

2009 RPS Cost Study

July 7, 2009

Summary

In March of 2008, the New York State Energy Research and Development Authority (NYSERDA) released a report entitled *New York Renewable Portfolio Standard Cost Study Update* (“2008 RPS Cost Study”).¹ To account for the market impacts of the recent turmoil in the financial markets and other key cost factors that have changed, NYSEDA, in consultation with the Department of Public Service (DPS), directed the preparation of a revision to the 2008 RPS Cost Study, to revisit the relevant assumptions and inputs and to re-estimate future RPS Attribute prices and RPS program costs (“2009 RPS Cost Study”). The primary drivers of the resulting changes in program cost estimates are a reduction in wind capacity factors, updated energy price forecasts, and updated project capital costs.

In administering the current RPS contracts, NYSEDA has observed underperformance, in comparison to the projections provided by the project sponsors, in almost every New York wind project. In light of this new information, projected wind capacity factors for the 2009 RPS Cost Study have been reduced by 10%. Reducing the capacity factors of the wind resources has a significant impact on the levelized cost of the wind resources, increasing the projected cost of wind resource supply blocks by approximately \$12 to \$14 per megawatt hour.

Electric energy revenue also directly impacts the projected costs of RPS procurements, as the balance of revenue beyond payment for RPS attributes and federal production incentives comes from the commodity market value of electricity production (and capacity). The market has experienced a substantial drop in electricity and natural gas prices since the onset of the economic crisis in late 2008. These price drops are another factor that increases projected program costs. Energy prices in the 2008 RPS Cost Study were provided by the New York Department of Public Service, reflecting forecasts conducted prior to the 2008 RPS Cost Study. In the 2009 RPS Cost Study, two sets of energy prices are used:

- Prices from a January 2009 Commission Energy Efficiency Portfolio Standard (“EEPS”) order. This forecast was developed from a model run employing an October 2008 gas price forecast. This forecast is referred to as the Long Run Average Cost (LRAC forecast).
- A forecast developed by La Capra Associates, a subcontractor to SEA, which is based on an April 2009 natural gas price forecast adjusted by the rate of change in the natural gas

¹ The 2008 RPS Cost Study revised an earlier 2004 report estimating the future costs of the New York Renewable Portfolio Standard Program. The 2008 and 2009 RPS Cost Studies were prepared for NYSEDA by Sustainable Energy Advantage (SEA), in consultation with the Department of Public Service. The 2008 RPS Cost Study is available at:
[http://www3.dps.state.ny.us/PSCWeb/PIOWeb.nsf/20b9016ae2129d5c852573db00779ee1/25f0de7d747422a1852574da0050c31b/\\$FILE/Express_Terms_03-E-0188SA19.pdf](http://www3.dps.state.ny.us/PSCWeb/PIOWeb.nsf/20b9016ae2129d5c852573db00779ee1/25f0de7d747422a1852574da0050c31b/$FILE/Express_Terms_03-E-0188SA19.pdf)

forecast growth rates, based on both NYMEX Henry Hub futures prices and the EIA's AEO 2009 post-ARRA update. This forecast is referred to as the "Henry Hub" forecast.

One factor that has a dampening effect on the projected program cost estimates is projected project cost figures. Capital costs for Main Tier projects in the 2008 RPS Cost Study were estimated based on the best available information on industry costs as of late 2007. Although the run-up in installed equipment costs predating the 2008 RPS Cost Study continued into mid-2008, the current recession has reduced input prices and demand for equipment, which is beginning to show up as reduced capital costs for equipment relative to early last year. As a result, projected capital costs have been reduced, particularly in the early study years.

As was the case in the 2008 RPS Cost Study, the 2009 RPS Cost Study includes program energy targets and associated cost estimates for three different load scenarios:

- **New Load.** In this scenario the load forecast does not include the 15% energy efficiency by 2015 and includes a 25% renewable portfolio standard (RPS).
- **25% RPS with EPS Load.** This scenario includes the 15 percent energy efficiency by 2015 and a 25% RPS.
- **30% RPS with EPS Load.** This scenario includes the 15 percent energy efficiency by 2015 and a 30% RPS.

The Total CST Energy Targets presented in Table 1 were developed following the approach outlined in the Commission's September 24, 2004 Order;² 2% of the total NYSERDA program obligation derived for each combination of load and program target.

The Incremental Main Tier Energy Targets in Table 1 were derived by subtracting the Main Tier Energy under Contract for **only** the first three authorized Main Tier procurements, from the Total Main Tier Energy Target for each load scenario modeled. Similarly, the Incremental CST Energy Targets are derived by subtracting the Expected Energy from Current CST Funding, from the Total CST Energy Target for each scenario modeled.

² Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Regarding Retail Renewable Portfolio Standard," issued and effective September 24, 2004.

Table 1: RPS Targets

| | 25% New Load | 25% EPS Load | 30% EPS Load |
|--|---------------------|---------------------|---------------------|
| Program Targets (in GWh) | | | |
| Main Tier | | | |
| Total Main Tier Energy Target | 8,321 | 4,564 | 10,123 |
| Main Tier Energy Under Contract | 2,947 | 2,947 | 2,947 |
| Incremental Main Tier Energy Target | 5,373 | 1,617 | 7,176 |
| | | | |
| Customer Sited Tier (CST) | | | |
| Total CST Energy Target | 168 | 96 | 206 |
| Expected Energy from Current CST Funding | 96 | 96 | 96 |
| Incremental CST Energy Target | 72 | - | 110 |
| | | | |
| Total Incremental RPS Goal | 5,445 | 1,617 | 7,286 |

A summary of the 2009 RPS Cost Study program cost estimates can be found below in Tables 2 and 3.³ As was the case in the 2008 RPS Cost Study, the incremental CST program targets presented in Tables 2 and 3 were developed following the approach outlined in the September 24, 2004 Order; 2% of the total incremental NYSERDA program obligation. These tables are presented as two scenarios, the first using the Henry Hub energy price forecast and the second using the LRAC energy price forecast. Year-by-year program costs may be found in Appendix A.

³ Each program cost scenario presented herein includes expenses associated with NYSERDA program administration. Such costs include program staffing and statutory public authority fees appropriate to the program cost scenario.

Table 2: Incremental Program Cost Summary (Henry Hub Forecast)

| (all costs in \$ millions) ⁴ | 25% New Load | 25% EPS Load | 30% EPS Load |
|--|-------------------|-----------------|-------------------|
| Main-Tier Program Cost | \$ 1,851.8 | \$ 292.9 | \$ 2,570.2 |
| Customer-Sited Tier Program Cost | | | |
| Individual Program Cost : | | | |
| Anaerobic Digester Program | \$ 15.8 | \$ -- | \$ 23.1 |
| Small Wind Program | \$ 1.6 | \$ -- | \$ 2.4 |
| PV Program | \$ 59.1 | \$ -- | \$ 86.7 |
| Fuel Cell Program | \$ 4.5 | \$ -- | \$ 6.7 |
| Total Base CST Program Cost | \$ 81.0 | \$ -- | \$ 118.9 |
| Monitoring and Verification Cost | \$ 5.4 | \$ -- | \$ 5.2 |
| Discretionary Funding | \$ 4.0 | \$ -- | \$ 7.0 |
| Total CST Cost | \$ 90.4 | \$ -- | \$ 131.2 |
| Total Base RPS Program Costs | \$ 1,942.1 | \$ 292.9 | \$ 2,701.4 |
| Aggressive PV (100 MW) Initiative Cost | \$ 226.2 | \$ 272.3 | \$ 211.3 |
| NYSERDA Administrative Costs & NYS Fees | \$ 38.0 | \$ 16.1 | \$ 58.7 |
| Total RPS w/ 100 MW PV Initiative Cost | \$ 2,206.3 | \$ 581.3 | \$ 2,971.4 |

Table 3: Incremental Program Cost Summary (LRAC Forecast)

| (all costs in \$ millions) ⁵ | 25% New Load | 25% EPS Load | 30% EPS Load |
|--|-------------------|-----------------|-------------------|
| Main-Tier Program Cost | \$1,435.3 | \$ 246.6 | \$2,034.8 |
| Customer-Sited Tier Program Cost | | | |
| Individual Program Cost : | | | |
| Anaerobic Digester Program | \$ 15.8 | \$ -- | \$ 23.1 |
| Small Wind Program | \$ 1.6 | \$ -- | \$ 2.4 |
| PV Program | \$ 59.1 | \$ -- | \$ 86.7 |
| Fuel Cell Program | \$ 4.5 | \$ -- | \$ 6.7 |
| Total Base CST Program Cost | \$ 81.0 | \$ -- | \$ 118.9 |
| Monitoring and Verification Cost | \$ 5.4 | \$ -- | \$ 5.2 |
| Discretionary Funding | \$ 4.0 | \$ -- | \$ 7.0 |
| Total CST Cost | \$ 90.4 | \$ -- | \$ 131.2 |
| Total Base RPS Program Costs | \$ 1,525.6 | \$ 246.6 | \$2,166.0 |
| Aggressive PV (100 MW) Initiative Cost | \$ 226.1 | \$ 272.3 | \$ 211.3 |
| NYSERDA Administrative Costs & NYS Fees | \$ 33.0 | \$ 15.6 | \$52.2 |
| Total RPS w/ 100 MW PV Initiative Cost | \$ 1,784.8 | \$ 534.4 | \$ 2,429.6 |

New CST Assessment

In addition to revising the assumptions and inputs used in the 2008 RPS Cost Study, new program funding estimates for the Customer Sited Tier (CST) have been developed on the basis of an assessment of achievable technology-specific market potential. This approach puts forth

⁴ Totals may not add correctly due to rounding.

⁵ Totals may not add correctly due to rounding.

for the Commission’s consideration an alternative to the 2% CST allocation specified in the September 24, 2004 Order.

This assessment has been developed based on NYSERDA’s extensive interactions with product vendors and service providers as well as NYSERDA’s experience with product research and development, business development, manufacturing, and other market transformation activities relating to CST technologies. In developing this assessment, NYSERDA used a systematic consideration of factors essential to technical maturation and market acceptance of the individual CST technologies, including consideration of the benefits to New York.

CST expected energy production based on the assessment of achievable market potential is expected to exceed 522 GWh, well in excess of the 201 GWh established on basis of the 2% CST allocation in the September 24, 2004 Order.⁶ Details of NYSERDA’s CST market potential assessment can be found in the attached document titled: *Customer-Sited Tier Program: Market Potential, Program Expectations and Funding Considerations, (2010-2015)* (see Attachment 1). A summary of the projections can be found in Tables 4 and 5 below. Year-by-year program costs may be found in Appendix B.

Table 4: Incremental Program Cost Summary with New CST Assessment (Henry Hub)

| (all costs in \$ millions) ⁷ | 25% New Load | 25% EPS Load | 30% EPS Load |
|--|-------------------|-----------------|-------------------|
| Expected CST Energy (GWh) | 522 | 522 | 522 |
| Main-Tier Program Cost | \$ 1,851.8 | \$ 292.9 | \$ 2,570.2 |
| Customer-Sited Tier Program Cost | | | |
| Individual Program Cost : | | | |
| Anaerobic Digester Program | \$ 71.0 | \$ 71.0 | \$ 71.0 |
| Small Wind Program | \$18.5 | \$18.5 | \$18.5 |
| PV Program | \$ 387.5 | \$ 387.5 | \$ 387.5 |
| Fuel Cell Program | \$ 36.6 | \$ 36.6 | \$ 36.6 |
| Total Base CST Program Cost | \$ 513.6 | \$ 513.6 | \$ 513.6 |
| Monitoring and Verification Cost | \$ 13.6 | \$ 13.6 | \$ 13.6 |
| Discretionary CST Technology Funding | \$ 25.8 | \$ 25.8 | \$ 25.8 |
| Total CST Cost | \$ 553.0 | \$ 553.0 | \$ 553.0 |
| Total Base RPS Program Costs | \$ 2,404.8 | \$ 845.9 | \$ 3,123.2 |
| NYSERDA Administrative Costs & NYS Fees | \$ 60.0 | \$ 40.3 | \$ 70.9 |
| Total RPS Initiative Cost | \$ 2,464.8 | \$ 886.2 | \$ 3,194.2 |

⁶ It should be noted the incremental Main Tier targets have not been adjusted to reflect the increase in expected energy production from this alternative CST approach.

⁷ Totals may not add correctly due to rounding.

Table 5: Total Incremental Program Cost Summary with New CST Assessment (LRAC)

| (all costs in \$ millions) ⁸ | 25% New Load | 25% EPS Load | 30% EPS Load |
|--|-------------------|-----------------|-------------------|
| Expected CST Energy (GWh) | 522 | 522 | 522 |
| Main-Tier Program Cost | \$1,435.3 | \$ 246.6 | \$2,034.8 |
| Customer-Sited Tier Program Cost | | | |
| Individual Program Cost : | | | |
| Anaerobic Digester Program | \$ 71.0 | \$ 71.0 | \$ 71.0 |
| Small Wind Program | \$18.5 | \$18.5 | \$18.5 |
| PV Program | \$ 387.5 | \$ 387.5 | \$ 387.5 |
| Fuel Cell Program | \$ 36.6 | \$ 36.6 | \$ 36.6 |
| Total Base CST Program Cost | \$ 513.6 | \$ 513.6 | \$ 513.6 |
| Monitoring and Verification Cost | \$ 13.6 | \$ 13.6 | \$ 13.6 |
| Discretionary CST Technology | \$ 25.8 | \$ 25.8 | \$ 25.8 |
| Total CST Cost | \$ 553.0 | \$ 553.0 | \$ 553.0 |
| Total Base RPS Program Costs | \$ 1,988.3 | \$ 799.6 | \$ 2,587.8 |
| | | | |
| NYSERDA Administrative Costs & NYS Fees | \$ 55.0 | \$ 39.8 | \$ 64.5 |
| Total RPS Initiative Cost | \$ 2,043.3 | \$ 839.3 | \$ 2,652.3 |

Changes to the 2008 RPS Cost Study

The 2009 RPS Cost Study reflects adjustments for several material developments and information acquired since the 2008 RPS Cost Study was completed. These are described below by program component:

- Implementation of the American Recovery and Reinvestment Act of 2009 (ARRA) and Carbon cost assumptions;
- Project capital costs;
- Financing assumptions;
- Wind capacity factors;
- RPS procurement timeline and project construction delays;
- Incremental Main Tier target adjustments;
- Supply adjustments;
- Energy price forecasts; and
- Recent funding additions to the CST.

Production Tax Credit, ARRA and Carbon Assumption

In the 2008 RPS Cost Study, although the Federal Production Tax Credit (PTC) was slated to expire soon, it was assumed to be in place for the study period of 2009 through 2015. The ARRA extended the PTC through 2012 for wind projects and through 2013 for other resources.

⁸ Totals may not add correctly due to rounding.

The ARRA also gives projects the option of taking a 30% investment tax credit (ITC) in the first year of the project instead of the PTC through 2012 (wind) and 2013 (other) respectively.⁹ The Lawrence Berkeley National Laboratory (LBNL) recently conducted a study to assess the conditions under which the ITC or PTC would be more advantageous for projects, based on their capital costs and capacity factors, and created a method to adjust the project costs for the newer ITC option.¹⁰ Where the ITC was projected to provide greater benefits than the PTC, the LBNL methodology was applied to adjust project costs to correspond with the increased benefits for the duration of the period specified under the ARRA resulting from the ITC option.

The 2008 RPS Cost Study Locational Based Marginal Price (“LBMP”) forecast for electricity included carbon allowance prices as projected to satisfy Regional Greenhouse Gas Initiative (“RGGI”) program requirements. The project team, NYSERDA and DPS staff discussed the merits of increasing the carbon price underlying the LBMP forecast to reflect more stringent carbon regulation being proposed at the Federal level. Ultimately, it was decided that:

- (a) although such policy developments were appearing far more likely than in times past, until passage of such policy its benefits were speculative and could not be secured by projects in either commodity electricity sales, financial hedges or financing until passed; and
- (b) in the event of the adoption of a substantially more stringent carbon policy, the simultaneous long-term continuation of the PTC substantially beyond 2012 (wind) and 2013 (other resources) would be unlikely. This is because the financial benefits to renewables associated with stringent carbon regulations have been projected by many to ramp up to a point where they may exceed the magnitude of PTC benefits.¹¹ A plausible future would have the PTC phasing out as a Federal carbon cap-and-trade ramps up.

Therefore the 2009 RPS Cost Study assumes that the PTC is in effect throughout the study period as a proxy for *either* continuation of the PTC or a phase out of the PTC in concert with a corresponding phase-in of a Federal carbon cap-and-trade program.

Project Capital Costs

The capital costs for Main Tier projects in the 2008 RPS Cost Study were estimated based on the best available industry information on costs, as of late 2007. Although the run-up in installed equipment costs predating the 2008 RPS Cost Study continued into mid-2008, the current recession has reduced input prices and demand for equipment, which is beginning to show up as reduced capital costs for equipment relative to early last year. For the 2009 RPS Cost Study, a blended index using data from the 2009 Energy Information Administration (EIA), Annual

⁹ ARRA also makes cash grants available in lieu of ITC available for projects under construction prior to 2010. This was deemed material to the schedule for financing and developing a project, discussed further below.

¹⁰ Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory. *PTC, ITC or Cash Grant? An Analysis of the Choice Facing Renewable Power Projects in the US*. March 2009. <http://eetd.lbl.gov/ea/emp/reports/lbnl-1642e.pdf>.

¹¹ Synapse 2008 CO₂ Price Forecasts, July 2009. See <http://www.synapse-energy.com/Downloads/SynapsePaper.2008-07.0.2008-Carbon-Paper.A0020.pdf>

Energy Outlook (AEO) April 2009 RPS Cost Study (Stimulus Case) Metals and Metal Products and Consumer Price indices was applied to reflect an estimate of the near-term drop in installed generation equipment prices, as well as their future trend. The index was then applied to adjust the capital costs utilized in the 2008 RPS Cost Study. As a result, projected capital costs were reduced, particularly in the early study years.

Financing Assumptions

For the 2008 RPS Cost Study, a carrying charge was calculated for each resource type using industry average debt/equity ratios and debt and equity returns. The current recession has resulted in decreased availability of debt and tax equity, more stringent financing terms and conditions, and generally greater risk aversion. For this 2009 RPS Cost Study, carrying charges were recalculated by adjusting parameters slightly. These changes were relatively minor, but resulted in increased debt rates for most technologies. It was assumed that the ARRA will mitigate some of the impact of the current financial crisis during the study period, so the assumptions are somewhat more optimistic through the study period than the present financial situation might indicate.

Wind Capacity Factors

The capacity factors used in the 2008 RPS Cost Study were provided to the project team by AWS Truewind as part of a technical forecasting assessment of wind potential in New York State. Recently there has been broad discussion in the industry regarding reported underperformance of wind farms relative to historical performance expectations. For example, a January 2009 Windpower monthly article about wind farm performance stated that U.S. wind farms are achieving capacity factors of about 10 percent below predictions.¹² In administering the current RPS contracts, NYSERDA has observed similar underperformance, in comparison to projections provided by project developers, by New York wind projects. In light of this new information, projected wind capacity factors were reduced by 10% for the 2009 RPS Cost Study. The capacity factors for wind blocks in the supply curve, ranging from 29% to 37% in the 2008 RPS Cost Study, were reduced to 26.1% to 33.3% in the 2009 RPS Cost Study.

Reducing the capacity factors of the wind resources had a significant impact on the levelized cost of the wind resources and increased the cost of wind resource supply blocks by approximately \$12 to \$14 per megawatt hour.

Procurement Timeline and Construction Delays

In the 2008 RPS Cost Study, it was assumed that there was ample project availability throughout the period because of ample lead time, liquid financial markets and access to capital, and clear expectations of the timing and frequency of Main Tier procurements. In the 2009 RPS Cost Study, the availability of resources was pushed back to reflect an observed slowdown in the New York development pipeline resulting from:

¹² Broehl, Jessie. *A Critical Gap in the Knowledge Bank*. Windpower Monthly, January 2009.

- the lack of authorization for NYSERDA to conduct new Main Tier procurements; and
- the recession driven slow-down in access to capital, falling energy prices (making the economic prospects for new generation substantially more challenging) and reduced access to financial hedges.

The assumptions corresponding to reduced availability of resource potential are shown in Table below. The percentages in the table represent the percentage of the total market potential modeled as available to be developed in a given year.

Table 6: Percent Availability of Resource Potential by Year

| Resource Type | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Biomass co-firing | 0% | 0% | 20% | 40% | 60% | 80% | 100% |
| Biomass CHP | 0% | 0% | 5% | 20% | 40% | 60% | 80% |
| Canadian Biomass co-firing | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Biomass (wood) | 0% | 0% | 0% | 10% | 20% | 40% | 60% |
| Landfill Methane | 0% | 0% | 20% | 40% | 60% | 80% | 100% |
| Onshore Wind | 5% | 15% | 30% | 50% | 70% | 90% | 100% |
| Onshore Wind (Medium/Small) | 5% | 15% | 30% | 50% | 70% | 90% | 100% |
| Canadian Wind | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Offshore Wind | 0% | 0% | 0% | 0% | 0% | 0% | 20% |
| Hydro (upgrades) | 0% | 0% | 20% | 40% | 60% | 80% | 100% |
| Hydro (new) | 0% | 0% | 0% | 20% | 40% | 60% | 80% |
| Canadian Hydro | 0% | 0% | 0% | 20% | 40% | 60% | 80% |

Incremental Main Tier Target Adjustments

The 2008 RPS Cost Study assumed that all contracted Main Tier facilities not in operation would enter commercial operation under the terms of the RPS Agreements. The 2008 RPS Cost Study further assumed that all the currently operating contracted facilities would deliver their full contract quantity for the entire duration of their contracts. Since the 2008 RPS Cost Study was completed certain projects have failed to enter commercial operation, and the RPS contracts with those projects have been terminated. In addition, one contract has been automatically adjusted, in accordance with its terms, to a lower MWh quantity due to facility underperformance.

Project cancellations and under performance adjustments have had the effect of reducing NYSERDA’s expected performance towards future Main Tier targets. As a result, NYSERDA’s incremental Main Tier targets have been increased by approximately 556 GWh.

Supply Adjustments

The original supply curve used in the 2008 RPS Cost Study was constructed based upon the incremental renewable energy potential from projects beyond those already operating at that time (late 2007). Subsequently, NYSERDA has contracted with a number of facilities through the

third Main Tier solicitation. In order to avoid double counting this resource potential, equivalent MW from the corresponding generic supply curve blocks were removed.

Energy Prices

Projected electric energy revenue directly impacts the projected costs of RPS procurements, as the balance of revenue beyond payment for RPS attributes and federal production incentives comes from the commodity market value of electricity production (and capacity). The energy prices in the 2008 RPS Cost Study were provided by the New York Department of Public Service, reflecting forecasts conducted prior to the 2008 RPS Cost Study. The market has experienced a substantial drop in electricity and natural gas prices since that time, due at least in part to the financial crisis, beginning in late 2008. In the 2009 RPS Cost Study, two sets of projected energy prices are used:

- Prices from a January 2009 Public Service Commission Energy Efficiency Portfolio Standard (“EEPS”) order. This forecast was developed from a model run employing an October 2008 gas price forecast. This forecast is referred to as the Long Run Avoided Cost (LRAC forecast);¹³
- A forecast developed by La Capra Associates, a subcontractor to SEA, which is based upon an April 2009 natural gas price forecast. In this forecast the base year was developed using actual April 2008 through March 2009 LBMP data and then adjusting those prices in future years by the rate of change in the natural gas forecast growth rates, based on both NYMEX Henry Hub futures prices and the EIA’s AEO 2009 post-ARRA update. This forecast is referred to as the “Henry Hub” forecast.

. The energy price forecasts for the 2008 RPS Cost Study, and the LRAC and La Capra Forecasts (2009 RPS Cost Study) are shown in Figures 1, 2 and 3 below.¹⁴

¹³ Cases 08-E-1003; 1007; 1014; 1019 (various Petitions); “Order Approving “Fast-Track” Utility-Administered Electric Energy Efficiency Programs with Modifications,” issued and effective January 16, 2009 (APPENDIX 2).

¹⁴ “Zones” refers to the “super-zones” described in the 2008 RPS Cost Study.

Figure 1: Projected Zone 1 LBMPs

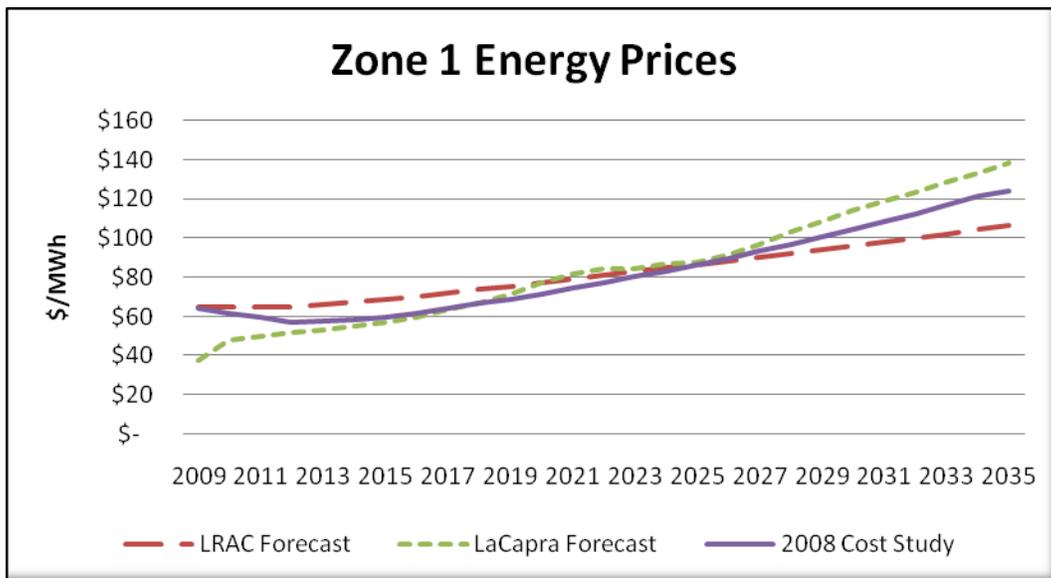


Figure 2: Projected Zone 2 LBMPs

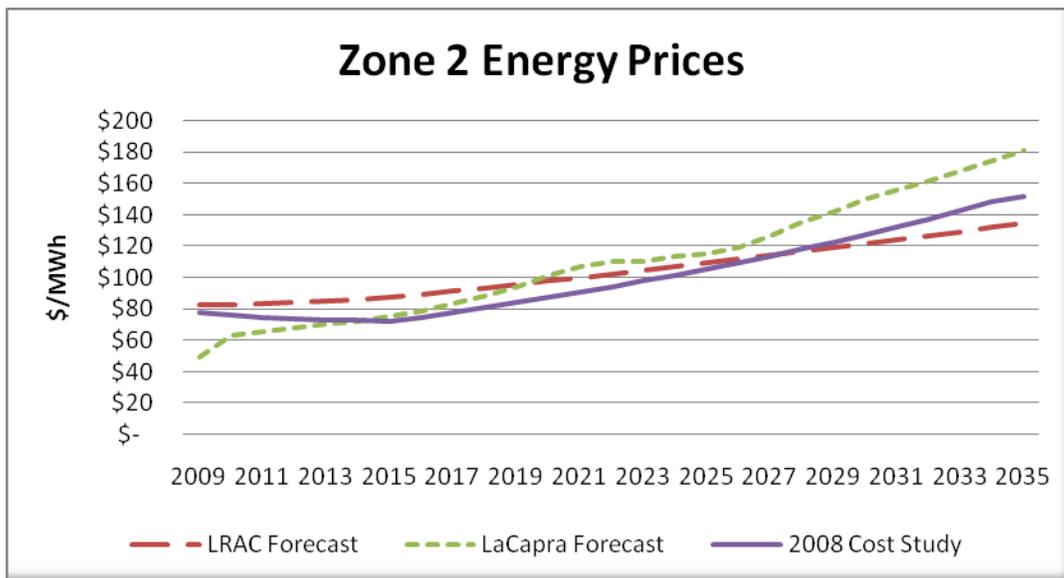
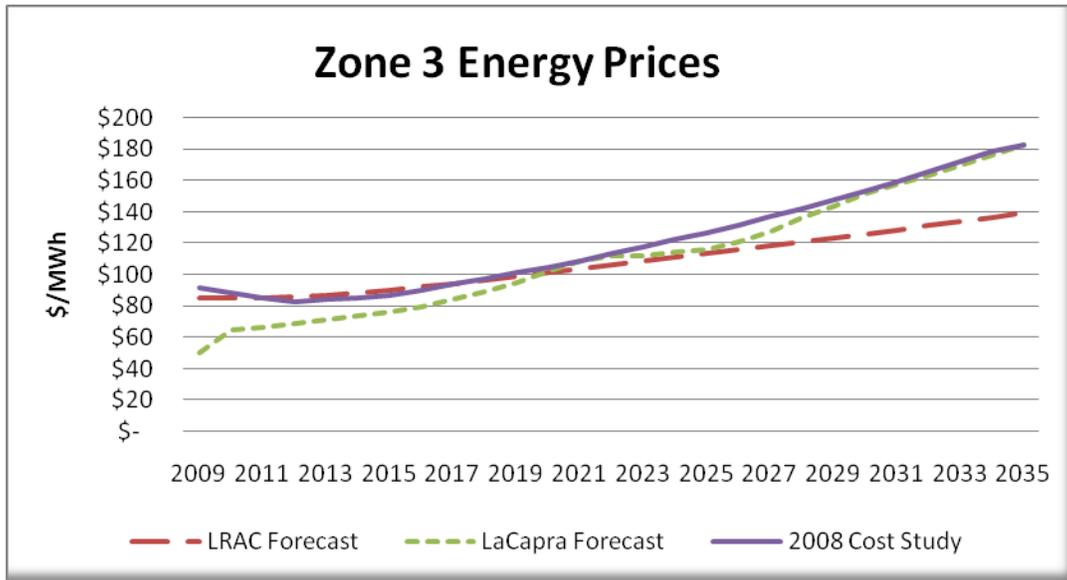


Figure 3: Projected Zone 3 LBMPs



Each of the 3 load scenarios was analyzed using each of the energy price forecasts, producing six 2009 RPS Cost Study scenarios in total. The results of the model runs are shown in Tables 7 and 8, below. For comparison, the results of the 2008 RPS Cost Study are shown in Table 9. Both the Henry Hub and the LRAC energy price forecasts result in an increase in the projected clearing price for Main Tier RPS Attributes (in \$/MWh) from those projected in the 2008 RPS Cost Study, with the highest increase resulting from the use of the Henry Hub forecast.

Table 7: Main Tier Clearing Prices Using Henry Hub Forecast

| Using La Capra Energy Price Forecast | | | | | |
|---|---------|---------|---------|---------|---------|
| | 2011 | 2012 | 2013 | 2014 | 2015 |
| New Load | \$31.83 | \$32.74 | \$38.83 | NA | NA |
| 25% RPS with EPS Load | \$21.59 | \$15.04 | \$17.72 | NA | NA |
| 30% RPS with EPS Load | \$31.83 | \$32.74 | \$38.83 | \$35.12 | \$40.56 |

Table 8: Main Tier Clearing Prices Using LRAC Forecast

| Using LRAC Energy Price Forecast | | | | | |
|---|---------|---------|---------|---------|---------|
| | 2011 | 2012 | 2013 | 2014 | 2015 |
| New Load | \$24.34 | \$24.59 | \$31.21 | NA | NA |
| 25% RPS with EPS Load | \$16.28 | \$14.57 | \$14.90 | NA | NA |
| 30% RPS with EPS Load | \$24.34 | \$24.59 | \$31.21 | \$27.45 | \$34.19 |

Table 9: Main Tier Clearing Prices from 2008 RPS Update

| 2008 Analysis | | | | | | |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| New Load | \$19.65 | \$18.94 | \$22.09 | \$22.28 | NA | NA |
| 25% RPS with EPS Load | \$19.65 | \$18.94 | NA | NA | NA | NA |
| 30% RPS with EPS Load | \$19.65 | \$18.94 | \$16.82 | \$15.15 | \$28.46 | \$31.67 |

CST Funding Additions

Since the completion and filing of the 2008 RPS Cost Study, the Commission has authorized an added allocation of approximately \$47 million to various technologies in the CST program. This 2009 RPS Cost Study reflects these latest authorized CST funding levels and associated funding allocations by technology. In addition, this 2009 RPS Cost Study includes an infusion of \$15 million in incentive funding to the PV program to cover program activity through the end of 2009, as specified in the June 23, 2009 Order.¹⁵

¹⁵ Case 03-E-0188; Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, “Order Concerning Further Modification of Funding for the Customer-Sited Tier,” issued and effective June 22, 2009.