

# **Grid Modernization: What's Next?**

## **Part 2**

**March 20, 2018**

# Introduction

**Rick Brown, PhD, President  
TerraVerde**

- **Founded 2009**
- **Independent Energy Advisor**
- **CASBO Strategic Alliance  
Partner since 2013**
- **Solar at over 200 sites:  
schools, municipal facilities,  
transit and water agencies**
- **\$50 Million on Prop 39  
Energy conservation  
measures**
- **Battery storage at 70 sites**
- **TerraGrid**

**Cary Garcia, Best Practices  
Coordinator, LGC/SEEC**

# Grid Modernization

## 1. Impact of Renewables

## 2. Policy & Economic Issues

- “\$150 Billion” over the next 10 years
- Who is going to pay...and how much (recent wildfires)?
- CPUC Distributed Energy Resource (DER) Action Plan

## 3. Traditional Vs. Non-Wire Alternatives

- <https://climateprotection.org/ferc-allows-energy-storage-play-nationwide-wholesale-markets/>

## 4. What's Next

- PG&E RFO
- SCE Ventura/Santa Barbara

# Energy Efficiency

## 1. Policy Issues

- AB 802
- Building Benchmarking

## 2. Commercial Issues

- Internet of Things (IoT)

## 3. Technology Issues

- Telemetry/Security



# Electrification/Transportation

## Policy Issues

- CA Air Resource Board Incentives
- Prop 39 Funding

## Commercial Issues

- New Bus Technologies/lifecycle costs
- EV Cars and Infrastructure

## Technology Issues

- Vehicle to Grid/Building



# Electrification/Fuel Switching

## Policy Issues

- SB 350/Decarbonization: Gas is 86x CO<sub>2</sub> in GHG Effects
- Health Effect of Gas  
<https://eta.lbl.gov/sites/all/files/publications/lbnl-185629.pdf>

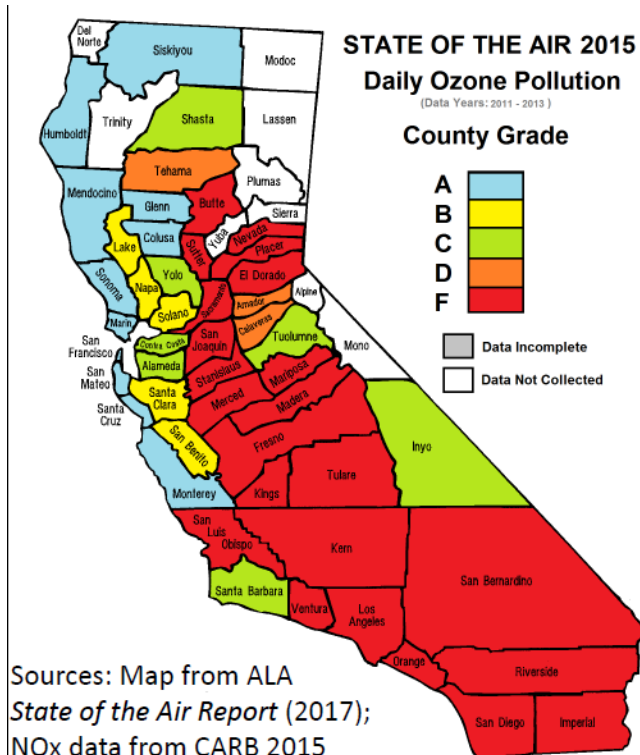
## Commercial Issues

- Low cost of Natural Gas: operations and equipment

## Technology Issues

- Ability to connect electric appliances to the Grid

# Air Quality



Sources: Map from ALA  
*State of the Air Report* (2017);  
NOx data from CARB 2015

## Outdoor + indoor air pollution from gas appliances:

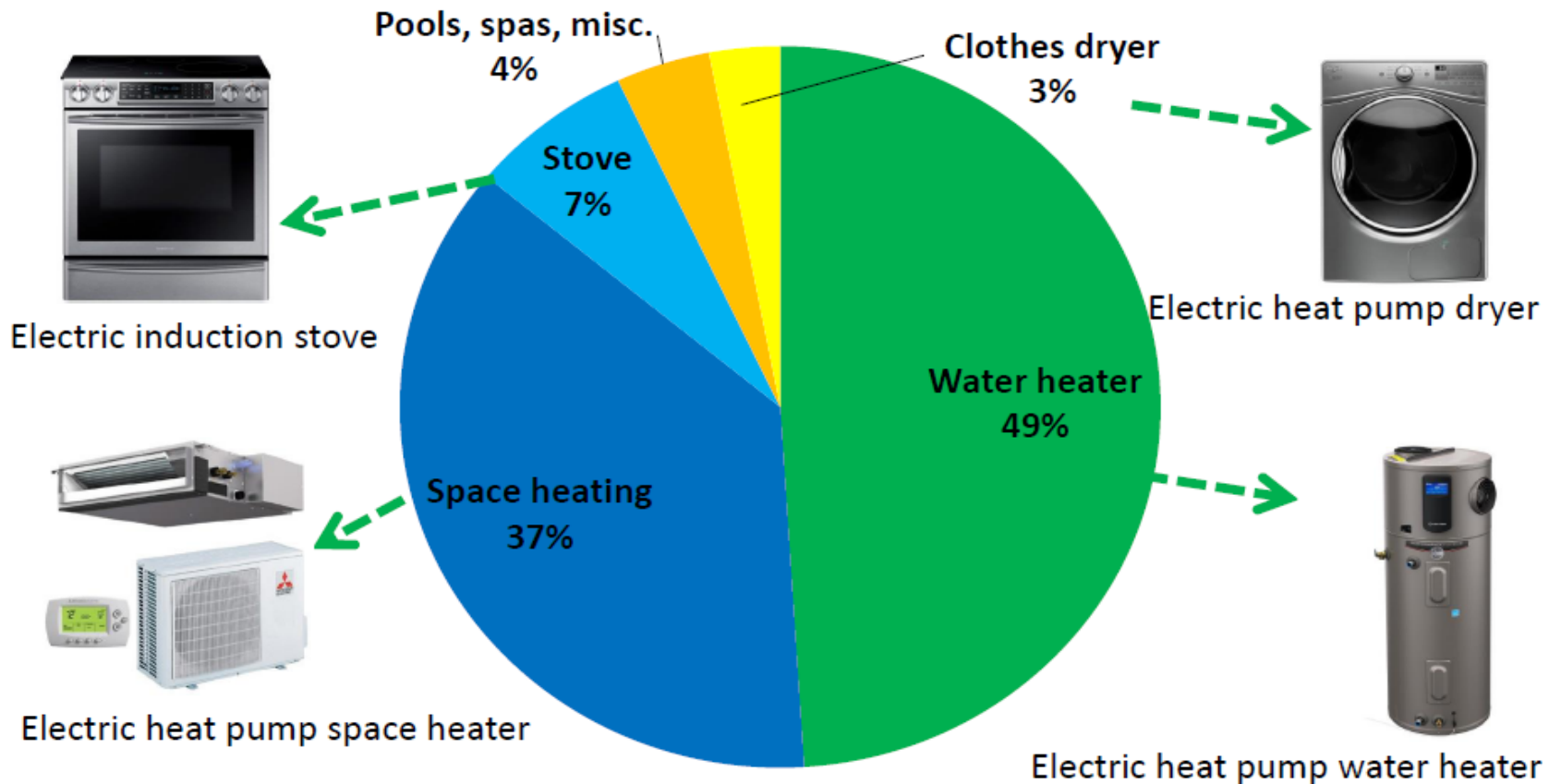
- Gas appliances in buildings responsible for 1/4 of NOx from gas in CA
- Criteria pollutants from incomplete combustion byproducts (CO, formaldehydes, SO<sub>2</sub>, NO<sub>2</sub>, particulates) – especially from gas stoves

9

1. **Building-related emissions are ~2<sup>nd</sup> largest source of GHGs in California (and most cities here today!) – roughly 25% of California's GHGs are from buildings.**

# Electrification of Everything

## Household Gas Consumption in CA and clean electric alternatives



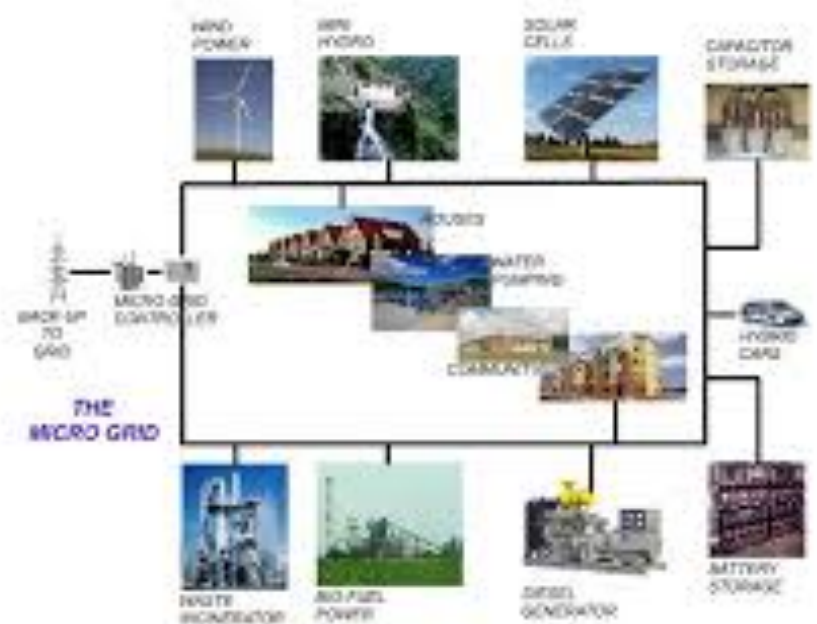


# California Communities Leading the Way

- **Los Angeles** - plans to set electrification targets in line w/ GHG goals (60%x2035)
- **Palo Alto/CPAU** - \$1500 HPWH rebates, streamline permitting, education/outreach, green building code
- **Marin/MCE** - low-income multifamily electrification pilot, contractor training, rebates
- **Sonoma/SCP** - support all-electric ZNE rebuild after fires, rebates, consumer education, outreach to contractors
- **Sacramento/SMUD** - \$1500 HPWH rebates
- **San Francisco + Oakland** - methane leakage research

# Microgrids

- Increasing frequency and magnitude of natural/climate disasters impacting the grid
- How can public agencies be better prepared?
- Example: Monterey PUSD
- What about supporting local communities?
- Example: Lancaster School District
- Microgrid and distributed energy resource (DER) opportunities



# Proposition 39: What's Next?

## 1. Policy Issues

- “New” Prop 39 Program Guidelines to be released June 1, 2018; competitive loans and grants
- Effort to extend program beyond 2020

## 2. Commercial Issues

- Also \$75 for “clean” transportation
- And \$100 Million in ECAA 0% Loans
- Unclear how much for grants; likely less than \$50

## 3. Legal/Contractual Issues

- Savings Projections in Contracts

# Questions



# Contact Information

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