



Annual Update to the Forecasted New Renewable Generation Required to Meet Policy Targets

California Energy Commission

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What To Expect From This Presentation

- Discussion of updated demand side assumptions and existing renewable generation that impacts the calculation of renewable net short (RNS)
- Comparison to staff's previous RNS forecast
- Discussion of forecast ranges, not a single point forecast
- Ideas for a 2024 and 2030 RNS



What Not To Expect From This Presentation

- Not a discussion of the type, location or timing of renewables to meet an RPS goal
- Not a discussion of the methodology to calculate the RNS



RNS Forecast Basic Methodology

1	Statewide Total Deliveries (Retail Sales)	
2	Non RPS Deliveries (CDWR, WAPA, MWD)	
	Small LSE Sales (<200 GWh) ←	No longer excluded
3	Adjusted Retail Sales for RPS	3=1-2
4	Incremental Uncommitted Energy Efficiency	
5	Additional Rooftop PV	
6	Additional Combined Heat and Power	
7	Adjusted Statewide Retail Sales for RPS	7=3-4-5-6
8	Total Renewable Energy Needed For 33% RPS	8=7* 33%
	Existing and Expected Renewable Generation	
9	Total Instate Renewable Generation	
10	Total Out-of-State Renewable Generation	
11	Total Existing Renewable Generation for CA RPS	11=9+10
12	Total RNS to meet 33% RPS In 2022	12=8-11



Renewable Net Short Update For 2022 (TWh)

	All Values in TWh for the Year 2022	Formula	Low Demand Forecast Renewable Net	Mid Demand Forecast Renewable Net	High Demand Forecast Renewable Net
1	Statewide Retail Sales - June 2012 IEPR12 Final		291.1	301.4	317.7
2	Non RPS Deliveries (CDWR, WAPA, MWD)		12.5	12.5	12.5
3	Retail Sales for RPS	3=1-2	278.6	288.9	305.2
4	Incremental Uncommitted Energy Efficiency		22.2	19.5	12.6
5	Additional Rooftop PV		-	0.4	0.7
6	Additional Combined Heat and Power		20.8	11.6	9.9
7	Adjusted Statewide Retail Sales for RPS	7=3-4-5-6	235.6	257.4	282.0
8	Total Renewable Energy Needed For 33% RPS	8=7* 33%	77.8	84.9	93.1
	Existing and Expected Renewable Generation				
9	Total In-State Renewable Generation (COD prior to 1/1/2014)		46.2	46.2	46.2
10	Total Out-of-State Renewable Generation (COD prior to 1/1/2014)		13.4	13.4	13.4
11	Total Existing Renewable Generation for CA RPS (COD prior to 1/1/2014)	11=9+10	59.6	59.6	59.6
12	Total In-State Renewable Generation (COD prior to 1/1/2013)		41.9	41.9	41.9
13	Total Out-of-State Renewable Generation (COD prior to 1/1/2013)		12.5	12.5	12.5
14	Total Existing Renewable Generation for CA RPS (COD prior to 1/1/2013)	14=12+13	54.4	54.4	54.4
15	Total RNS to meet 33% RPS In 2022 (GWh) (COD prior to 1/1/2014)	15=8-11	18.2	25.3	33.5
16	Total RNS to meet 33% RPS In 2022 (GWh) (COD prior to 1/1/2013)	16=8-14	23.4	30.5	38.7



Demand Forecast

- Retail Sales Forecast from ***California Energy Demand 2012-2022(CED 2011), Adopted Forecast****
 - Form 1.1c
- Demand Forecast Adjustments CED 2011
 - Form 1.1c - CDWR, MWD, WAPA - pumping loads
 - Small LSEs (<200 GWh) no longer excluded

*Posted June 22, 2012



Demand Forecast

Range of Adjusted Retail Sales

- Low and High Case Retail Sales use CED 2011 Form 1.1B adjusted for CA LSE's in other balancing areas
- Pumping loads remain unchanged from Mid Case. Assumes annual pumping loads are not correlated to econ/demo drivers



Demand Forecast

Range of Adjusted Retail Sales

GWh	Low Demand Case	Mid Demand Case	High Demand Case
2020	272,818	282,138	295,025
2022	278,602	288,854	305,154



Demand Forecast Demand Reduction Programs

- Incremental Uncommitted Energy Efficiency (IUEE)
 - forecasted amounts above that already included in Form 1.1c retail sales forecast
- IOU - High, Medium and Low range forecasts from CEC's *Energy Efficiency Adjustments for a Managed Forecast: Estimates of Incremental Uncommitted Energy Savings Relative to the California Energy Demand Forecast 2012-2022* Posted July 31, 2012, updated September 20, 2012
- POU - High, Medium and Low range forecasts from CEC's *Preliminary California Energy Demand Forecast 2012-2022* Posted August 26, 2011



Demand Forecast Demand Reduction Programs for IOU and POU IUEE

	2022 (GWh)		
	Low IUEE Savings	Mid IUEE Savings	High IUEE Savings
IOU Savings	9,081	14,783	16,494
POU Savings	3,500	4,760	5,676
Statewide Savings	12,581	19,543	22,170

	2020 (GWh)		
	Low IUEE Savings	Mid IUEE Savings	High IUEE Savings
IOU Savings	7,366	11,501	12,797
POU Savings	2,923	3,921	4,673
Statewide Savings	10,289	15,423	17,470



Demand Reduction Programs Incremental Distributed Generation (DG)

- Impacts of *AB 32 Scoping Plan* and Governor's Clean Energy Jobs Plan to RNS Calculation
 - 12,000 MW of DG with an emphasis on PV – 3,000 MW CSI impact included on the demand and remaining 9,000 MW will be included on supply side
 - 6,500 MW Combined Heat and Power (CHP) over Next 20 Years – only additional onsite CHP impacts RNS calculation



Demand Reduction Programs Additional Roof Top PV In RNS

Installed Capacity: AB 32 = 3,000 MW goal

Roof Top PV amounts already in CED 2011

GWh	Low Demand PV Savings	Mid Demand PV Savings	High Demand PV Savings
2020	4,429	3,870	3,619
2022	5,465	4,701	4,278
Installed MW	Low Demand PV Savings	Mid Demand PV Savings	High Demand PV Savings
2020	2,582	2,311	2,189
2022	3,162	2,790	2,585

Highlighted cell indicates 3,000 MW goal is met in CED 2011 forecast



Demand Reduction Programs New Onsite CHP in RNS

CEC sponsored **Combined Heat And Power: Policy Analysis And 2011 - 2030 Market Assessment – ICF Consultant Report***

- inventory of existing CHP capacity
- estimates of technical and market potential for new CHP (onsite and wholesale) in California
- accounts for the AB 32 mandates, RPS, and CPUC CHP sponsored settlement agreement

*June 2012



Demand Reduction Programs

New Onsite CHP in RNS

	Case		
2022 - Onsite CHP Installed MW	Base	Medium	High
Total	1,297	1,523	2,735
Total - Loss Adjusted Onsite	1,407	1,652	2,966
2022 - Onsite CHP GWh	Base	Medium	High
Total	9,089	10,673	19,164
Total - Loss Adjusted Onsite	9,858	11,576	20,785
2020 - Onsite CHP Installed MW	Base	Medium	High
Total	1,193	1,399	2,474
Total - Loss Adjusted Onsite	1,294	1,517	2,683
2020 - Onsite CHP GWh	Base	Medium	High
Total	8,358	9,801	17,338
Total - Loss Adjusted Onsite	9,066	10,630	18,805
Loss Factor = 7.8%			
Capacity Factor = 80%			



Existing Renewable Generation RPS-Eligible

- RPS-eligible existing renewable generation and expected to be operational for California in the current year both in- and out-of-state
- Contracted generation or capacity factor generation method to capture full year of generation for plants with commercial on-line date (COD) after January 1



Existing Renewable Generation

In-State Renewable Energy

- For all RPS-eligible generators, staff averaged the 2006-2011 QFER reported generation
- In-state RPS-eligible with COD after 1/1/2011 and prior to 12/31/2012, staff used contract databases (CPUC and CEC's) or capacity factor approach for an annual energy estimate
- Staff also provides an annual estimate for RPS-eligible with COD to 12/31/2013



Existing Renewable Generation Out-of-State RPS-Eligible Generation

- Hydro – average of 2005-2011 EIA reported generation
- Non Hydro - average 2007-2011 Power Source Disclosure reported generation



Existing Renewable Generation Out-of-State RPS-Eligible Generation

- Retail electric service providers are required to report to the Energy Commission under the Power Source Disclosure Program
 - “claimed” purchases by fuel type
 - distinguish purchases by in-state sources or out-of-state imports
- RNS method excludes out-of-state contracts with expiration date prior to 12/31/2017



Example of QFER and PSD RPS-Eligible Energy

Company Name	Plant Name	Fuel Type	Installed or Contract Capacity MW	2011 (GWh)	2010 (GWh)	Average 2009- 2006 (GWh)	Average 2011- 2006 (GWh)
University of California, San Diego	UCSD Solar PV System	Solar (PV/Thermal)	1.2	1.8	1.7		1.7
PG&E	Vaca Dixon Solar Station	Solar (PV/Thermal)	2.0	4.3	4.1		4.2
Wheelabrator Technologies Inc.	Wheelabrator Shasta	Wood/Wood Waste	62.8	391.4	397.6	395.4	394.8



Existing Renewable Generation

Facilities On-Line Most Current Full-Year QFER Data Set		TWh
2006-2011 QFER Excluding Small Hydro		27.4
2011 Power Source Disclosure Program Out-of-State Long-Term Renewable Purchase Claims		
		7.3
QFER In-State Small Hydro Claims (Average 2005 – 2011)	2005	6.0
	2006	6.7
	2007	4.0
	2008	4.0
	2009	4.4
	2010	5.0
	2011	6.2
AVERAGE		5.2
That Started Generating Prior to the End of the Most Current Full-Year QFER Data Set		
Instate Renewables Contracted Annual Generation With COD January 1, 2011, Through December 31, 2011		3.0
Out of State Renewables Contracted Annual Generation With COD January 1, 2011, Through December 31, 2011		0.0
Facilities Expected to Begin Generation Before the End of the Next Calendar Year		
Instate Renewables Annual Generation With COD After January 1, 2012, Through December 31, 2013		10.6
Out of State Renewables With Long Term Contracts Annual Generation With COD After January 1, 2012, Through December 31, 2013		6.1
IN-STATE RENEWABLE (existing or with COD prior to 1/1/2014)		46.2
OUT-OF-STATE RENEWABLE (existing or with COD prior to 1/1/2014)		13.4
TOTAL EXISTING RENEWABLE (COD prior to 1/1/2014)		59.6
Instate Renewables Annual Generation With COD After January 1, 2012, Through December 31, 2012		6.4
Out of State Renewables With Long Term Contracts Annual Generation With COD After January 1, 2012, Through December 31, 2012		5.1
IN-STATE RENEWABLE (existing or with COD prior to 1/1/2013)		41.9
OUT-OF-STATE RENEWABLE (existing or with COD prior to 1/1/2013)		12.5
TOTAL EXISTING RENEWABLE (COD prior to 1/1/2013)		54.4



Comparison to Previous RNS Forecast

All Values in TWh for the Year 2020		Formula	Mid Demand Forecast Renewable Net Short (vintage 2011)	Mid Demand Forecast Renewable Net Short (vintage 2012)	Difference
1	Statewide Retail Sales		297.9	294.6	(3.3)
2	Non RPS Deliveries (CDWR, WAPA, MWD)		13.6	12.5	(1.1)
3	Retail Sales for RPS	3=1-2	284.3	282.1	(2.2)
4	Additional Energy Efficiency		17.1	15.4	(1.7)
5	Additional Rooftop PV		3.2	1.2	(2.1)
6	Additional Combined Heat and Power		7.2	10.6	3.4
7	Adjusted Statewide Retail Sales for RPS	7=3-4-5-6	256.7	254.9	(1.8)
8	Total Renewable Energy Needed For 33% RPS	8=7* 33%	84.7	84.1	(0.6)
	Existing and Expected Renewable Generation				
9	Total In-State Renewable Generation (COD prior to 1/1/2013)		34.2	41.9	7.7
10	Total Out-of-State Renewable Generation (COD prior to 1/1/2013)		9.2	12.5	3.3
11	Total Existing Renewable Generation for CA RPS	11=9+10	43.4	54.4	11.0
12	Total RNS to meet 33% RPS In 2020 (GWh)	12=8-11	41.3	29.7	(11.6)



2024 and 2030 Scenarios

2024

- Using the CED 2011 retail sales average annual growth rate for 2019-2022 to extrapolate growth to 2024, with the exception of EV recharging
- EV recharging forecasts through 2030
- New onsite CHP forecasts already developed through the year 2030
- No changes to existing renewables



2024 and 2030 Scenarios

2030

- Using the CED 2011 retail sales average annual growth rate for 2019-2024 to extrapolate growth to 2030, with the exception of EV recharging
- The EV recharging forecasts already developed through the year 2030



2024 Forecast and 2030 Scenarios

2030 (cont'd)

- New onsite CHP forecasts developed through the year 2030 (33% RPS)
- Assume a 40 year retirement date for all non-hydro existing renewable generation
- Small hydro not subject to this retirement assumption
- California RPS goal raised from 33% to 40%



Next Steps

- Written comments should be submitted to the Energy Commission staff by 4:00 p.m. on October 8, 2012 to:
docket@energy.ca.gov
- After consideration of oral and written comments a staff Final RNS Annual Update Report will be available before the end of 2012



Questions or Comments



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