Entergy Louisiana: Analysis of Long-Term Achievable Demand Response Potential

Draft Report

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I. EXECUTIVE SUMMARY

ICF was retained by Entergy Louisiana, LLC (ELL) to conduct a demand response potential study, and to develop demand response program inputs for the company's 2019 integrated resource plan. This report complements a report on an energy efficiency potential analysis that was conducted by ICF for the same purpose.

As with the energy efficiency potential study, a bottom-up process was used to determine achievable potential forecasts for the 2019–2038 period for multiple demand response programs covering the residential, commercial and industrial sectors under reference and high-case scenarios. The key results are:

- **Demand response programs achieve savings of 5.3% of electricity demand by 2038 in the high case and 4.0% in the reference case.**
- **Demand growth is offset by 55% by 2038 in the high case and by 41% in the reference case.**
- **The residential programs (Direct Load Control and Time of Use) followed by the industrial Time of Use program are the dominant programs in the forecast**, contributing a combined 87% of total savings in both the reference and high case.
- **The demand response programs are cost-effective** with total-resource-cost test benefit-to-cost ratios of 1.4 or higher for all programs in both reference and high cases.

II. STUDY APPROACH

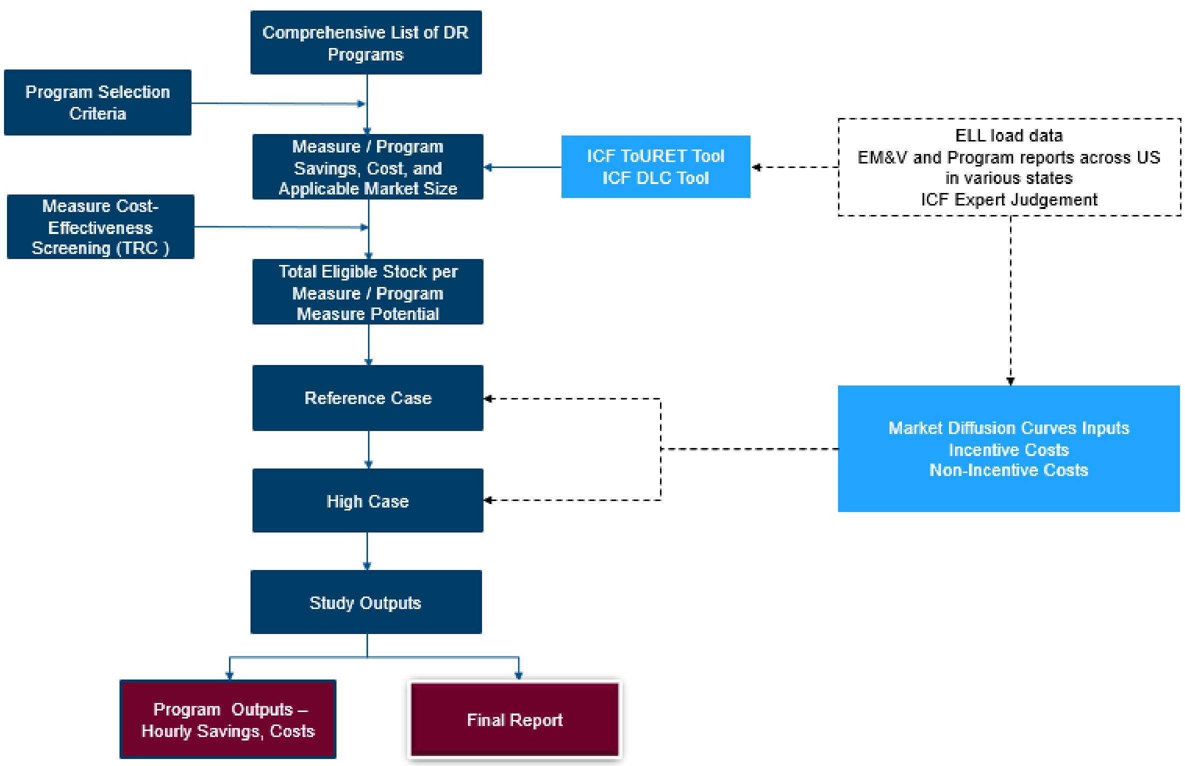
Overview

ICF used a bottom-up approach to evaluate demand response (DR) potential for Entergy Louisiana, LLC (ELL). We began the analysis by putting together a comprehensive list of standard and pilot DR programs currently implemented in U.S. markets. Then we collected data required to model and evaluate the potential measures for different programs, such as implementation costs, market size, and participation criteria. Data sources included ELL data; publicly available data, such as potential studies and annual reports; and ICF expert input. We then ran this information through ICF DR models to evaluate savings and cost-effectiveness.

Measures with total resource cost (TRC) test ratios of 1.0 or higher were included in the achievable program potential analysis. We analyzed two scenarios: **reference case** potential and **high case** potential. These cases were specified for each DR program by varying the levels of participation (as with the Direct Load Control program) or by using different pricing levels (as with the Time of Use program). Utility assumptions such as retail rates, avoided costs, and discount rates were held constant in both scenarios.

Figure 1 shows our bottom-up approach to this study.

Figure 1. Overview of Approach to Potential Study



Finally, ICF provided ELL with the data inputs required for its integrated resource plan (IRP). These included hourly load shapes for each program, which reflect savings forecasted for every hour of every year of the analysis, annual program costs, and program benefit-cost results. We produced these inputs for the reference and high cases.

Data Collection and Program Design

ELL Data

ELL provided ICF with the following data:

- Forecasted hourly load for 2019–2038, split up by residential, commercial, and industrial sectors
- Forecasted electricity avoided costs for 2019–2038 – capacity and energy
- 2017 customer counts for each sector
- AMI meter saturation data
- Definitions for ELL seasons and peak periods
- Discount rate for net-present-value analyses (WACC)
- Retail electricity rates, for each sector

DR Program Types

We began by assessing two primary DR program types, dispatchable and rate-based programs, as shown in Table 1.

Table 1: Sample List of DR Programs from Which Applicable Program List Is Filtered

Dispatchable/Load Response	Rate-Based/Price Response
Direct Load Control	Time of Use Pricing
Interruptible/Curtailable Load	Critical Peak Pricing
	Real-Time Pricing

Dispatchable programs are programs in which the utility offers customers payments for reducing demand during specified periods. They can include either the reduction of usage by a customer when an event is called or the control of switches by the utility directly. Note that such programs require the analysis of multiple measures, as described below.

Rate-based programs are programs in which customers voluntarily reduce their demand in response to energy price signals or pre-informed pricing structures that they enroll in (that is, opt-in programs).

We then used the following criteria to choose programs most applicable to the ELL service area:

- Availability of data from programs across the U.S.
- Agreement with current and planned technological deployments. For example, DR devices such as smart thermostats in the state of Louisiana and within ELL's service area
- Analysis of load forecasts provided by ELL
- Expert opinion of ICF

We selected five programs to model for this IRP, which included Direct Load Control programs for residential and commercial loads, and Time of Use for the residential, commercial and industrial sectors. The other programs were not included in this analysis as they did not meet the above criteria for evaluation. For example, the Critical Peak Pricing program was not warranted by the load shapes as there were no steep rises in loads during the peak hours; the gradual nature of the peaking suited the Time of Use program better. For the Real-Time Pricing program, the infrastructure needed for implementation is more advanced and the pricing mechanism and communication is not yet well-established in the DR community. Interruptible, on the other hand, was already available to existing customers enrolled in the program and no new customer enrolment is permitted in the ELL territory.[1]

Seasonal and peak definitions used were consistent with Midcontinent Independent System Operator (MISO) system peak definitions.

DR Program and Measure Data

ICF then developed ELL-specific inputs for the selected programs.

Direct Load Control – Residential and Commercial Sectors

Direct Load Control programs would involve ELL remotely operating the switches for devices in customer homes and businesses to shave loads during peak events. ICF modeled the DLC program by collecting data on the measures listed in Table 2.

Table 2: DLC Measures Considered

Class/Sector	DLC Measure
Residential	Room AC Switch
	Central AC Switch
	Smart Thermostat
	Water Heater Switch
	Smart Appliances
Commercial	Central AC Switch
	Water Heater Switch
	Smart Thermostat

The data collection process for DLC programs included:

- Obtaining the saturation levels of the DLC measure switches/appliances/devices or building characteristics.
- Determining the fraction of the population eligible for a measure within a program to be implemented. This defines the market size for a measure and is determined by the saturation of enabling technologies.
- Research on DLC programs implemented by other program administrators.
- Estimation of the number of DLC events during each year. For this study, the DLC events were determined by the top 10 4-hour block events during the summer of each forecast year.

[1] Per ELL Rate Schedule LIS-L, Rider 2, effective October 1, 2015.

Time of Use – Residential, Commercial, and Industrial Sectors

Time of Use prices are tariffs with different prices for energy use for different times of the day, typically in blocks separated out by peak and off-peak (and occasionally mid-peak). Savings for this non-dispatchable program are based on the reaction of consumers to price signals during the day and compared to consumption on a standard flat rate.

ICF's data collection and program design for the Time of Use programs involved:

- Determination of the participation levels of the programs for each sector
- Design of Time of Use pricing slabs and rates based on
  - Researching other programs in similar weather conditions and adjacent utilities and states
  - Load-and-cost duration curve analysis to determine the best ratios of prices during different hour blocks
- Building elasticity measures to characterize the load reduction and shifting by the consumers under different pricing scenarios

Program Modeling

ICF extended the data collection process for programs to design the DR programs for Entergy Louisiana by including several assumptions. These assumptions were based on research of existing programs and potential changes anticipated for the duration of IRP forecast.

Assumptions

Program Costs

We estimated program costs to reflect average annual costs over the long run, and similarly developed incentive and non-incentive program cost estimates. Costs were developed based on the following:

- Actual program costs of different programs being implemented in the United States
- Costs published in studies on DR potential
- ICF program evaluation and implementation experience

DR program costs include:

- Initial administrative costs – Costs per participant, paid to set up a customer as a program participant.
- Ongoing incentives – The amount, per kilowatt, paid for ongoing participation in the program, typically via direct payment/bill discount.
- New participant incentives – Program payments that ELL would make to the customers to opt-in to the DR programs. Incentive costs were estimated for each measure.
- Program costs – Costs of the program, in dollars per kilowatt, that are paid for ongoing participation in the program and that vary depending on that participation, which includes customer service, maintenance, replacement of switches on burn-hour, etc.
- Program administrative costs – Costs, in dollars per year, paid for the program for system coordination, sale to the Independent System Operator (ISO), etc. These are independent of the number of customers enrolled in the program.
- Participant costs – Costs paid by the customer to enroll in the DR program; includes measure and installation cost. These are assumed to be zero for all programs modeled in

this study. Consequently, the participation numbers are guided by the saturation of enabling devices.

- Non-incentive costs – Include administration, marketing, education and training, and evaluation costs.

Participation

The participation schedule for each program was forecasted according to these rates:

- A **base rate**, or the participation level in Year 1 of the program. This is the enrollment in pilot programs.
- A **maximum participation rate.**
- A **ramp-up rate**, which determines how quickly the participation grows from the base rate to the maximum rate.

A key assumption was that all programs were modeled as opt-in DR products. Therefore, the programs are first implemented as pilots that gradually ramp up to maximum participation levels. A customer must enroll to participate in the pilot or the program, and the cost development included this assumption. Opt-in programs are typically characterized by lower maximum rates of adoption and generally lower participation levels than opt-out programs, but the per-participant effect of these types of programs is higher than those of opt-outs.

Scenario Development

ICF forecasted achievable potential for the DR programs under two scenarios. We first developed the reference case estimates by measure and program using the approaches described in the previous sections. Then we developed the high-case scenario.

- **Reference case potential**. The level of cost-effective savings that could realistically be achieved by DR programs, given the best information available at the time of the potential study.
- **High case potential**. The level of cost-effective savings that could be achieved by DR programs when implemented more aggressively. This case was defined differently for the various program types.

For Direct Load Control programs, the reference and high cases were defined by varying the adoption rates and maximum achievable participation. The high case assumes 25% higher maximum achievable participation and an adoption rate designed to reach that level. For the Time of Use program, the high and reference cases were created to reflect different levels of pricing signals, specifically the ratios for peak to off-peak. The high case also assumes a slightly higher response (curtailment during peak period or shift of usage from the peak to off-peak period) to a given price signal by customers.

Assumptions about customer decision-making criteria, utility assumptions such as avoided costs and discount rates, as well as exogenous economic factors such as growth and inflation were all held constant across scenarios.[2]

[2] One reason these factors are held constant in ICF's model is that ICF's demand-side management (DSM) forecasts are used as inputs to ELL's integrated resource planning model, which varies utility, macroeconomic, and other assumptions.

Potential Evaluation

ICF used its Demand Response Potential Model (DRPM) to forecast savings, evaluate the program costs, and generate program post-impact load shapes. The two assessment models used in this study are described below:

- **Time of Use Rate Evaluation Tool (ToURET)**

  ICF's ToURET uses time-varying tariff data (e.g., time of use) to model the demand/consumption shifts that reflect consumer behavior. It inputs price elasticity values to quantify the response of the consumer to dynamic pricing. The output is an annual DR load profile for use in resource planning, along with various DR output metrics such as peak demand reduction, utility revenue change, and annual consumption impact. ToURET also facilitates the evaluation of impacts over multiple pricing and elasticity scenarios. The elasticities were calculated as the national average of Time of Use programs researched for this study.

- **Direct Load Control Model**

  The Direct Load Control model uses historic and potential program information to quantify the impact of measures during DR events. The model accounts for the rebound or snap-back that occurs during the hours immediately following a DR event.

Measure Screening

Measure screening was performed on Direct Load Control measures using the TRC test. Measure TRC benefits include avoided energy costs and avoided capacity costs due to the measure over the measure lifetime (which in this case is one year, since DR measures have a life of one year). Measure TRC costs include participant costs and program implementation costs. Seven out of the eight Direct Load Control measures passed the measure TRC. These measures are shown in Table 3.

Table 3: Direct Load Control (DLC) Measures with a TRC B/C Test Ratio of 1.0 or Higher

Class/Sector	DLC Measure
Residential	Room AC Switch
	Central AC Switch
	Smart Thermostat
	Water Heater Switch
Commercial	Central AC Switch
	Water Heater Switch
	Smart Thermostat

The other programs (Time of Use and Interruptible) do not have individual measures that require screening.

Achievable Demand Response Potential

DR programs have the potential to reduce demand growth between 2019 and 2038 by 41% in the reference case and by 55% in the high-case scenario, as shown in Figure 2.[3] The average annual reduction in peak (summer) load is 387 megawatts in the reference case and 512 megawatts in the high case in 2038, as shown in Figure 3. This amounts to 4.0% of the average annual peak load in 2038 in the reference case and a 5.3% reduction in peak load in the high case.

Figure 2: Load Growth and Load Impact by DR Programs

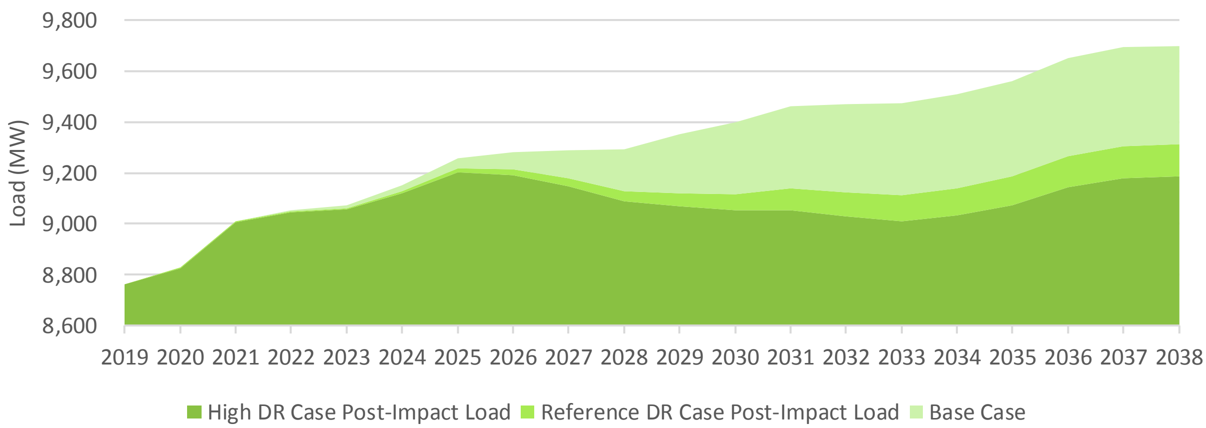
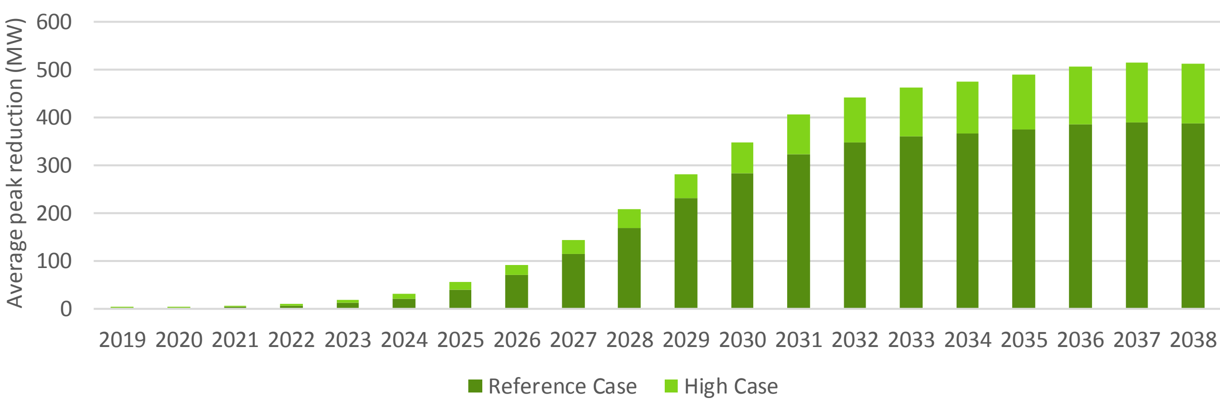


Figure 3: Average Summer Peak Load Reduction by DR Programs



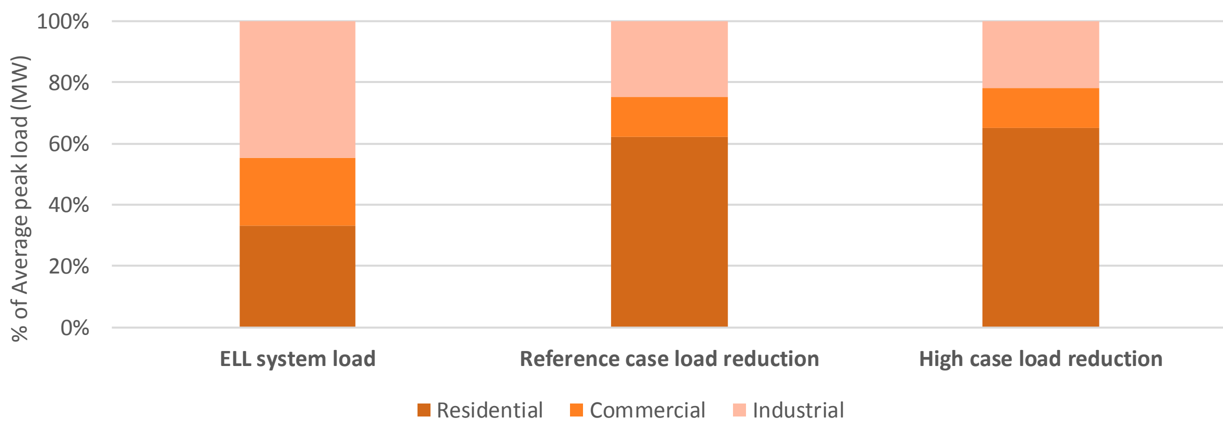
The savings growth is highly impacted by the participation numbers and follows an S-curve – the diffusion curve for adoption of new technologies – from 2019 to 2038. In the first few years, when the pilot programs are introduced, it is assumed that participation is limited. Thus, the low savings reflect the limited number of participants as a fraction of the eligible population. As stated previously, all programs were modeled as opt-in programs that will be implemented as pilot programs that gradually ramp up to maximum participation levels.

[3] Note the y-axis 1,550 MW.

ELL MW load is dominated by industrial (45%, in 2038), followed by residential and commercial, as shown in The savings growth is highly impacted by the participation numbers and follows an S-curve – the diffusion curve for adoption of new technologies – from 2019 to 2038. In the first few years, when the pilot programs are introduced, it is assumed that participation is limited. Thus, the low savings reflect the limited number of participants as a fraction of the eligible population. As stated previously, all programs were modeled as opt-in programs that will be implemented as pilot programs that gradually ramp up to maximum participation levels.

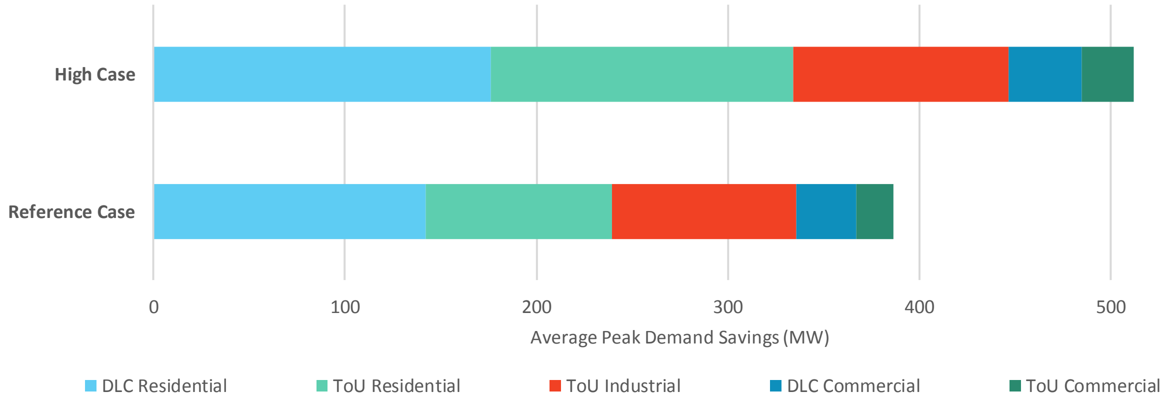
. The savings, though, are dominated by the residential programs, followed by industrial and commercial. The dominance of the residential sector is due to multiple factors such as high, if not highest, percentage of baseline load; higher number of customers; high response to pricing signals; and higher number of programs considered in this analysis. The residential load also follows the MISO system load more closely than the other two sectors, thus aligning its peaks well enough to maximize the savings from load reduction or shift to off-peak. Commercial, on the other hand, has peaks misaligned with the MISO system peak, which reduces the effect of differential pricing that Time of Use employs. This reduced impact is further mitigated by the fact that commercial elasticities are lower than residential elasticities.

Figure 4: System Load and, and Load Savings Distribution by Sector in 2038



To better understand the distribution of savings, Figure 5 shows the savings by DR program. The residential sector contributes 62–65% of the savings in 2038, primarily through the Direct Load Control program. This result is a function of the number of measures being considered in the program, the market size, and the corresponding participation levels. The residential Time of Use program contributes the next highest amount of savings, followed by the industrial Time of Use.

Figure 5: Average Summer Peak Load Reduction, by Program



Program implementation costs grow rapidly with participation quadrupling between 2023 and 2028. Costs level off over the next 10 years. The cost progression over the program period is shown in Table 4.

Table 4: Annual Program Costs

Reference Case	Cost of Implementation in $ mil				
	2019	**2023**	**2028**	**2033**	**2038**
Residential	$0.2	$0.8	$7.8	$7.8	$7.3
Commercial	$0.2	$0.3	$1.8	$1.6	$1.5
Industrial	$0.1	$0.1	$0.3	$0.6	$0.6
Total - Reference Case	**$0.5**	**$1.2**	**$9.9**	**$9.9**	**$9.3**
High Case					
Residential	$0.5	$1.2	$7.5	$10.3	$9.4
Commercial	$0.2	$0.4	$1.7	$2.1	$1.8
Industrial	$0.1	$0.1	$0.3	$0.6	$0.7
Total - High Case	**$0.8**	**$1.7**	**$9.5**	**$13.0**	**$11.9**

Table 5 shows the levelized costs of the programs (in dollars per kilowatt) and benefit-cost test results. The programs are all cost-effective under the Total Resource Cost (TRC) test, and overall the portfolio of programs is highly cost-effective with a TRC test result of 3.9 in the reference case and 4.3 in the high case.

Table 5: Levelized Costs and Benefit-Cost Test Results of the DR Portfolio

Program Type	Levelized Costs ($/kW)		TRC Test (Cost-Benefit Ratio)	
	Reference Case	High Case	Reference Case	High Case
Residential DLC	$76	$77	2.5	2.4
Residential ToU	$7	$7	13.1	15.1
Residential Subtotal	**$48**	**$42**	**3.7**	**4.1**
Commercial DLC	$97	$93	1.4	1.5
Commercial ToU	$18	$14	5.6	7.1
Commercial Subtotal	**$67**	**$59**	**2.0**	**2.2**
Industrial ToU	$8	$7	13.1	13.8
Industrial Subtotal	**$8**	**$7**	**13.1**	**13.8**
All DLC	**$80**	**$80**	**2.2**	**2.2**
All ToU	**$8**	**$7**	**11.7**	**13.2**
Total DR Portfolio	**$40**	**$37**	**3.9**	**4.3**

III. IRP INPUTS

Using the outputs of this study, ICF developed the demand response inputs for ELL's IRP, including load shapes, annual program costs, and benefit-cost results. We aggregated measure level load shapes to the program level and used these program-level load shapes in the IRP analysis.

IV. APPENDICES

A. Avoided Costs
B. Measure/Program Assumptions

Avoided Costs	
Year	Avoided Capacity Cost [Real 2017 $/kW-year]
2019	$75.06
2020	$76.56
2021	$78.09
2022	$79.65
2023	$81.24
2024	$82.87
2025	$84.53
2026	$86.22
2027	$87.94
2028	$89.70
2029	$91.49
2030	$93.32
2031	$95.19
2032	$97.09
2033	$99.04
2034	$101.02
2035	$103.04
2036	$105.10
2037	$107.20

Measures					Participation**			Cost Data**			
Measure ID	Sector	Sub-Sector/Class	Program	Measure Name	Eligible Customers* - % of Sector	Maximum Participation (in 2038, as % of eligible customers)		Initial ($/participant)	Fixed (1000 $'s)	Incentive ($/MW)	Variable Non-Incentive ($/MW)
						Base	High				
1	Residential	N/A	DLC	Room AC Switch	14%	10%	13%	$90	$22	$70	$30
2	Residential	N/A	DLC	Smart Thermostat	5%	20%	25%	$55	$100	$49	$21
3	Residential	N/A	DLC	Water Heater Switch	36%	23%	29%	$120	$50	$60	$20
4	Residential	N/A	DLC	Central AC Switch	66%	20%	25%	$160	$100	$20	$3
5	Commercial	Small C&I	DLC	HVAC	38%	6%	8%	$300	$100	$21	$9
6	Commercial	Small C&I	DLC	Water Heater Switch	22%	5%	6%	$400	$75	$63	$27
7	Commercial	Small C&I	DLC	Smart Thermostat	35%	20%	25%	$200	$100	$35	$15
8	Commercial	Medium C&I	DLC	HVAC	18%	15%	19%	$600	$100	$7	$3
9	Commercial	Medium C&I	DLC	Water Heater Switch	24%	10%	13%	$250	$75	$25	$10
10	Residential	N/A	ToU	N/A	100%	27%	27%	$0	$100	$0	$5
11	Commercial	N/A	ToU	N/A	100%	14%	14%	$0	$100	$0	$5
12	Industrial	N/A	ToU	N/A	100%	22%	22%	$0	$100	$0	$5

*Source: RECS, CBECS and ICF expert opinion
** Participation and Cost data is obtained from multiple sources that include potential studies and pilot DR programs across US, along with ICF program implementation

Measures					Costs and Cost Effectiveness Tests			
Measure ID	Sector	Sub-Sector/Class	Program	Measure Name	Levelized Costs ($/MW)		High Case	Reference Case
					High Case	Reference Case	TRC	TRC
1	Residential	N/A	DLC	Room AC Switch	$177.05	$177.46	0.92	0.92
2	Residential	N/A	DLC	Smart Thermostat	$105.46	$109.41	1.75	1.63
3	Residential	N/A	DLC	Water Heater Switch	$105.26	$104.58	2.18	2.21
4	Residential	N/A	DLC	Central AC Switch	$54.30	$53.44	2.87	2.94
5	Commercial	Small C&I	DLC	HVAC	$66.26	$69.36	2.18	2.03
6	Commercial	Small C&I	DLC	Water Heater Switch	$258.58	$274.27	0.50	0.47
7	Commercial	Small C&I	DLC	Smart Thermostat	$89.03	$90.99	1.82	1.76
8	Commercial	Medium C&I	DLC	HVAC	$111.08	$115.41	0.95	0.91
9	Commercial	Medium C&I	DLC	Water Heater Switch	$89.04	$93.20	1.54	1.44
10	Residential	N/A	ToU	N/A	$6.54	$7.49	15.06	13.14
11	Commercial	N/A	ToU	N/A	$13.92	$17.51	7.07	5.62
12	Industrial	N/A	ToU	N/A	$7.15	$7.51	13.77	13.10

Measures				Annual MW Savings High Case																			
Measure ID	Sector	Sub-Sector/Class	Program	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
1	Residential	N/A	DLC	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.5	0.8	1.1	1.4	1.8	2.2	2.4	2.6	2.7	2.8	3.0	3.1	3.0
2	Residential	N/A	DLC	0.1	0.1	0.2	0.3	0.4	0.7	1.1	1.7	2.5	3.4	4.5	5.7	7.0	7.6	8.2	8.4	8.8	9.5	9.7	9.5
3	Residential	N/A	DLC	0.4	0.7	1.0	1.7	2.6	4.3	7.1	11.0	15.7	21.4	28.9	36.0	44.4	48.7	52.0	53.7	56.3	60.4	61.9	60.8
4	Residential	N/A	DLC	0.6	1.1	1.7	2.8	4.5	7.2	11.9	18.5	26.6	36.2	48.8	60.9	75.0	82.3	87.9	90.8	95.2	102.0	104.6	102.7
5	Commercial	Small C&I	DLC	0.1	0.1	0.2	0.3	0.5	0.8	1.3	2.0	2.9	4.1	5.5	6.7	8.0	9.0	9.5	10.1	10.5	10.7	10.9	11.0
6	Commercial	Small C&I	DLC	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.5	1.5	1.6	1.6	1.7	1.7
7	Commercial	Small C&I	DLC	0.1	0.2	0.3	0.4	0.7	1.0	1.6	2.5	3.8	5.2	7.0	8.5	10.2	11.5	12.1	12.9	13.4	13.6	13.9	14.1
8	Commercial	Medium C&I	DLC	0.0	0.1	0.1	0.2	0.3	0.4	0.7	1.1	1.6	2.2	2.9	3.6	4.3	4.8	5.1	5.4	5.6	5.7	5.8	5.9
9	Commercial	Medium C&I	DLC	0.0	0.1	0.1	0.2	0.3	0.4	0.7	1.1	1.6	2.2	2.9	3.6	4.3	4.9	5.1	5.4	5.7	5.8	5.9	5.9
10	Residential	N/A	ToU	0.0	0.4	1.2	2.3	4.5	8.5	15.7	27.9	46.0	68.9	94.1	115.8	132.2	141.6	146.7	150.1	152.9	156.2	157.7	157.8
11	Commercial	N/A	ToU	0.0	0.1	0.2	0.4	0.8	1.5	2.8	4.9	8.0	12.0	16.4	20.1	22.9	24.5	25.4	25.9	26.3	26.6	26.7	26.8
12	Industrial	N/A	ToU	0.0	0.3	0.8	1.6	3.1	6.0	11.2	19.8	32.7	49.5	67.4	82.9	94.2	101.4	105.7	108.6	110.2	111.4	112.2	112.5

Measures				Annual MW Savings Reference Case																			
Measure ID	Sector	Sub-Sector/Class	Program	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
1	Residential	N/A	DLC	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.7	1.0	1.4	1.8	2.1	2.2	2.3	2.3	2.3	2.5	2.5	2.5
2	Residential	N/A	DLC	0.0	0.0	0.1	0.1	0.2	0.4	0.8	1.4	2.2	3.3	4.5	5.5	6.6	6.9	7.1	7.1	7.3	7.8	7.9	7.7
3	Residential	N/A	DLC	0.1	0.2	0.4	0.7	1.3	2.6	5.0	8.9	14.2	20.8	28.7	35.2	41.8	44.0	45.3	45.5	46.7	49.4	50.3	49.1
4	Residential	N/A	DLC	0.2	0.3	0.6	1.2	2.3	4.4	8.4	15.0	24.1	35.2	48.5	59.5	70.6	74.3	76.5	76.8	79.0	83.6	85.0	83.0
5	Commercial	Small C&I	DLC	0.0	0.0	0.1	0.1	0.3	0.5	0.9	1.6	2.7	4.0	5.4	6.5	7.5	8.1	8.3	8.6	8.7	8.8	8.9	8.9
6	Commercial	Small C&I	DLC	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.6	0.8	1.0	1.1	1.2	1.3	1.3	1.3	1.3	1.4	1.4
7	Commercial	Small C&I	DLC	0.0	0.0	0.1	0.2	0.3	0.6	1.2	2.1	3.4	5.1	6.9	8.3	9.6	10.4	10.6	10.9	11.1	11.2	11.3	11.4
8	Commercial	Medium C&I	DLC	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.9	1.4	2.1	2.9	3.5	4.0	4.4	4.4	4.6	4.7	4.7	4.7	4.8
9	Commercial	Medium C&I	DLC	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.9	1.4	2.1	2.9	3.5	4.0	4.4	4.5	4.6	4.7	4.7	4.8	4.8
10	Residential	N/A	ToU	0.0	0.3	0.8	1.4	2.8	5.2	9.7	17.2	28.4	42.6	58.1	71.5	81.6	87.4	90.6	92.6	94.4	96.5	97.3	97.4
11	Commercial	N/A	ToU	0.0	0.1	0.2	0.3	0.6	1.1	2.0	3.6	5.9	8.8	11.9	14.7	12.5	17.9	18.5	18.9	19.2	19.4	19.5	19.5
12	Industrial	N/A	ToU	0.0	0.2	0.7	1.4	2.7	5.1	9.6	16.9	27.9	42.3	57.6	70.8	80.5	86.6	90.4	92.8	94.2	95.2	95.8	96.2