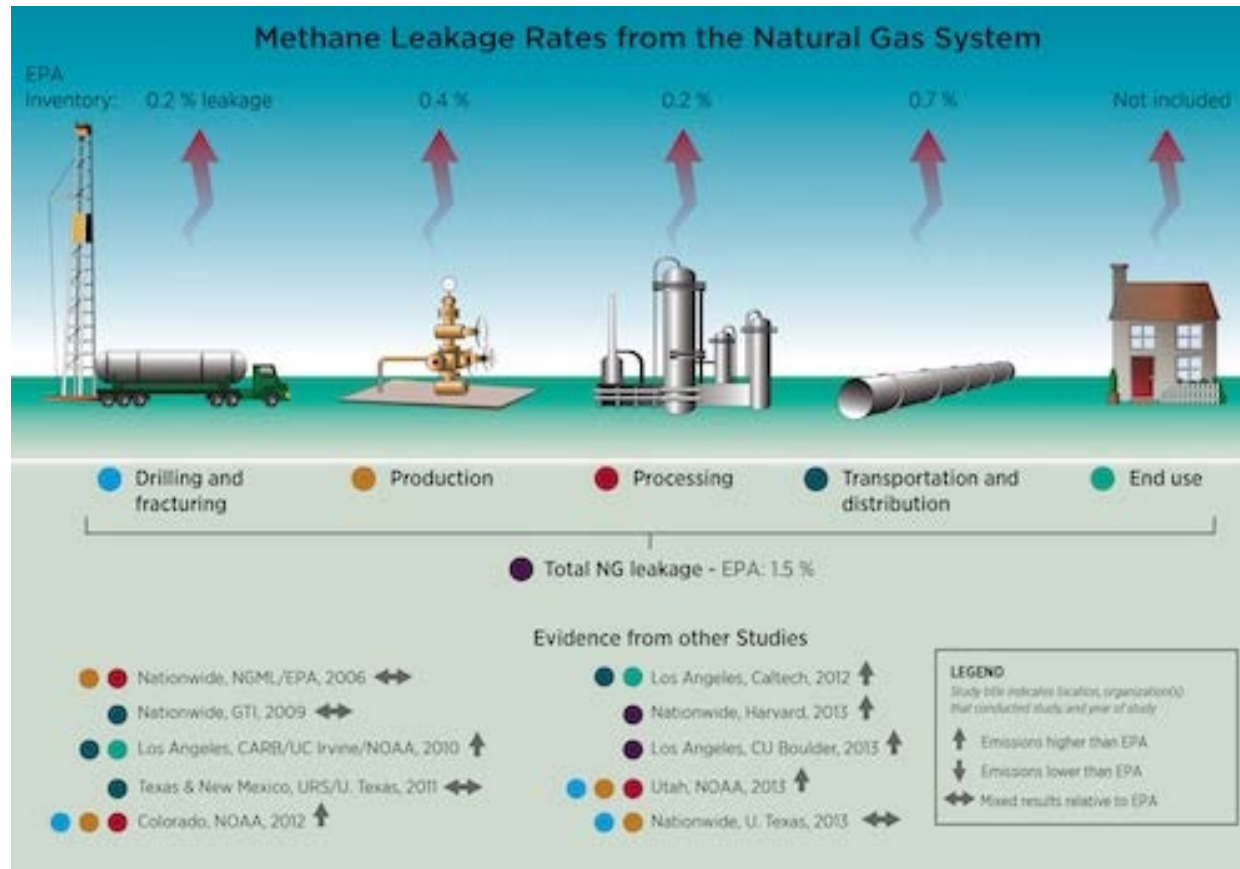


**California Energy Commission**  
**June 14, 2018**

Rory Cox, Analyst, Energy Efficiency Branch



# The Problem We're Trying to Solve



Source: Stanford University/Science



# What is Electrification?

Definitions (Google):

1. The action or process of charging something with electricity
2. The conversion of a machine or a system to the use of electrical power



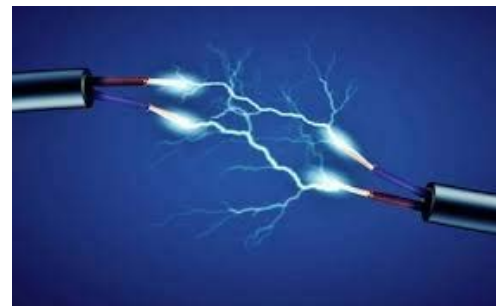


# Important Definitions

**Fuel Switching:** Refers to replacing a non-IOU fuel with an IOU fuel



**Fuel Substitution:** Refers to replacing an IOU-fuel with another IOU fuel





## To be more specific...



Heating: The carbon version



Heating: The electric version  
(an electric heat pump)



## To be more specific...



Water heating: The carbon version



Water eating: The electric version (an electric water heater)



## To be more specific...



Cooking: The carbon version



Cooking: The decarbonized version (induction stove)



# CPUC's Approach to Electrification

CPUC is currently exploring appropriate program concepts to promote electrification as a tool to reduce greenhouse gas emissions.

Our concerns:

- Grid integration
- Distribution deferral
- Locational benefits
- Time of Use



Photo: Scientific American



# The Three-Prong Test

- Currently, incentive programs that involve fuel substitution must pass the “Three Prong Test.”
- The Prongs are:
  1. Program must not increase source BTU consumption
  2. Program must be cost effective (have a TRC and PAC benefit/cost ratio of 1 or greater)
  3. Program must not adversely impact the environment

CPUC is currently reconsidering the three-prong test in R.14-10-003 (the IDER proceeding)





# Possible Program Design Approaches

- I. All Electric tariff
  - Currently this is available for the already existing electric homes
  - Customers receive a lower rate per kWh as they have higher electricity consumption
  - Revenue requirement may need to be made up for by increased rates for dual fuel customers





# Possible Program Design Approaches

## II. Resource Acquisition - Rebates

- Currently, electric appliances receive only small portion of EE incentives
- Incentives could be offered but decline over time as market uptake increases, similar to California Solar Initiative
- Incentives could be scaled to the amount of GHGs the appliance will reduce over it's lifecycle





# Possible Program Design Approaches

## III. Resource Acquisition - Financing

- On-bill financing could provide low- or no-interest loans for electric appliances
- Could have dedicated financing program for customers wishing to have all electric home or business
- Could target in disadvantaged communities



Image: Conroy Refrigeration & HVAC



# Possible Program Design Approaches

## IV. Resource Acquisition – Emerging Technologies

- Could develop “technology priority maps” to prioritize all electric appliances.
- This would provide a pipeline for products to go from the development stage to market adoption
- For example, a “grid interactive electric water heater” is now available, but is not part of the demand response programs



Image: Toonpool



# Possible Program Design Approaches

## V. Market Transformation

- Energy Division now developing a market transformation framework
- Will recognize quantifiable energy and GHG savings from market-level activities
- May adopt a schedule of milestones and metrics including targets and timelines
- Could include offramps in case of failure





# Example of Combining Program Concepts

- Title 24 now requires solar on new residential construction
- Net Energy Metering (NEM) continues to offer bill credits for excess energy produced
- Program could combine wholesale NEM compensation for rooftop PV with an extra incentive for heat pump water heaters and demand response
- With the right mix of T24 requirements and design credit options, new buildings can become grid assets



Photo: UnderstandSolar.com



# Other Agencies and Their Approaches

- California Energy Commission: Electric appliances increase the Energy Design Rating of a building, per Title 24. Considering all-electric buildings in the IEPR
- CARB: Developing a feasibility study for zero carbon buildings, as well as a spreadsheet tool that measure GHGs from all aspects of a building
- Department of Communities Services and Development (CSD): Administers Low Income Weatherization Program. Calculates per-building energy and GHG savings.



# Pending Legislation

- AB 3001 (Bonta): Would change building and public utilities code to encourage all electric buildings. Not advancing.
- AB 3232 (Friedman): Requires CEC to produce plans to make all buildings emission free by 2030. Advanced to floor.
- SB 1477 (Stern): Would create a *Zero Emission Heating Market Transformation Fund* at State Treasury. Advanced to Floor.



# Policy Initiatives

- CA Energy Commission are considering an all electric building code for 2022, and is considering electrification in the next Integrated Energy Policy Report
- CARB is developing a tool to quantify reduction of GHG emissions at the building level from electrification strategies
- Three pieces of legislation this session dealing with electrification: Market Transformation, building codes, ratepayer funded programs. Two of the three have advanced to the floor



# Next Steps

- CPUC will open up a proceeding to consider approaches to all-electric buildings
- Focus on how to combine program ideas (like NEM, DR, and rebates) to get more value from mandated rooftop solar
- Watch and research electrification programs of SMUD and SCE
- Develop and monitor pilots: disadvantaged communities in San Joaquin Valley and fire rebuilding effort in the North Bay



## Discussion

