A BIT ABOUT MY CAREER TRAJECTORY

Professional
- Government & Politics
- NGO
- Private Sector

Education & Science
- Ph.D. in Ecology
- NEON
- UC Davis Policy Institute
- ASU Professor of Practice
A FEW THINGS I’VE LEARNED

- Running climate change programs at large organizations requires skills I didn’t learn in school:
  - Soft diplomacy, teambuilding, and communication skills;
  - Allies across many operating units/departments at technical and leadership levels;
  - Co-design and ownership of new programs combined with metrics to hold entire organization accountable; and
  - Strong sense of optimism;

- The best leaders:
  - Are mentors;
  - Give credit to others; and
  - Understand that when their team looks good, they look good
RECOMMENDATIONS

- You have agency over your time and career:
  - Saying “yes” too much leads to a lack of respect for your time
  - Mentors are critical to career perspective and success – just ask!
    - If advice doesn’t sound right to you, investigate further…
  - You have to set aside the time to have a larger perspective on your career and carve out opportunities and time for yourself to grow.
    - Internships
    - Fellowships
    - Volunteer opportunities
    - Jobs
QUESTIONS WHEN CHOOSING TO WORK WITH AN ORGANIZATION

- Is the topic you want to work on a priority of organizational leadership?
  - Is it included in an organization’s mission and vision statements?
- Does an organization issue reports on the topic you want to work on – to the board, to investors, to the public?
- Does the organization have employee performance metrics reflecting support for the topic you want to work on?
- Does the position you are applying for (or the boss of the position you are applying for) have a budget and staff that allows for accomplishing the goals set out in the job description?
- What is the percentage of female leadership and is there a culture of mentorship at the organization?
- Do I like the team I would work with or do I only like the issue I’d be working on?
- Does the organization support work—life balance?
“Wildfires, hurricanes and other extreme weather cost the nation 247 lives, nearly $100 billion in damage during 2018” – Washington Post, February 6, 2019

“2018 was the fourth warmest year on record -- and more evidence of a ‘new normal,’ scientist group reports” – Washington Post, January 25, 2019

“The escalating pace of Antarctic ice loss

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss</td>
<td>0.003</td>
<td>0.005</td>
<td>0.016</td>
<td>0.025</td>
</tr>
</tbody>
</table>

Source: Rigor et al, 2019, Proceedings of the National Academy of Sciences

“Ice loss from Antarctica has sextupled since the 1970s, new research finds … already a significant contributor to sea level rise” – Washington Post, January 14, 2019
PACIFIC GAS AND ELECTRIC CASE STUDY: CA CLIMATE RISK ASSESSMENT

- 24,000 employees
- 5.3 million electric customers
- 70,000 square mile service area
- ~70% GHG-free energy
- 4.4 million gas distribution customers
- 7,700 MW of owned electric generation capacity

[Table of energy resources]

<table>
<thead>
<tr>
<th>ENERGY RESOURCES</th>
<th>PG&amp;E 2016 POWER MIX (Actual)</th>
<th>2016 CA POWER MIX² (For Comparison)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible Renewable:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Biomass and waste</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>- Geothermal</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>- Small hydroelectric</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>- Solar</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>- Wind</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Coal</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Large Hydroelectric³</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>17%</td>
<td>36%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>24%</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Unspecified⁴</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
PG&E defines climate resilience as “the actions to be taken related to our assets, infrastructure, operations, employees and customers to mitigate against these potential consequences and adapt to a changing climate and resulting weather patterns.”

200% projected increase in non-urban areas burned by wildfire by 2050 vs. 1961-1990 average

Up to 40 percent of California’s landmass at elevated or extreme level of fire danger.

### More hot summer days projected for Central Valley by 2050

<table>
<thead>
<tr>
<th>Decade Ending</th>
<th>High Emission Scenario</th>
<th>Low Emission Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>2030</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>2040</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>2050</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>2060</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>2070</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>2080</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>2090</td>
<td>47</td>
<td>26</td>
</tr>
<tr>
<td>2100</td>
<td>57</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: Cal-Adapt online database for Central Valley location with a 98% (4 days per year) maximum temperature of 100 degrees Fahrenheit relative to a 1961–1990 May–October baseline.

### Inconsistent and extreme precipitation:

- 2016: drought and reduced hydroelectric output;
- 2017: 180% above normal precipitation;
- 2018: 74% of normal precipitation; 23% snowpack water equivalent

Source: Range values taken from California Coastal Commission Sea Level Rise Guidance, August, 2015.
Adaptation Policy

- Far more incentives than laws/regulation
- Trying to deal with a myriad of rapidly changing local climate change impacts
- Less mature field (mirrors action in UNFCCC)
- More complex implementation roles & responsibilities

Mitigation Policy

- Some incentives; increasing number of laws/regulation
- Targets reducing a set number of greenhouse gas emissions from different sectors
- More mature field (mirrors action in UNFCCC)
- Clearer implementation roles & responsibilities

2018 Camp Fire, photo credit: Washington Post
CA’S ENERGY UTILITIES & CLIMATE CHANGE IMPACTS

Rising Temperatures + Drought + Stronger Storms + Forest Management + Utility Operations = Increased Wildfire & Landslide Risks

Pacific Gas & Electric
• Responsible for causing:
  • 2015 Butte Fire
  • 2017 (11 out of 16 fires in firestorm complex)
  • 2018 Camp Fire
• ~100 people died in combined fires
• $32 Billion combined cost
• 2019 Declared Bankruptcy
• $14 Billion set aside for settlements

Southern CA Edison
• Responsible for causing
  • 2017 Thomas Fire
  • Subsequent devastating mudslide
  • 1 died in the fire and 23 died in mudslide
• $2.4 Billion combined cost
• Current lawsuits against Montecito Water District and SCE

San Diego Gas & Electric
• Responsible for causing
  • 2007 Witch Fire
• No People died
• $1.3 B cost to consumers
• ~$2 Billion in settlement
• 2017 CPUC rejects application to charge customers $379 Million to help cover costs
CPUC regulates:
- Energy utilities
- Water utilities
- Telecommunications

- OIR: Order Instituting Rulemaking (newest element)
- RAMP: Risk Assessment Mitigation Phase
- GRC: General Rate Case
**CPUC CLIMATE ADAPTATION ORDER INSTITUTING RULEMAKING (OIR)**

- **OIR Phase 1 Focus:** large energy utilities
- **Phase 2 Focus:** smaller energy utilities, water, and telecommunications utilities.
- **5 Working Group Topics:**
  - Definition of Adaptation for Utilities
  - Data Sources, Models, and Tools
  - Guidelines for Utility Climate Adaptation Assessment and Planning
  - Vulnerable and Disadvantaged Communities
  - Decision-making Framework

---

**PHASE 1 CLIMATE CHANGE ADAPTATION RULEMAKING SCHEDULE**

<table>
<thead>
<tr>
<th>EVENT</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping Memo issued</td>
<td>October 10, 2018</td>
</tr>
<tr>
<td>Comments on Scoping Memo</td>
<td>15 days after Scoping Memo issued^4</td>
</tr>
<tr>
<td>Working group process (meetings, proposals, reports, comments, and replies)</td>
<td>Q4 2018 through Q2 2019, with each topic addressed sequentially</td>
</tr>
<tr>
<td>Final set of working group session report comments and replies received</td>
<td>Summer 2019</td>
</tr>
<tr>
<td>Proposed Decision</td>
<td>90 days following submission</td>
</tr>
<tr>
<td>Commission Decision</td>
<td>September 2019</td>
</tr>
</tbody>
</table>
Issue 9/16/19

Only Addresses Topics 1 & 2 out of 5 total Topics

Topic 1: Definition of Climate Change Adaptation

PD-Proposed Definition: Adaptation to climate change for energy utilities regulated by the Commission refers to adjustment in utility systems using strategic and data-driven consideration of actual or expected climatic impacts and stimuli or their effects on utility planning, facilities maintenance and construction, and communications, to maintain safe, reliable, affordable and resilient operations.

Topic 2: Appropriate Data Sources, Models, and Tools

PD Proposed Guidance: The utilities are directed to use the California Fourth Climate Change Assessment and the studies, data, tools, and models contained in that Assessment when analyzing climate impacts, climate risk, and climate vulnerability of utility infrastructure and operations.

- Iterative updates to occur with future Climate Assessments.
- Utilities directed to use 10 (out of 32) Global Climate Models
- Energy utilities are directed to use the business-as-usual RCP 8.5 for planning, proposed investment and operational purposes
Disadvantaged communities: Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation, or with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment.

Climate-Vulnerable Communities: Vulnerable communities experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factor(s), which are exacerbated by climate impacts.

Sources: Planning and Investing for a Resilient California; ICARP TAC
OIR TOPIC 4: RELATIONSHIP BETWEEN CLIMATE-VULNERABLE & DISADVANTAGED COMMUNITIES
NEXT STEPS

- Implementation of OIR Topics 1 & 2
- OIR Proposed Decision on Topics 3-5 expected in 2020
- Will utilities continue to capture climate risk in RAMP filings or in other ways?
- What is the best way to include climate adaptation in GRCs?
- Continued coordination on climate adaptation planning between utilities; state, tribal, and local governments; other critical service providers; insurance industry; etc.
BACKGROUND SLIDES
DEFINITIONS AND CONCEPTS

- **Climate Justice** is defined as “the concept that no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation”

- **Environmental Justice** is defined in CA state statute as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies”

- **Social justice** may be broadly understood as the “fair and compassionate distribution of the fruits of economic growth.” “Social justice means equal rights, opportunity and treatment for all.”

Sources: *Planning and Investing for a Resilient California; California’s 4th Climate Change Assessment: Environmental Justice Report; The San Diego Foundation;* Photo credits: NPR
DEFINITIONS AND CONCEPTS

- The **Climate Gap** describes how people of color and low-income populations will be both the first ones impacted by climate change as well as the least capable of adapting to the resulting impacts.

- The **Just Transition** is from a fossil fuel based/extraction economy to a green/sustainable economy, including (1) explicitly equitable public policy; (2) **meaningful participation from the people affected by the transition**; and (3) taking a social justice or holistic approach to address the political, economic, and social inequities of the fossil fuel economy.

- **Frontline Communities** experience continuing injustice and face a legacy of systemic, largely racialized, inequity that influences their living and working places, the quality of their air and water, and their economic opportunities. **Frontline communities are experts in creating solutions to protect and preserve air, water, land, and communities**, despite their historical exclusion from decision-making and from public resources and services. **Frontline communities should be engaged in developing technologies, policies, professions, services, and projects for addressing the causes and impacts of climate change and healing from historical injustices.**

Source: *California’s 4th Climate Change Assessment: Environmental Justice Report*
### FIGURE 5 | COMPARING CAENVIRONMENTSCREEN AND HEALTHY PLACES INDEX INDICATORS

<table>
<thead>
<tr>
<th>Domain</th>
<th>Component</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollution Burden</td>
<td>Exposure</td>
<td>Ozone concentrations, PM2.5 concentrations, Diesel PM Emissions, Drinking water quality, Pesticide use, Toxic releases from facilities, Traffic density</td>
</tr>
<tr>
<td></td>
<td>Environmental Effects</td>
<td>Toxic cleanup sites, Groundwater threats, Hazardous waste, Impaired water bodies, Solid waste sites and facilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Environment</td>
<td>Ozone PM 2.5, Diesel PM Water Contaminants</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>Retail Density, Park Access, Tree Canopy, Supermarket Access, Alcohol Outlets</td>
</tr>
<tr>
<td>Economic</td>
<td>Employed Income</td>
</tr>
<tr>
<td>Social</td>
<td>Two Person Household Voting in 2012</td>
</tr>
<tr>
<td>Housing</td>
<td>Severe Housing Cost Burden (Renter and Homeowner), Housing Habitability, Housing Crowding, Homeownership</td>
</tr>
<tr>
<td>Education</td>
<td>In Preschool, In Highschool, Bachelor’s Education or Higher</td>
</tr>
<tr>
<td>Transportation</td>
<td>Automobile Access, Active Commuting</td>
</tr>
<tr>
<td>Healthcare</td>
<td>Health Insurance</td>
</tr>
</tbody>
</table>

**CalEnviroScreen 3.0**
20 indicators >> 4 components >> 2 burdens >> 1 score

Statewide census tracts ranked by percentile and averaged to obtain component scores. Component scores are combined to burden scores (0-10). Burden scores are multiplied together (0-100).

**Healthy Places Index**
24 indicators >> 6 domains >> 1 index

Indicators available at census tract scales. Domains are weighted toward final index value based on association with life expectancy at birth.

**Source:** California’s 4th Climate Change Assessment: Environmental Justice Report
Side-by-side comparison of CES, HPI, and HPI+Race maps, where red signifies the least climate resilient in all three. On the CES map, red is the top 25th percentile (most disadvantaged), and on the HPI maps, red is the bottom 25th percentile (least healthy).

Source: California’s 4th Climate Change Assessment: Environmental Justice Report