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Cost-Benefit Analysis of the New Jersey Clean Energy Program Energy Efficiency Programs:

Home Performance with Energy Star Summary Report

February 2013

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Summary

The Center for Energy, Economic and Environmental Policy (CEEPP) of the Edward J. Bloustein School of Planning and Public Policy, Rutgers University was asked by the New Jersey Board of Public Utilities (NJBPU) to conduct a cost-benefit analysis of the 2009, 2010, 2011, and 2012 Home Performance with Energy Star Program. Initially, the analysis was to be conducted by Tier, but this data is not available so this analysis uses the aggregated results presented in the New Jersey Clean Energy Program Financial Reports¹. Please note that non-energy impacts, such as reductions in water usage and improved health and safety, have not been included in this analysis. These types of impacts should be investigated and quantified in the future.

Cost-Benefit Analysis Assumptions

The key components of the energy efficiency cost-benefit analysis and the data sources and processes for determining these components have been discussed previously in the Annual Cost-Benefit Analysis reports presented by CEEPP for 2009-2012². The number of participant installations, participant electricity and natural gas savings, and administrative costs were provided by the New Jersey Clean Energy Program. The Home Performance with Energy Star incremental costs, measure lives, and allocation factors were estimated based on the weighted average of measures actually installed under the programs. For the 2012 CBA, CEEPP used 3rd quarter data since that was the most recently available data. Also, for the 2012 CBA, CEEPP used all assumptions from the 2011 Cost benefit analysis report.

It is assumed by CEEPP that wholesale electricity prices account for the national sulfur dioxide and nitrogen oxide allowance programs and the Regional Greenhouse Gas Initiative carbon dioxide program (until New Jersey withdrew from the program in May 2011). Therefore, the societal cost test does not differ from the total resource cost test because emissions savings are not accounted for separately for the 2011 cost-benefit model societal cost test. Federal tax credits are not included. In addition, this cost-benefit analysis does not include the benefit of avoided Transmission and Distribution.

The Clean Energy Program Reports each include installed, committed and total savings for all programs. For the purposes of the cost-benefit analysis, only the installed savings were used. Energy savings and budget data were reported for the total program, but calculations to determine per unit cost and savings were also made.

Results

The results of the cost-benefit analysis for the Home Performance with Energy Star program from 2009 through 3rd quarter 2012 are presented in Table 1 below. For each year, the Participant Cost Test Benefit-Cost ratio is above one, while the ratio for all other tests is less than one.

¹ 2009 Report: <http://www.njcleanenergy.com/files/file/Library/NJCEP%204Q%202009%20Report.pdf>, 2010 Report: http://www.njcleanenergy.com/files/file/Library/BPURpt4Q10_NJCEP_FINAL_20110608.pdf, 2011 Report: http://www.njcleanenergy.com/files/file/Library/BPURpt4Q11_NJCEP_FINAL_UPDATED_20120312.pdf, and 2012 3rd Quarter Report: [http://www.njcleanenergy.com/files/file/Library/NJCEP%20PTG%20Month%20Report%20-%20Sep%202012_Updated%20\(2\).pdf](http://www.njcleanenergy.com/files/file/Library/NJCEP%20PTG%20Month%20Report%20-%20Sep%202012_Updated%20(2).pdf)

² 2009 Retrospective CBA Report: <http://policy.rutgers.edu/ceeep/publications/2012/2009Cost-BenefitAnalysisNJCEP.pdf>, 2010 Retrospective CBA report: <http://policy.rutgers.edu/ceeep/publications/2012/2010Cost-BenefitAnalysisNJCEP.pdf>, 2011 Retrospective and 2012 Prospective CBA Report: <http://policy.rutgers.edu/ceeep/publications/2012/2011Cost-BenefitAnalysisNJCEP.pdf>

Table 1: Home Performance with Energy Star CBA Results 2009-2012

	2009	2010	2011	2012 (3rd Quarter)
Participant Cost Test	\$4,032,906	\$39,239,701	\$24,710,621	\$22,318,856
Benefit-Cost Ratio	1.4	4.7	4.3	3.8
Program Administration Cost Test	(\$7,706,993)	(\$36,703,780)	(\$8,664,037)	(\$9,407,983)
Benefit-Cost Ratio	0.2	0.1	0.4	0.4
Ratepayer Impact Measure	(\$9,039,067)	(\$39,123,448)	(\$12,832,085)	(\$13,018,353)
Benefit-Cost Ratio	0.2	0.1	0.3	0.4
Total Resource Cost Test	(\$8,834,143)	(\$10,534,475)	(\$3,202,275)	(\$2,689,915)
Benefit-Cost Ratio	0.2	0.3	0.7	0.7
Societal Cost Test	(\$8,680,586)	(\$10,534,475)	(\$3,202,275)	(\$2,689,915)
Benefit-Cost Ratio	0.2	0.3	0.7	0.7

Table 2 shows estimated annual avoided emissions for NO_x, SO₂, and CO₂ from EPA's Power Plant Emissions Calculator (PPEC)³. PPEC is a spreadsheet-based tool that estimates electric power sector emissions from (1) energy efficiency (EE) policies or programs that can reduce electricity demand and (2) solar policies or programs that increase the use of solar power on the electric grid. P-PEC makes its calculations based on data from the EPA's Emissions and Generation Resource Integrated Database (eGRID), which contains detailed information on capacity factors, location, generation, and emissions for almost all power plants in the United States. P-PEC uses data from 2009, the most recent year for which eGRID data is available. P-PEC makes its estimates based on the Capacity Factor Rule-of-Thumb⁵, which is the assumption that in the event of a reduction in demand or an increase in solar energy supply, the plants most likely to see reductions in generation will be those with the lowest capacity factors.

Based on the PPEC results, the Home Performance with Energy Star Program saved an estimated 10,223 pounds of NO_x, 54,475 pounds of SO₂, and 5,612 short tons of CO₂ annually between 2009 and the third quarter of 2012.

Table 2: Annual Avoided Emissions from Power Plant Emissions Calculator

	2009	2010	2011	2012 (3rd Quarter)
MWh Savings	1,155	939	2,131	2,676
NO _x Reduction (lbs)	1,711	1,391	3,157	3,964
SO ₂ Reduction (lbs)	9,117	7,412	16,822	21,124
CO ₂ reduction (short tons)	939	764	1,733	2,176

³ <http://www.epa.gov/airquality/eere/download.html>