Evaluating Draft Resource Plans for the 2012 IRP

Energy and Environment Committee

Seattle City Council

March 22, 2012

Introduction

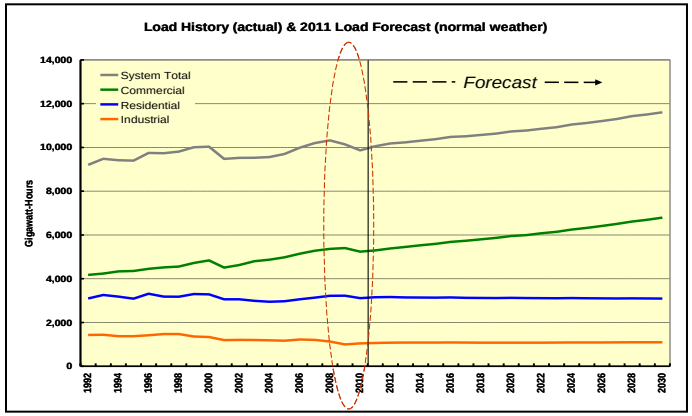
- Washington's HB1010 Requires City Light to Revise the Integrated Resource Plan (IRP) Every Two Years
  - An approved IRP must be filed with the State by September 1, 2012
- City Light has Developed Eight Draft Plans to Address:
  - HB1010 Regulatory Requirements
  - I-937 Requirements
  - Reliability Targets
- City Light Seeks the Council's Guidance Before Evaluating Three Draft Plans in More Detail

Contents

- Four Key Trends
- Eight Draft Plans
- Initial Evaluation Results

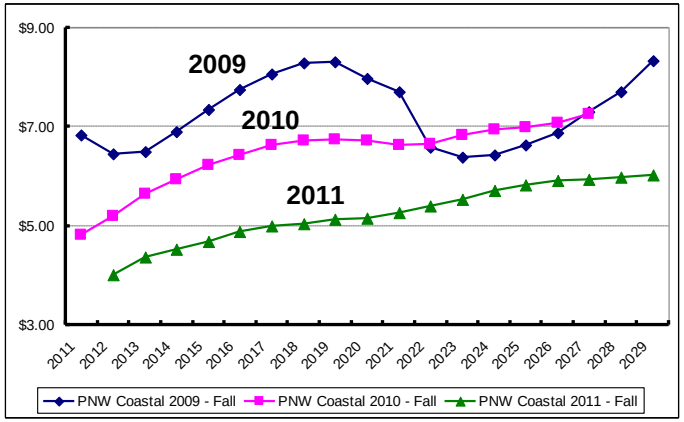
Four Key Trends

- Electricity Demand Falls With Recession
  - Delays new resource need by 2-3 years



Source: City Light

- Growing Shale Gas Supplies Shake-Up Gas and Power Industries
  - Gas prices down nearly 40%, lowering power market prices



Source: Ventyx

Four Key Trends (*Continued*)

- Regulation of CO_2 Emissions Put on "Back Burner" in 2011
  - Updated E3 outlook delays CO_2 emissions costs until 2018 and cuts the cost/ton

Bipartisan Bill Introduced in House to Block EPA Carbon Regulations

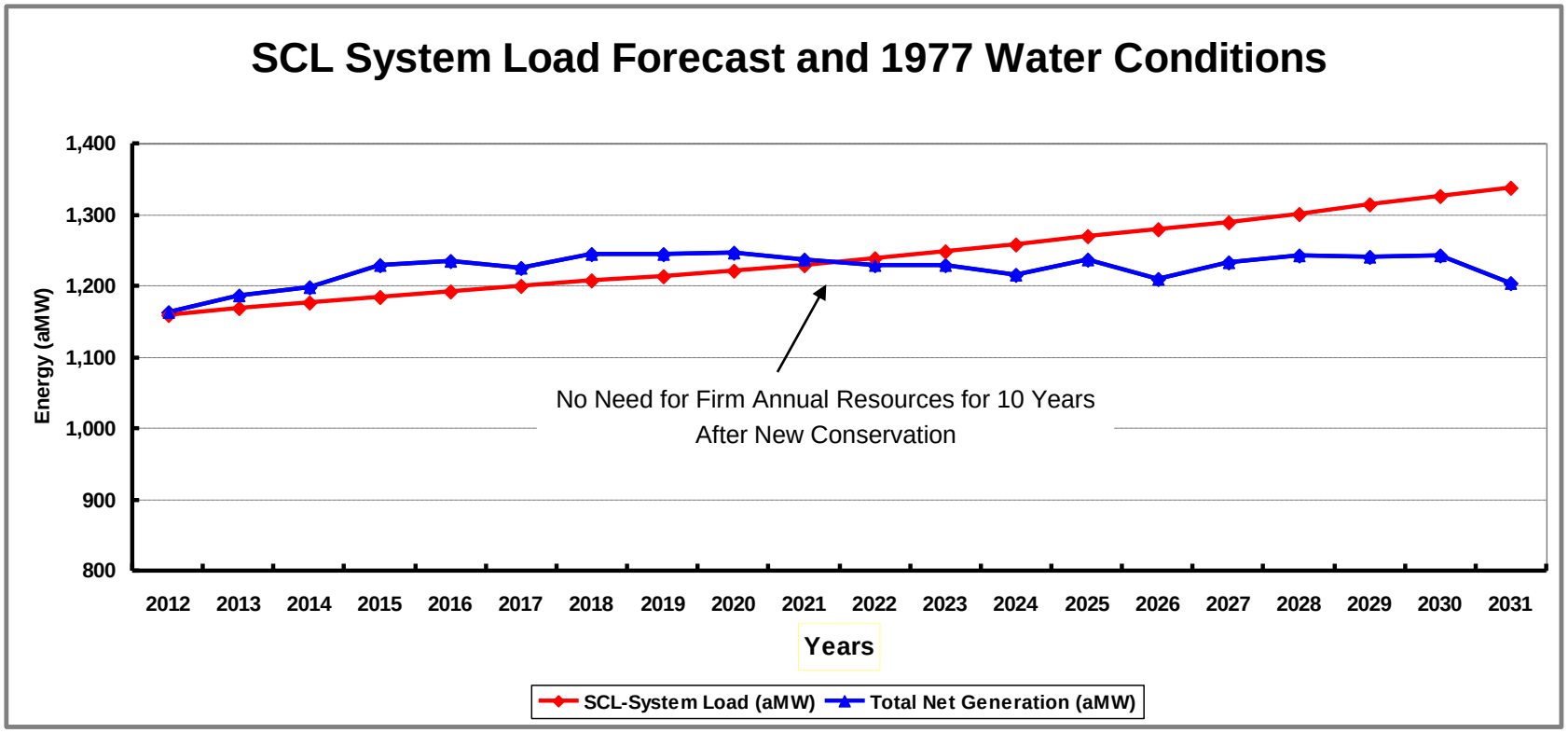
Hart, Kathleen. *SNL Energy Finance Daily*. (March 4, 2011).
"...economic threat posed by the EPA's climate change agenda."
"The EPA needs to be reined in."
"...strong bipartisan support"

- California PUC Ruling Expands PNW Renewable Energy Credit (REC) Supplies
  - Cap on sales to California creates more competitive PNW market – our REC price outlook is cut by over 40%

Calif. PUC Approves Use of TRECs for Renewables Compliance After Months of Debate

Stanfiel, Jeff., SNL Energy Power Daily (Jan. 18, 2011).
"...allowing the use of tradable renewable energy credits"
"…**can meet no more than 25% of their annual requirement…**"
(emphasis added)

Existing Firm Annual Resources



Notes: Includes planned outages for turbine rebuilds and other scheduled maintenance. Winter capacity is adequate.

Summary of Eight Draft Plans: Range of New Resources Over Time

Range of New Resources in 5, 10, and 15 Years (aMW)

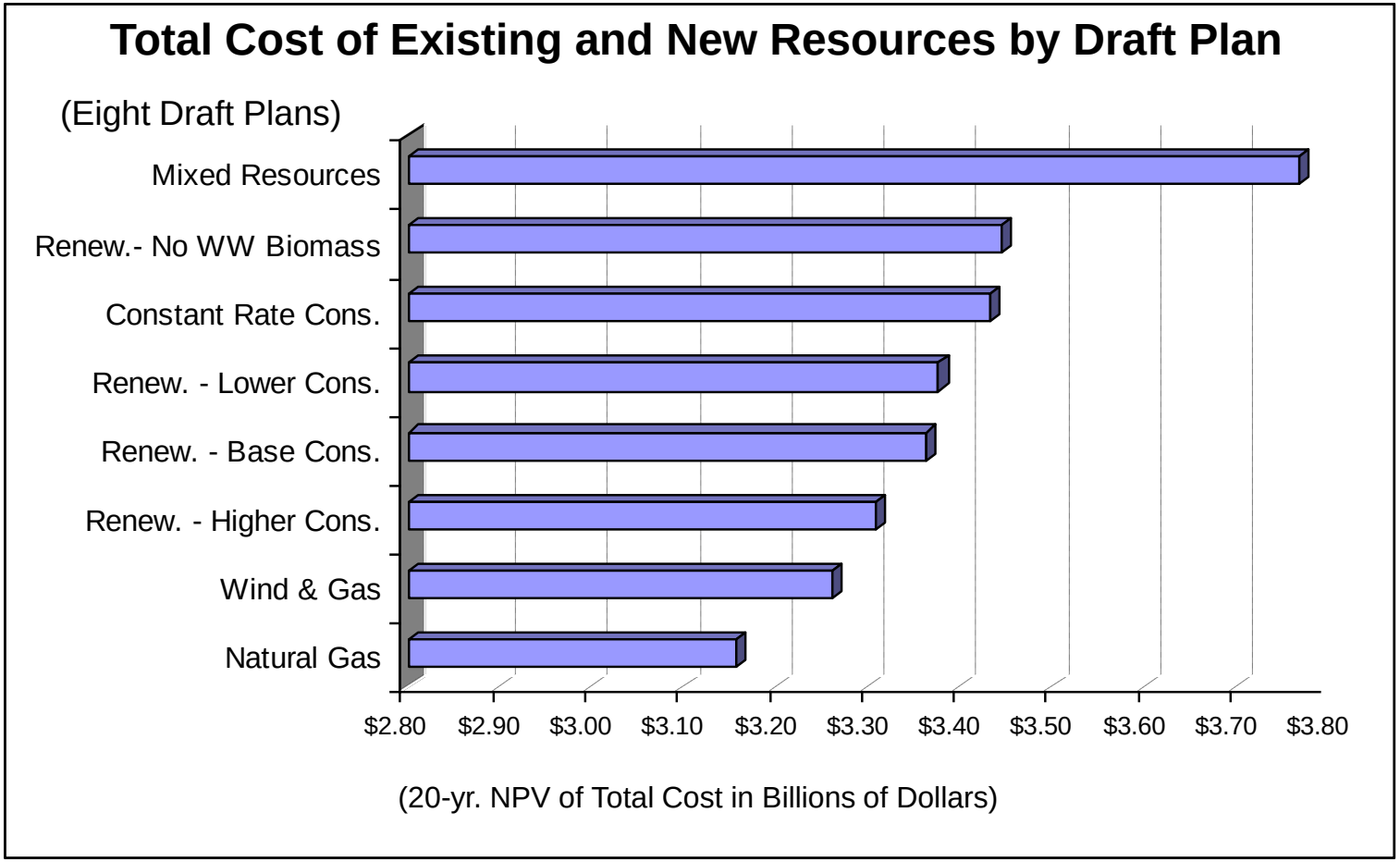
Resources	5 Years	10 Years	15 Years
Conservation	59 – 77	117 – 157	171 – 207
Renewables	0	8 – 28	168 – 203
Natural Gas	0	0 – 25 (25 in one plan)	0 – 175 (50 – 175 in three plans)

- Conservation is at the core of all the draft plans
- Limited need for new generating resources in the first decade
- Significant need for new generating resources in the second decade

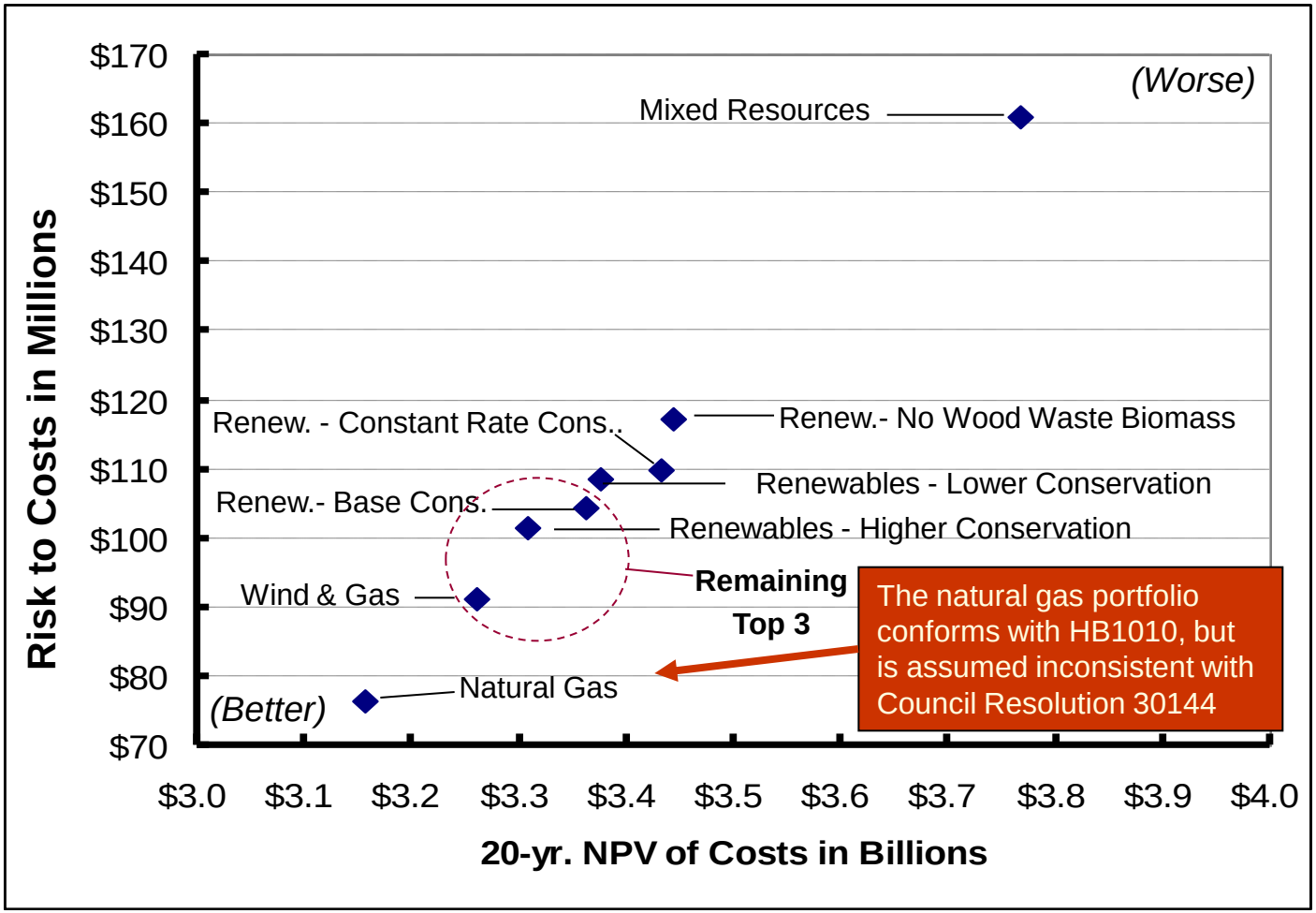
Draft Plan Evaluation Criteria

- All Draft Plans are Designed to Comply With Regulatory Criteria
- Other Evaluation Criteria
  - Cost
    - Measured as NPV of resource and operating costs net of market purchases and sales
  - Risk
    - Measured initially as the mean absolute deviation
    - Top 3 to be evaluated on a stochastic risk measure considering weather-driven demand changes, fuels, and hydro conditions. Scenarios also will consider specific risk factors
  - Environmental Performance
    - Costs attributed to all emissions of carbon dioxide, sulfur dioxide, nitrogen oxide, mercury, and particulate,
      - Each is priced at the estimated cost of mitigation (or offsets) and incorporated into the total draft plan costs

Costs for Eight Draft Resource Plans



Initial Results: Combined View of Costs and Risk to Costs



Note: A more robust measure of risk and scenarios will be completed for the top 3 portfolios

City Council Energy & Environment Committee Policy Guidance

- Identifying Top 3 Draft Resource Plans for Further Evaluation
- Input on Scenarios to Test the Top 3 Draft Resource Plans
  - Examples:
    - Electricity Demand
    - Natural Gas Prices

Next Steps

- Test Methods for Accounting for GHG Emissions from Wood Waste Biomass
- Risk Analysis and Scenarios for Top 3 Plans
- Public Meetings on Draft Plans in April
- IRP Stakeholder Meeting No. 4
- City Council Energy & Environment Committee Review of Results and Identification of a “Preferred Plan” on July 24

Questions or Comments?

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http://www.seattle.gov/light/news/issues/irp/
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Appendix

(Background Information: Not intended for presentation)

Seattle City Council Resolution 30144 (Excerpt)

- A RESOLUTION proclaiming the City of Seattle's actions supporting and honoring Earth Day 2000
  - Section 2
    - 1. Establishing a long-range goal of meeting the electric energy needs of Seattle with no net greenhouse gas emissions. City Light's power resource portfolio is composed primarily of resources that produce little or no greenhouse gas emissions. Immediately, City Light will meet growing demand with no net increase in greenhouse gas emissions by:
      - a) Using cost-effective energy efficiency and renewable resources to meet as much load growth as possible
      - b) Mitigating or offsetting greenhouse gas emissions associated with any fossil fuels used to meet load growth

Natural Gas

Average Megawatts

	Conservation	Nat. Gas C.C. Turbine	Short-Term Market	RECs	Total RECs & Resources
2012	14				14
2013	27				27
2014	41				41
2015	55				55
2016	69				69
2017	83				83
2018	97		10		107
2019	111				111
2020	125				125
2021	139	5		15	159
2022	153	35		16	204
2023	167	70		18	255
2024	181	140		19	340
2025	194	155		21	370
2026	205	175		22	402
2027	213	175		24	412
2028	220	190		25	435
2029	227	175		30	432
2030	233	180		32	445
2031	237	220		34	491

Wind and Gas

Average Megawatts

	Conservation	Wind	Nat. Gas C.C. Turbine	Short-Term Market	RECs	Total RECs & Resources
2012	14					14
2013	27					27
2014	41					41
2015	55					55
2016	69					69
2017	83					83
2018	97			10		107
2019	111					111
2020	125					125
2021	139			5	15	159
2022	153	35				188
2023	167	70				237
2024	181	70	75			327
2025	194	70	90			354
2026	205	90	90			384
2027	213	90	90			392
2028	220	100	90			410
2029	227	100	90			417
2030	233	100	90			423
2031	237	125	93			455

Renewables – Higher Conservation

Average Megawatts

	Conservation	Landfill Gas	W. Waste Biomass	Hydro Efficiency	Wind	Geothermal	Photovoltaic	RECs	Total RECs & Resources
2012	14								14
2013	29								29
2014	45								45
2015	61								61
2016	77								77
2017	93								93
2018	109								109
2019	125								125
2020	141								141
2021	157							13	170
2022	173	8	10						191
2023	182	8	40	5					235
2024	191	8	40	5	75				319
2025	199	8	40	5	95				347
2026	207	8	40	5	115				375
2027	214	8	40	5	115				382
2028	221	8	40	5	125	10			409
2029	227	8	40	5	125	10			415
2030	232	8	40	5	125	10			420
2031	237	8	40	5	125	20	20		455

Renewables – Base Conservation (SCL Strategic Plan)

Average Megawatts

	Conservation	Landfill Gas	W. Waste Biomass	Hydro Efficiency	Wind	Geothermal	Photovoltaic	Short-Term Market	RECs	Total RECs & Resources
2012	14									14
2013	27									27
2014	41									41
2015	55									55
2016	69									69
2017	83								3	86
2018	97	8						10		115
2019	111	8								119
2020	125	8								133
2021	139	8							7	154
2022	153	8	30							191
2023	167	8	40	5	20					240
2024	181	8	40	5	90					323
2025	194	8	40	5	100					347
2026	205	8	40	5	125					382
2027	213	8	40	5	125					390
2028	220	8	40	5	125			15		412
2029	227	8	40	5	125					404
2030	233	8	40	5	125					410
2031	237	8	40	5	125	20	20			455

Renewables – Lower Conservation

Average Megawatts

	Conservation	Landfill Gas	W. Waste Biomass	Hydro Efficiency	Wind	Geothermal	Photovoltaic	Short-Term Market	RECs	Total RECs & Resources
2012	13									13
2013	25									25
2014	36									36
2015	48									48
2016	59									59
2017	71								3	74
2018	82	8						15		106
2019	94	8								102
2020	105	8						5		118
2021	117	8	20						7	152
2022	128	8	40	5	10					191
2023	140	8	40	5	45					238
2024	151	8	40	5	115					319
2025	163	8	40	5	125	5				346
2026	171	8	40	5	125	20	5			374
2027	179	8	40	5	125	20	5			382
2028	186	8	40	5	125	20	15	10		409
2029	193	8	40	5	125	20	15			406
2030	200	8	40	5	125	20	15			413
2031	206	8	40	5	125	20	50			454

Constant Rate Conservation

Average Megawatts

	Conservation	Landfill Gas	W. Waste Biomass	Hydro Efficiency	Wind	Geothermal	Photovoltaic	Short-Term Market	Total RECs & Resources
2012	14								14
2013	27								27
2014	41								41
2015	50								50
2016	62								62
2017	74								74
2018	85	8						15	109
2019	97	8							105
2020	108	8			5				121
2021	120	8	20		5				153
2022	132	8	40	5	5				189
2023	143	8	40	5	40				236
2024	155	8	40	5	115				323
2025	167	8	40	5	120	5			345
2026	179	8	40	5	125	20			376
2027	190	8	40	5	125	20			388
2028	202	8	40	5	125	20	10		410
2029	214	8	40	5	125	20	10		421
2030	225	8	40	5	125	20	10		433
2031	237	8	40	5	125	20	20		455

Renewables – No Wood Waste Biomass

Average Megawatts

	Conservation	Landfill Gas	Hydro Efficiency	Wind	Geothermal	Photovoltaic	Short-Term Market	RECs	Total RECs & Resources
2012	14								14
2013	27								27
2014	41								41
2015	55								55
2016	69								69
2017	83								83
2018	97						10		107
2019	111								111
2020	125								125
2021	139	8						7	154
2022	153	8	5	25					191
2023	167	8	5	55					235
2024	181	8	5	125					319
2025	194	8	5	125	20				352
2026	205	8	5	125	20	20			383
2027	213	8	5	125	20	20			391
2028	220	8	5	125	20	20			398
2029	227	8	5	125	20	20			405
2030	233	8	5	125	20	20			411
2031	237	8	5	125	20	50	10		455

Mixed Resources

Average Megawatts

	Conservation	Landfill Gas	W. Waste Biomass	Hydro Efficiency	Wind	Nat. Gas C.C. Turbine	Geothermal	Solar Thermal	Short-Term Market	RECs	Total RECs & Resources
2012	14										14
2013	27										27
2014	41										41
2015	55										55
2016	69										69
2017	83										83
2018	97								10		107
2019	111	8		5							124
2020	125	8		5							138
2021	139	8		5						2	154
2022	153	8	20	5			10				196
2023	167	8	20	5	35		10				245
2024	181	8	20	5	35	25	10	50			334
2025	194	8	20	5	35	25	10	50			347
2026	205	8	20	5	35	50	10	50			382
2027	213	8	20	5	35	50	10	50			390
2028	220	8	20	5	35	65	10	50			412
2029	227	8	20	5	35	50	10	50			404
2030	233	8	20	5	35	50	10	50			410
2031	237	8	20	5	35	50	20	80			455