<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docket Number</td>
<td>19-IEPR-03</td>
</tr>
<tr>
<td>Project Title</td>
<td>Electricity and Natural Gas Demand Forecast</td>
</tr>
<tr>
<td>TN #</td>
<td>227209</td>
</tr>
<tr>
<td>Document Title</td>
<td>California’s Economic and Demographic Assumptions</td>
</tr>
<tr>
<td>Description</td>
<td>Presentation by Nancy Tran of CEC</td>
</tr>
<tr>
<td>Filer</td>
<td>Raquel Kravitz</td>
</tr>
<tr>
<td>Organization</td>
<td>California Energy Commission</td>
</tr>
<tr>
<td>Submitter Role</td>
<td>Commission Staff</td>
</tr>
<tr>
<td>Submission Date</td>
<td>3/1/2019 11:42:06 AM</td>
</tr>
<tr>
<td>Docketed Date</td>
<td>3/1/2019</td>
</tr>
</tbody>
</table>
California’s Economic and Demographic Assumptions

Nancy Tran
March 4, 2019
Energy Assessments Division
California Energy Commission
Electricity Consumption and the Economy

Clear relationship between energy use and economic upswings and downswings

Source: Moody’s Analytics, CA Energy Commission Commision
Recession Uncertainty

Total Non-Farm Employment
(annual growth rate)

Source: U.S. Bureau of Labor Statistics
Key Economic Drivers Used in the Forecast

- Population
- Households
- Personal Income
- Output by Sector
- Employment by Sector
- Unemployment Rate
- Household Size
Slow down in California’s population growth – less than 0.9% growth last year


Source: CA Department of Finance
Key Aspects: Birth Rates and Migration

Drivers

– Number of women of child bearing ages
– State of job market
– Wage and salary opportunities
– Housing prices
– Death rates (minor)
Moody’s Economic Projections

Custom CEC High Scenario
– Provides more consistent range

Baseline Scenario
– “Likely” scenario

Low Growth Scenario Options
– S2: Slower Near-Term Growth
– S3: Moderate Recession
– S5: Below-Trend Long-Term Growth
CED 2019 Scenario Example

- CEDU 2018 High Demand
- CED 2019 Preliminary Mid Case
- Moody's Scenario 2 - Slower Near Term Growth
- Moody's Scenario 3 - Moderate Recession
- Moody's Scenario 5 - Below-Trend Long-Term Growth
- Historical

Billions 2018$
Associated Energy Demand Cases

Low Energy Demand:
  – Moody’s “Lower Long-Term Growth” scenario

Mid Energy Demand:
  – Moody’s “Baseline” scenario

High Energy Demand:
  – Moody’s special scenario created for the Energy Commission
California’s Mid and Long-Term Growth

Mid-term expectations (3-5 years)
– Housing and tech growth
– GSP grows at 2-3%+ annually

Long-term expectations (5-10 years)
– Tech and infrastructure improvements keeping pace with national level
– GSP grows at 2%+ annually
### Mid Case Comparison: CEDU 2018 vs CED 2019 Prelim.

<table>
<thead>
<tr>
<th>Key Driver</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross State Product</td>
<td>0.01%</td>
<td>0.05%</td>
<td>0.02%</td>
</tr>
<tr>
<td>Personal Income</td>
<td>-0.79%</td>
<td>-1.51%</td>
<td>-1.49%</td>
</tr>
<tr>
<td>Manufacturing Output</td>
<td>0.65%</td>
<td>-1.03%</td>
<td>-2.04%</td>
</tr>
<tr>
<td>Non-Farm Employment</td>
<td>0.51%</td>
<td>0.30%</td>
<td>0.18%</td>
</tr>
</tbody>
</table>
California Housing Construction Completions
(Number of Units, Seasonally Adjusted)

Source: Moody’s Analytics
Other short-term Economic Drivers

- Housing affordability
- Lower oil and gasoline prices
- Income growth from technology industries
- Government stimulus
Regional Breakout

- Los Angeles
- San Diego
- Central Valley
- Bay Area
Unemployment Rate

– Currently 4.6 percent, down from 13.0 percent in 2010 (EDD)

Job Growth

– Trade, transportation, utilities, entertainment, and biotech sectors
– “Silicon Beach” continues to attract venture capitalists

Upsides

– Continues to draw international investors as housing prices appreciate
– More multi-family units to be built (UCLA Anderson Forecast)
San Diego Region

Unemployment Rate
– Currently 3.2 percent, down from 10.4 percent in 2010 (EDD)

Job Growth
– Business services, biotech, defense, and manufacturing
– Attracting startups in clean tech: 2,577 clean tech companies

Upsides
– Large concentration of high income earners and military
Central Valley Region

Unemployment Rate
– Currently 5.8 percent, down from 15.2 percent in 2010 (EDD)

Job Growth
– Leisure and hospitality, transportation, warehousing, financial activities, and healthcare.
– Central Valley food producers and Bay Area tech moving more inland to Sacramento region

Upsides
– Construction industry is growing steadily
– Affordability is increasing domestic migration
Unemployment Rate
– Currently 2.2 percent, down from 9.1 percent in 2010 (EDD)

Job Growth
– Tech continues to be a key driver – integration of products into many business infrastructures
– Leisure and hospitality also seeing growth

Upsides
– Growth in nonresidential units due to startups
Forecast Uncertainties

• Drought/Fires
• Gasoline and oil prices
• Impact of Baby Boomers and Millennials
• Migration patterns
• Tariffs impact on manufacturing
• Recession possibility
Questions?