



RRTP PROPOSED PLANNING SCENARIO NET BENEFITS ASSESSMENT, 2013-2027

Prepared for:
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November 26, 2011



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1 INTRODUCTION

In June of 2011 Navigant prepared a report entitled “Evaluation of the Residential Real Time Pricing Program, 2007-2010” for Commonwealth Edison Company. The report presented a four-year evaluation of the net benefits for the Residential Real Time Pricing (RRTP) program. ICC Docket 06-0617 required an economic evaluation after the end of calendar year 2010 to assess if the program generated net benefits for Illinois residential customers.

The original report presented both a historical evaluation of net benefits looking at the four years that RRTP had been operating, as well as a forward-looking assessment of future net benefits through the year 2020. The forward-looking assessment looked only at continued costs and benefits for the participants already enrolled in the program as of 2010. This type of forward look is important since RRTP is a program with high start-up costs, but benefits continue steadily for as long as the program stays active. The start-up costs cover the development of program tools and the metering, billing and enrollment processes needed to run the program.

While the two original assessments (historical and forward-looking) are important as documentation of what has happened, neither of them is sufficient for making a decision today on what is best for the future. A different look at costs and benefits is needed based on starting where the program is today and following a reasonable growth plan for a forecasted time period. To this end, ComEd created a proposed planning scenario for actively continuing the program and adding participants over the next five years. This report assesses the net benefits of that plan using the methodology outlined in the original report and the most up-to-date cost and benefit information currently available.



2 DESCRIPTION OF THE PROPOSED PLANNING SCENARIO

The basis of the proposed planning scenario is a five-year expansion of the RRTP program to reach a total of 50,000 participants by the end of 2017. The expansion would be spurred by additional funding to market the program and build awareness among all ComEd Residential customers of the program's availability to them and the benefits they could receive from real-time pricing.

There were 11,530 participants at the end of 2010.¹ There has been continuing growth in the number of new participants during 2011 even though there has been no additional investment in marketing and awareness campaigns for the RRTP program during the year. On the other hand, several factors offset this growth in the number of participants. Increased marketing activity by other Residential Energy Suppliers (RES) causing some RRTP participants to leave the program. Also, the weak economy contributed to a higher than normal number of move-outs among existing participants, and limited resources were put into retention activities during the 2011 evaluation year. The combined effect of new customers joining and existing participants leaving is expected to yield an RRTP participant count near 10,500 at the end of 2011.

Funding for an active new campaign to market and build awareness of the program cannot start until after the conclusion of the current proceeding to evaluate the future of the RRTP program. The future timeline for resolution of this proceeding is uncertain, but it is anticipated that some initial new marketing and building awareness funding could possibly begin in the Fall of 2012. Combined with regular on-going growth, this is expected to put the number of participants at 12,700 by the end of 2012.

The assessment presented here presumes that the beginning of 2013 would be the starting point for five full years of an active marketing and building awareness campaign to bring the number of participants up to 50,000 by the end of 2017. Assuming that momentum builds with time during a sustained campaign, this would translate into annual growth of 5,400 new participants in 2013, and 7,975 new participants in each year 2014 through 2017. The new participant growth forecast under the proposed planning scenario is summarized in Table 1.

New participants join the program throughout the year, meaning that some new customers participate for the full year while others may participate for only a few days. For some benefit calculations, it is helpful to know the average number of participants for the year or the number of participants mid-year (which is equivalent to summer peak participation). It is assumed that new participants join at a steady pace throughout the year, so the number of average participants per year is estimated as last year's end of year participant count plus half of the new participants joining in the given year. The forecast of annual average participants is also shown in the table.

¹ "Evaluation of the Residential Real Time Pricing Program, 2007-2010", Navigant Consulting, Inc., June 20, 2011, page 109.



Table 1. RRTP Participant Growth for Proposed Planning Scenario

	Forecast New Participants	End of Year Participants	Annual Average Participants
2010		11,530	9,767
2011	-1,030*	10,500	11,015
2012	2,200	12,700	11,600
2013 (Yr 1)	5,400	18,100	15,400
2014 (Yr 2)	7,975	26,075	22,088
2015 (Yr 3)	7,975	34,050	30,063
2016 (Yr 4)	7,975	42,025	38,038
2017 (Yr 5)	7,975	50,000	46,013
2018 and After	0	50,000	50,000

*Note: Some new participants joined RRTP in 2011 even without an active marketing and building awareness campaign for the program. However, this growth was offset by a loss of participants to other Retail Energy Suppliers who were actively recruiting in 2011, and a greater than average number of move-outs.



3 UPDATED INPUTS TO THE NET BENEFITS METHODOLOGY

Standing in the present and making decisions on the best plan forward is different than assessing the historical effects of past decisions. While the original evaluation of the RRTP program focused on assessing its net benefits from inception through its first four years of operation, deciding what is best for the future requires some adjustments to the inputs used in the net benefits methodology. For example, there are start-up costs which do not have to be re-incurred for the program to continue. There are also changes in the external world since the time of the original evaluation that require changes in input values. The rest of this section discusses the inputs to the net benefits methodology that will change for this proposed planning scenario net benefits assessment.

3.1 *Timeframe for Analysis*

Beginning the analysis in 2013 reflects a reasonable time frame to enable a full re-start of the marketing and building awareness campaign for the program, should the program continue. The length of time to be included in the analysis is set at fifteen years (2013 to 2027) based on the following reasoning.

It is important to extend the analysis beyond the five-year campaign period since benefits continue annually for each year a participant stays in the program, while program costs are higher during campaign years. A balanced picture of costs and benefits requires analysis across a period of time that extends for the length of time the participant is expected to remain in the program.

A program life of 15 years reflects a conservative estimate of the average customer dwell time in the program. As of November 1, 2010, when the original analysis began, 12,152 customers had entered the program and 1,141 (9.4%) had dropped from the program. This is likely a higher than normal dropout rate because it occurred during an economic recession when move-out rates in the ComEd service area were higher than the historical average. The average time in the program as of Nov 1, 2010 was 641 days, and so the annualized drop rate was 5.3%. At this rate the average program dwell time is a little over 18 years. To be conservative, we chose to assume a 15 year average enrollment period. The loss of RRTP participants to alternative RES's during 2011 is considered to be a one-time phenomena due to the start of the RES marketing campaigns during that year. Future RRTP participants will have already faced RES marketing and their decision to join RRTP is considered a personal long-term commitment, similar to what was seen in 2007-2010.

It should be noted that since new participants join the program over a five year period, selecting 2013 to 2027 for the analysis timeframe slightly under-estimates benefits from the program. This is because fifteen years of net benefits are being included for participants who join the program in 2013, but new participants in 2014 to 2017 will have net benefits counted for less than fifteen years. For example, new participants in 2017, the last year of the marketing and building awareness campaign, will only show net benefits for ten years within this analysis timeframe (2017 to 2027).



Their net benefits are expected to continue for another five years outside of the analysis period (2029 to 2032).

3.2 Start-up Costs

In this going-forward view, there is no reason to include program start-up costs incurred during the formation years of the program. This decision reflects the fact that the program infrastructure is now in place and continuing the program will involve no additional expenditures in this area. Essentially, they are sunk costs which do not change based on decisions about the future of the program.

3.3 Meter Costs

Incremental meter costs are \$0 in the going-forward view. This reflects the assumption that the program will be heavily promoted to households that already have Advanced Metering Infrastructure (AMI) meters, and that in the future AMI meters will be standard equipment, in which case it is not appropriate to charge this cost against the RRTP program.

Also, the original evaluation included a small cost for ComEd's processing of Change Meter Orders (CMOs) whenever a new participant joined the RRTP program. Going forward, the CMO cost is considered part of the AMI meter installation cost and is no longer assigned as a cost of the RRTP program.

3.4 Avoided Capacity Costs

The forecasted Avoided Capacity Costs listed in Table 24 of the original RRTP evaluation report have been revised to be consistent with the avoided capacity cost forecast used in the most recent net benefits analysis of ComEd's energy efficiency (EE) portfolio.

Both the original RRTP cost series and the new EE cost series are based on the same market clearing prices from the PJM Reliability Pricing Model (RPM) Base Residual Auction. This avoided capacity cost is \$27.73 for auction year 2013/2014 and \$125.99 for auction year 2014/2015.

In future years, both series transition to the Cost of New Entry (CONE) for CONE Area 3. However, the new EE series smooths the transition from the RPM value to the CONE value over a period of several years while the original RRTP cost series did not do any smoothing. The value of \$125.99 per MW-day in 2014 changed abruptly to \$379.43 per MW-day in 2015.

CONE is still believed to be the most appropriate base case for future avoided capacity costs during the peak period since it represents the levelized capital costs and fixed operations and maintenance costs of a new gas combustion turbine. However, it is reasonable to expect that the results of the



annual RPM process will slowly move towards the CONE level over the next few years rather than change abruptly. The smooth transition used in the new EE avoided capacity cost series will now also be used for this assessment of the RRTP proposed planning scenario. The updated values based on the EE cost series are shown in Table 2.

Table 2. Updated Avoided Capacity Costs for RRTP Proposed Planning Scenario

Year	\$/MW-day	\$/KW-day	\$/KW-year	Source
2013	\$27.73	\$0.03	\$10.12	RPM
2014	\$125.99	\$0.13	\$45.99	RPM
2015	\$141.85	\$0.14	\$51.78	CONE
2016	\$198.95	\$0.20	\$72.62	CONE
2017	\$256.05	\$0.26	\$93.46	CONE
2018	\$317.94	\$0.32	\$116.05	CONE
2019	\$318.61	\$0.32	\$116.29	CONE
2020	\$321.21	\$0.32	\$117.24	CONE
2021	\$324.96	\$0.32	\$118.61	CONE
2022	\$327.56	\$0.33	\$119.56	CONE
2023	\$332.14	\$0.33	\$121.23	CONE
2024	\$337.35	\$0.34	\$123.13	CONE
2025	\$336.54	\$0.34	\$122.84	CONE
2026	\$337.52	\$0.34	\$123.19	CONE
2027	\$339.79	\$0.34	\$124.02	CONE

Source for RPM: "2015/2015 RPM Base Residual Auction Results", PJM DOCS #645284, Table 1, p. 4
Source for CONE: Avoided capacity costs used to calculate net benefits for ComEd EE Portfolio

Note that while the avoided capacity costs reported in this table are consistent with those used for EE program evaluation, the exact avoided capacity cost values may not be exactly the same as what is seen reported for use in evaluation of EE programs. Small differences in the values may be reported because the EE programs are being offered into the PJM Demand Resource market, and PJM guidelines state that "the Unforced Capacity (UCAP) value of an Energy Efficiency Resource is equal to the Nominated EE Value of the EE Resource multiplied by the Demand Resource Factor and the Forecast Pool Requirement."²

The Demand Resource Factor is "used to determine the reliability benefit of demand resource products and to assign an appropriate value to demand resource programs."³ It represents the probability that a demand resource will be available when it is needed. The DR Factor is calculated by PJM and is 0.957 for ComEd in 2014. It is assumed to be constant over the remainder of the forecast period.

² "PJM Manual 18: PJM Capacity Market", Revision: 12, Effective Date: May 25, 2011, page 37.

³ Ibid., page 147



The Forecast Pool Requirement is “the amount equal to one plus the unforced reserve margin (stated as a decimal number) for the PJM Region.”⁴ It represents the reserve margin added to capacity requirements. If an EE program reduces demand for electricity, it also reduces the need to carry reserve margin for that demand. The Forecast Pool Requirement is 1.0804 for ComEd in 2014 and it is assumed to stay constant over the rest of the forecast period.

For ComEd EE program evaluation, the Demand Resource Factor and the Forecast Pool Requirement are factored into the avoided capacity cost value. These two adjustments are not part of the avoided capacity costs used for RRTP evaluation since RRTP is not offered into the PJM market as a Demand Resource. PJM is currently considering development of rules to allow Price Responsive Demand programs like RRTP to participate in the capacity market, but this market has not yet been established.⁵

Here is an example of the difference between the two series of avoided capacity costs. In 2014, the RRTP avoided capacity cost value is \$125.99 per MW-day based on RPM auction results. The equivalent avoided capacity cost value for EE program evaluation in 2014 is $\$125.99 \times 0.957 \times 1.0804 = \130.27 . This factor difference between the two series is constant throughout the forecast period.

3.5 Other Inputs

These critical assumptions used in Navigant’s original evaluation report remain in place without adjustment:

- A discount rate of 1%;
- Zero forecast error (that is, a zero differential between the fixed price and average real time hourly price);
- 10% hedging premium.

The following discussion explains changes made to other inputs.

Forecasted fixed and variable program costs were adjusted from the original evaluation to align with the 15-year planning scenario which includes growth to 50,000 participants. The base scenario in the original evaluation did not include any growth in participants.

Marketing and building awareness costs are based on past experience with marketing this program and are forecast to be \$100 per new participant to achieve a total of 50,000 program participants by the end of 2017. The original evaluation did not include any going-forward marketing and building awareness costs in the base scenario since there was no forecasted growth in participants after 2010. The program growth scenarios in the original evaluation assumed marketing and building awareness costs of \$70 or \$80 per new participant in the different scenarios. The \$100 per new

⁴ Ibid., page 150

⁵ “Price Responsive Demand”, PJM Staff Whitepaper, March 3, 2011



participant used in this proposed planning scenario is considered a conservative figure based on historical experience and it has the potential to be lower.

Environmental benefits of the RRTP program were estimated in the original evaluation report. They represent the social environmental and health benefits associated with reductions in SO₂, NO_x, and CO₂ emissions that come from the conservation and shifting behaviors seen when residential electric customers join the RRTP program. In the original evaluation, these environmental benefits were quantified outside of the net benefits calculation. Within this assessment of the RRTP proposed planning scenario, total net benefits are shown both with and without inclusion of the quantified environmental benefits.

All values are in 2010 dollars to make them directly comparable to the numbers in the original evaluation report, "Evaluation of the Residential Real Time Pricing Program, 2007-2010", Navigant Consulting, Inc., June 20, 2011.⁶

⁶ The 2010 dollars can be converted to dollars for any year by applying the appropriate inflation adjustments. For example, the current rate of annual inflation is 3.5% (Consumer Price Index), so to put all values into 2011 dollars they would have to be multiplied by 1.035.



4 NET BENEFITS ASSESSMENT OF THE PROPOSED PLANNING SCENARIO

The new assessment estimates total net benefits for the RRTP proposed planning scenario for three different populations:

1. All PJM customers
2. All ComEd customers
3. ComEd Residential customers

Navigant considers the net benefits that accrue to all PJM customers to be the best indicator of overall economic benefits for consumers from the RRTP program. However, the subset of benefits that accrue only to ComEd residential customers is also reported based on the guidelines of the ruling from Illinois Commerce Commission (ICC) Docket 06-0617. That docket requires specific identification of the net economic benefits accruing to ComEd's residential customers. Net benefits evaluation for all ComEd customers is included as a third view to provide additional information that may be helpful in the assessment of the proposed planning scenario.

It should be noted that these three population views differ only in the estimate of non-participant benefits. All other costs and benefits are the same for each view. The ComEd Residential non-participant benefits are a subset of All ComEd non-participant benefits, just as All ComEd non-participant benefits are a subset of PJM non-participant benefits. Each represents an alternative view of benefits and the values reported in the tables are not additive.

Summary of Results

Table 3 gives the 'big picture' net benefits results for each of the three population views for the RRTP proposed planning scenario.

The discounted net benefit to PJM customers from an RRTP program that reaches 50,000 participants by the end of 2017 is estimated to be \$124 million over a 15-year program horizon. Including environmental benefits, net benefits grow to \$133 million.

Net benefits for the RRTP proposed planning scenario are smaller but still strongly positive when looking only at the ComEd residential customer population. For ComEd Residential customers, the net benefits are \$34 million without environmental benefits and \$43 million with environmental benefits, though it should be noted that it is highly unlikely that all of the environmental benefits would accrue to ComEd residential customers. Similarly, looking at the whole ComEd customer population, net benefits are \$38 million and \$47 million, respectively.



Table 3. Net Present Value of Benefits and Costs for RRTP Proposed Planning Scenario

	PJM View	ComEd View	ComEd Residential Customer View
Participant Benefits: Avoided Capacity Costs	\$32,418,750	\$32,418,750	\$32,418,750
Participant Benefits: Consumer Surplus	\$38,446,039	\$38,446,039	\$38,446,039
Non-Participant Benefits: Market Effects	\$94,973,823	\$8,855,166	\$4,282,236
TOTAL BENEFITS	\$165,838,612	\$79,719,955	\$75,147,025
TOTAL COSTS	\$41,386,745	\$41,386,745	\$41,386,745
NET BENEFITS	\$124,451,867	\$38,333,210	\$33,760,280
Environmental Benefits	\$9,116,260	\$9,116,260	\$9,116,260
NET BENEFITS WITH ENVIROMENTAL BENEFITS	\$133,568,127	\$47,449,470	\$42,876,540

Net benefits reflect the proposed planning scenario where RRTP participation reaches 50,000 by year-end 2017.

The evaluation period is 2013 through 2027.

The societal discount rate is 1%.

Program start-up costs and incremental meter costs are zero.

The energy component of the flat rate is assumed to be perfectly balanced with hourly prices (zero differential).

Hedging Premium is 10%.

NPV are calculated as the mean of 14 iterations of different weather scenarios over the forecasted years.

Source: Navigant analysis



It is useful to take a look at how these costs and benefits are distributed over time, particularly during the first six years of the evaluation period. Table 4 shows annual benefits and costs for each major category during the participant growth years of 2013 through 2017, and then at the 50,000 full-year participant level in 2018. The annual benefits and costs for 2018 continue for each of the remaining nine years of the planning horizon, 2019-2027.

Table 4. Annual Benefits and Costs for RRTP Program Proposed Planning Scenario, 2013 to 2018

	2013	2014	2015	2016	2017	2018
Participant Benefits: Avoided Capacity Costs	\$79,520	\$518,300	\$794,200	\$1,409,000	\$2,194,000	\$2,961,000
Participant Benefits: Consumer Surplus	\$991,800	\$1,422,000	\$1,936,000	\$2,450,000	\$2,963,000	\$3,220,000
Non-Participant Benefits: Market Effects PJM View	\$2,451,000	\$3,515,000	\$4,783,000	\$6,052,000	\$7,320,000	\$7,954,000
Non-Participant Benefits: Market Effects ComEd View	\$356,700	\$511,500	\$696,000	\$880,400	\$1,065,000	\$1,157,000
Non-Participant Benefits: Market Effects ComEd Res View	\$110,600	\$158,600	\$215,800	\$272,900	\$330,000	\$358,600
Environmental Benefits: Social Environment and Health	\$235,163	\$337,283	\$459,064	\$580,845	\$702,626	\$763,516
Program Costs	\$2,062,000	\$2,811,000	\$3,131,000	\$3,446,000	\$3,756,000	\$2,959,000

Net benefits reflect the proposed planning scenario where RRTP participation reaches 50,000 by year-end 2017.

The evaluation period is 2013 through 2027.

The societal discount rate is 1%.

Program start-up costs and incremental meter costs are zero.

The energy component of the flat rate is assumed to be perfectly balanced with hourly prices (zero differential).

Hedging Premium is 10%.

NPV are calculated as the mean of 14 iterations of different weather scenarios over the forecasted years.

Source: Navigant analysis

Aggregate participant benefits from avoided capacity costs increase significantly between 2013 and 2017 for two reasons: there is rapid growth in the number of RRTP participants, and there are increases in the avoided capacity costs. After 2017, participation stabilizes at 50,000 and growth in benefits comes only from forecasted increases in avoided capacity costs, as discussed previously in Table 2.

Participant benefits from consumer surplus also grow steadily throughout the 2013 to 2017 period due to increases in the number of program participants. After 2018, aggregate participant benefits are maintained at the 50,000 full-year participant level on an annual basis.

Non-participant benefits, environmental benefits, and program costs also follow this same pattern. They grow from 2013 to 2018 due to increases in the number of average RRTP participants, then stay constant on an annual basis after that.