

Appendix 10: Review of Alternative Rate Structures Appendix

May 24, 2010
EE-2009-0237

Research Conducted

- ✓ KEMA / UtiliPoint
- ✓ EPRI
- ✓ E-Source
- ✓ Freeman, Sullivan & Co.
- ✓ Brattle Group

KEMA / UtiliPoint

- ✓ Highest Response Measured Was Residential Customers on TOU
- ✓ TOU Has The Highest Participation Rate
- ✓ CPP Pricing Does Not Adequately Represent Marginal Costs
- ✓ Homeowners Would Participate in TOU if Properly Promoted
- ✓ TOU Is Easiest to Understand And Least Risky For All Customers

EPRI

- ✓ **Consumers Respond To Price Signals**
- ✓ **Doubling The Price Reduced Usage 10% to 20%**
- ✓ **Central A/C Saturation Greatly Increases Elasticity**
- ✓ **The Ratio of Peak / Off-Peak Prices is More Important Than Price Level**
- ✓ **Enabling Technologies Could Improve Response**

Freeman, Sullivan & Co.

- ✓ **Programmable Communicating Thermostats Can Improve Response 50%**
- ✓ **In-Home Displays Reduce Consumption**
- ✓ **Customers Are Reluctant To Sign Up For CPP Tariffs (Risk Aversion)**
- ✓ **Response Has Been Lower In The Midwest Studies**
- ✓ **Time-Based Rates Must Be Marketed To Be Successful**
- ✓ **Customers Like Time-Based Rates**

E Source (Marketing)

- ✓ **TOU Customers Can Save 15% Annually**
- ✓ **Programs Need To Be Simple To Gain Participants**
- ✓ **Campaigns Are Very Successful With Existing A/C Cycling Participants**
- ✓ **Direct Mail Works**

EPRI, ESource, Brattle Studies Show Residential Time-of-Use Participants

Shave Load 11% to 18%: KW

Conserve 4% to 6% or More (kWh)

Save 10% to 15% \$\$

KCP&L Participants (system potential)

Shave 100 MW at Peak

Conserve 67k MWhs

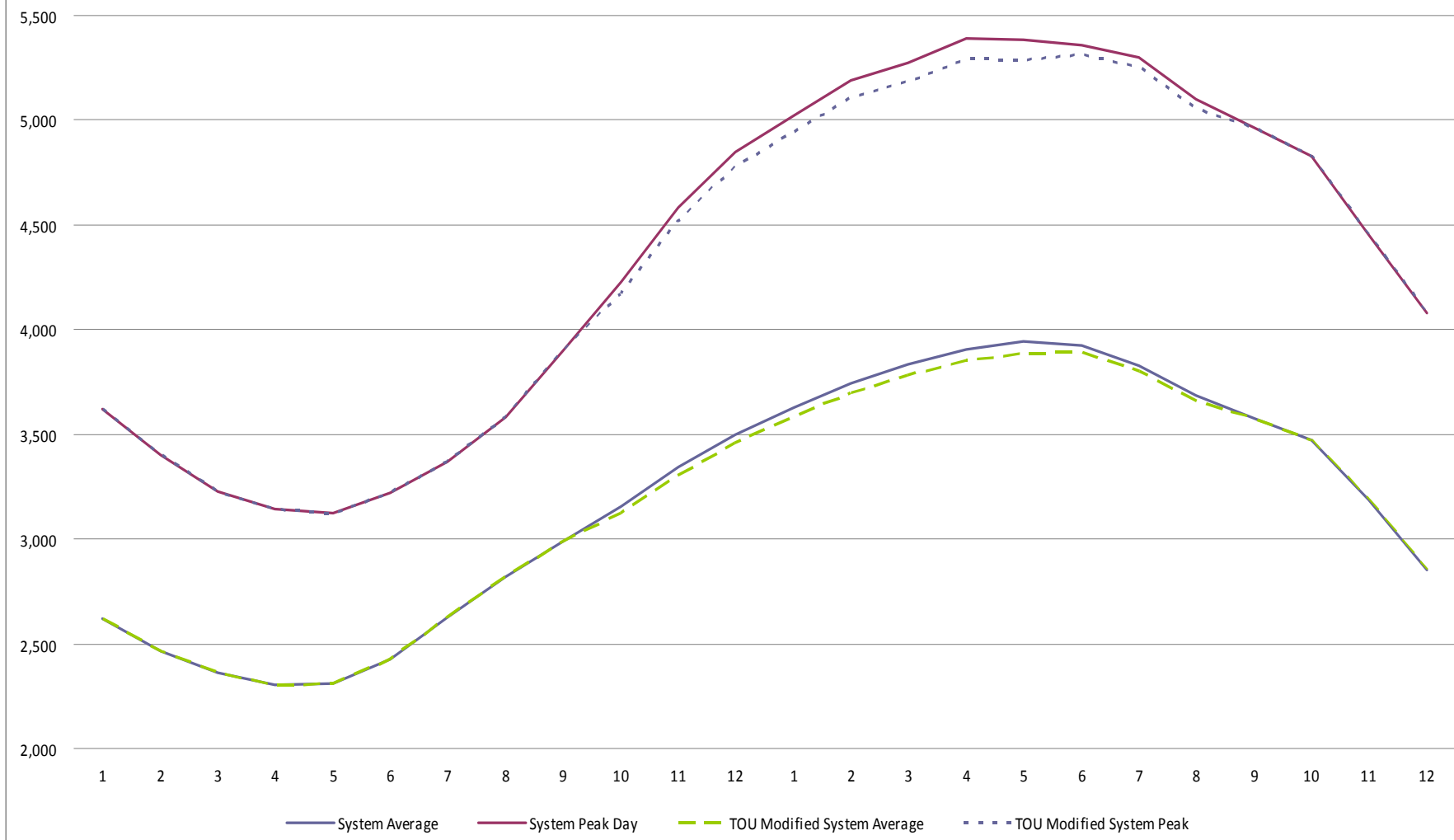
Save \$4 Million

EPRI: Price Elasticity of Demand for Electricity

ESource: Big Innovations for Small Customers. Utilities Experiment with Dynamic Pricing for Residential Customers

The Brattle Group: The Impact of Dynamic Pricing on Westar Energy and Pricing Pilot: The "Manhattan Skyline" Slide

A Residential Time-of-Use Tariff Potentially Reduces The System Peak 100 MW



Utilities With Significant Time-of-Use Participation



	CUSTOMER PARTICIPATION				
	2004	2005	2006	2007	2008
Alabama Power Co	1,378,652	1,394,256	1,409,209	1,424,638	1,434,823
Industrial	60,086	59,835	5,325	5,387	5,572
Standard Rate	60,086	59,835	4,557	4,663	4,689
Time-of-Use			768	724	883
Participation Rates	0.0%	0.0%	14.4%	13.4%	15.8%
Arizona Public Service Co	966,022	1,007,460	1,051,559	1,085,846	1,101,809
Residential	859,069	896,472	936,458	965,923	977,826
Standard Rate	501,697	514,899	525,777	527,736	505,053
Time-of-Use	357,372	381,573	410,681	438,187	472,773
Participation Rates	41.6%	42.6%	43.9%	45.4%	48.3%
Oklahoma Gas & Electric Co	806,153	816,579	827,394	836,662	844,629
Industrial	9,612	9,983	10,088	10,118	9,649
Standard Rate	9,026	9,414	9,505	9,528	8,984
Time-of-Use	586	569	583	590	665
Participation Rates	6.1%	5.7%	5.8%	5.8%	6.9%
United Illuminating Company	321,742	320,641	321,416	323,120	616,204
Commercial	28,903	28,941	29,266	29,317	52,023
Standard Rate	22,080	21,893	21,438	21,625	39,877
Time-of-Use	6,823	7,048	7,828	7,692	12,146
Participation Rates	23.6%	24.4%	26.7%	26.2%	23.3%
Industrial	1,475	1,355	861	1,180	1,797
Standard Rate	934	814	735	657	1,047
Time-of-Use	541	541	126	523	750
Participation Rates	36.7%	39.9%	14.6%	44.3%	41.7%
Residential	290,109	289,116	290,081	291,248	560,734
Standard Rate	281,049	280,033	255,857	251,852	482,348
Time-of-Use	9,060	9,083	34,224	39,396	78,386
Participation Rates	3.1%	3.1%	11.8%	13.5%	14.0%
Wisconsin Public Service Corp	416,722	421,802	425,250	429,661	432,833
Commercial	44,661	45,163	52,071	53,323	38,112
Standard Rate	44,661	45,163	46,504	47,530	32,112
Time-of-Use			5,567	5,793	6,000
Participation Rates	0.0%	0.0%	10.7%	10.9%	15.7%
Residential	371,068	375,631	372,774	375,929	394,316
Standard Rate	371,068	375,631	359,470	362,398	380,481
Time-of-Use			13,304	13,531	13,835
Participation Rates	0.0%	0.0%	3.6%	3.6%	3.5%

Summary Table

TOU Program Features

	Participation	Peak Hours	Discount	Premium	Price Cents	Other Factors
Residential						
(1) APS	48%	36%	60%	23%	13	Dry Climate
(2) United Illuminating	14%	24%	20%	23%	23	Winter Discount
Wisconsin	4%	30%	48%	84%	12	New Program
C&I						
United Illuminating	24%	24%	27%	18%	22	Winter Discount
Alabama	16%	21%	33%	285%	3	KW Discount
Wisconsin	16%	30%	48%	85%	12	Flexible Hours
OG&E	7%	15%	5%	328%	4	KW Discount

(1) APS TOU Rate structurally benefits customers who use > 1,000 kWhs. Inclining Block Rates.

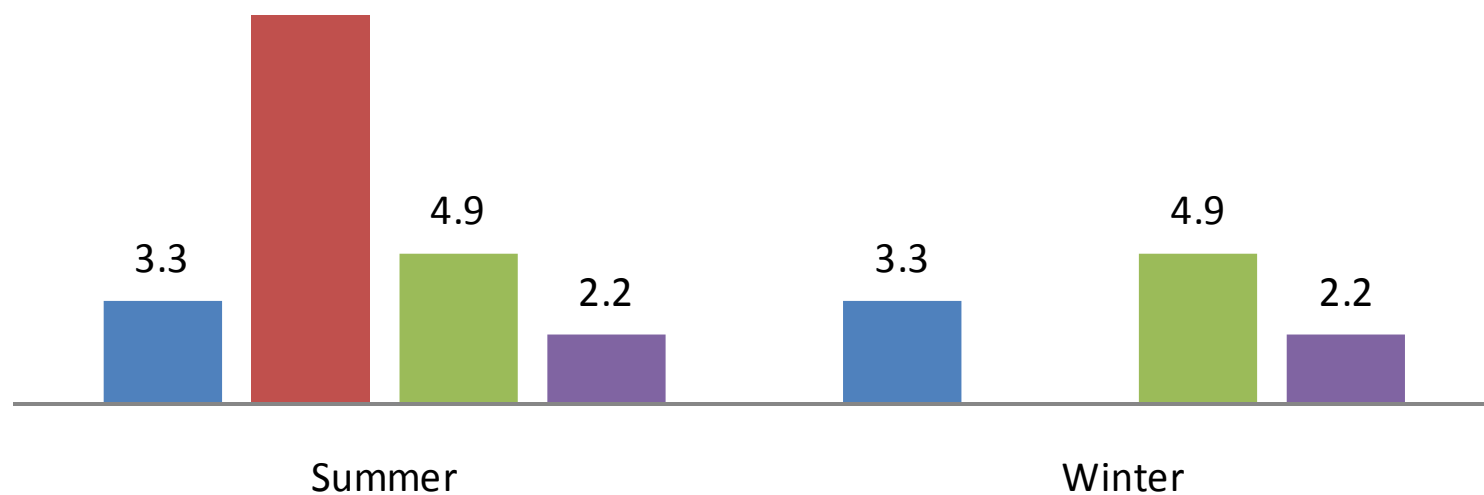
(2) United Illuminating's TOU rate is mandatory for customers who exceed 2,000 kWhs.

Working Time-of-Use Programs



Alabama Power Industrial TOU 16% Participation

■ Tier 1 ■ Peak ■ Intermediate ■ off-peak



Standard Tier 2 Rate is 2.1

Working Time-of-Use Programs



Alabama Power Time-of-Use

Participants Don't Pay Demand Charge of \$5/kVa in All Months

Off-Peak Price is Lower than First Tier Only

Peak Period from 12pm – 7pm Weekdays June - Sep

2 Hour Intermediate Shoulder Each Side of Peak

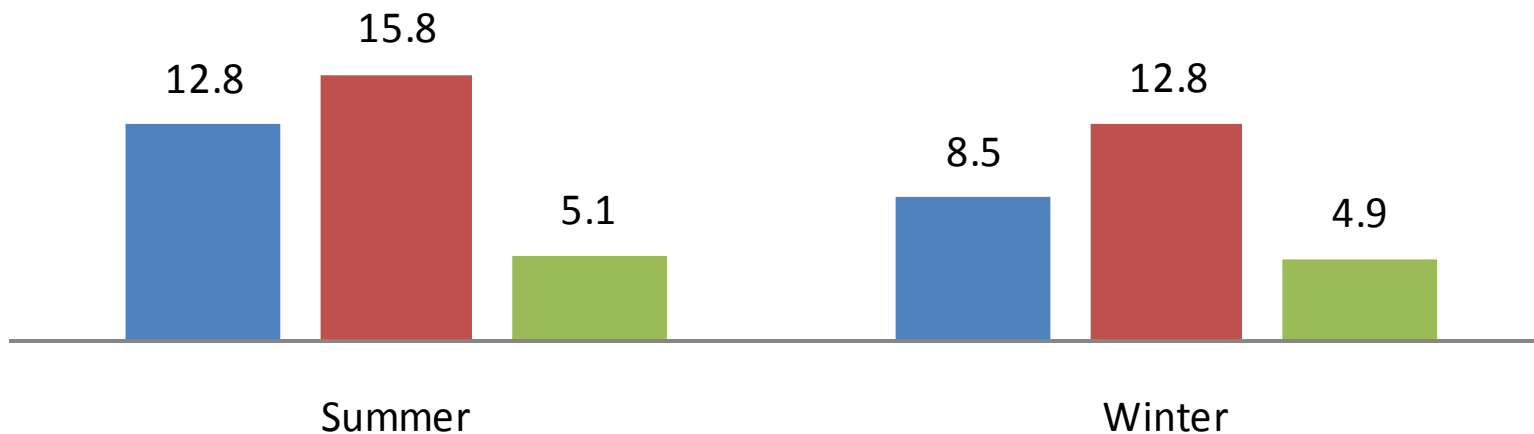
Winter Intermediate Period is 9am – 7pm

Structurally Benefits a Low Load Factor Business

Arizona Public Service Residential TOU

48% Participation

■ Standard ■ Peak ■ off-peak



Working Time-of-Use Programs



APS Residential Time-of-Use: Established Rate

Program Growth = Demand Growth 1.7%

Off-Peak Discount is Real

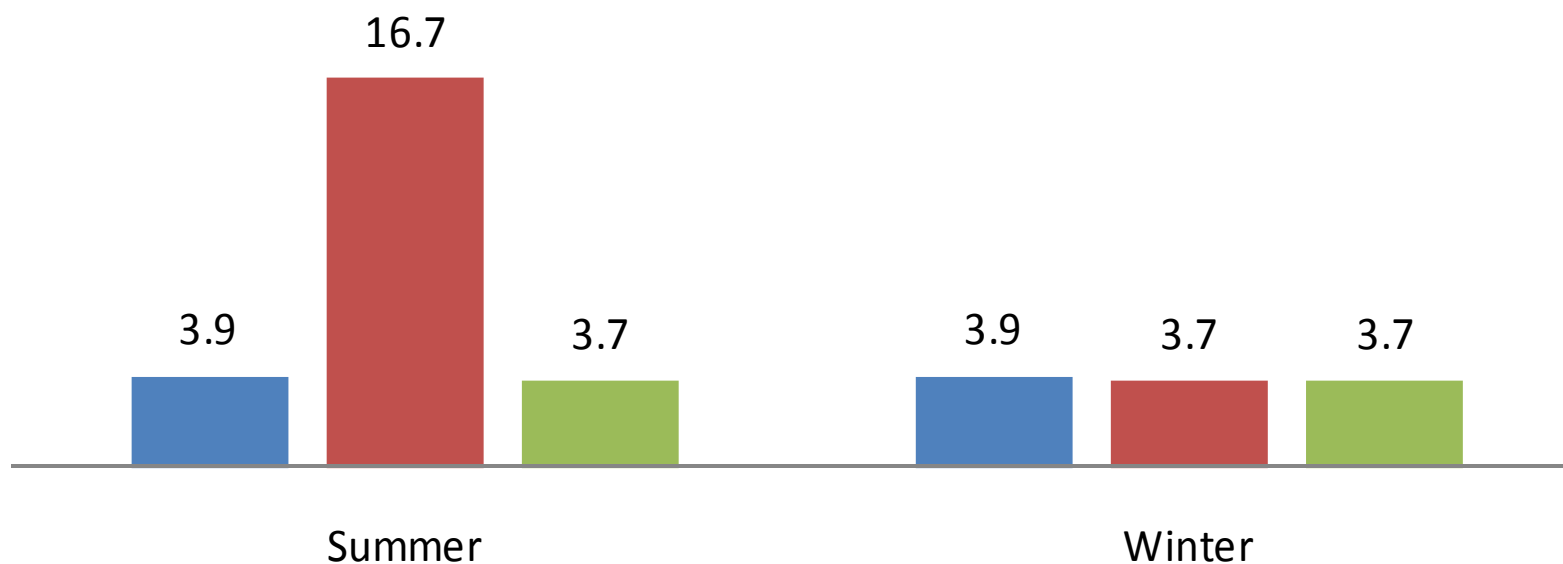
On-Peak Penalty is Small

Peak is 9am to 9pm Year-Round

Bigger Savings for Bigger Users

OG&E Industrial TOU 7% Participation

■ Standard ■ Peak ■ off-peak



Working Time-of-Use Programs



Oklahoma Gas & Electric Time-of-Use

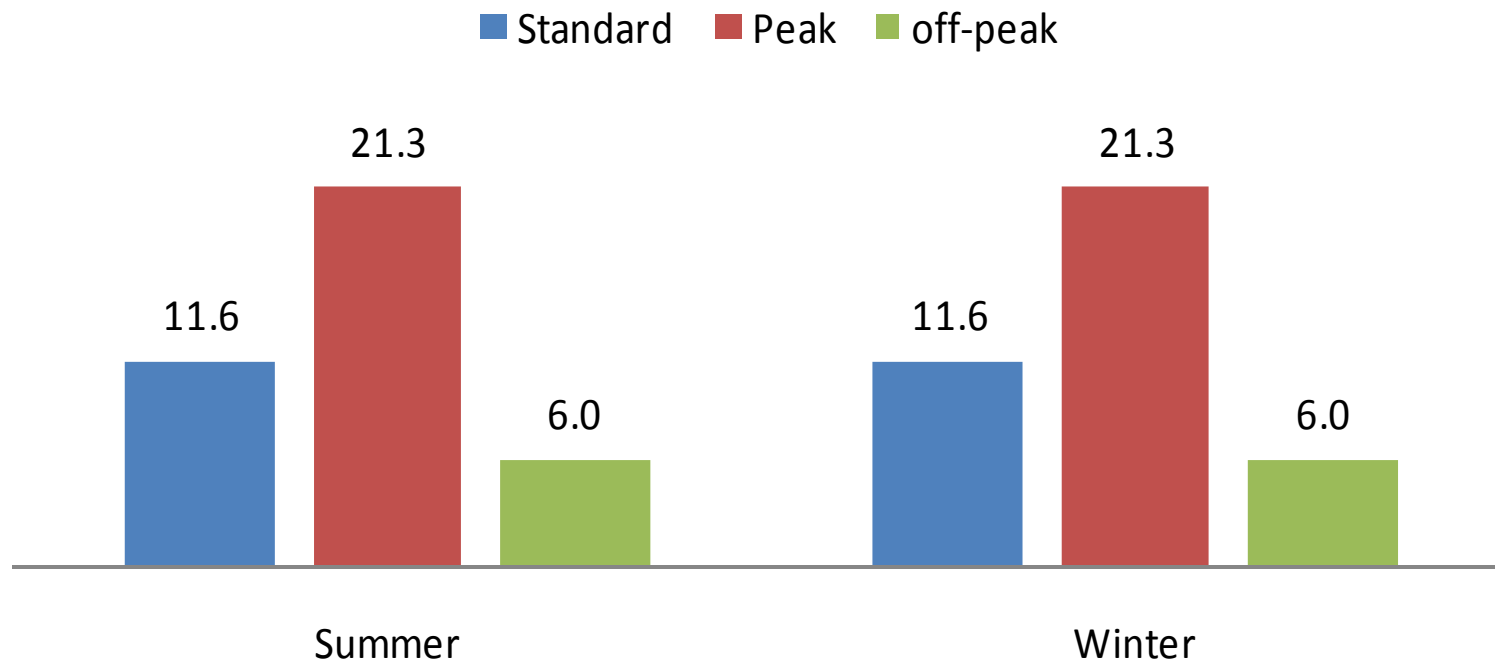
Participants Don't Pay Seasonal Demand Charge of \$5/kW in June thru September

Receive a Lower Price in All Hours Oct. – May

Short Peak Period from 2pm – 7pm Weekdays; 15%

Structurally Benefits a Low Load Factor Business

Wisconsin PS Residential TOU 3.5% Participation



Working Time-of-Use Programs



Wisconsin Residential Time-of-Use:

Growth From 0 to 3.5% in Three Years

Goes From Half Price to Twice the Price

Summer Peak is 9am to 7pm

Winter Peaks are (8 to 12) & (4 to 9)

Peak is 26% of Hours

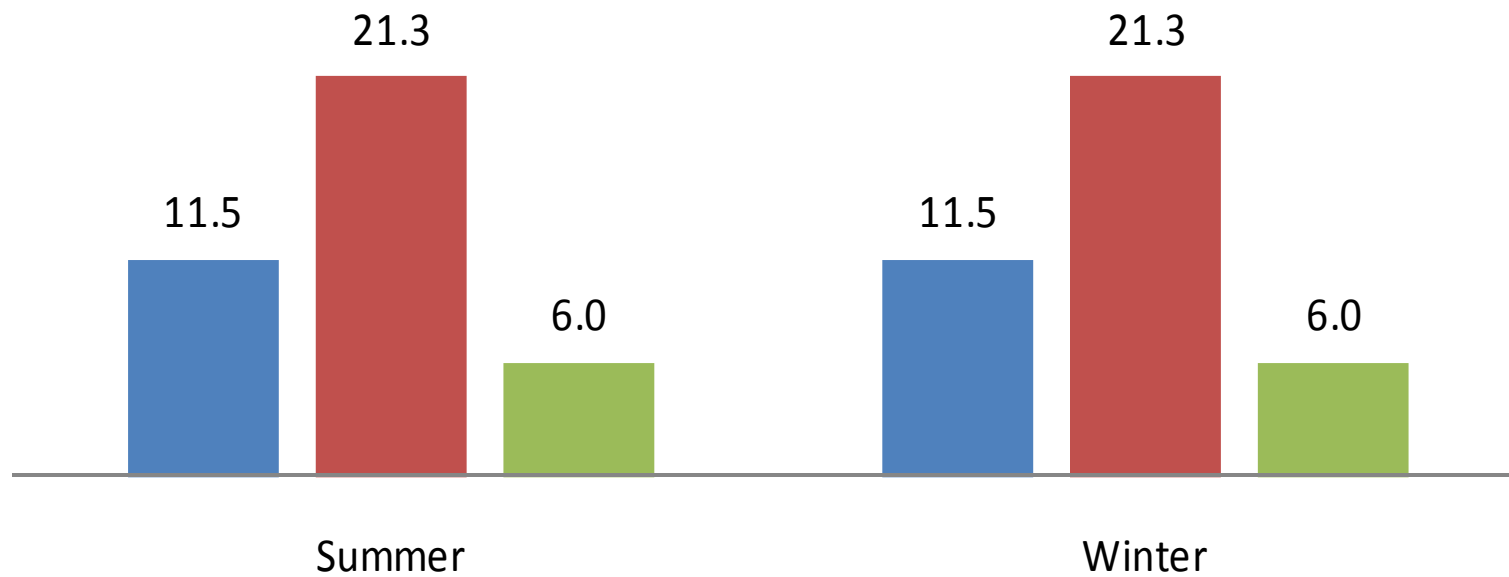
Bigger Savings for Bigger Users

Working Time-of-Use Programs



Wisconsin PS C&I TOU 16% Participation

■ Standard ■ Peak ■ off-peak



Working Time-of-Use Programs



Wisconsin P. S. TOU: New in '06, 50% growth in '08

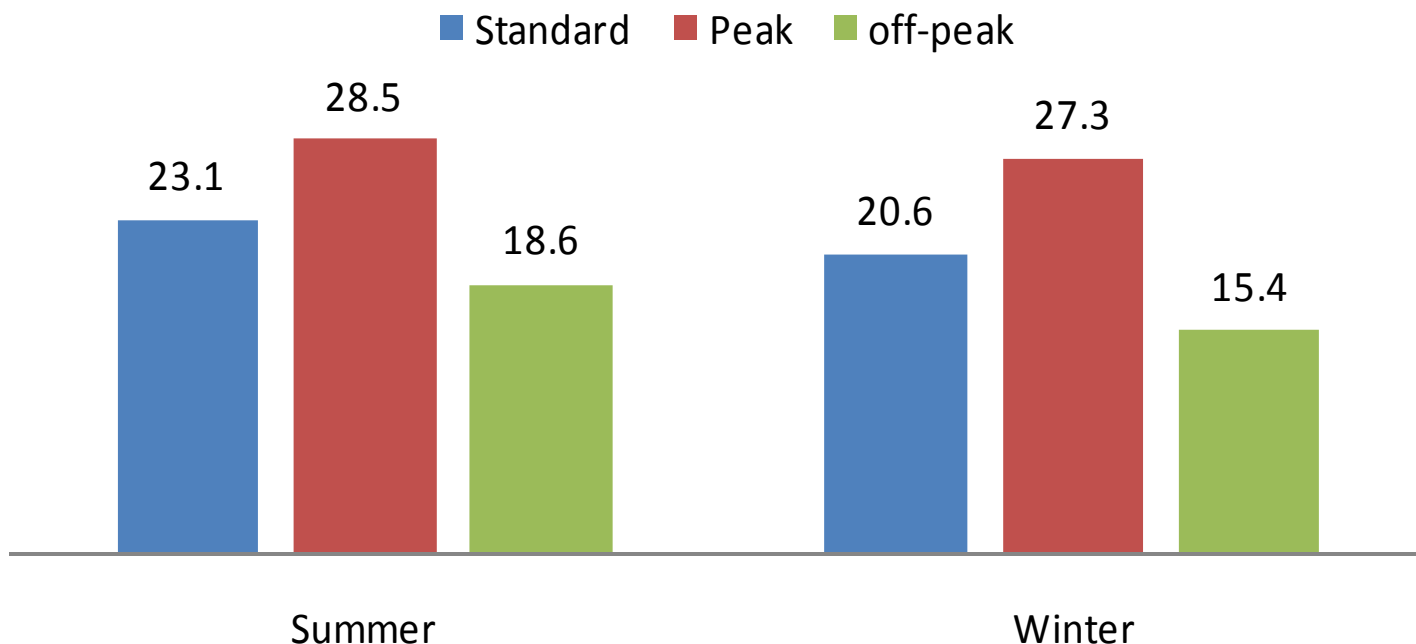
Off-Peak Discount is Real

Peak Period Options Are Offered

**Winter: (8 to noon & 4 to 9), or (9 to noon & 4 to 10), or
(9am to 8pm)**

**Summer: (9am – 7pm), or (10am – 8pm), or
(9am to 8pm)**

United Illuminating Residential TOU 14% Participation



Working Time-of-Use Programs



UI Residential Time-of-Use:

2.3% Annual Growth Rate (5 years)

Prices ARE HIGH: 28 Cents

Peak is Noon to 8pm

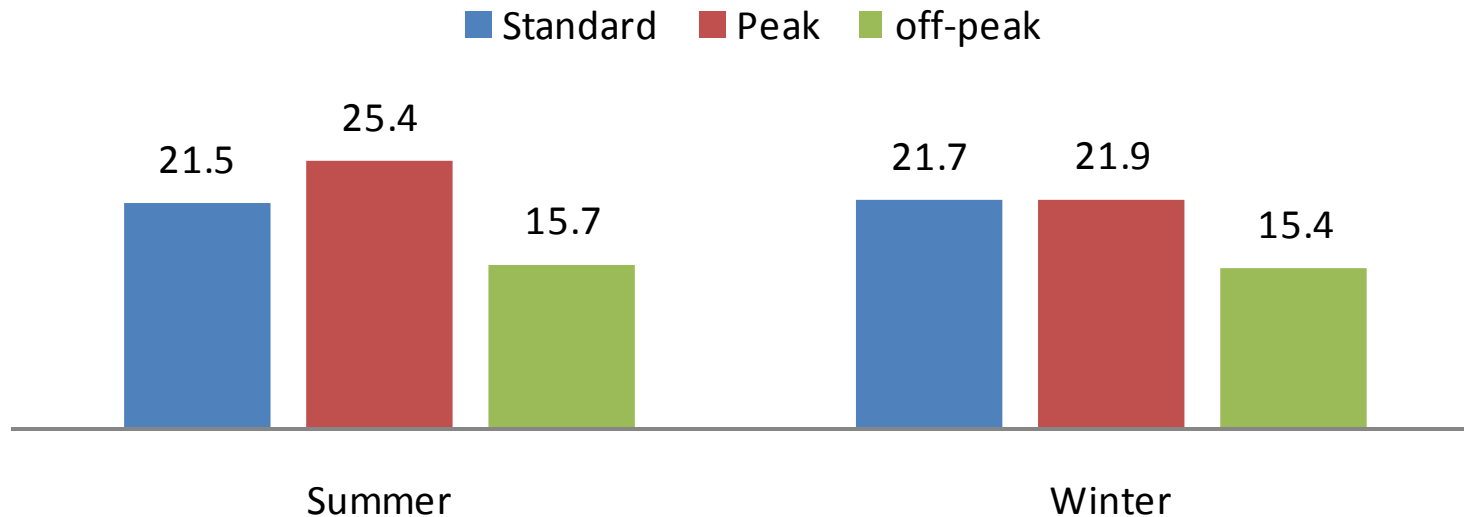
On-Peak Penalty and Off-Peak Discount Are Same

Peak is 24% of Hours

Bigger Savings for Bigger Users

Working Time-of-Use Programs

United Illuminating C&I TOU 23% Commercial to 40% Industrial Participation



Working Time-of-Use Programs



United Illuminating: 5 year Growth Rate 1.4%

Price Levels Are High

Off-Peak Discount is Real

Peak Period is 10am – 6pm Year-Round

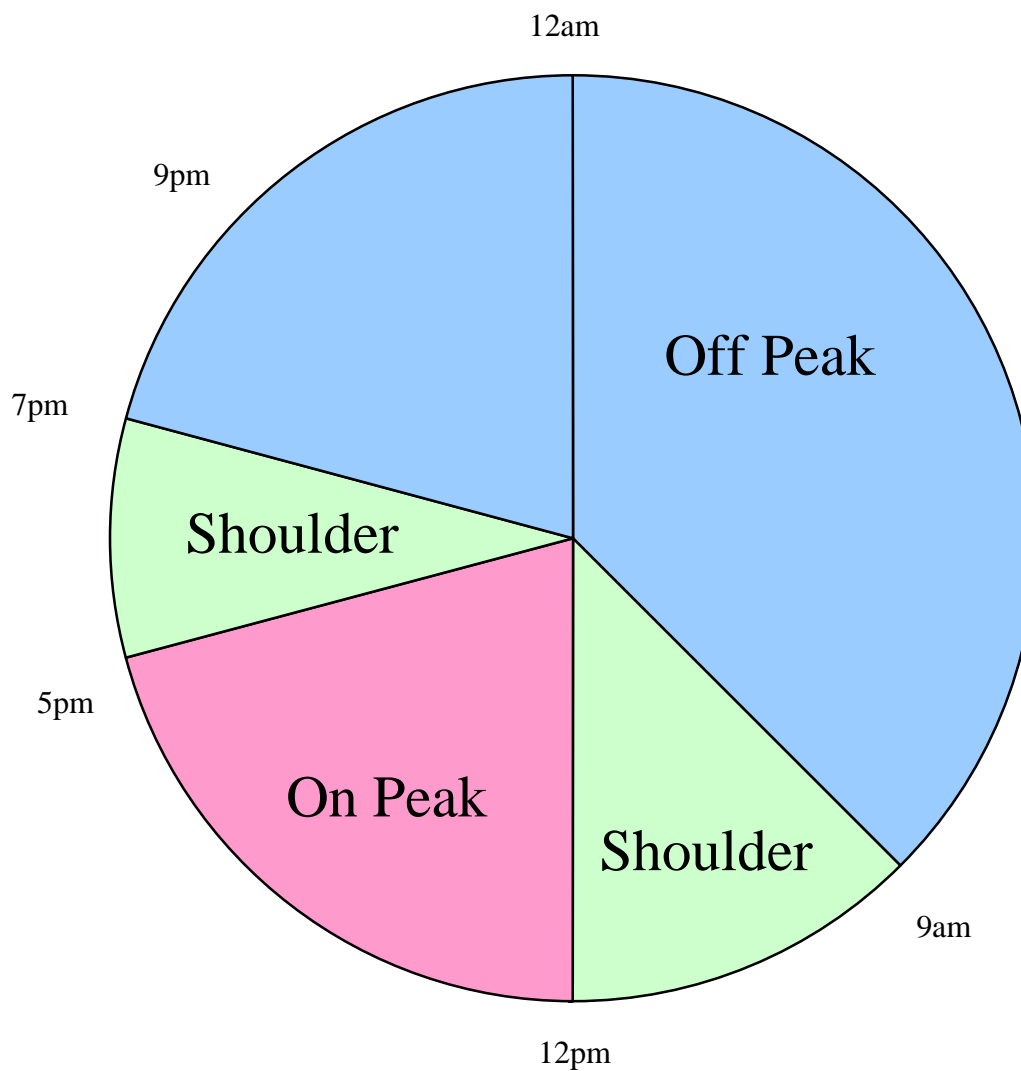
Structurally Benefits a High Load Factor, Electric Heat

Residential Time-of-Use

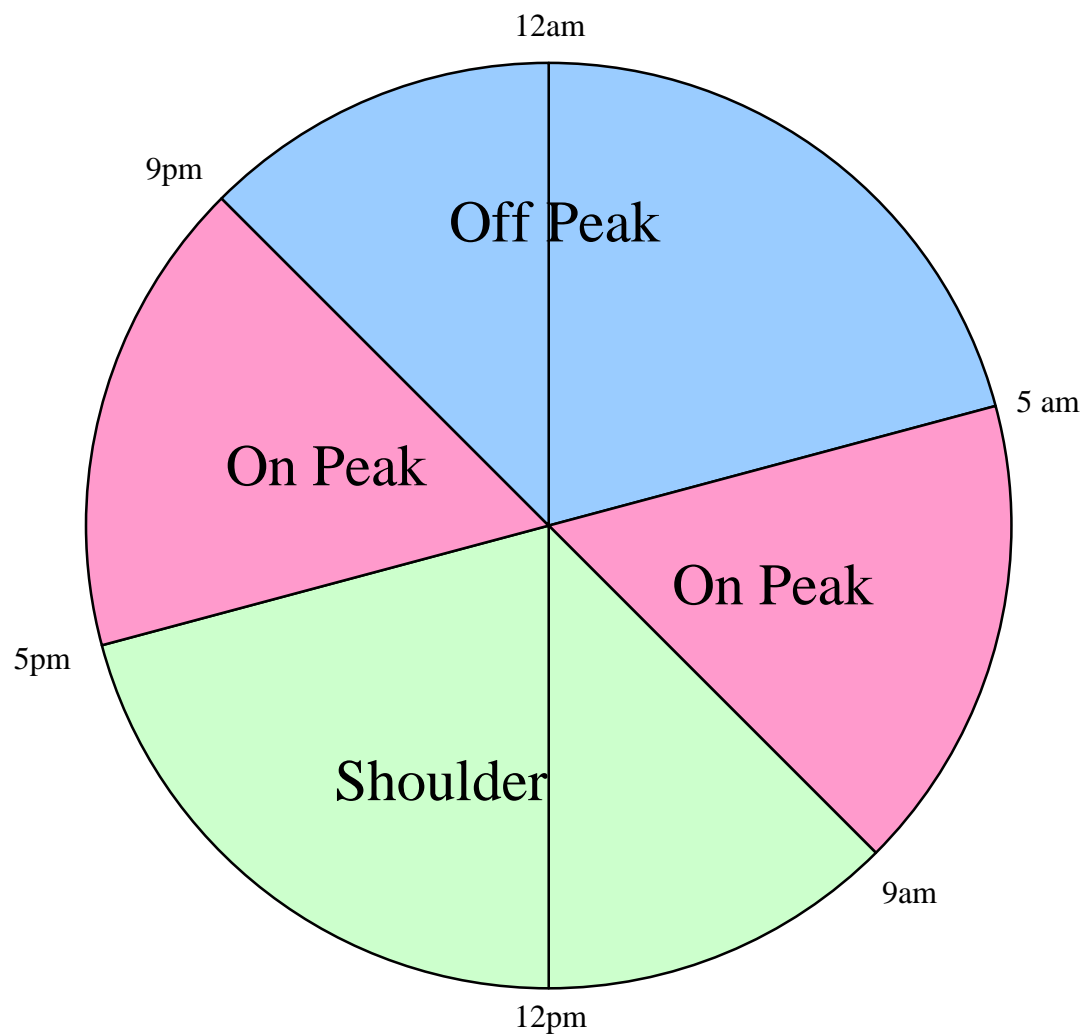
The “9 to 5” Rate



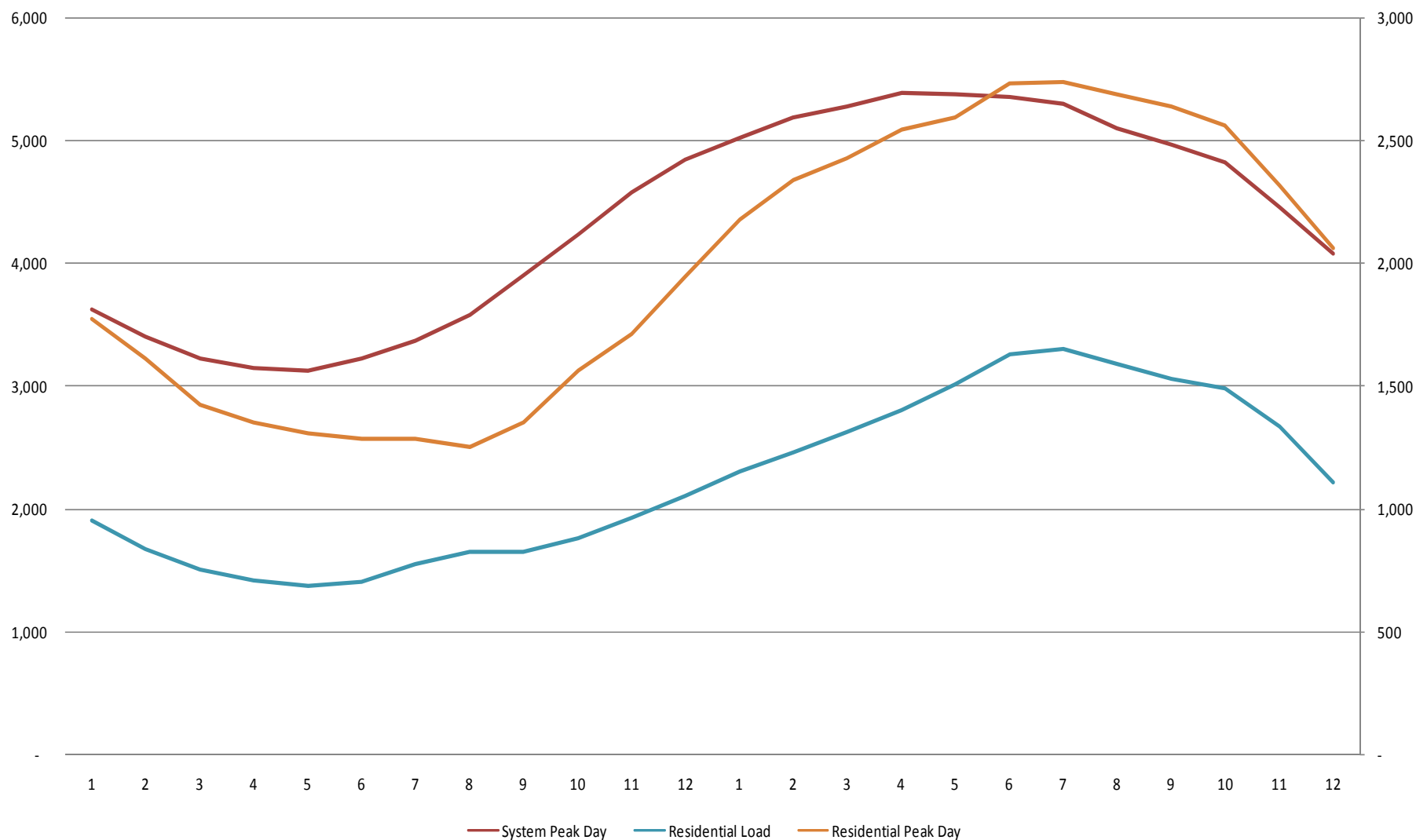
Summer Schedule



Winter Schedule



In Summer, The Residential Peak Demand Occurs After The System Peak Demand



Residential Time-of-Use Tariff Lowers Winter Peaks 60 MW to 80 MW

