April 11, 2012

STUDY: **Oncor 2012 Commercial Load Management Program**
          Program Performance and Optimization

Client: Industrial Energy User (not identified in this published report)

The purpose of this study was to quantify our client's actual program performance in 2011 in order to optimize the 2012 program payout. In 2011, the program payout was very simple and rewarded a high "nominated" curtailment amount without any downside for under-performance. In 2012, several changes to the program rules shift the incentives to making a more "accurate" nomination of curtailment capabilities.

Specifically, the program awards maximum payout only to those participants who provide demand reduction kW amount that is at least 75% of the nominated value. For determination of this 75% threshold, the participant's "worst" single hour kW demand reduction is used. Thus, if a participant was to "over nominate" the amount of participation and end up being measured as having provide *less* than 75% of the nominated amount, the 2012 payout would be <u>significantly</u> less than the 2011 payout.

Verdigris Energy found that if our case study client conducts the 2012 program with an exact duplicate of the 2011 program, the Oncor payout would go from $20,228 in 2011 to $8,000 in 2012. The values used to determine these results are depicted below.

<u>2011 PROGRAM BASE CASE</u>

During the test on May 31, our case study client's actual measured demand reduction was 979.56 kW, During the program period from June-September, our case study client's "worst hour" of performance contributed 521.61 kW of demand reduction.

	Date	Start	End	Event Avg kW	Benchmark*	Event Worst Hour kW	Demand Reduction (kW)**
2011 Curtailment Periods							
TEST	5/31/11	3:00 PM	4:00 PM	36	1,016	36	980
EVENT 1	6/27/11	5:30 PM	7:00 PM	168	887	179.6	707
EVENT 2	8/3/11	4:00 PM	7:00 PM	324	875	353.3	522
EVENT 3	8/4/11	4:00 PM	7:00 PM	200	875	216.9	658
EVENT 4	8/24/11	4:00 PM	7:00 PM	188	978	189.0	789
Amount of kW Curtailment Used for Second (larger) Payout===>							**522**

*Benchmark is the average kW Demand during same period on five prior workdays

Based on the test values, Verdigris Energy calculated the payout in 2011 at a total of $20,228. This is presented as 2011 Base Case.

2011 Payouts (Base Case)				
	D.R. (kW)	% of Contract	Incentive ($/KW)	Payout
CONTRACT	1,000			
TEST	980	98%	$10	$9,796
EVENTS	522	52%	$20	$10,432
				$20,228

2012 PROGRAM BASE CASE

As part of this study, Verdigris Energy calculated the amount of the program payout, using the new rules in 2012 applied to the actual performance in 2011. We found that the payout dropped from more than $20,000 to $8,000 in 2012. The results are depicted in 2012 Base Case.

2012 Payouts (Base Case)				
	D.R. (kW)	% of Contract	Incentive ($/KW)	Payout
CONTRACT	1,000			
TEST	980	98%	$0.18	$176
EVENTS	522	52%	$15	$7,824
				$8,000

Our client must either exit the program in 2012, or adjust its strategy to optimize payout according to the new rules imposed in 2012. As noted above, these new rules reward accuracy of the nomination.

Specifically, it is of paramount importance to nominate a load reduction kW amount on which which our client is confident it can achieve at least 75% performance. The payout schedule is reflected in the table "2012 Payout Schedule."

2012 Payout Schedule
2012 Incentive on a sliding scale as follows:
Achievement >75% of Contract yields $40/kW
Achievement 50%-75% of Contract yields $15/kW
Achievement <50% of Contract yields $0/kW
Achievement 100-110% of Contract yields a $16/kW Bonus
Payouts for 75%+ are based on curtailment observed during the "Program's" worst hour, not the meter's worst hour

2012 SCENARIO ANALYSIS & OPTIMIZATION

Verdigris Energy conducted analysis using different assumptions, in order to optimize program payout. We found that *adjusting the nominated demand reduction from 1,000 kW to 600 kW*, and changing no other variables (i.e., an exact duplicate of 2011 performance) *would restore the "minimum expected payout" to slightly higher than 2011 levels*. We qualify the result as a "minimum expected payout" because one key variable that cannot be pre-determined. Specifically, as noted in the bottom box of the 2012 Payout Schedule (above), if our client achieves the 75%+ threshold, the amount of kW upon which Oncor pays is **not** the "worst hour" for our client, but rather, is based on load reduction (in kW) during the *program's* worst hour.

2012 Payouts (Scenario 1 based on Worst Hour)				
	D.R. (kW)	% of Contract	Incentive ($/KW)**	Payout
CONTRACT	600			
TEST	980	163%	$0.18	$108
EVENTS	522	87%	$39.82	$20,771
				$20,879

Accordingly, we created Scenario 2, which provides an "expected value" based on our case study client's "average" performance in 2011 (again, using 600 kW as the nomination). Using the average performance as the payout basis, we found "expected payout" exceeds $27,000. The actual payout would also include a $960

2012 Payouts (Scenario 2 Based on Avg DR)				
	D.R. (kW)	% of Contract	Incentive ($/KW)**	Payout
CONTRACT	600			
TEST	980	163%	$0.18	$108
EVENTS	684	114%	$39.82	$27,231
				$27,339
		Plus Performance Bonus (TDB)		$960

bonus for "over performance," yielding a total payout of $28,299.

OTHER VARIABLES TO CONSIDER

Based on actual data from 2011, we assert that 600 kW is the optimum nomination for the 2012 program year to balance the desire for highest payout against the danger of failing to achieve the 75% threshold. However, other variables should be taken into consideration. If all variables are fully optimized, our case study client could achieve unprecedented energy cost savings.

At our meeting on April 10, Verdigris Energy provided the client documentation supporting our strongly advised hedging recommendations for the summer of 2012. In that discussion, our client suggested that changing production schedules would achieve a reduction of energy costs by shifting energy use away from price-volatile summer weekday afternoons. We concur fully with this assessment, but on further consideration, believe an alternative strategy may yield superior results.

The benefit of shifting load away from summer weekday afternoons is two-fold. It entails "avoiding" price spikes on the spot energy market, and achieving a lower 4CP demand, which is key determinant of delivery charges. The downside of shifting load is also two-fold (not counting operational considerations not considered in this review). Those downsides are considered below.

First, by shifting load to off-peak periods, our client will almost certainly need to further reduce the kW nomination in the curtailment program. As a reminder, the curtailment program period covers only 1-7pm weekdays. It stands to reason that if our client shifts load away from this time period, it will be difficult, if not impossible, to achieve further load reduction on the Oncor program.

Second, by shifting load in lieu of hedging energy costs with a block purchase for this summer, our client loses significant "opportunity costs" for reducing usage during a price spike and selling cheap power back into a very expensive market. As an illustration of this, consider August of 2011. During the month, there were 21 hours where the spot price of electricity exceeded $1.00/kWh. By purchasing a block of energy at $0.07/kWh, then reducing load and selling back at $1.00/kWh, our client would incur a $0.93/kWh credit for every kWh pre-purchased but not used. To put this in perspective, an 800 kW hedge at $0.07/kWh would cost roughly $20,000. Selling back that same 800 kW at $1.00/kWh for 21 hours would **yield more than $280,000**.

It should be noted that curtailment events on the Oncor Program will almost certainly occur only

during those periods when the spot price of electricity is at or near the cap price presently at $3.00/kWh and going to 4.50/kWh in July. It is not unreasonable to expect that value of energy sold-back during the Oncor curtailment events may exceed the value gained from participating in the program.

Presently the on-peak block prices for summer are as follows:
JUNE: $0.03758/kWh
JULY: $0.06245/kWh
AUGUST: $0.07298/kWh
SEPTEMBER: $0.03670
Summer Average: $0.05243

This compares to the 2011 summer on-peak average of **$0.09532/kWh**.

RECOMMENDATIONS

Verdigris Energy recommends the following:
- Participate in the Oncor Commercial Load Managemment Program with a nominated value at or near 600kW for the 2012 program year
- Purchase an 800kW on-peak block of power for June-Sept
- Consider an incremental purchase of 200 kW during a "super peak" period
- Be prepared to reduce load during the following events
    1. A Curtailment event called by Oncor
    2. A high-probability 4CP event forecast by MP2
    3. A sustained "blowout" in real-time spot energy prices at a threshold determined by the client (based on the opportunity cost of lost production)

As always, we appreciate the opportunity to be of service.

Sincerely,

Jeff Nottingham