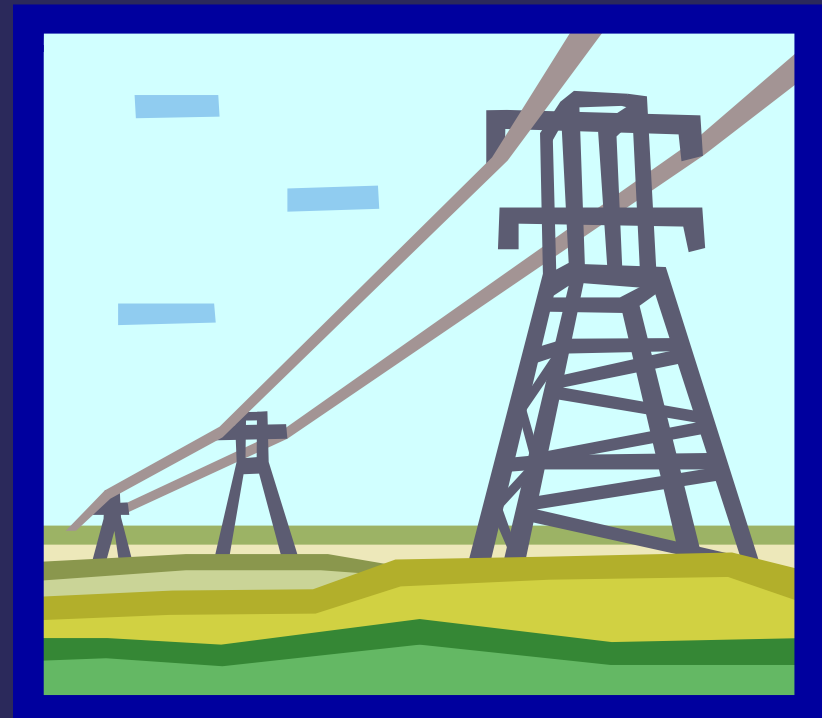


# Analysis of the IDR Threshold Requirement at ERCOT

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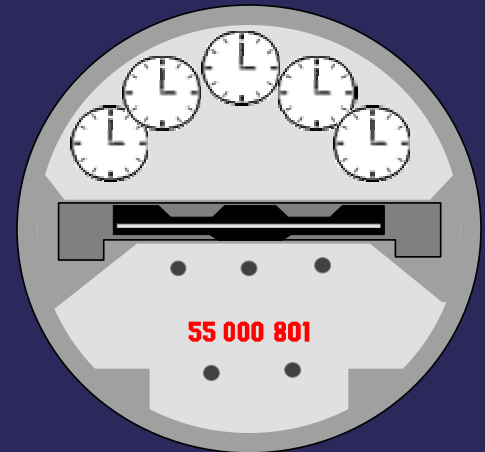
Presented by:  
Carl Raish  
Lindsey Turns



# Overview

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- ERCOT responsibilities
  - Settlements and billing
  - Load Profiling
- Current IDR requirements
- IDR Threshold Analysis
  - Methodology
  - Results



# Load Profiling in the ERCOT Market

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- Load Profiles
  - Reconcile ~50% of energy in the ERCOT market
  - 9 profile segments and 8 weather zones yields 72 profile types
- Load Research program
- Evaluate impact of the IDR requirement



# Current IDR Requirement

---

- Once an IDR always an IDR
- Peak demand greater than 1000 kW (1000 kVa)
- Service provided at transmission voltage (above 60 kV)
- Retailer may have an IDR installed and used for settlement purposes



# Protocol Revision Request

---

- Protocol revision request (PRR) to optionally remove any IDR with peak load less than 1000 kW for a year
  - Addresses new customer with smaller load than predecessor
  - Existing customer whose load has dropped
- In the approval process

# IDR Threshold Analysis

## *Scenarios*

---



The analysis addressed three scenarios:

- Allowing a voluntary removal threshold
- Lowering the mandatory installation threshold
- Lowering the required installation threshold and allowing voluntary removal below that threshold

# IDR Threshold Analysis

## *Criteria*

---



The analytical process addressed the following criteria:

- Profiling Error  
Quantifying impact of increasing or decreasing profiling error by increasing or decreasing number of IDRs
- Premise Level Impacts  
Settlement and TDSP charges
- Societal Impacts  
Deadweight Loss
- System Reliability Benefits



# Methodology

## Overview

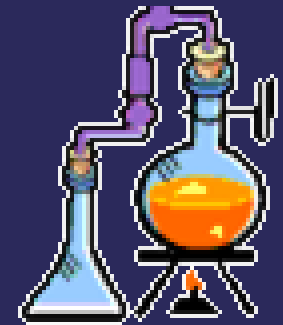
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- Calculated the load factor and made a profile assignment (BUSHILF, BUSMEDLF, or BUSLOLF)
- Applied ERCOT's data aggregation process to allocate usage to profiles
- Quantified energy differential between actual energy used and energy allocated by profiles
  - Net Profiling Error/Cost
  - Total Profiling Error/Cost
  - Cross Customer Error/Cost

---

# METHODOLOGY



# Methodology

## *Profiling Error*

---



Profiling Error illustrates whether the profile overestimates or underestimates the true usage. The formula is:

$$PE = \sum \left( E_{i_{actual}} - E_{i_{profiled}} \right)$$

where PE = Profiling Error (kWh) for a premise

$E_{i_{actual}}$  = Actual Energy (kWh) for a 15-minute interval, and

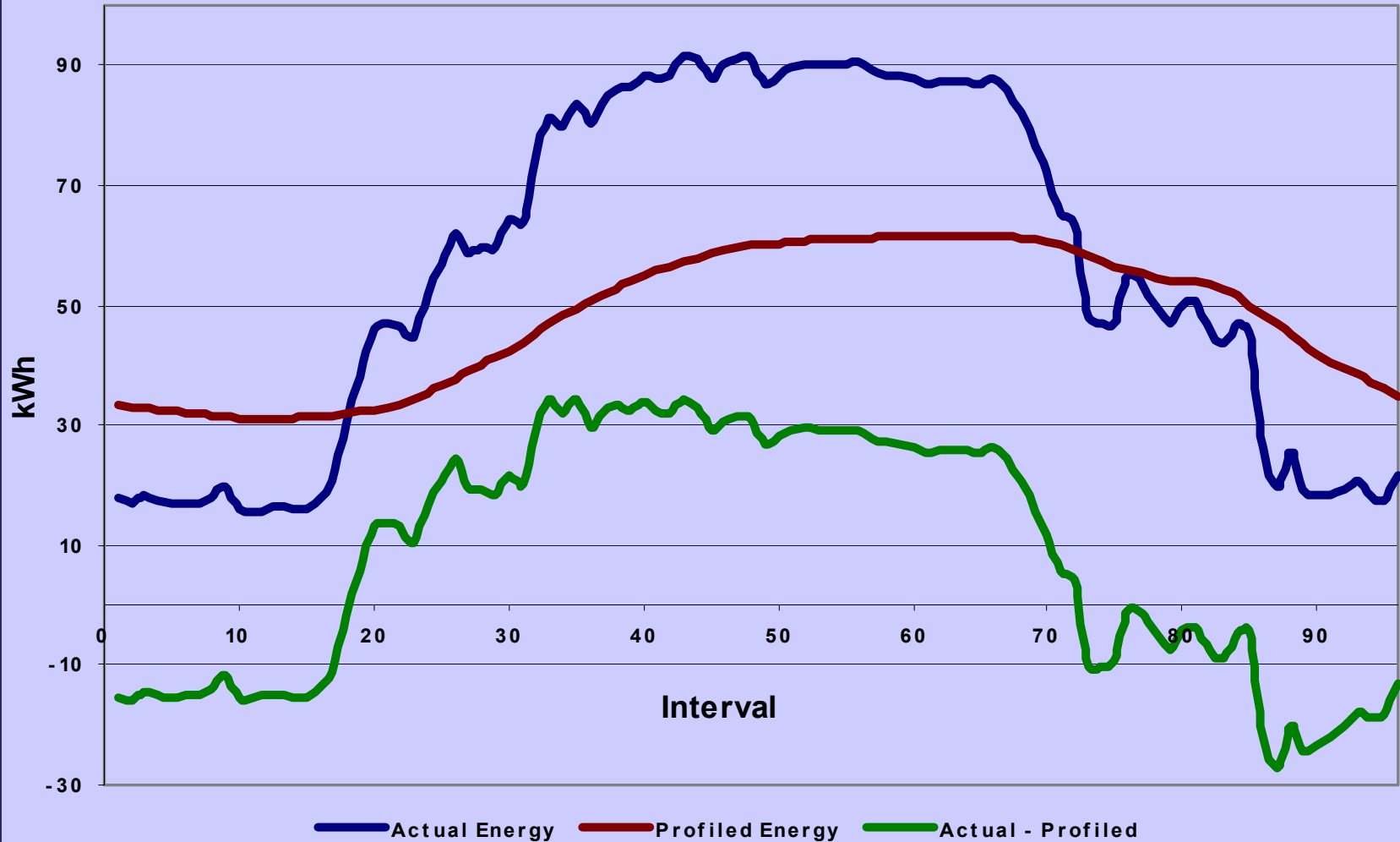
$E_{i_{profiled}}$  = Profiled Energy (kWh) for a 15-minute interval.

# Actual vs. Profiled Energy

## *Example for a Day*

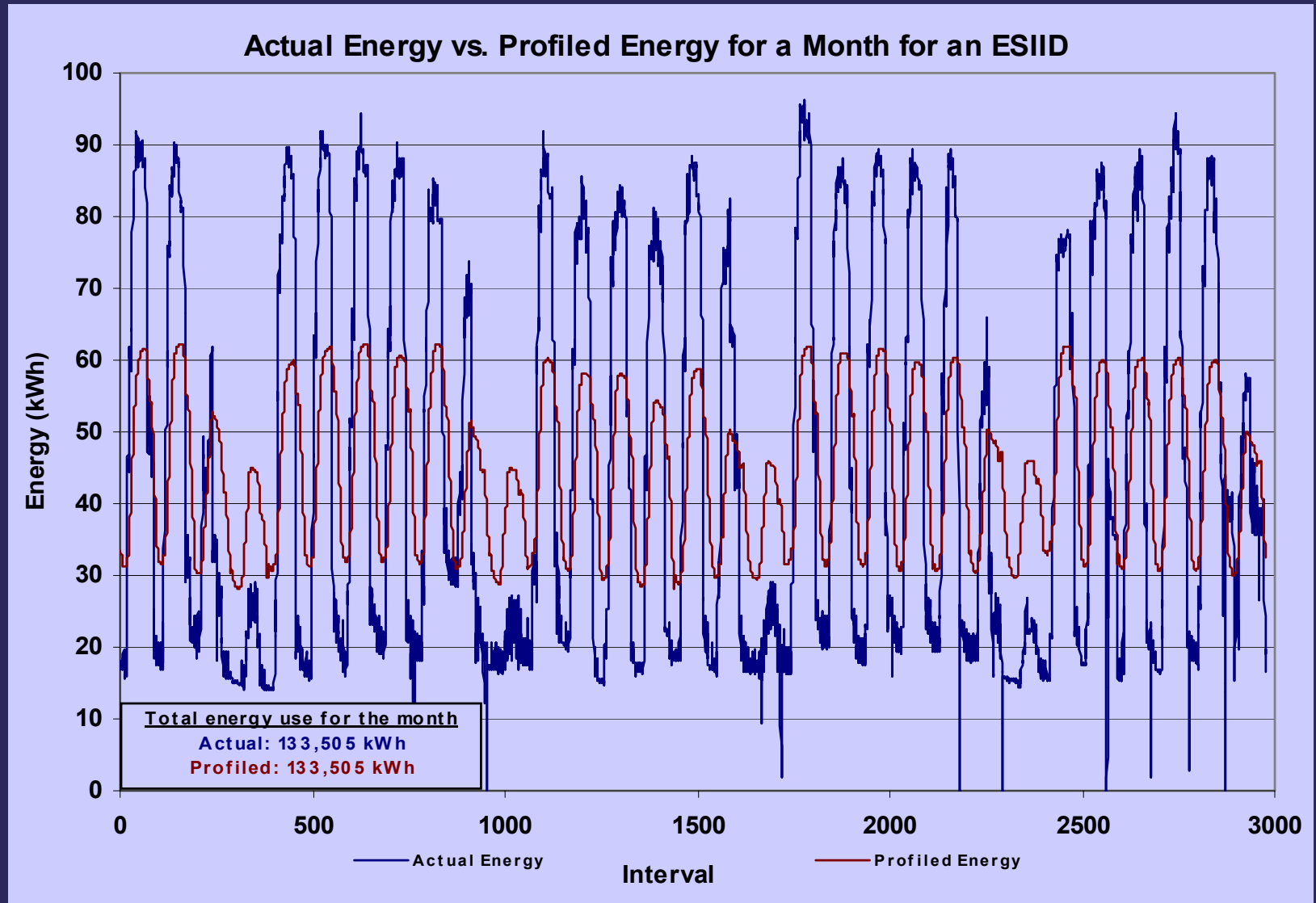


Actual vs. Profiled Energy for a Day for an ESID



# Actual vs. Profiled Energy

## *Example for a Month*



# Balancing Energy Market

## MCPE

---



- ERCOT's market is primarily bilateral ... prices are not transparent
- One day ahead ERCOT receives balanced load and resource schedules from QSEs
- ERCOT buys balancing energy in each congestion zone as needed for each interval approximately 30 minutes ahead
- MCPE (Market Clearing Price for Energy) is determined through bidding and is the only transparent energy price in the ERCOT market

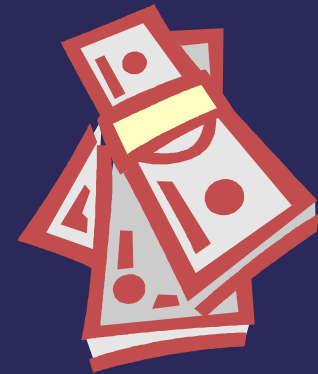
# Methodology

## Settlement Cost

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Settlement Cost is used as a basis for comparison of other calculated costs in the analysis and is found by:

$$SE = \sum \left( E_{i_{actual}} \times MCPE_i \right)$$



where SE = Settlement Cost for an ESIID (\$),  
 $E_{i_{actual}}$  = Actual energy (kWh) for a 15-minute interval  $i$ ,  
and  $MCPE_i$  = Market Clearing Price of Energy for a 15-minute interval  $i$ .

# Methodology

## *Net Profiling Error Cost*

---



Net Profiling Error Cost indicates whether, at the end of the year, the profile allocates higher or lower costs than the IDR. The formula is:

$$NPEC = \sum (PE_i \times MCPE_i)$$



where NPEC = Net Profiling Error Cost (\$) for an esiid,  
PE<sub>i</sub> = Profiling Error (kWh) for a 15-minute interval i,  
MCPE<sub>i</sub> = Market Clearing Price of Energy (\$/MWh) for  
a 15-minute interval i

# Methodology

## *Net Error*

---



The percentage of the Net Profiling Cost to the Settlement cost is given by:

$$\text{Net Error} = \frac{NPEC}{SE}$$

where NPEC = the Net Profiling Error Cost (\$), and SE = Settlement Cost (\$)

# Methodology

## Total Profiling Error

---



Total Profiling Error represents the total amount of Profiling Error over the year and is found by:

$$TPE = \sum \left| E_{i_{actual}} - E_{i_{profiled}} \right|$$

where TPE = the Total Profiling Error (kWh),

$E_{i_{actual}}$  = Actual energy (kWh) for an ESIID for a 15-minute interval,

$E_{i_{profiled}}$  = Profiled Energy (kWh) for a 15-minute interval for an ESIID

# Methodology

## *Cross Customer Error*

---



Cross Customer Error represents Profiling Error at the premise level or can be thought of as the measure of the total amount of settlement cost being incorrectly allocated to premises within the group. Cross Customer is found by:

$$CCE = \left| \sum (PE_i \times MCPE_i) \right|$$

where CCE = Cross Customer Error (\$) for an ESIID,  
PE<sub>i</sub> = Profiling Error for a 15-minute interval, and  
MCPE<sub>i</sub> = Market Clearing Price of Energy for a 15-minute interval.



# Estimates for IDR Costs

---

ERCOT estimated the annualized incremental cost of IDR metering using the following assumptions:

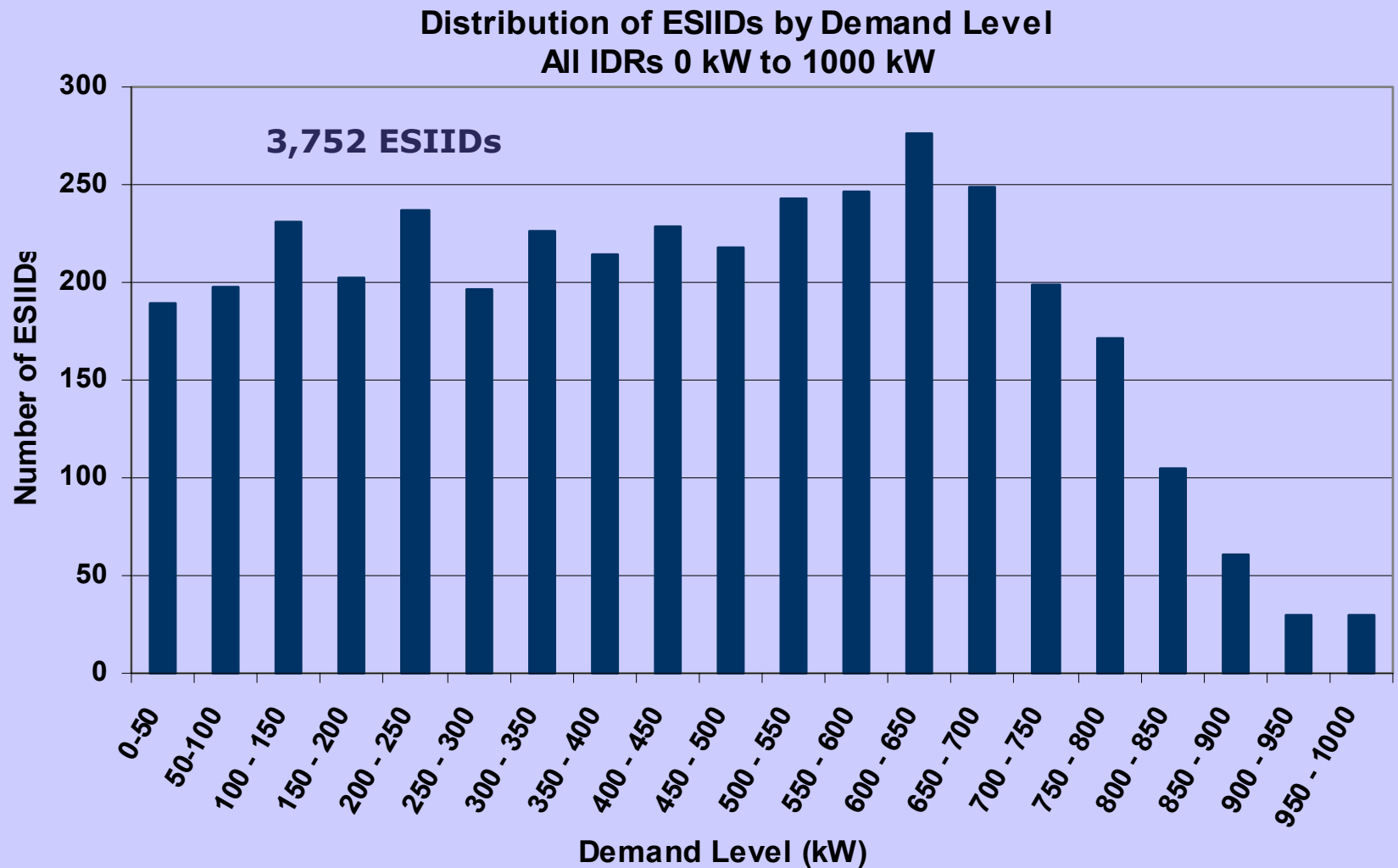
IDR Purchase/Installation	\$1000
Annual Reading Cost	\$72
Amortization Period	15 years
Interest Rate	5.0%
Annualized IDR Cost	\$168

---

# RESULTS



# Distribution of IDRs Less Than 1000 kW



# Dead Weight Loss Results

## *Based on Annual Consumption*



Demand Level (kW)	Counts	Total kWh	Settlement Cost (\$)	Dead Weight Loss (\$)	Dead Weight Loss Per MWH	Dead Weight Loss Per IDR
0 - 50	189	12,339,740	\$482,781	\$2,142	\$0.004436	\$11.33
50 - 100	198	40,439,449	\$1,482,753	\$1,172	\$0.000790	\$5.92
100 - 150	231	89,201,969	\$3,210,288	\$329	\$0.000102	\$1.42
150 - 200	202	111,101,851	\$3,976,499	\$1,252	\$0.000315	\$6.20
200 - 250	237	173,698,124	\$6,180,964	\$826	\$0.000134	\$3.49
250 - 300	197	180,050,027	\$6,389,880	\$1,053	\$0.000165	\$5.35
300 - 350	226	255,414,624	\$9,011,827	\$749	\$0.000083	\$3.31
350 - 400	214	284,864,012	\$10,100,562	\$505	\$0.000050	\$2.36
400 - 450	228	379,574,327	\$13,410,662	\$1,975	\$0.000147	\$8.66
450 - 500	218	414,422,254	\$14,587,235	\$741	\$0.000051	\$3.40
500 - 550	243	524,682,032	\$18,510,503	\$1,694	\$0.000092	\$6.97
550 - 600	247	582,488,044	\$20,403,832	\$1,468	\$0.000072	\$5.94
600 - 650	276	752,469,249	\$26,296,407	\$1,138	\$0.000043	\$4.12
650 - 700	249	697,722,807	\$24,511,941	\$1,308	\$0.000053	\$5.25
700 - 750	199	600,833,144	\$21,122,922	\$1,206	\$0.000057	\$6.06
750 - 800	172	559,917,753	\$19,707,178	\$824	\$0.000042	\$4.79
800 - 850	105	328,976,820	\$11,706,855	\$466	\$0.000040	\$4.44
850 - 900	61	217,715,831	\$7,726,144	\$284	\$0.000037	\$4.66
900 - 950	30	91,750,471	\$3,445,999	\$971	\$0.000282	\$32.35
950 - 1000	30	80,444,841	\$2,845,555	\$96	\$0.000034	\$3.19
<b>TOTAL</b>	<b>3,752</b>	<b>6,378,107,370</b>	<b>\$225,110,786</b>	<b>\$20,199</b>	<b>\$0.000090</b>	<b>\$5.38</b>

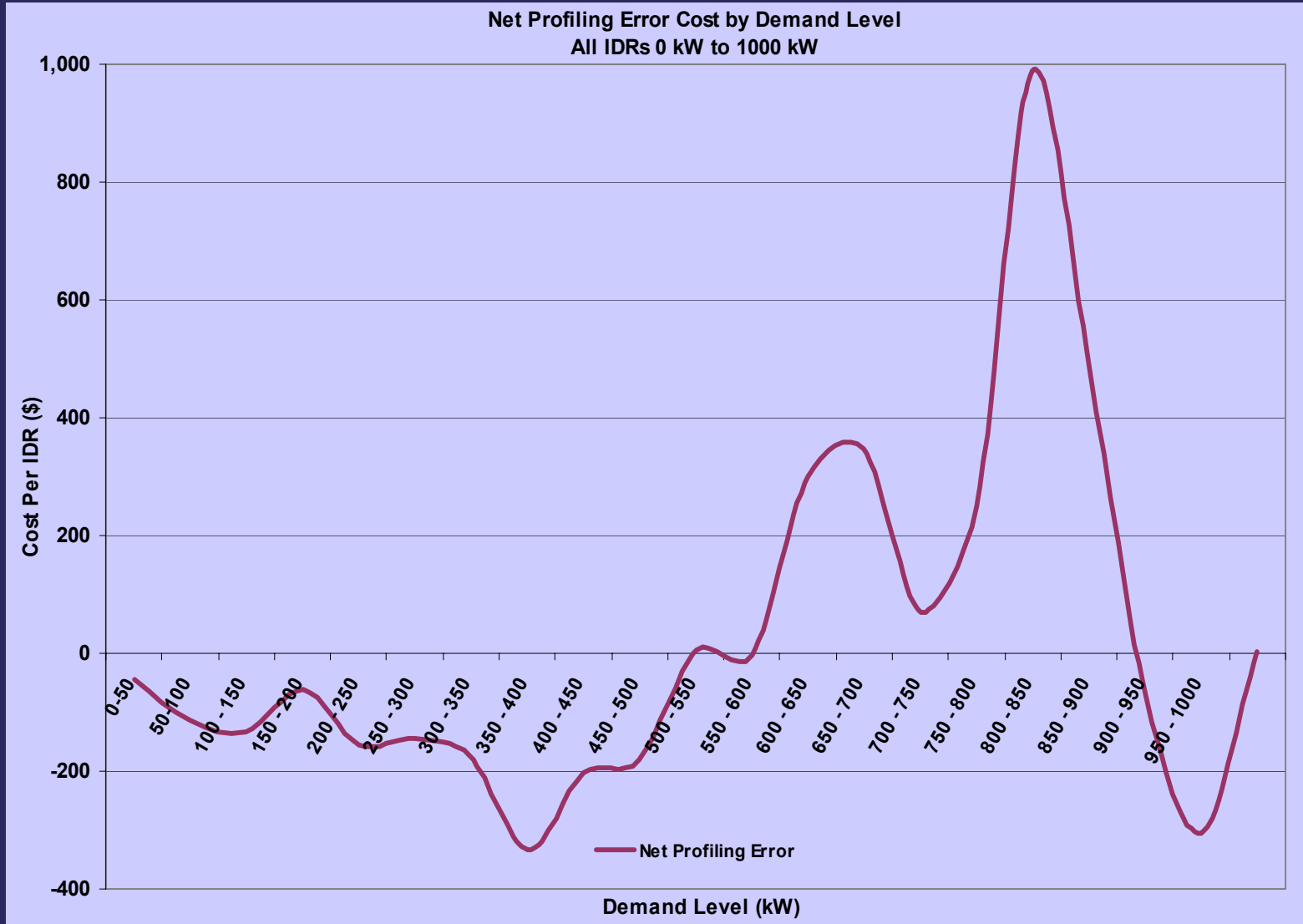
# Voluntary Removal Threshold

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Current requirement specifies that once an IDR is installed it must remain and be used for settlement

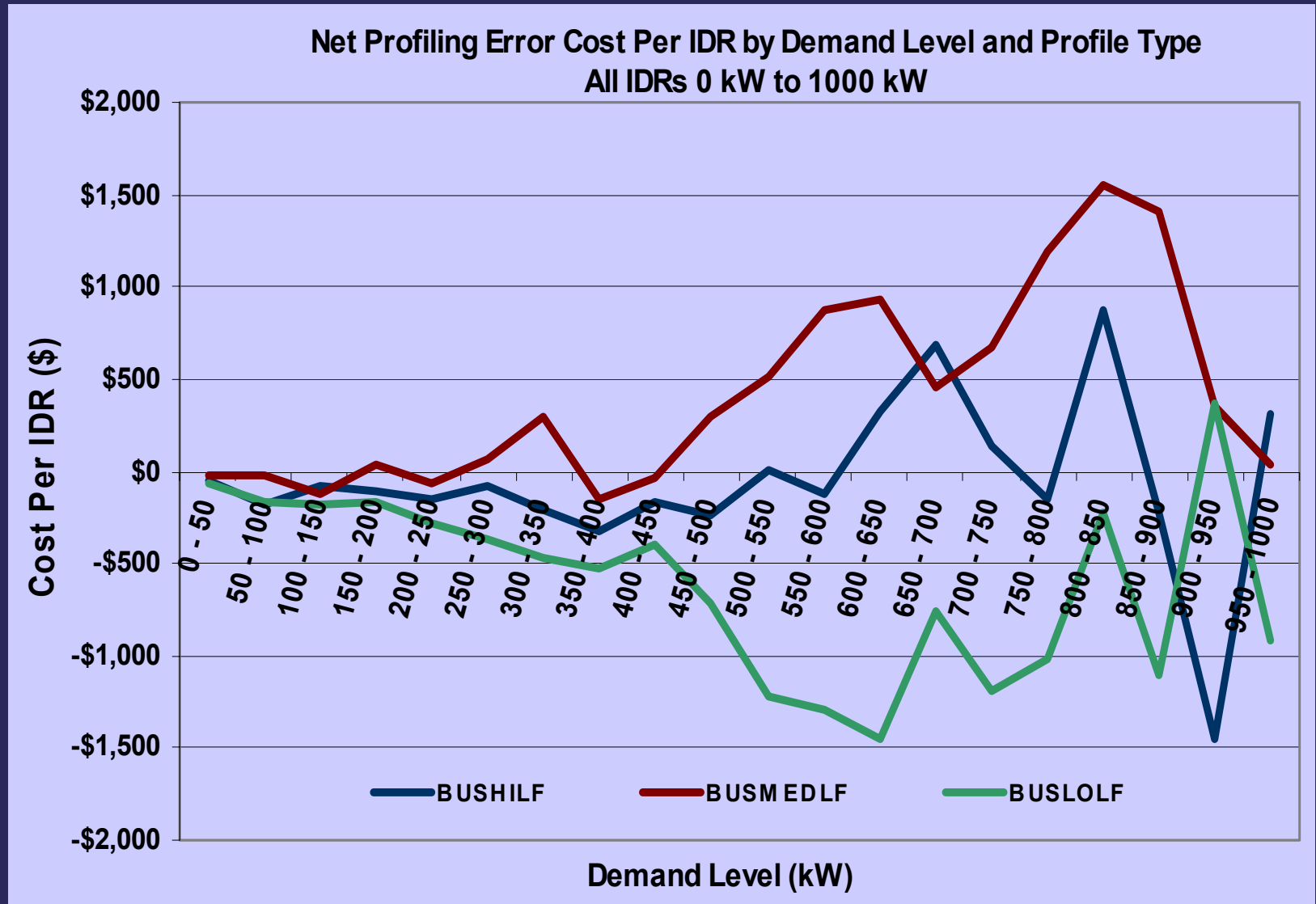
*ERCOT analyzed the impact of establishing a demand threshold below which IDRs could be voluntarily removed*

# Voluntary Removal Net Profiling Error Cost

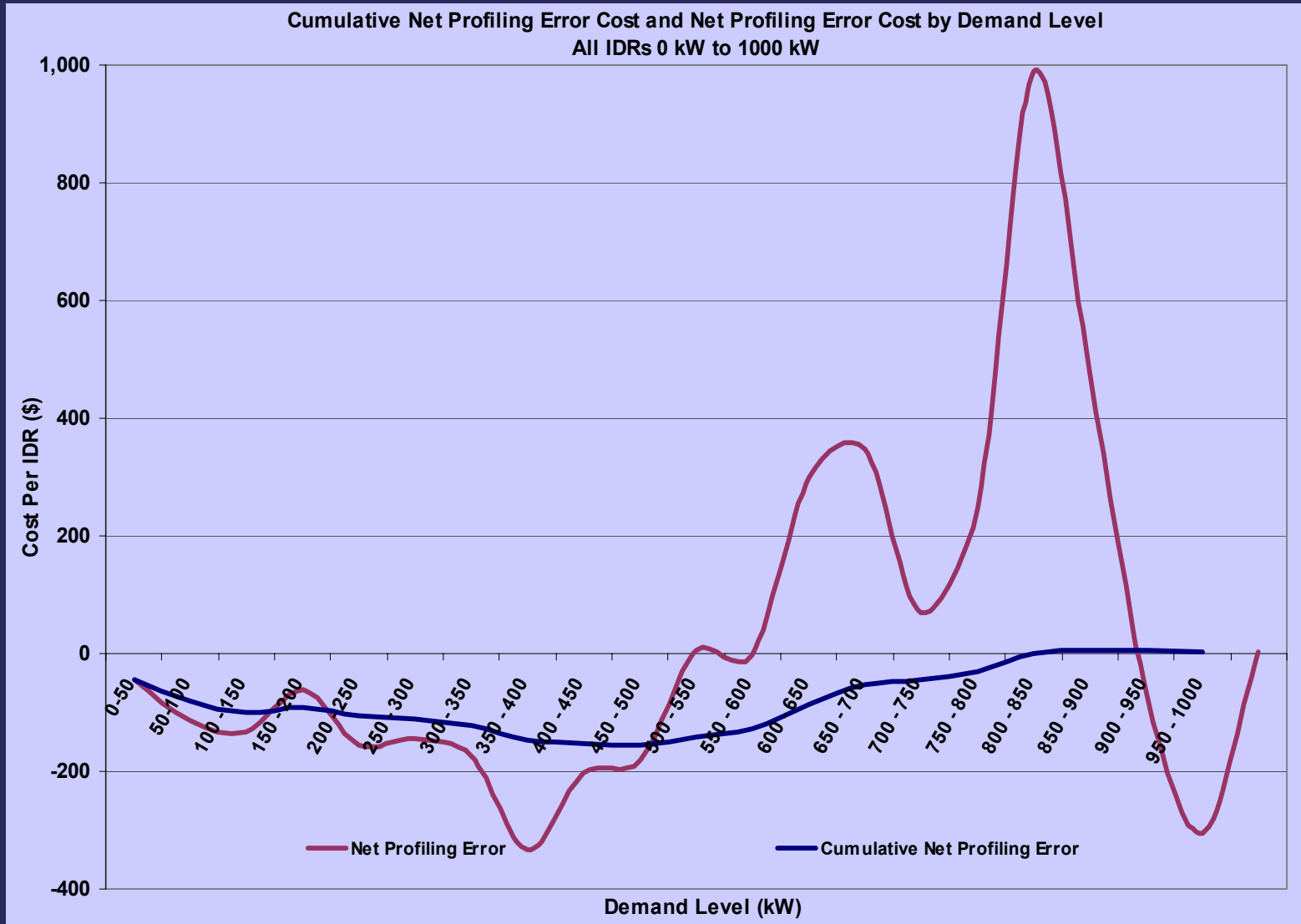


# Voluntary Removal

## Net Profiling Error Cost



# Voluntary Removal Net Profiling Error Cost



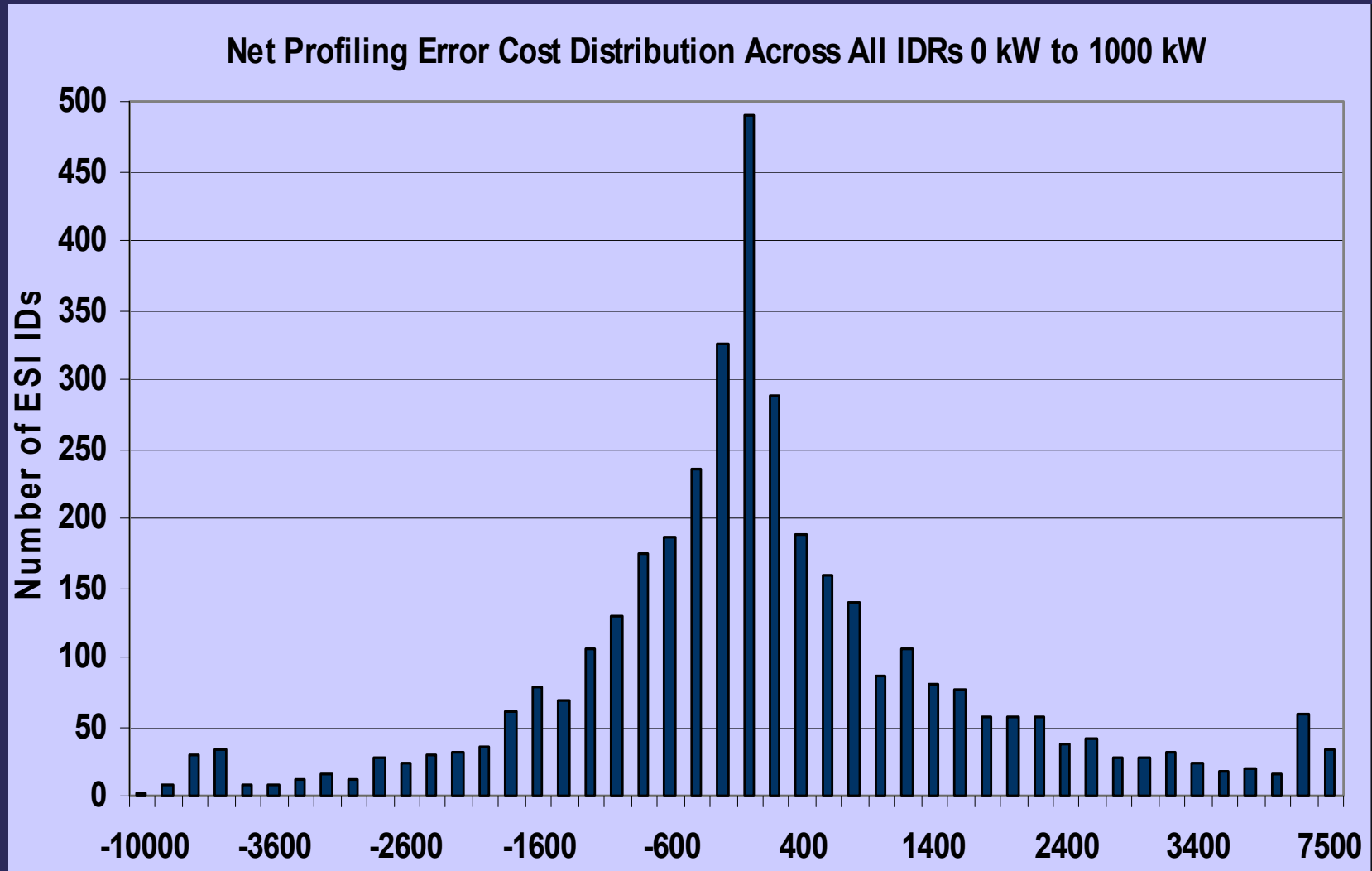


# Voluntary Removal

## Net Profiling Error - All IDRs 0 kW to 1000 kW

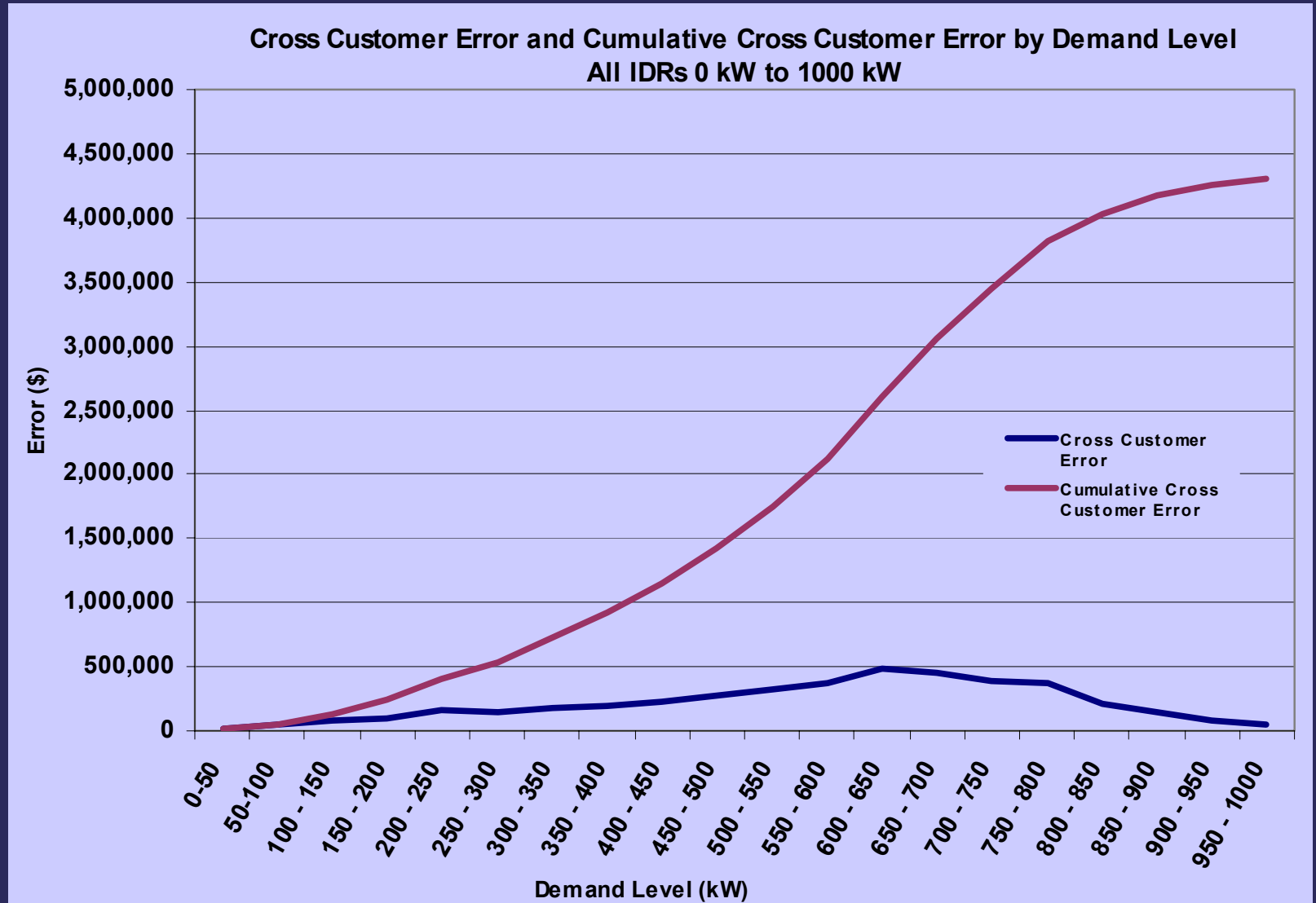
Demand Level (kW)	Counts	Total kWh	Settlement Cost (\$)	Net Profiling Error Cost (\$)	Net Error %	Net Profiling Error Cost Per IDR (\$)
0 - 50	189	12,339,740	\$482,781	-\$8,549	-1.8%	-\$45
50 - 100	198	40,439,449	\$1,482,753	-\$22,713	-1.5%	-\$115
100 - 150	231	89,201,969	\$3,210,288	-\$30,938	-1.0%	-\$134
150 - 200	202	111,101,851	\$3,976,499	-\$12,181	-0.3%	-\$60
200 - 250	237	173,698,124	\$6,180,964	-\$36,731	-0.6%	-\$155
250 - 300	197	180,050,027	\$6,389,880	-\$28,554	-0.4%	-\$145
300 - 350	226	255,414,624	\$9,011,827	-\$39,304	-0.4%	-\$174
350 - 400	214	284,864,012	\$10,100,562	-\$71,180	-0.7%	-\$333
400 - 450	228	379,574,327	\$13,410,662	-\$45,925	-0.3%	-\$201
450 - 500	218	414,422,254	\$14,587,235	-\$39,272	-0.3%	-\$180
500 - 550	243	524,682,032	\$18,510,503	\$1,050	0.0%	\$4
550 - 600	247	582,488,044	\$20,403,832	-\$389	0.0%	-\$2
600 - 650	276	752,469,249	\$26,296,407	\$82,967	0.3%	\$301
650 - 700	249	697,722,807	\$24,511,941	\$86,314	0.4%	\$347
700 - 750	199	600,833,144	\$21,122,922	\$14,029	0.1%	\$70
750 - 800	172	559,917,753	\$19,707,178	\$42,996	0.2%	\$250
800 - 850	105	328,976,820	\$11,706,855	\$103,760	0.9%	\$988
850 - 900	61	217,715,831	\$7,726,144	\$29,288	0.4%	\$480
900 - 950	30	91,750,471	\$3,445,999	-\$2,067	-0.1%	-\$69
950 - 1000	30	80,444,841	\$2,845,555	-\$9,165	-0.3%	-\$306
<b>Total</b>	<b>3,752</b>	<b>6,378,107,370</b>	<b>\$225,110,786</b>	<b>\$13,435</b>	<b>0.0%</b>	<b>\$4</b>

# Distribution of Net Profiling Error



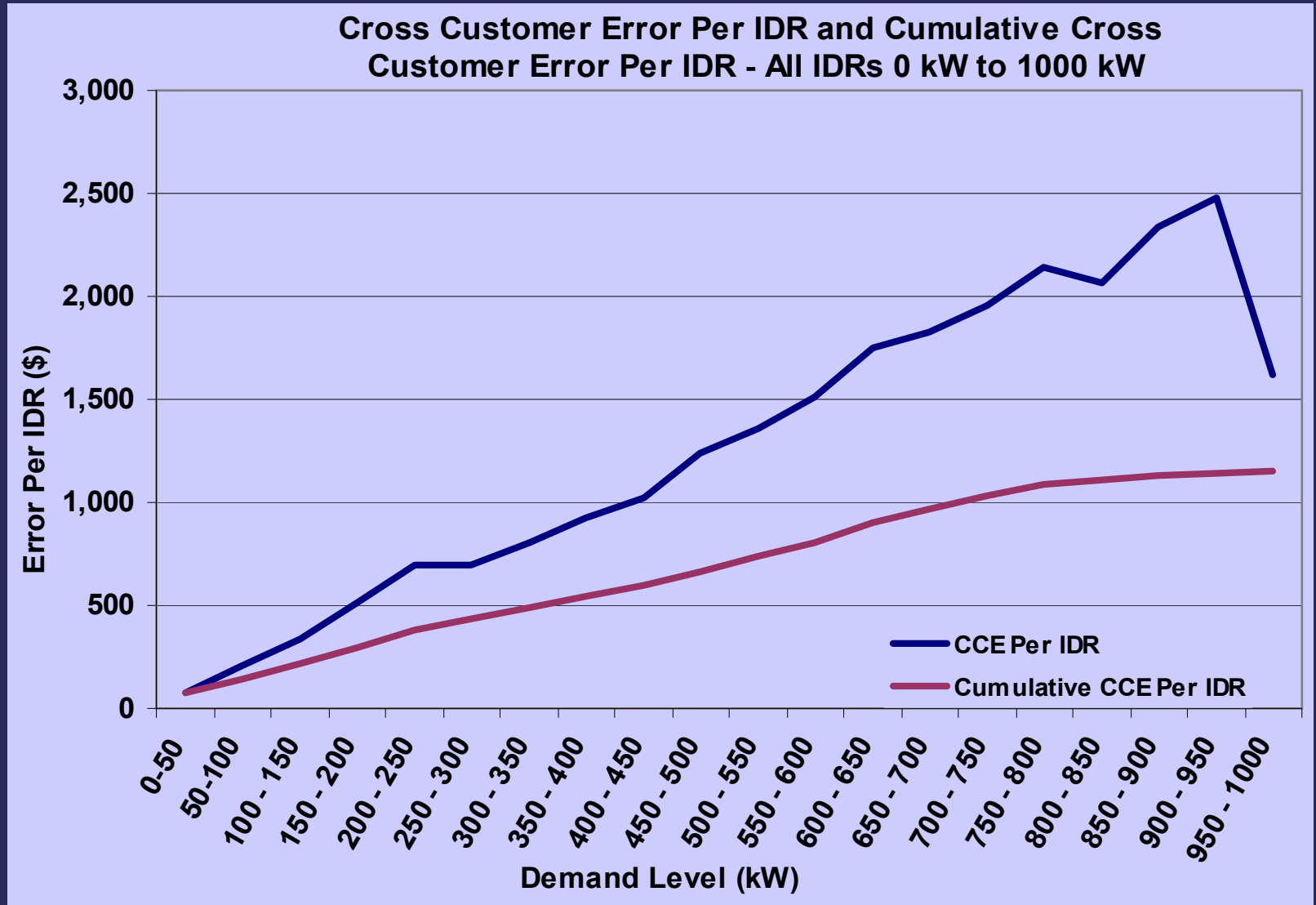
# Voluntary Removal

## Cross Customer Error



# Voluntary Removal

## Cross Customer Error



# Voluntary Removal

## Cross Customer Error Summary - All IDRs 0 kW to 1000 kW

Demand Level (kW)	Counts	Total kWh	Settlement Cost (\$)	Cross Customer Error (\$)	Cross Customer Error %	Cross Customer Error (\$) Per IDR
0 - 50	189	12,339,740	\$482,781	\$14,415	3.0%	\$76
50 - 100	198	40,439,449	\$1,482,753	\$40,740	2.7%	\$206
100 - 150	231	89,201,969	\$3,210,288	\$78,762	2.5%	\$341
150 - 200	202	111,101,851	\$3,976,499	\$103,745	2.6%	\$514
200 - 250	237	173,698,124	\$6,180,964	\$165,438	2.7%	\$698
250 - 300	197	180,050,027	\$6,389,880	\$137,737	2.2%	\$699
300 - 350	226	255,414,624	\$9,011,827	\$180,677	2.0%	\$799
350 - 400	214	284,864,012	\$10,100,562	\$198,513	2.0%	\$928
400 - 450	228	379,574,327	\$13,410,662	\$233,476	1.7%	\$1,024
450 - 500	218	414,422,254	\$14,587,235	\$270,499	1.9%	\$1,241
500 - 550	243	524,682,032	\$18,510,503	\$329,736	1.8%	\$1,357
550 - 600	247	582,488,044	\$20,403,832	\$372,215	1.8%	\$1,507
600 - 650	276	752,469,249	\$26,296,407	\$481,650	1.8%	\$1,745
650 - 700	249	697,722,807	\$24,511,941	\$454,046	1.9%	\$1,823
700 - 750	199	600,833,144	\$21,122,922	\$390,314	1.8%	\$1,961
750 - 800	172	559,917,753	\$19,707,178	\$368,111	1.9%	\$2,140
800 - 850	105	328,976,820	\$11,706,855	\$217,127	1.9%	\$2,068
850 - 900	61	217,715,831	\$7,726,144	\$142,737	1.8%	\$2,340
900 - 950	30	91,750,471	\$3,445,999	\$74,317	2.2%	\$2,477
950 - 1000	30	80,444,841	\$2,845,555	\$48,635	1.7%	\$1,621
<b>TOTAL</b>	<b>3,752</b>	<b>6,378,107,370</b>	<b>\$225,110,786</b>	<b>\$4,302,891</b>	<b>1.9%</b>	<b>\$1,147</b>



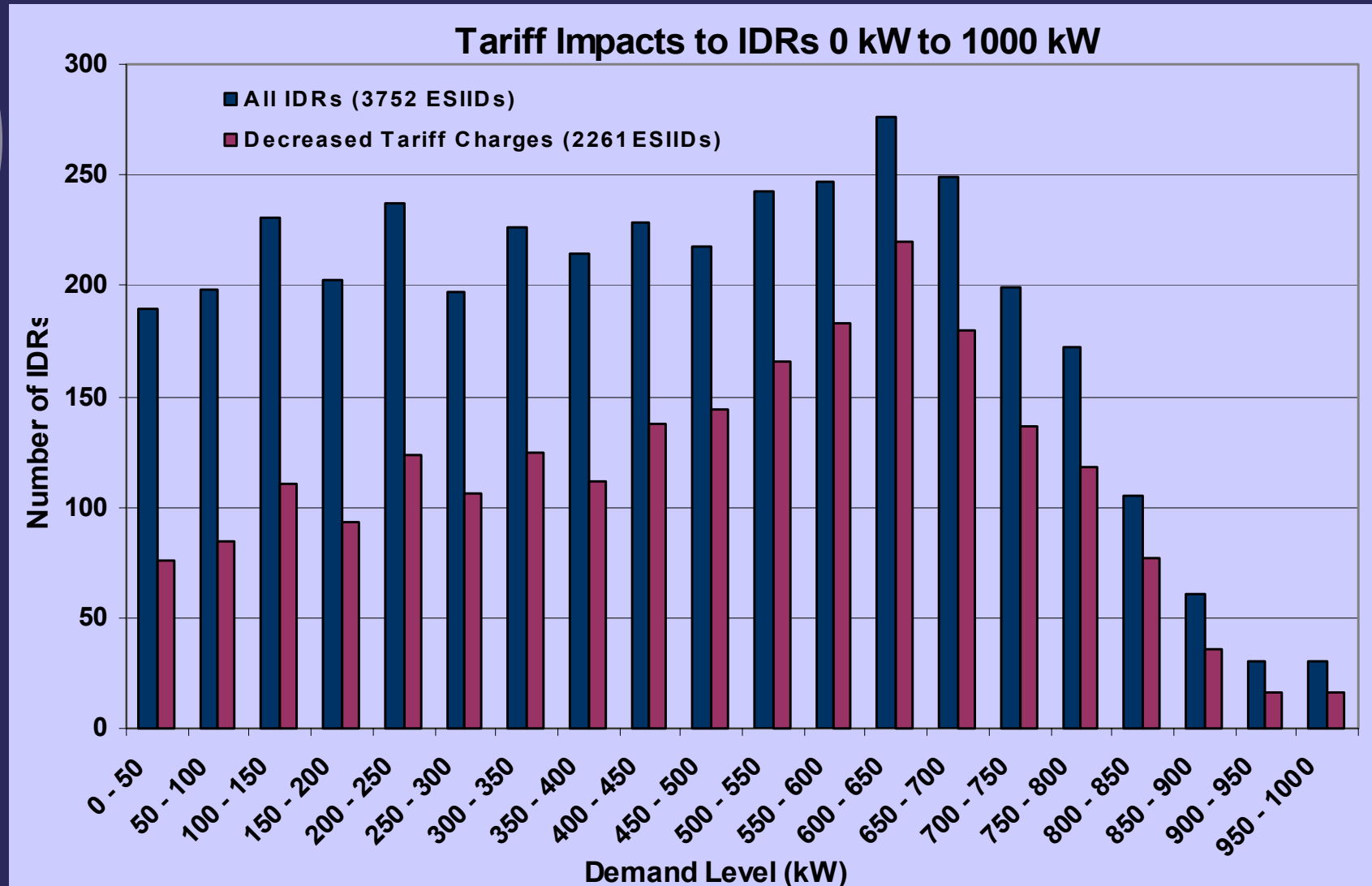
# Voluntary Removal

## Cumulative Cross Customer Error-All IDRs 0 kW to 1000 kW

Demand Level (kW)	Counts	Total kWh	Settlement Cost (\$)	Cross Customer Error (\$)	Cross Customer Error %	Cross Customer Error (\$) Per IDR
0 - 50	189	12,339,740	\$482,781	\$14,415	3.0%	\$76
50 - 100	387	52,779,189	\$1,965,534	\$55,155	2.8%	\$143
100 - 150	618	141,981,157	\$5,175,822	\$133,917	2.6%	\$217
150 - 200	820	253,083,008	\$9,152,321	\$237,662	2.6%	\$290
200 - 250	1,057	426,781,132	\$15,333,286	\$403,100	2.6%	\$381
250 - 300	1,254	606,831,160	\$21,723,165	\$540,837	2.5%	\$431
300 - 350	1,480	862,245,784	\$30,734,992	\$721,515	2.3%	\$488
350 - 400	1,694	1,147,109,796	\$40,835,554	\$920,028	2.3%	\$543
400 - 450	1,922	1,526,684,123	\$54,246,216	\$1,153,504	2.1%	\$600
450 - 500	2,140	1,941,106,377	\$68,833,450	\$1,424,003	2.1%	\$665
500 - 550	2,383	2,465,788,409	\$87,343,954	\$1,753,739	2.0%	\$736
550 - 600	2,630	3,048,276,452	\$107,747,785	\$2,125,954	2.0%	\$808
600 - 650	2,906	3,800,745,701	\$134,044,192	\$2,607,603	1.9%	\$897
650 - 700	3,155	4,498,468,509	\$158,556,133	\$3,061,649	1.9%	\$970
700 - 750	3,354	5,099,301,653	\$179,679,055	\$3,451,964	1.9%	\$1,029
750 - 800	3,526	5,659,219,406	\$199,386,234	\$3,820,074	1.9%	\$1,083
800 - 850	3,631	5,988,196,226	\$211,093,088	\$4,037,202	1.9%	\$1,112
850 - 900	3,692	6,205,912,057	\$218,819,232	\$4,179,939	1.9%	\$1,132
900 - 950	3,722	6,297,662,528	\$222,265,232	\$4,254,256	1.9%	\$1,143
950 - 1000	3,752	6,378,107,370	\$225,110,786	\$4,302,891	1.9%	\$1,147

# Voluntary Removal

## *Distribution of IDRs by Tariff Impact and Demand Level*





# Tariff Savings for Premises which Benefit by Removing IDR Meter

Demand Level (kW)	Counts	Total kWh	Non-IDR (NCP) Total Cost (\$/yr)	Avg. NCP Cost Per IDR (\$)	IDR (4CP) Total Cost (\$/yr)	Avg. 4CP Cost Per IDR (\$)	Savings Per IDR (\$)	% of Total IDRS (<1000 kW)
0 - 50	76	6,198,619	38,256	503	92,090	1,212	708	40.6
50 - 100	84	19,904,282	78,451	934	135,360	1,611	677	42.6
100 - 150	111	50,703,481	165,154	1,488	229,518	2,068	580	48.5
150 - 200	93	62,503,000	193,740	2,083	249,753	2,686	602	46.5
200 - 250	124	111,149,036	332,336	2,680	423,700	3,417	737	53.2
250 - 300	106	116,865,751	335,463	3,165	424,587	4,006	841	54.4
300 - 350	125	181,702,080	480,137	3,841	602,026	4,816	975	56.1
350 - 400	112	193,924,139	494,103	4,412	626,454	5,593	1,182	52.8
400 - 450	138	275,836,328	670,071	4,856	881,141	6,385	1,529	61.9
450 - 500	144	320,252,016	790,996	5,493	1,047,141	7,272	1,779	66.4
500 - 550	166	408,245,372	1,018,177	6,134	1,335,669	8,046	1,913	69.5
550 - 600	183	493,440,648	1,215,482	6,642	1,586,677	8,670	2,028	74.4
600 - 650	220	652,844,673	1,622,025	7,373	2,083,830	9,472	2,099	79.1
650 - 700	180	564,666,738	1,384,544	7,692	1,817,742	10,099	2,407	72.0
700 - 750	136	463,146,238	1,115,694	8,204	1,428,136	10,501	2,297	68.3
750 - 800	118	420,100,462	1,049,724	8,896	1,313,949	11,135	2,239	69.0
800 - 850	77	276,861,413	692,909	8,999	886,375	11,511	2,513	74.0
850 - 900	36	133,148,008	332,504	9,236	403,378	11,205	1,969	58.1
900 - 950	16	62,956,435	159,397	9,962	192,821	12,051	2,089	55.2
950 - 1000	16	49,912,428	130,980	8,186	158,131	9,883	1,697	51.6
<b>Total</b>	<b>2,261</b>	<b>4,864,361,147</b>	<b>12,300,142</b>	<b>5,440</b>	<b>15,918,478</b>	<b>7,040</b>	<b>1,600</b>	<b>60.7</b>



# Voluntary Removal

## Net Profiling Error Summary of IDRs with Lower Tariff Charges

Demand Level (kW)	IDRs With Lower Settlement Costs			IDRs With Higher Settlement Costs		
	Counts	Net Profiling Error Cost (\$)	Net Profiling Error Cost Per IDR (\$)	Counts	Net Profiling Error Cost (\$)	Net Profiling Error Cost Per IDR (\$)
0 - 50	27	1,408	52	49	(2,392)	(49)
50 - 100	24	4,209	175	60	(7,619)	(127)
100 - 150	41	8,503	207	70	(15,353)	(219)
150 - 200	38	19,094	502	55	(17,032)	(310)
200 - 250	54	26,601	493	70	(32,251)	(461)
250 - 300	46	30,892	672	60	(28,779)	(480)
300 - 350	49	37,254	760	76	(40,145)	(528)
350 - 400	45	31,292	695	67	(38,083)	(568)
400 - 450	51	43,014	843	87	(50,831)	(584)
450 - 500	71	63,610	896	73	(53,300)	(730)
500 - 550	99	99,403	1,004	67	(45,170)	(674)
550 - 600	101	103,022	1,020	82	(79,002)	(963)
600 - 650	121	157,968	1,306	99	(94,459)	(954)
650 - 700	112	133,077	1,188	68	(69,166)	(1,017)
700 - 750	83	122,935	1,481	53	(58,428)	(1,102)
750 - 800	68	132,578	1,950	50	(54,810)	(1,096)
800 - 850	51	89,734	1,759	26	(24,375)	(937)
850 - 900	28	58,961	2,106	8	(11,300)	(1,412)
900 - 950	10	27,216	2,722	6	(6,476)	(1,079)
950 - 1000	11	18,305	1,664	5	(6,039)	(1,208)
<b>Total</b>	<b>1,130</b>	<b>1,209,076</b>	<b>1,070</b>	<b>1,131</b>	<b>(735,009)</b>	<b>(650)</b>

# Voluntary Removal

## Cumulative Cross Customer Error Summary of IDRs with Lower Tariff Charges



Demand Level (kW)	Counts	Cross Customer Error for Higher Settlement Cost IDRs (\$)	Cross Customer Error for Lower Settlement Cost IDRs (\$)	Total Cross Customer Error (\$)	Cross Customer Error (\$) Per IDR
0 - 50	76	2,392	1,408	3,800	50
50 - 100	160	10,011	5,616	15,627	98
100 - 150	271	25,364	14,119	39,483	146
150 - 200	364	42,395	33,213	75,609	208
200 - 250	488	74,646	59,815	134,461	276
250 - 300	594	103,425	90,707	194,132	327
300 - 350	719	143,569	127,961	271,530	378
350 - 400	831	181,653	159,252	340,905	410
400 - 450	969	232,484	202,266	434,750	449
450 - 500	1,113	285,784	265,876	551,660	496
500 - 550	1,279	330,954	365,279	696,233	544
550 - 600	1,462	409,957	468,301	878,258	601
600 - 650	1,682	504,416	626,269	1,130,685	672
650 - 700	1,862	573,581	759,346	1,332,928	716
700 - 750	1,998	632,010	882,281	1,514,291	758
750 - 800	2,116	686,820	1,014,860	1,701,680	804
800 - 850	2,193	711,195	1,104,593	1,815,788	828
850 - 900	2,229	722,494	1,163,555	1,886,049	846
900 - 950	2,245	728,970	1,190,771	1,919,741	855
950 - 1000	2,261	735,009	1,209,076	1,944,085	860

# Mandatory Installation Threshold

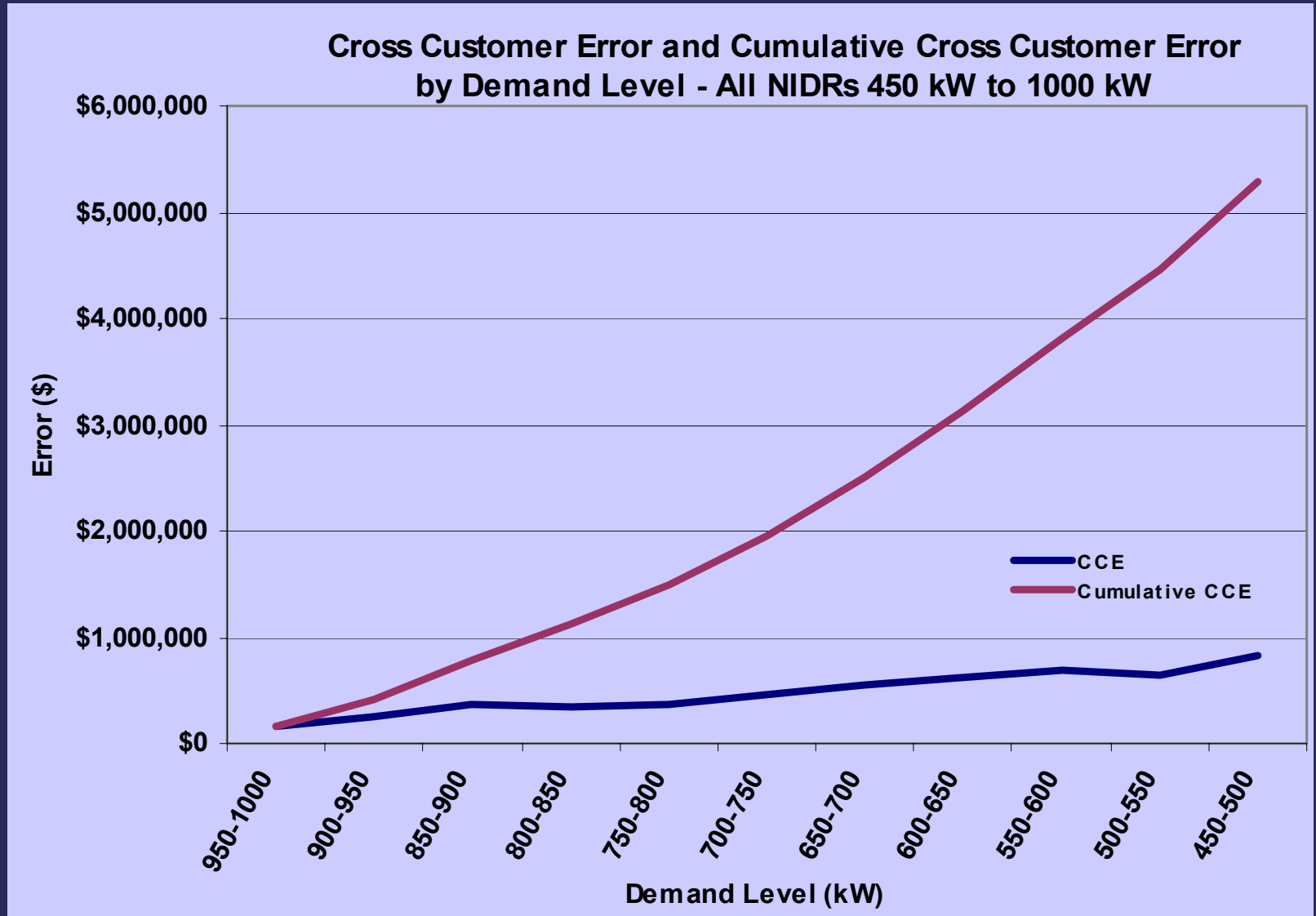
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Current requirement specifies an IDR shall be installed when peak demand is greater than 1000 kW (more than two times in a year)

*ERCOT considered lowering the threshold required for installation*

# Mandatory Installation

## Cross Customer Error

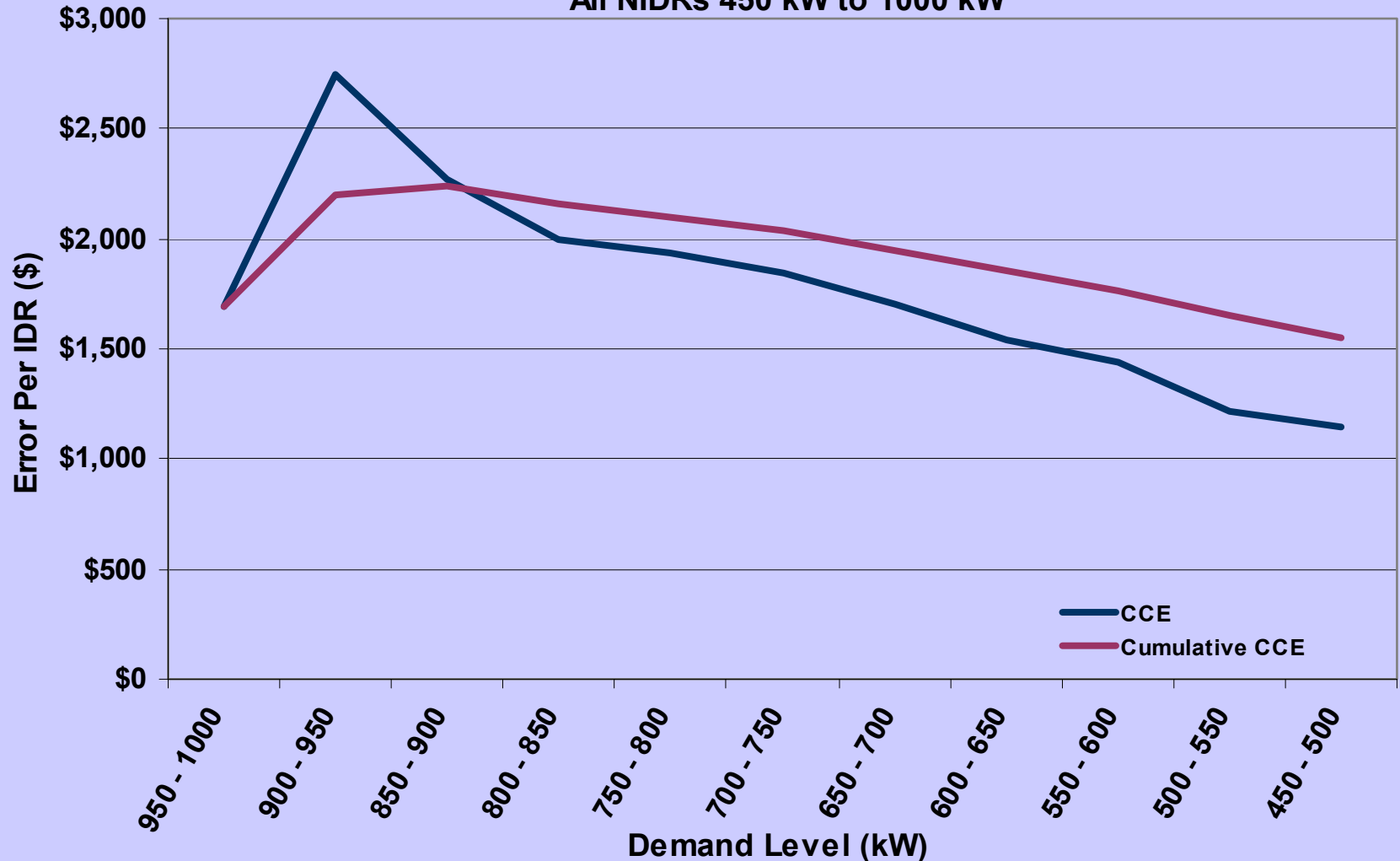


# Mandatory Installation

## *Cross Customer Error Per IDR*

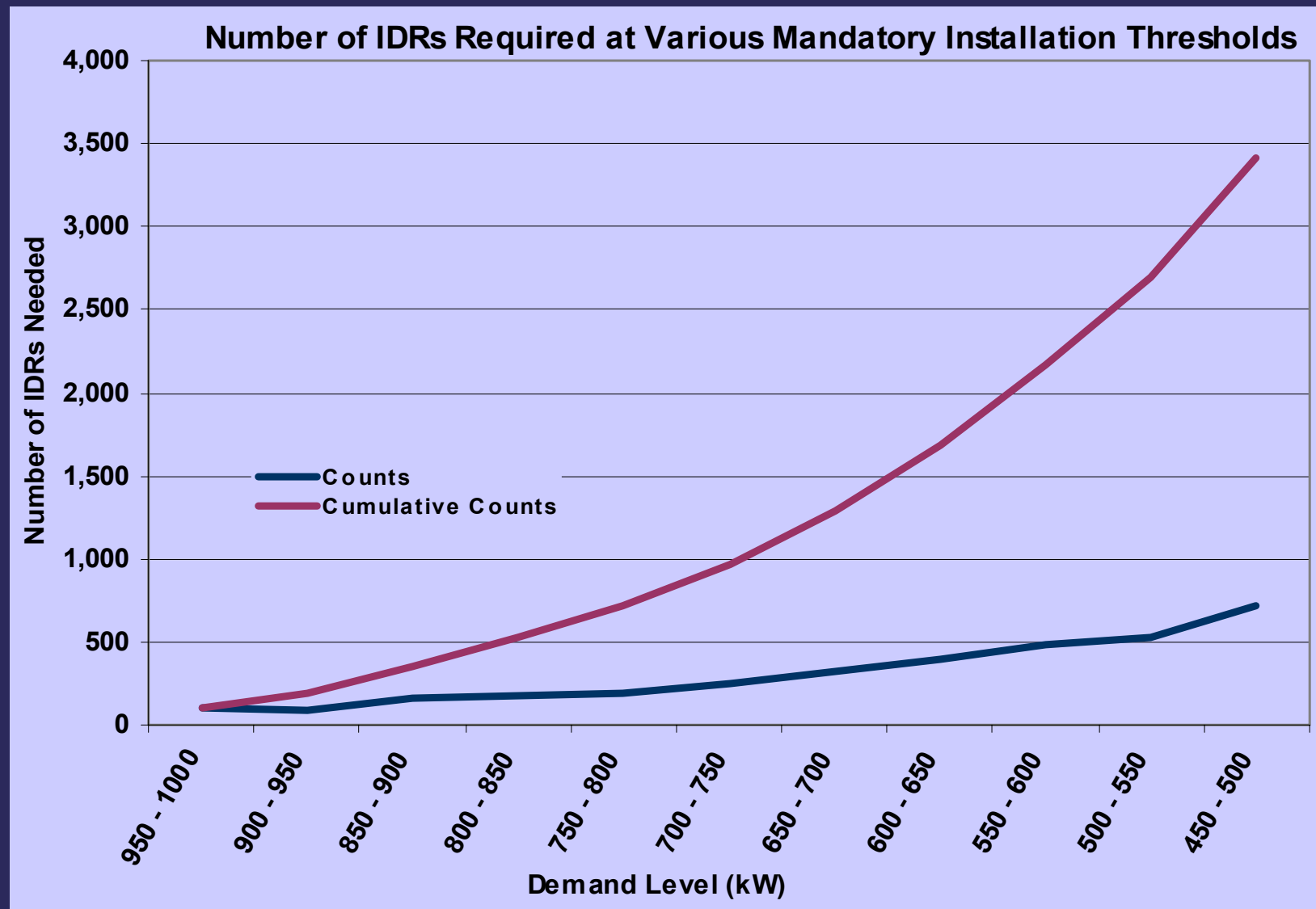


**Cross Customer Error Per IDR by Demand Level**  
All NIDRs 450 kW to 1000 kW



# Mandatory Installation

## *Number of IDRs that would be Required*



# Mandatory Installation

## Cumulative Cross Customer Error

### All NIDRs 450 kW to 1000 kW



Demand Level (kW)	Counts	Total kWh	Settlement Cost (\$)	Cross Customer Error (\$)	Cross Customer Error %	Cross Customer Error (\$) Per IDR
950 - 1000	99	304,375,543	\$10,808,737	\$167,847	1.55%	\$1,695
900 - 950	191	608,290,038	\$22,230,022	\$420,324	1.89%	\$2,201
850 - 900	354	1,146,969,355	\$41,385,031	\$791,167	1.91%	\$2,235
800 - 850	523	1,635,566,288	\$58,868,430	\$1,128,793	1.92%	\$2,158
750 - 800	714	2,158,152,959	\$77,374,670	\$1,498,775	1.94%	\$2,099
700 - 750	964	2,781,897,753	\$99,506,131	\$1,959,217	1.97%	\$2,032
650 - 700	1,289	3,561,006,365	\$127,076,699	\$2,514,159	1.98%	\$1,950
600 - 650	1,687	4,459,700,769	\$158,599,950	\$3,128,380	1.97%	\$1,854
550 - 600	2,169	5,463,397,724	\$193,952,100	\$3,823,731	1.97%	\$1,763
500 - 550	2,700	6,472,404,885	\$229,592,099	\$4,470,997	1.95%	\$1,656
450 - 500	3,419	7,657,393,997	\$271,442,023	\$5,292,340	1.95%	\$1,548

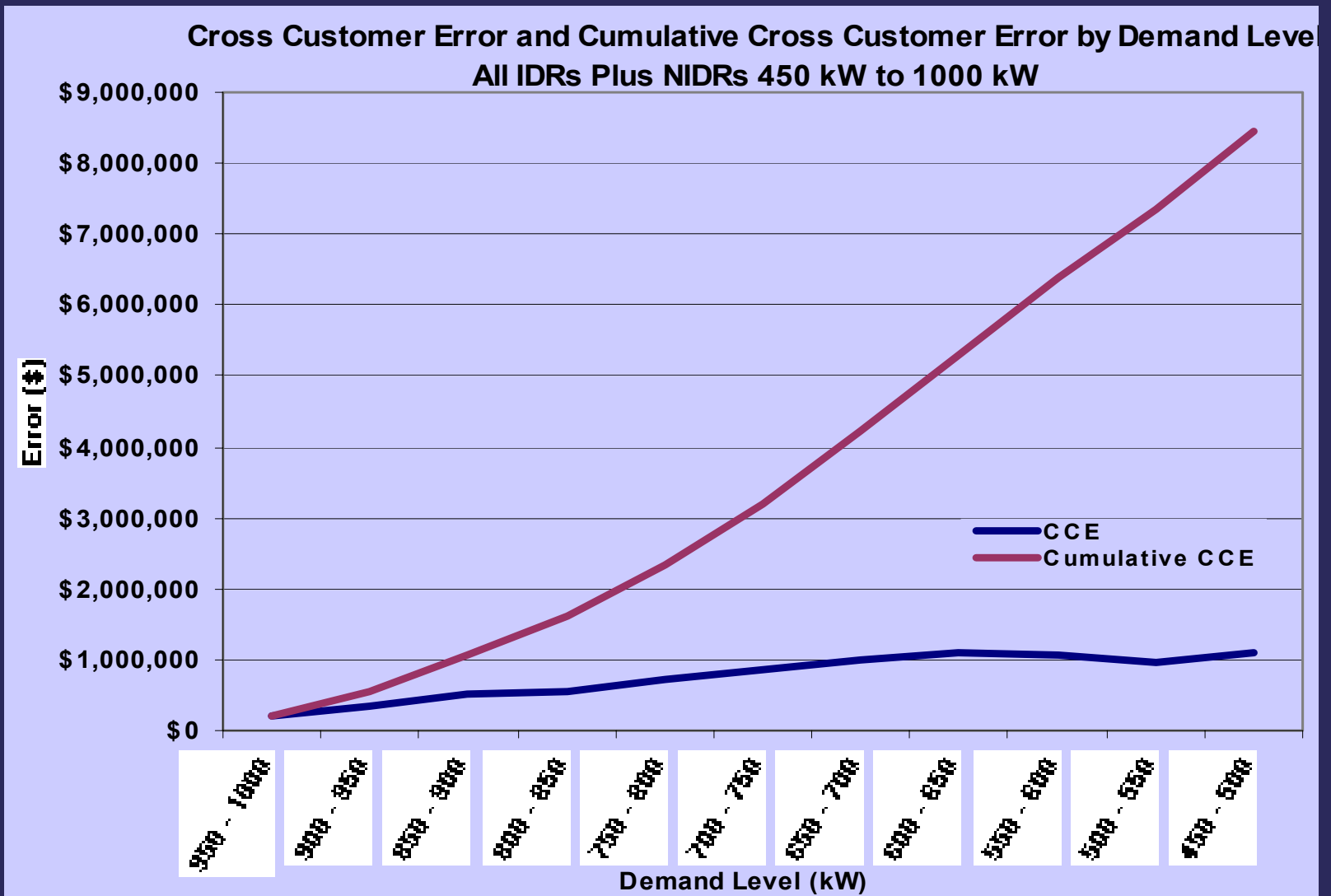
# Combination Required Installation and Optional Removal Thresholds

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*ERCOT considered lowering the  
required installation threshold and  
allowing voluntary removal of IDRs  
below that threshold*

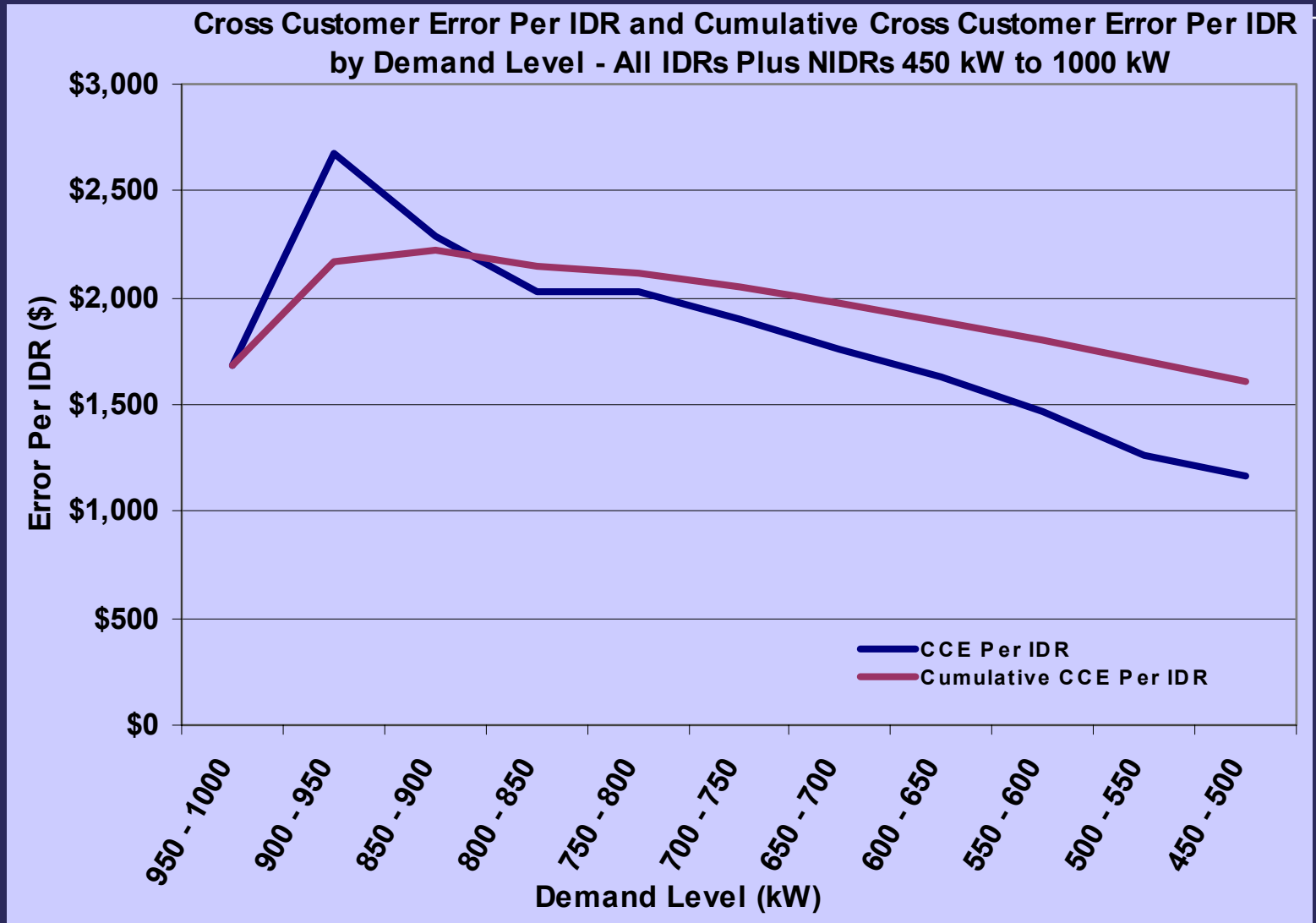


# Mandatory Installation and Optional Removal *Cross Customer Error*



# Mandatory Installation and Optional Removal

## *Cross Customer Error Per IDR*



# Reliability Benefits

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With IDRs accurate price signals at times of short supply can reduce demand levels and increase reliability

- Value to customer of maintaining load
- Avoided costs of rationing
- Avoided costs of restoration
- Avoided damage to reputation of utility/ISO
- Avoided payments from lawsuits
- More opportunities for demand side resources

# ERCOT Recommendations

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- Initially set IDR threshold at 700 kW
  - 964 IDRs would need installation
  - Cross Customer Error reduction ~ \$2 million per year
- Optional removal below 200 kW
  - 802 premises impacted however likely that only 364 would experience tariff reductions
  - TDSP tariff reductions ~ \$635/premise
  - ~ \$208 Cross Customer Error introduced

# ERCOT Recommendations

## *Additional Research*

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- Incorporate UFE calculation and adjustment and extend analysis down to 100 kW for mandatory installation
- Analyze benefits of a mandatory TOU provision
- Analyze load research data to refine estimates particularly in 100 kW to 700 kW range