

Overview of Demand Response Programs in Michigan

Presentation to

Roadmap for Implementing Michigan's Next Energy Policy

Stakeholder Group

Monday, September 21, 2015



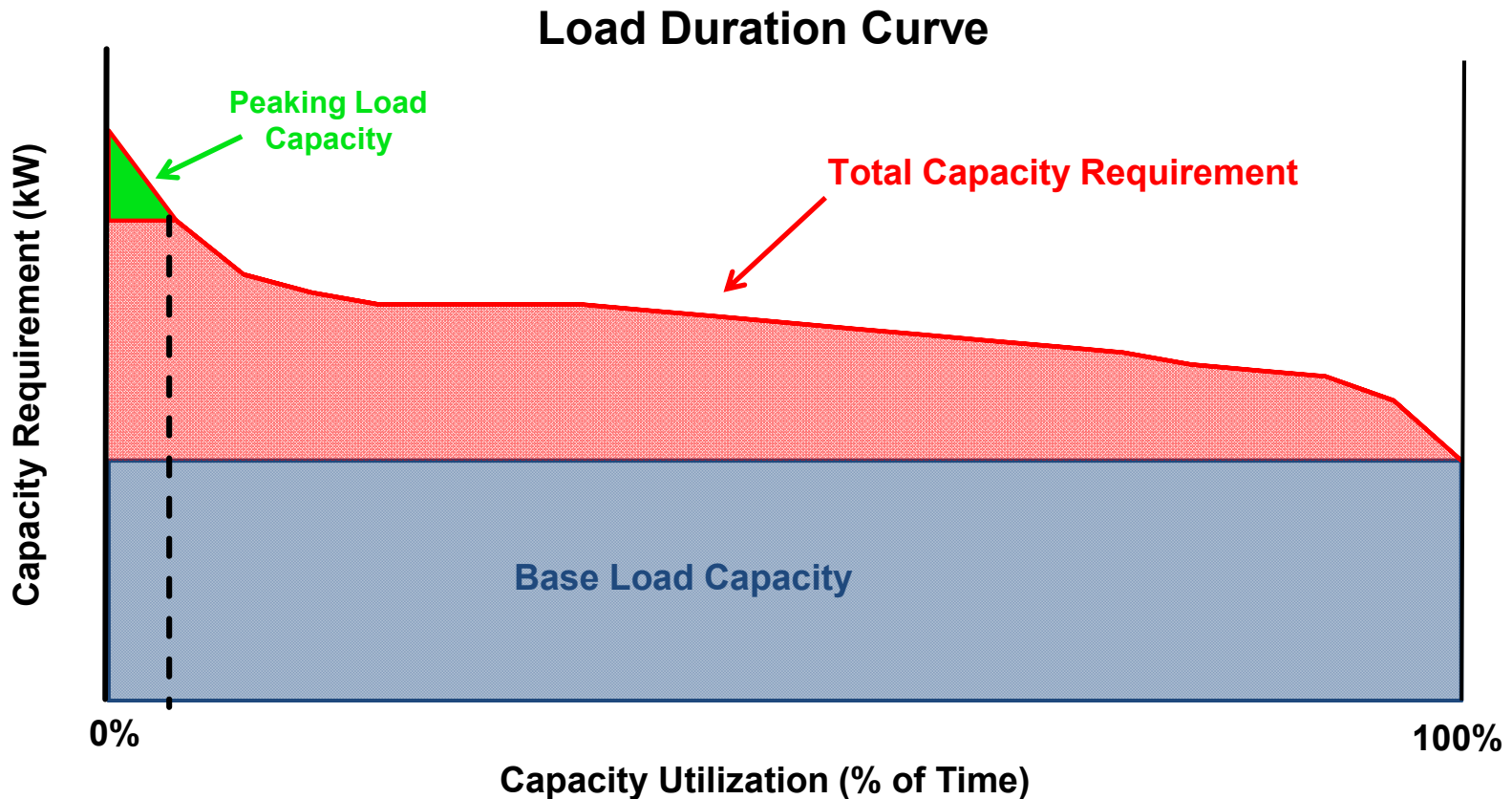
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Potential for DR in Michigan

- Mitigate potential capacity shortfall
 - Even if there isn't an *imminent* capacity shortfall, DR can help postpone an *inevitable* capacity shortfall.
- Provides a gradual change to load shape
- Can create additional energy savings
- Peak shaving helps save on all demand related costs
 - This includes transmission
- There is a well developed library of successful DR programs on which to draw experience



Peak Load Shaving



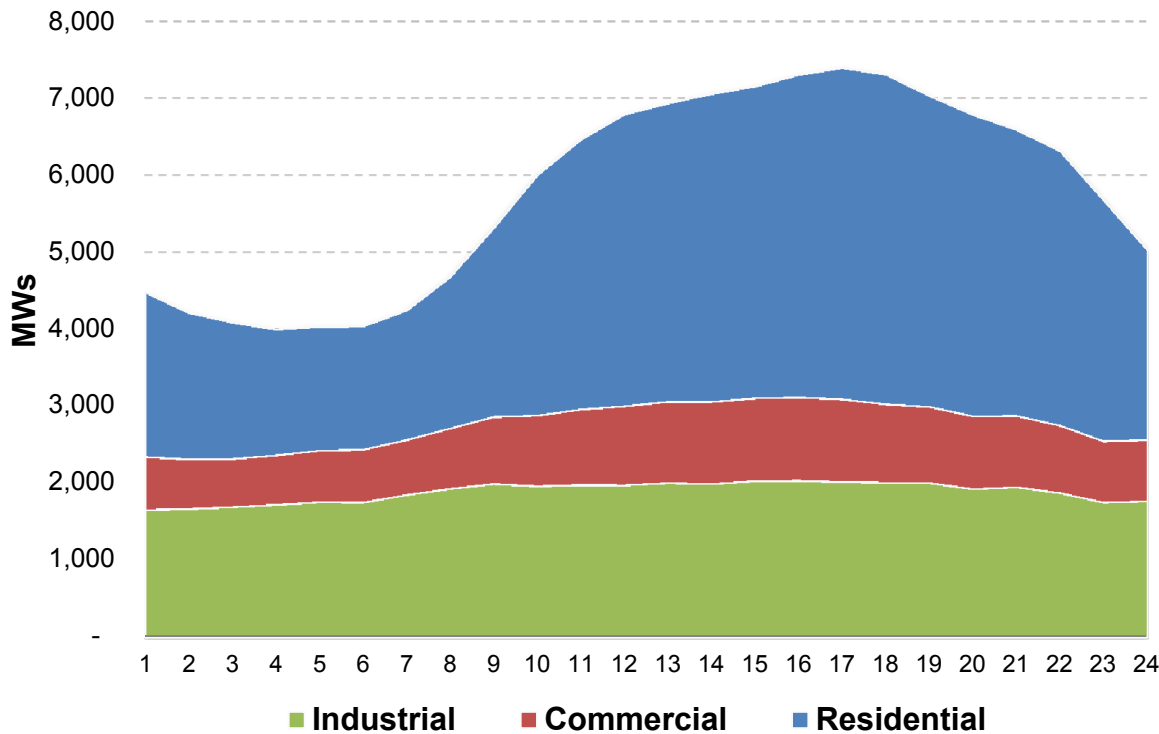
Source: Amy Ryan. March 20, 2015. *Metering & Smart Energy International*. "Demand Response: Uruguay power company selects Innovari's interactive platform". Available at: <http://www.metering.com/demand-response-uruguay-power-company-selects-innovaris-interactive-platform/> (accessed 9/18/15)



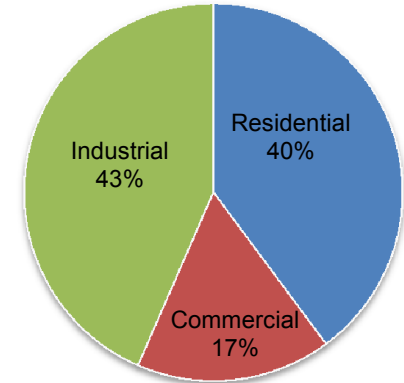
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Contribution to Peak by Class

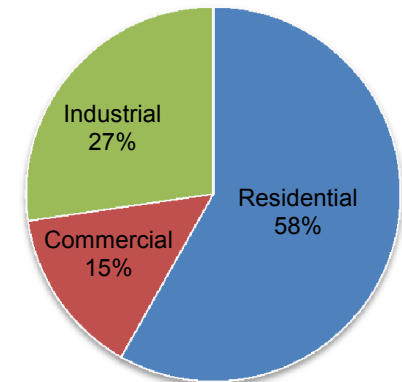
Consumers Energy Load Data from July 5th, 2010



5 AM Total Load by Class



5 PM Total Load by Class



A National Assessment of Demand Response Potential, FERC 2009

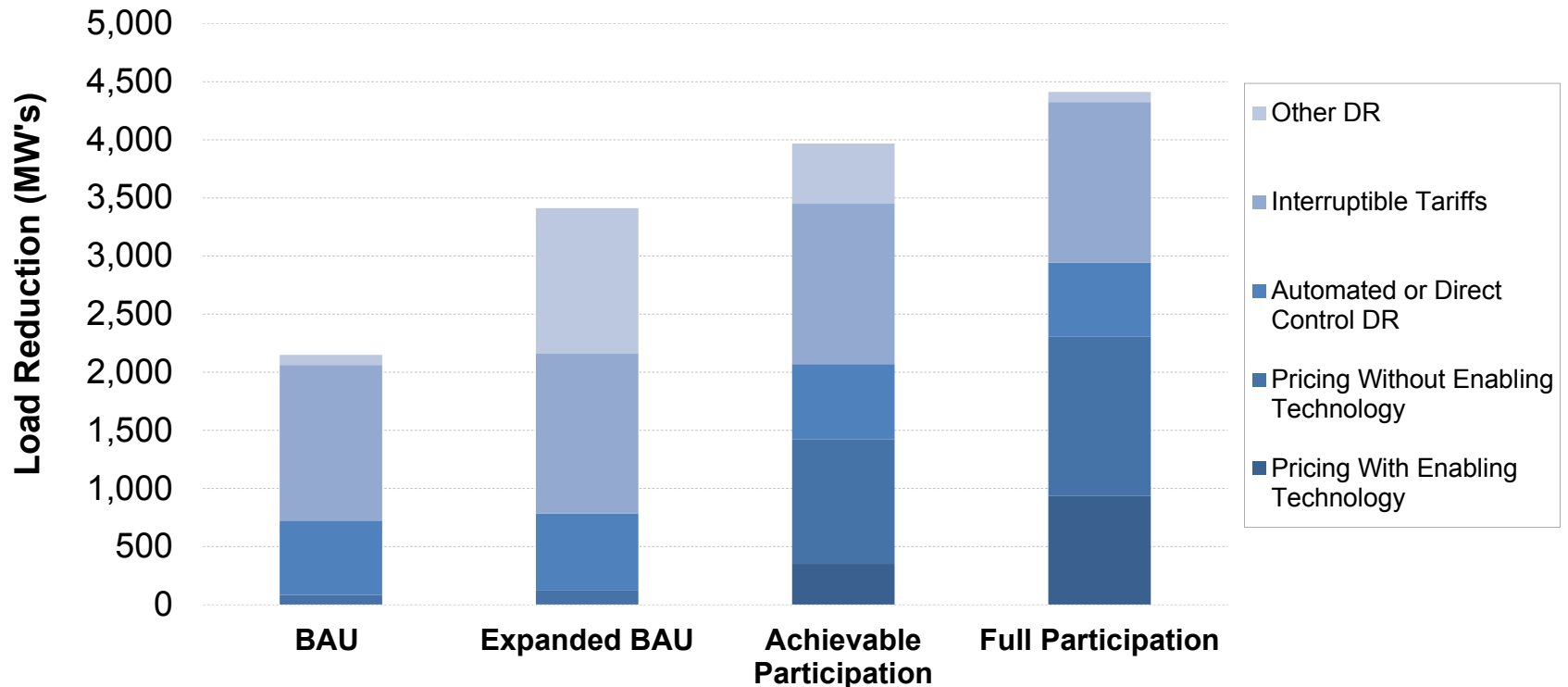
- Key drivers of Michigan's demand response potential estimate include:
 - Above average residential CAC saturation of 57%
 - Above average share of peak demand (37%) in the Large C&I classes
 - A large amount of existing demand response
 - Potential to deploy AMI at a faster-than-average rate.
 - Pricing with enabling technologies are cost effective for all customer classes, except for the residential class. DLC is cost effective for all customer classes (FERC 2009).



FERC NADR Model Results

MI DR Potential in 2019, by DR Type

(2019 System Peak = 27.5 GW)



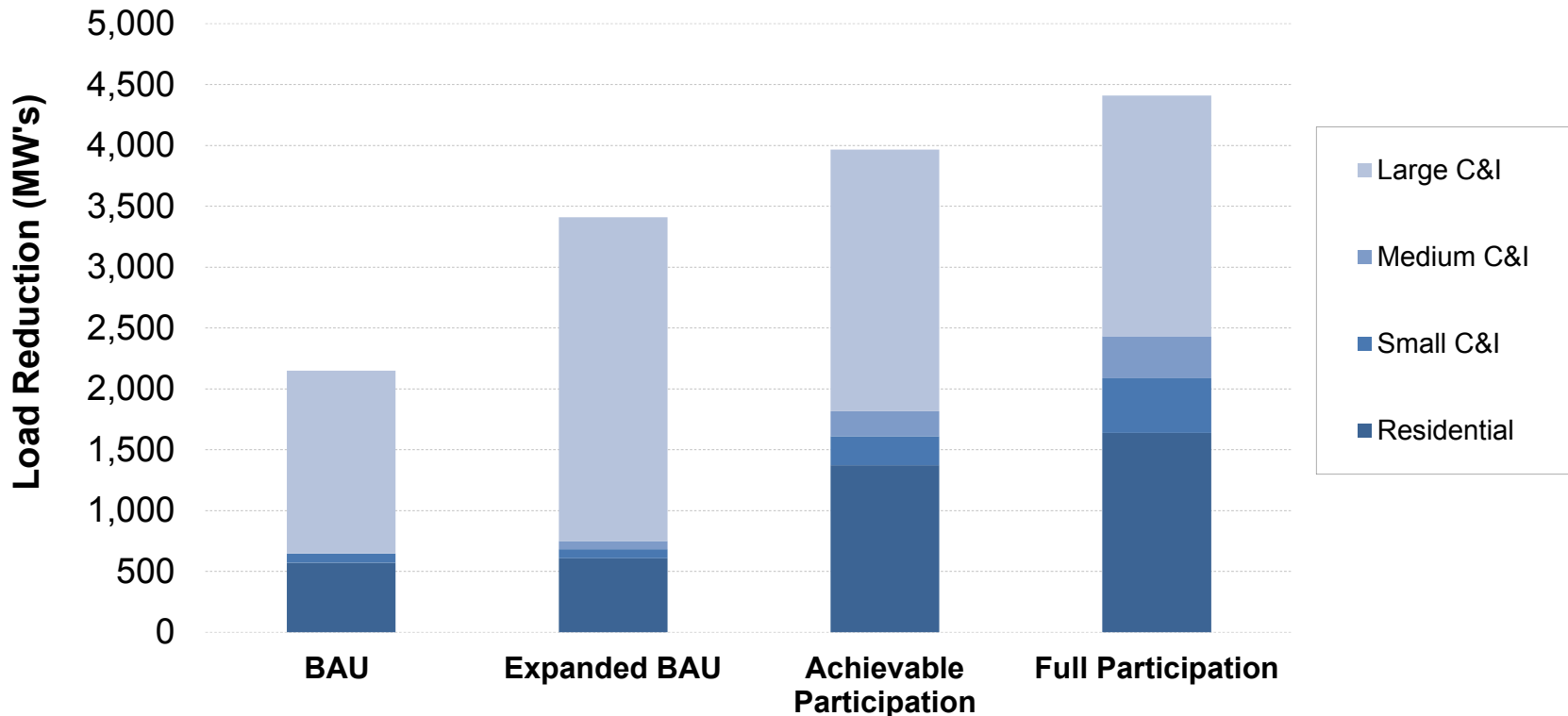
Source: The Federal Energy Regulatory Commission (FERC). June 2009. *A National Assessment of Demand Response Potential*. Available at: <https://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf> (accessed 9/18/15)



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FERC NADR Model Results

MI DR Potential in 2019, by Customer Category (2019 System Peak = 27.5 GW)

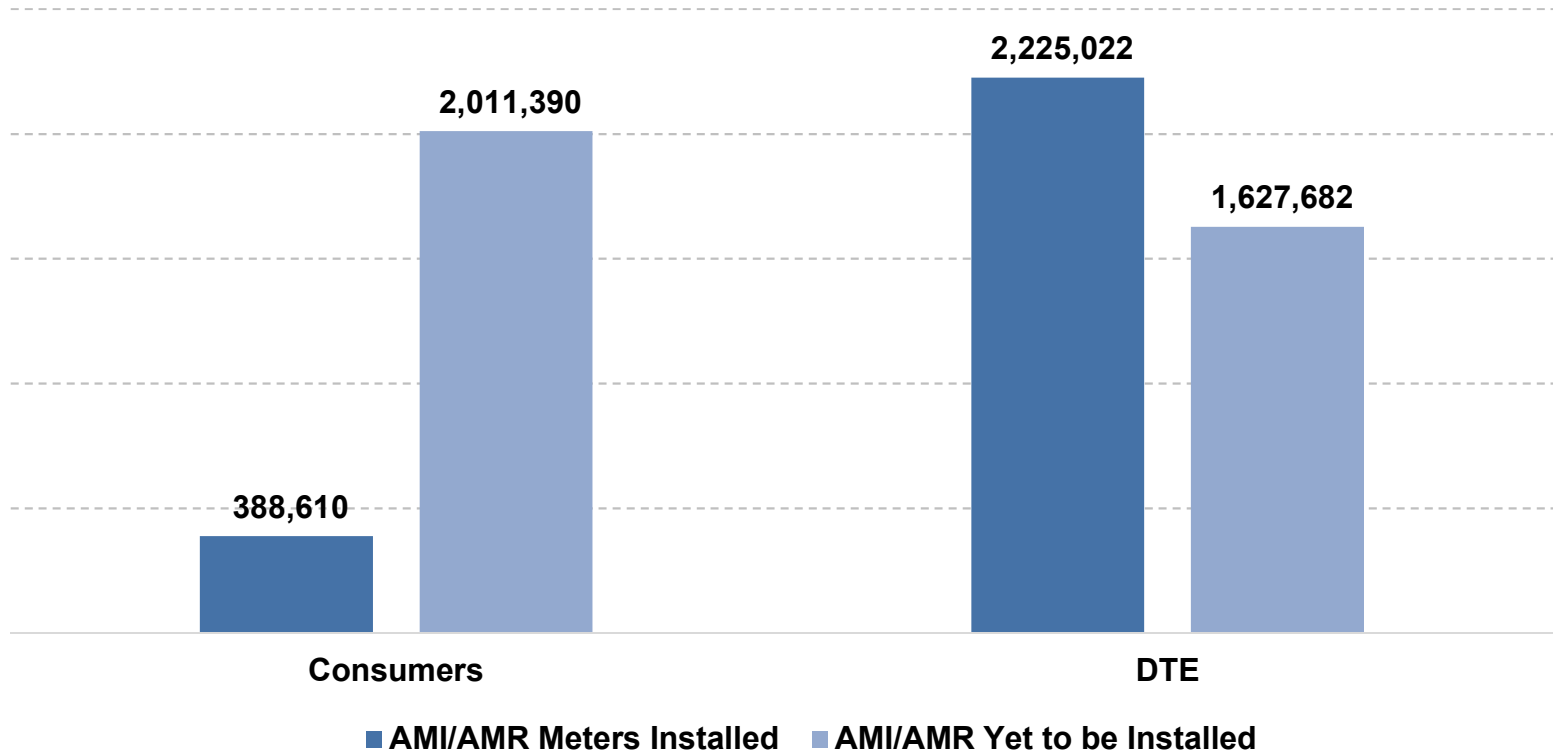


Source: FERC. June 2009. *A National Assessment of Demand Response Potential*. Available at: <https://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf> (accessed 9/18/15)



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Smart Meter Deployment



Source: MPSC Utility Survey



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Types of Demand Response Rate

- Behavioral
 - Discounted rates are offered to encourage load shifting and shaving
 - Includes Time-of-Day rates, dynamic and critical peak pricing rates, and commercial/industrial curtailable service
- Direct Control
 - The utility has direct control over customer assets
 - Includes residential AC or water heater cycling and commercial/industrial interruptible load



Time-of-Use, Curtailable, and Interruptible Rates

- Time-of-Use
 - Usage during different times of day are charged different amounts
 - On-peak, off-peak, mid-peak, critical-peak
 - Usually charged on energy (kWh), but discounts are sometimes given to large commercial or industrial customers on demand (kW)
- Curtailable Load
 - Separately metered customer load that can be reduced when the Utility calls
 - The rate, discount, or payback for the curtailment is based on market, contracted, or customer specified price
 - The Utility does not control the load; the customer does
 - Rates **are not** offered to residential customers
- Interruptible Load
 - Separately metered load that the Utility can interrupt when it has an emergency (or sometimes economic) need
 - Customer is usually rewarded with a reduced rate on their interruptible portion of load, but may be compensated like curtailable load
 - Customer can override an interruption
 - Rates **are** offered to residential customers through controlled space-conditioning load rates



DR Technology Requirements

- Metering
 - Controllable and interruptible loads are separately metered
 - Space-conditioning and water heaters on special rates are separately metered
 - Residential CPP, DP, TOU, etc. rates usually require AMI or other special metering, and may include additional charges for extra meters
 - Additional demand meters may be necessary for larger customers
- Controllable load
 - Switches on air conditioners or water heaters
- Interruptible load
 - Designated by the customer
 - Testing requirements
- Load history
- Price communication with the utility



DR Contract Requirements

- Large C&I customers usually must have contracts with the utility
- Some rates allow the customer to choose on-peak times
- Economic curtailment rates (I&M) require the customer to select a market price to trigger curtailment
- Notification methods



Different DR Rates

Company	Time of Day	Dynamic Pricing	Critical Peak Pricing	Peak Time Rebate	Real Time	Curtable	Interruptible
Consumers Energy	R		R C I	R			R C I
DTE Energy	R C		R				R C I
Indiana Michigan	R C				I	I	R C I
WEPCo	R C I				I	C	C I
UPPCO	C		C		I		C I
WPSC	R C						R C I
NSP	R C		C				C
Alpena							I
Midwest	R C I						R
Thumb		R C					R

R: Residential C: Commercial I: Industrial

Time-of-day: on and off peak
Dynamic: on, mid, and off peak
Critical: on, mid, off, and critical peak

Rebate: on, mid, off, and rebate for peak reduction
Real Time: real time LMP



Consumers Energy's DR Rates

- Direct Load Management Pilot (DLM)
 - Must have AMI
 - Customer can override one event per year
 - Company can manage load for system integrity, emergency purchase, economic reasons, or system capacity emergency
 - DLM credit of \$0.025 for kWh>600
- Residential Time-of-Day (RT)
 - On and off peak rates
- Residential Dynamic Pricing Pilot (RDP)
 - Cannot be in conjunction with net metering
 - On, mid, off and critical peak rates
- Residential Dynamic Pricing Rebate Pilot (RDPR)
 - Same as RDP, but customer is **credited \$0.50/kWh of reduced load during critical peak hours**
- Secondary Energy-only Dynamic Pricing Pilot (GSDP)
- Secondary Demand Dynamic Pricing Pilot (GSDDP)
- Primary Energy-only Dynamic Pricing Pilot (GPDP1-3)
- General Service Primary Time of Use Pilot Rate (GPTU)
- General Service DLM
 - Same as Residential
 - DLM credit of \$0.025 for kWh>1200
- GDP (commercial or industrial) with Interruptible Service Provision (GI)
 - Interrupted at any time
 - "The Company shall endeavor to provide notice in advance..."
 - Penalty for non-interruption



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- Direct Load Management Pilot (DLM)
- Residential Time-of-Day (RT)
- Residential Dynamic Pricing Pilot (RDP)
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- Secondary Energy-only Dynamic Pricing Pilot (GSDP)
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- General Service Primary Time of Use Pilot Rate (GPTU)
- General Service DLM
- GDP (commercial or industrial) with Interruptible Service Provision (GI)

Residential Dynamic Pricing Rates

	Summer PS Charge Dynamic Pricing	Summer PS Charge Dynamic Rebate
Off-Peak	6.3812¢	6.4402¢
Mid-Peak	8.3565¢	8.0056¢
On-Peak	13.2947¢	18.1093¢
Critical Peak	50¢	-50¢

During a critical peak event, customers are credited for incremental energy reductions. Reductions are the difference between the customer's baseline hourly consumption and the recorded critical peak consumption. The customer's baseline consumption is the hourly average from the prior 5 non-even business days

Source: Consumers Energy Company. July 24, 2012. *Rate Book for Electric Service*. Available at: <http://www.dleg.state.mi.us/mpsc/electric/ratebooks/consumers/consumers13cur.pdf> (accessed 9/18/15)



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DTE Energy's DR Rates

- Interruptible Space -Conditioning Service rate (D1.1)
 - Cycles customer's separately metered AC or heat pump
 - Interrupted at any time for 30 minutes max, total 8 hours/day max
- Residential Time of Day Service Rate (D1.2)
- Residential Time of Day Farm and Space Heating Rate (D1.4)
 - Rate closed since 1994
- Space Conditioning, Water Heating Time of Day Rate (D1.7)
 - Applies to separately metered space-conditioning and/or water heating
- *Proposed Geothermal Time of Day Service Rate (D1.7)*
 - Proposed in U-17767 to combine D1.4 and D1.7 to this new rate
- Experimental Dynamic Peak Pricing Rate (D1.8)
 - Limited to 5000 customers
 - Proposed removing the limit and "Experimental" in U-17767
- Experimental Residential Load Management (Rider 14)
 - **Not available to D1.1 customers**
 - \$4 bill credit for each day that service is interrupted
- Interruptible General Service rate (D3.3)
 - Limited to 300 customers
 - Penalty for non-interruption
- Interruptible Supply rate (D8)
 - Penalty for non-interruption
- Interruptible Supply rider (Rider 10)
 - Rider to Primary Supply Rate and Special Manufacturing Supply Rate
 - Same % of load is interrupted on each customer
 - Penalty for non-interruption, however Company may still interrupt



DTE Energy's DR Rates

- Interruptible Space -Conditioning Service rate (D1.1)
- Residential Time of Day Service Rate (D1.2)
- Residential Time of Day Farm and Space Heating Rate (D1.4)
- Space Conditioning, Water Heating Time of Day Rate (D1.7)
- *Proposed Geothermal Time of Day Service Rate (D1.7)*
- Experimental Dynamic Peak Pricing Rate (D1.8)
- Experimental Residential Load Management (Rider 14)
- Interruptible General Service rate (D3.3)
- Interruptible Supply rate (D8)
- Interruptible Supply rider (Rider 10)
- **The CoolCurrents® air conditioning rate could save you up to 14% on your summer air conditioning bill.**
 - This program is designed to help you save on your summer air conditioning bill.
- **How it works:**
 - DTE Electric will install a small wireless box mounted near your separately-metered CoolCurrents meter.
 - On select hot summer days, DTE Electric would briefly interrupt your air conditioning unit by sending a remote signal to activate the device in 15 minute intervals limited to no more than 8 hours in a 24 hour period.
 - By allowing us to briefly cycle your air conditioning unit on and off, you may be able to reduce your carbon footprint helping you become a little greener.
 - CoolCurrents helps us provide more reliable service to all customers on days when the demand for electricity is high due to extreme hot weather.

Source: DTE Electric Company. July 15, 2015. *Rate Book for Electric Service*. Available at:
<http://www.dleg.state.mi.us/mpsc/electric/ratebooks/dtee/dtee1cur.pdf> (accessed 9/18/15)



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Indiana Michigan Power's DR Rates

- Load Management Water-Heating Provision (RS)
 - Closed since 2002
- Residential Time-of-Day Service (RS-TOD, TOD2)
- Small General Service Time-of-Day Service (SGS-TOD2)
- Medium General Service Time-of-Day Service (MGS-TOD)
- Load Management Time-of-Day Provision (SGS, MGS, and LGS)
 - For thermal storage, space-heating, water-heating
- Contract Service-Interruptible Power (CS-IRP)
 - Rate is agreed upon by contract between the Company and customer (must be a discount)
 - **“Minimum compensation for mandatory (capacity) interruptions shall be 80% of the applicable PJM Reliability Pricing Model clearing price.”**
- Emergency Curtailable Service (Rider ECS)
 - For MGS, LGS, and LP rates
 - The Company and customer agree on method of notification
- **Company reserves the right to test customer's ability to curtail, limited to once per contract term.**
 - **Test failure results in another test, if 3 tests are failed during a season then Company can discontinue service under the rider.**
 - No penalty for non-interruption, but Company may discontinue service
- Energy Price Curtailable Service (Rider EPCS)
 - Same as Rider ECS' first 3 points
 - Customer selects
 - day-ahead or current day notification
 - maximum curtailment duration (2,4,8 hours) and curtailed days
 - minimum price at which the customer would be willing to curtail
 - Curtailment credit is the hourly EPCS Energy and the greater of:
 - 80% of AEP East real-time LMP
 - The customer selected minimum price
 - 3.5¢/kWh
- Experimental Real-Time Pricing Service (RTP)
 - Applies to Large Power customers (LP)



Indiana Michigan Power DR Rates

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- Residential Time-of-Day Service (RS-TOD, TOD2)
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 - day-ahead or current day notification
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 - Curtailment credit price is the greater of:
 - 80% of AEP East real-time LMP
 - The customer selected minimum price
 - 3.5¢/kWh

Source: Indiana Michigan Power Company. November 18, 2010. *Schedule of Tariffs Governing the Sale of Electricity*. Available at: <http://www.dleg.state.mi.us/mpsc/electric/ratebooks/iandm/iandm15cur.pdf> (accessed 9/18/15)



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Other Interesting Rates

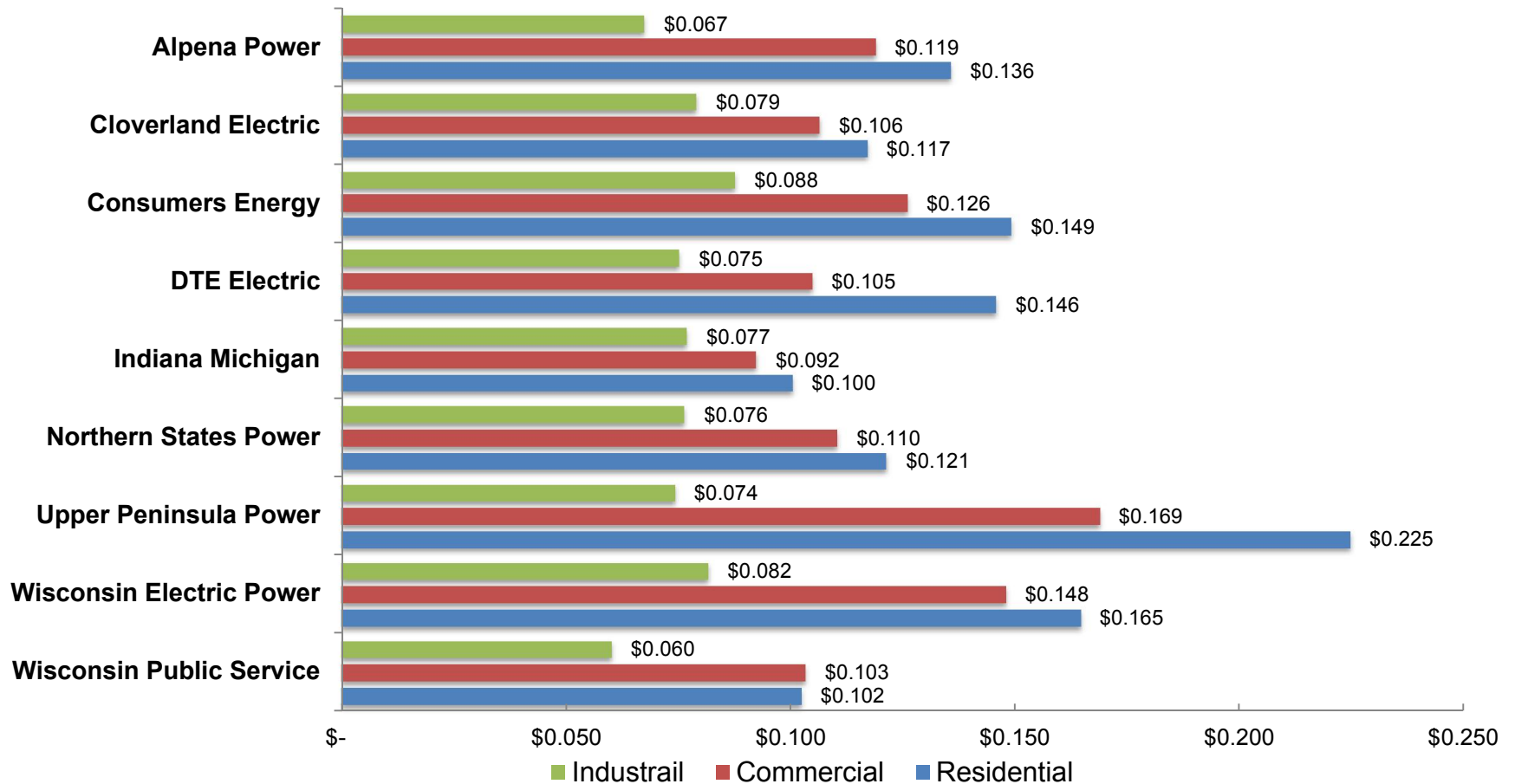
- **NSP - Off-Peak Service MOP-1**
 - 1.8 ¢/kWh for off-peak (night time) energy, expects customer's service to not be energized at all on-peak
- **Midwest - Interruptible Whole House Comfort Service**
 - 2.5¢/kWh discount if Coop can **control residential customer's backup generator**
- **UPPCO - WP-3 Light and Power Service**
 - Designates minimum 1000kW of load as interruptible and that load is charged \$3.66/kW instead of firm load charge of \$11.16/kW.
- **WPSC - Online Power Exchange**
 - Company posts an offer rate online, customers use it to decide on curtailment
- **WE Energies - Experimental Power Market Incentives**
 - Company offers a price per kWh for customer load curtailed based on the customer's "reference load shape." The reference load shape is the load from the matching week day from the previous week.

Source: MPSC-Approved Electric Utility Rate Books, n.d. Available at: http://www.michigan.gov/mpsc/0,1607,7-159-16377_52818_53477-214344--,00.html (accessed 9/15/15)



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Average Retail Rates, 2014

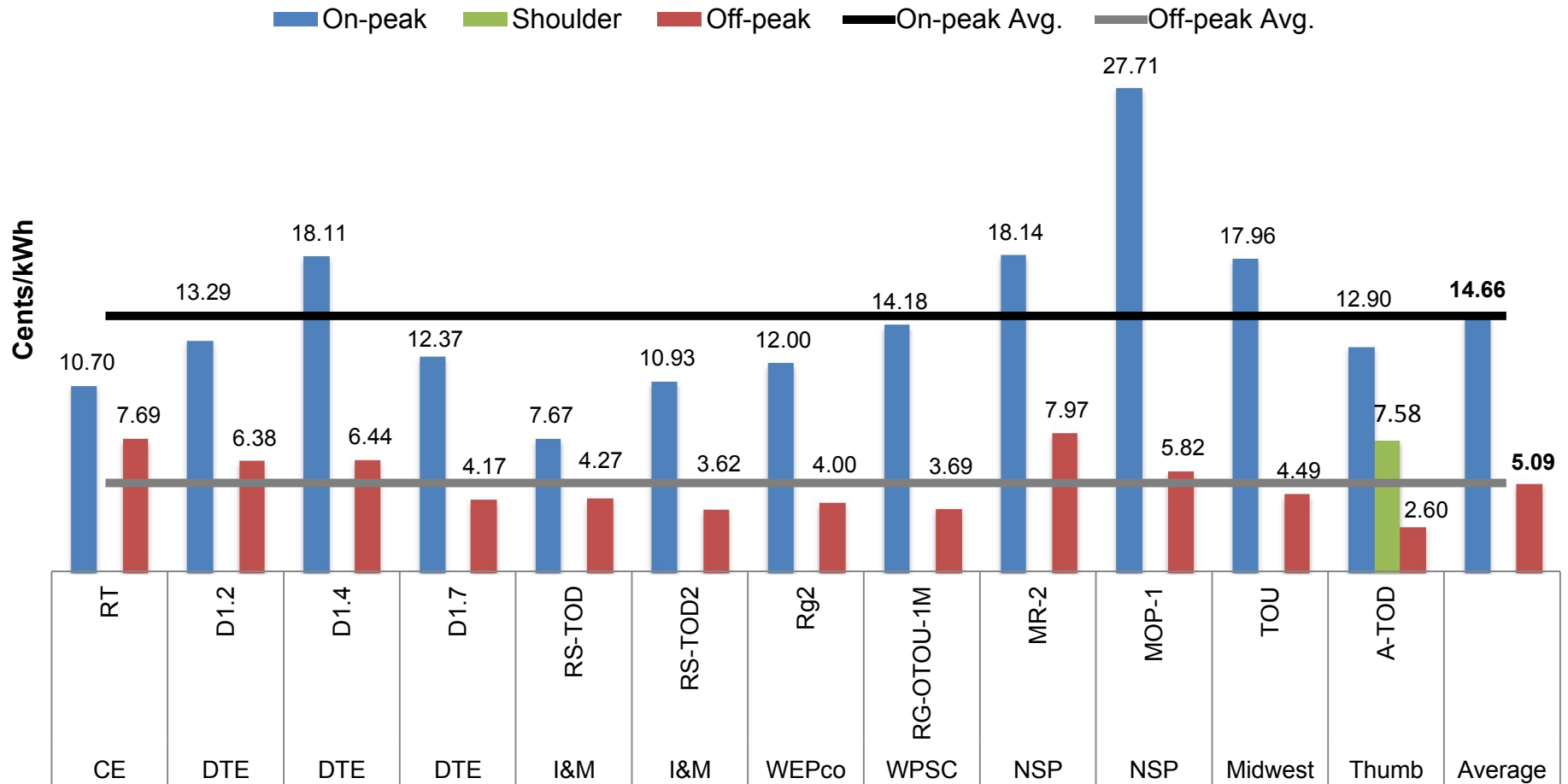


Source: U.S. Energy Information Administration. August 11, 2015. *Electric power sales, revenue, and energy efficiency Form EIA-861*. Available at: <http://www.eia.gov/electricity/data/eia861/> (accessed 9/15/15)



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Residential Time-of-Day Rates

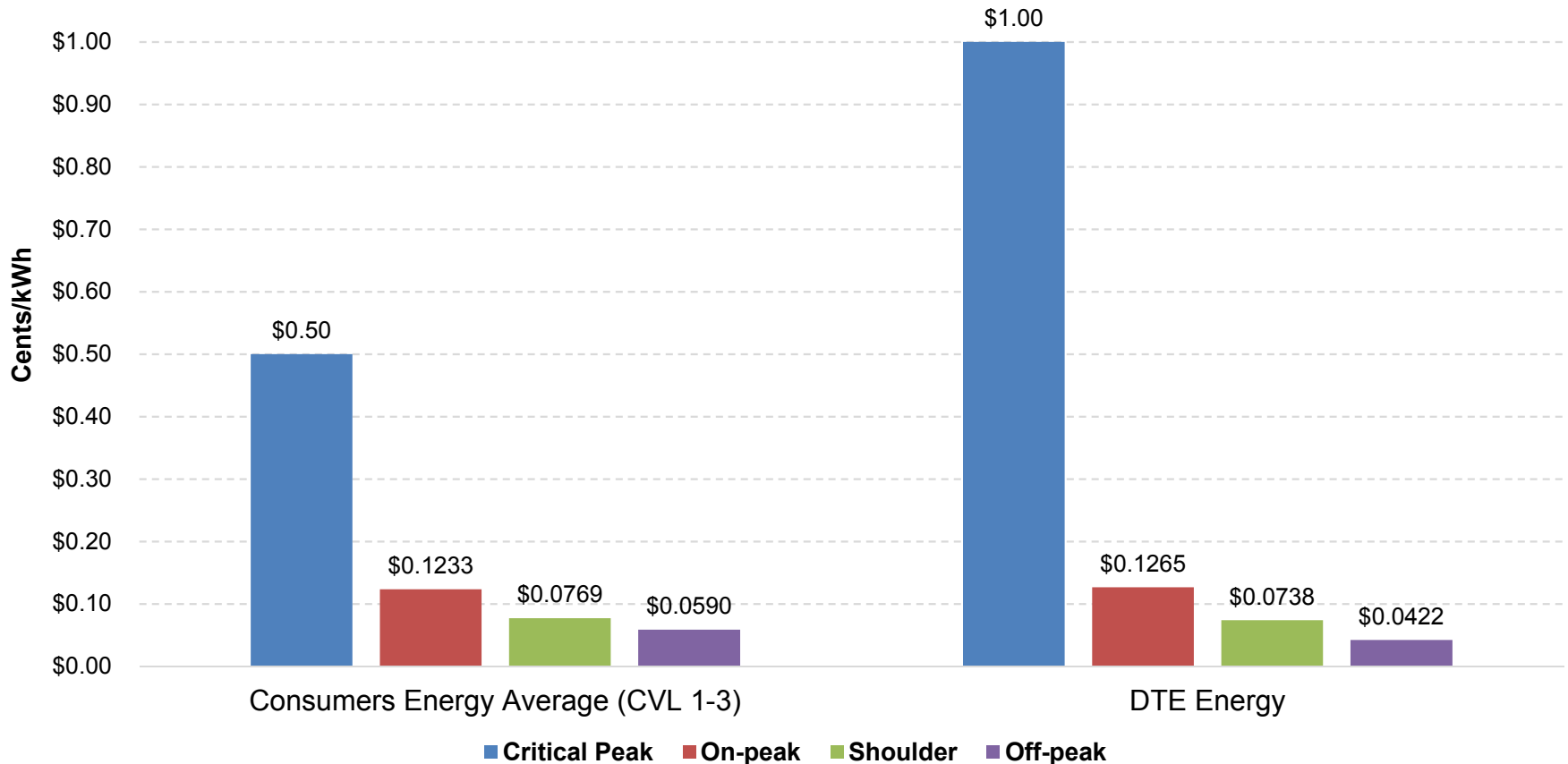


Source: Michigan Public Service Commission. n.d. *MPSC-Approved Electric Utility Rate Books*. Available at: http://www.michigan.gov/mpsc/0,1607,7-159-16377_52818_53477-214344--,00.html (accessed 9/15/15)



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Critical Peak Pricing Rates



Source: DTE Electric Company. July 15, 2015. *Rate Book for Electric Service*. p. 122. Available at: <http://www.dleg.state.mi.us/mpsc/electric/ratebooks/dtee/dtee1cur.pdf> (accessed 9/18/15) and Consumers Energy Company. July 24, 2012. *Rate Book for Electric Service*. p. 167. Available at: <http://www.dleg.state.mi.us/mpsc/electric/ratebooks/consumers/consumers13cur.pdf> (accessed 9/18/15)



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On-Off Peak Ratios

Residential

Company	Type	Rate	Summer On-Off Ratio
Consumers	TOD	RT	1.39
DTE	TOD	D1.4	1.80
Consumers	CPP	RDP	2.08
Thumb	DP	A-TOD	2.09
I&M	TOD	RS-TOD2	2.28
Consumers	Rebate	RDPR	2.81
DTE	TOD	D1.2	2.97
DTE	CPP	D1.8	3.00
DTE	TOD	D1.7	3.02
Midwest	TOD	TOU	3.27
I&M	TOD	RS-TOD	3.85
WPSC	TOD	RG-OTOU-1M	4.00
WEPco	TOD	Rg2	4.76
NSP	TOD	MR-2	4.96
NSP	TOD	MOP-1	11.11
		average	3.56
		max	11.11
		min	1.39

Commercial

Company	Type	Rate	Summer On-Off Ratio
DTE	TOD	D1.7	1.31
WEPco	TOD	Cg3	1.53
WEPco	TOD	Cg3C	1.53
Uppco	CPP	CP-RR-T	1.76
Uppco	CPP	CP-RR-P	1.76
Uppco	CPP	CP-RR-S	1.76
Consumers	CPP	GS	2.01
Thumb	DP	GS-TOD	2.09
Midwest	TOD	GTOU-single	2.14
I&M	TOD	SGS-TOD2	2.38
I&M	TOD	MGS-TOD	3.68
WPSC	TOD	RG-OTOU-1M	4.00
WEPco	TOD	Cg5	4.00
I&M	TOD	SGS	4.01
NSP	TOD	MST-1	4.96
Consumers	CPP	GSD	5.20
Midwest	TOD	GTOU-three	9.30
NSP	TOD	MOP-1	11.11
		average	3.58
		max	11.11
		min	1.31



Peak Time Comparison - Residential

Company	Type	Rate	AM											PM											
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
Consumers Energy	TOD	RT	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Green	Green
Consumers Energy	CPP	RDP	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green
Consumers Energy	Rebate	RDPR	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
DTE Energy	TOD	D1.2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Green	Green
DTE Energy	TOD	D1.4	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Green	Green
DTE Energy	TOD	D1.7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Green	Green
DTE Energy	CPP	D1.8	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green
Indiana Michigan Power	TOD	RS-TOD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Green	Green
Indiana Michigan Power	TOD	RS-TOD2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
WEPco	TOD	Rg2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
WPSC	TOD	RG-OTOU-1M	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
NSP	TOD	MR-2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
NSP	TOD	MOP-1	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Midwest	TOD	TOU	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Thumb	DP	A-TOD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

Source: Michigan Public Service Commission. n.d. *MPSC-Approved Electric Utility Rate Books*. Available at: http://www.michigan.gov/mpsc/0,1607,7-159-16377_52818_53477-214344--,00.html (accessed 9/15/15)



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Peak Time Comparison - Commercial

Company	Type	Rate	AM											PM											
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
Consumers Energy	CPP	GS	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green
Consumers Energy	CPP	GSD	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green
DTE Energy	TOD	D1.7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Indiana Michigan Power	TOD	SGS	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
Indiana Michigan Power	TOD	SGS-TOD2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Indiana Michigan Power	TOD	MGS-TOD	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
WEPco	TOD	Cg3	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
WEPco	TOD	Cg3C	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
WEPco	TOD	Cg5	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
UPPCO	CPP	CP-RR-S	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
UPPCO	CPP	CP-RR-P	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
UPPCO	CPP	CP-RR-T	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
WPSC	TOD	RG-OTOU-1M	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
NSP	TOD	MST-1	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
NSP	TOD	MOP-1	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green
Midwest	TOD	GTOU-single	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Midwest	TOD	GTOU-three	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Thumb	DP	GS-TOD	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green

Source: Michigan Public Service Commission. n.d. *MPSC-Approved Electric Utility Rate Books*. Available at: http://www.michigan.gov/mpsc/0,1607,7-159-16377_52818_53477-214344--,00.html (accessed 9/15/15)



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Peak Time Comparison - Industrial

Company	Type	Rate	AM											PM												
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Consumers Energy	CPP	GP-CVL3	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Consumers Energy	CPP	GP-CVL2	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Consumers Energy	CPP	GP-CVL1	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Consumers Energy	CPP	GPTU-CVL3	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Consumers Energy	CPP	GPTU-CVL2	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Consumers Energy	CPP	GTPU-CVL1	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Green	
Indiana Michigan	RTP	RTP	White																							
WEPco	TOD	CP1	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Red	Red	Green	
WEPco	TOD	CP1	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Red	Red	Green	
WEPco	TOD	CP1	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Red	Red	Green	
WEPco	TOD	CP2	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP2	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP2	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP2	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP3	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP3	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CP3	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	PMI	White																							
WEPco	RTP	CpLC	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
WEPco	TOD	CpLC	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Choose 8a - 8p or	Choose 10a - 10p	Green	
UPPCO	RTP	RTMP	White																							
UPPCO	RTP	RTMP-D	White																							
Midwest	TOD	LTOU	Green	Green	Green	Green	Green	Green	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Red	Red	Green

Source: Michigan Public Service Commission. n.d. *MPSC-Approved Electric Utility Rate Books*. Available at: http://www.michigan.gov/mpsc/0,1607,7-159-16377_52818_53477-214344--,00.html (accessed 9/15/15)



Current Rate Case Proposals

- U-17735 Consumers Energy
 - Dynamic pricing off-peak prices set to PSCR base
 - RDP, RDPR, and GSPD
 - Critical peak price set to \$1/kWh
 - GDP-GI (interruptible provision)
 - Reduce minimum interruptible demand from 700kW to 500kW
 - GPTU
 - Increase total load served to 100 MW
- U-17767 DTE Energy
 - D5 Option II Interruptible Water Heating Service Rate - Eliminating option II since it has been closed to new customers for 37 years and hard to monitor since load is not separately metered. Will retain D5 Option I for those customers desiring a interruptible separately metered water heating service.
 - D8 Interruptible Supply Rate – Increase availability by 100 MW as a result of customer demand
 - R10 Interruptible Supply Rider – Eliminating non-market based option under R10 since most customers prefer the market based (MISO) option
 - D1.2 Residential Time-of-day Service Rate - Reducing the customer charge; increase cap on participation to allow customers on D1.4 to transfer. D1.4 has been closed since 1994
 - D1.7 Space Conditioning, Water Heating Time-of-day Rate – Adjust on peak hours to be consistent with other DTE time of day rates.
 - D1.8 Experimental Dynamic Peak Pricing Rate – Remove “experimental” from title; remove customer cap; slightly decrease critical peak pricing rate to encourage more users.

Source: Consumers Energy Company. December 5, 2014. *Testimony in MPSC Case No. U-17735*. Available at:

<http://efile.mpsc.state.mi.us/efile/docs/17735/0002.pdf> (accessed 9/18/15) and DTE Electric Company. December 19, 2014. *Testimony in MPSC Case No. U-17767*. Available at: <http://efile.mpsc.state.mi.us/efile/docs/17767/0001.pdf> (accessed 9/18/15)



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Summary Observations

- There is **a lot of variation** among DR rates
 - Incentives, penalties, on-peak hours, availability, additional charges, size limits, basic tariff language
- No uniform testing methodology for curtailable or interruptible loads
- Residential customers like discounts, dislike taking advantage of them if it takes any effort
- Large customers like interruptible discounts, dislike interruption



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