CALIFORNIA ENERGY COMMISSION

IMPACT OF ASSEMBLY BILL 32 SCOPING PLAN ELECTRICITY RESOURCE GOALS ON NEW NATURAL GAS-FIRED GENERATION

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Electricity System Implications of 33 Percent Renewables
June 29, 2009

Potential Impact on New Proxy Electric Generation

- California Air Resources Board's Assembly Bill 32 (AB 32) (Núñez, Chapter 488, Statutes 2006) *Climate Change Scoping Plan*

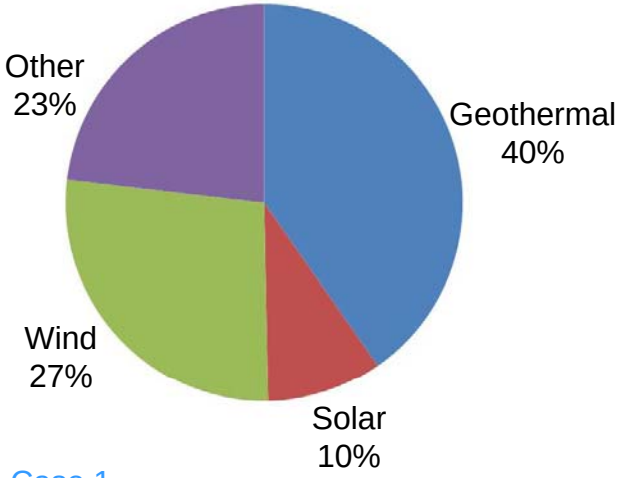
- State Water Resources Control Board's pending policy to reduce the adverse impacts of once-through cooling from coastal gas-fired power plants

Year 2020	EE and Rooftop PV Goals	CHP Goals	Renewables Goal (Statewide Retail Sales)	Sample OTC Compliance Plan
Case 1 Reference	No additional	No additional	20% by 2012 29,145 GWh Net Short	12,655 MW Retired and 7,758 MW Added
Case 2 High Solar	34,707 GWh EE 4,845 GWh Rooftop PV	32,304 GWh	33% by 2020 45,481 GWh Net Short	12,655 MW Retired and 7,758 MW Added
Case 3 High Wind	34,707 GWh EE 4,845 GWh Rooftop PV	32,304 GWh	33% by 2020 45,481 GWh Net Short	12,655 MW Retired and 7,758 MW Added

2020 California Renewable Resource Mix

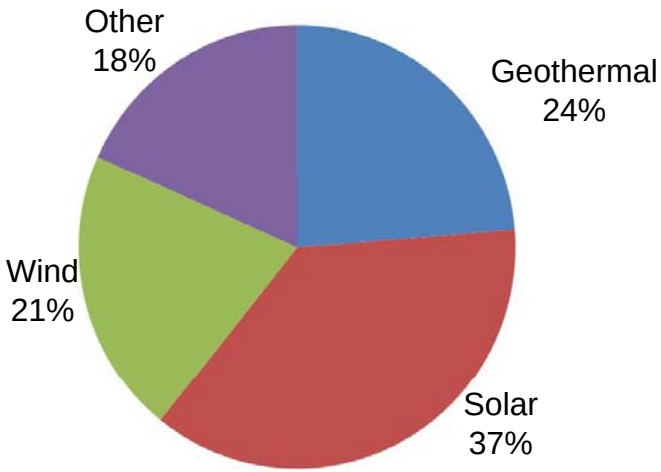
Percent of Total Renewable Energy

Case 1
Reference Case

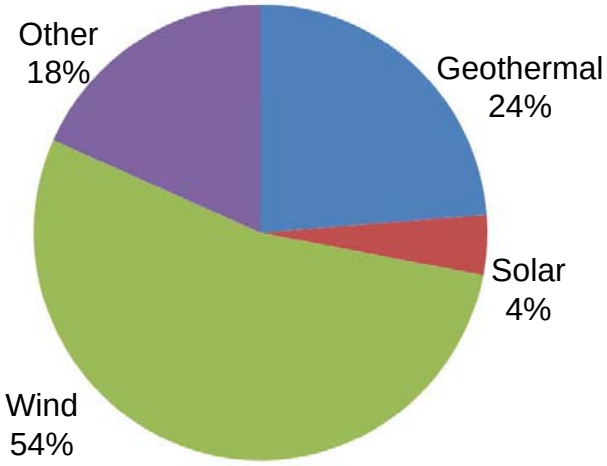


Case 1
Renewable Energy =
61.8 TWh

Case 2
High Solar



Case 3
High Wind



Case 2 and 3
Renewable Energy =
78 TWh

Key Drivers

- Study years 2012, 2016 and 2020
- CHP is Must Take and Base Loaded Natural Gas-fired Generation
- Sample OTC compliance path
- Energy Efficiency hourly profiles
- IEPR07 Demand Forecast
- Consistent Hourly Wind and Load Profiles

Amount of New Proxy Generic Generation Additions In California Did Not Change between Cases 1,910 MW added between 2012 and 2020

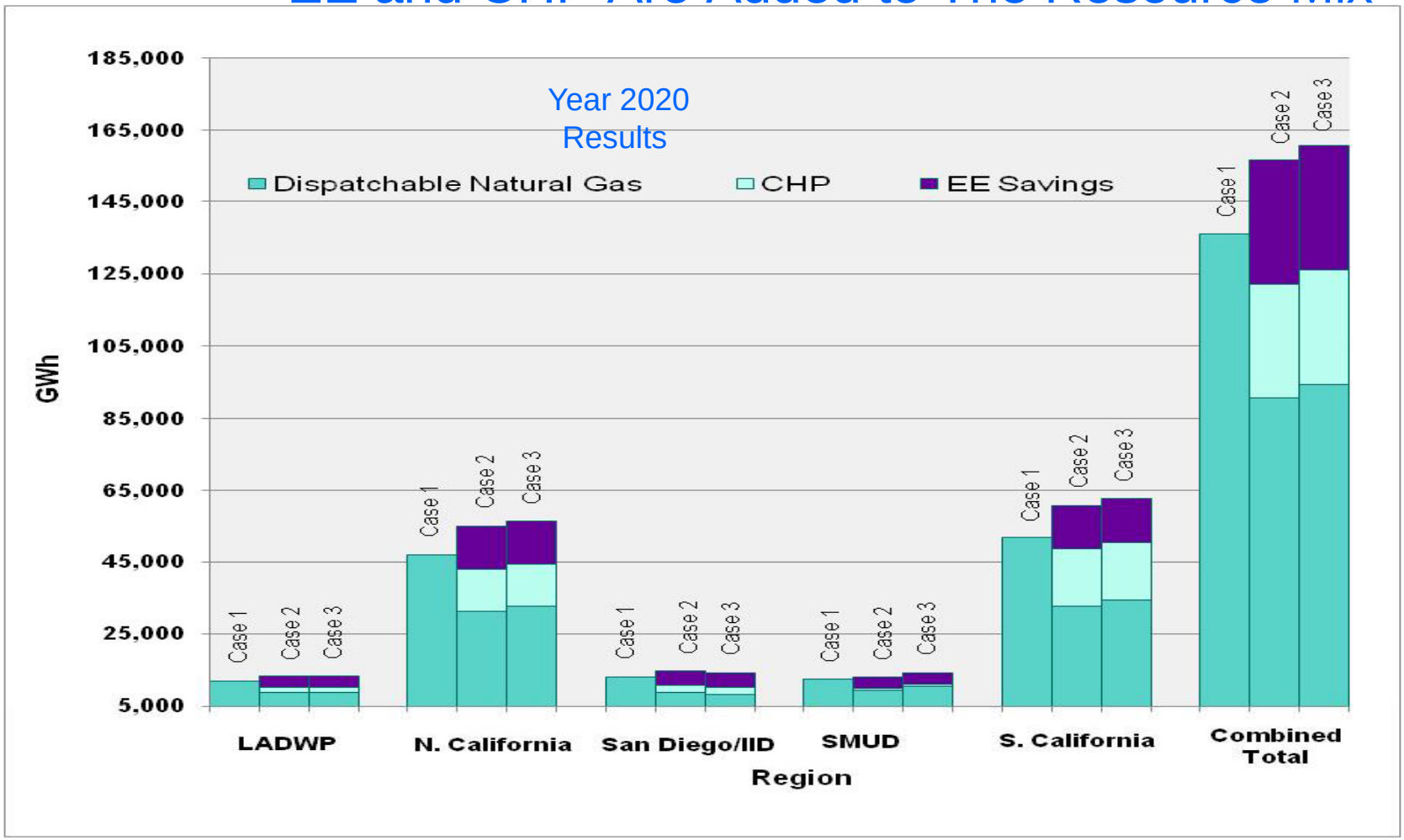
- Statewide over 10,000 MW of dependable gas-fired CHP and EE are included in Cases 2 and 3

- OTC Retirements of 12,655 MW and OTC Additions of 7,758

Capacity Factors of Proxy OTC Combined Cycle Additions Drop to Low Levels For Case 2 and Case 3

2020	Case 1 Reference	Case 2 High Solar	Case 3 High Wind
Proxy CC OTC in Northern CA	61%	20%	23%
Proxy CC OTC in Southern CA	56%	22%	25%
Proxy CT OTC in Southern CA	17%	15%	15%

Dispatchable Natural Gas Decreases When More EE and CHP Are Added to The Resource Mix



Natural Gas Use For Electric Generation (2020 Bcf/Day)

Bcf/Day	California	Rest of WECC	Total WECC
Case 1 Reference Case	**2.88**	**3.16**	**6.04**
Case 2 High Solar	**2.52**	**2.60**	**5.12**
Case 3 High Wind	**2.60**	**2.55**	**5.15**

California Natural Gas Use For Electric Generation (Bcf/day)

Bcf/Day	2012	2016	2020	Change in 2020 From Case 1
Case 1	2.36	2.57	2.88	
Case 2 High Solar	2.34	2.45	2.52	-12%
Case 3 High Wind	2.34	2.48	2.60	-10%

Next Steps

- Over Generation Issues
- Scoping Plan Goals for Transportation Electrification
- Sensitivities
  - OTC Compliance Schedule/Options
  - CHP Characterizations
  - EE Hourly Profiles
  - Hydro Generation
  - Load Forecast

QUESTIONS

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FULL REPORT *IMPACT OF ASSEMBLY BILL 32 SCOPING PLAN ELECTRICITY RESOURCE GOALS ON NEW NATURAL GAS-FIRED GENERATION* available at http://www.energy.ca.gov/2009_energypolicy/notices/2009-06-29_workshop.html

Additional Details for Slide 3

- Energy Efficiency Goal – 32,000 GWh and 34,707 GWh including losses
- Rooftop Photovoltaic – 4,500 GWh and 4,845 GWh including losses
- Combined Heat-and-Power – 30,000 GWh and 32,304 GWh including losses
- 33 Percent RPS – 61,800-78,000 GWh - 61,800 uses all electric sector Scoping Plan goals, 78,000 uses only 33% RPS goal
- OTC Compliance/Replacement – 12,655 MW retired and 7,758 MW added(1,000 MW Simple Cycle and 6,758 Combined Cycle)

Additional Details for Slide 3

All Cases use the same OTC Compliance path

Case 1 – 20% RPS by 2012 and Scoping Plan goals not included

Case 2 – 33% RPS by 2020 dominated by concentrated solar with Scoping Plan goals

Case 3 – 33% RPS by 2020 dominated by wind with Scoping Plan goals