

Disclaimer

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Coast Electric Power Association

Residential Time of Use program

Coast Electric Power Association (Coast) was organized in 1939 through a merger of two electric cooperatives (Hancock Electric and Gulf Coast Electric) in South Mississippi. We provide power to almost 79,000 rural Mississippians in Hancock, Harrison and Pearl River Counties. Our mission is “to provide our member/owners superior service and dependable electricity at the lowest possible price, and to improve the economy and quality of life in our community.”

Coast first began offering a Time of Use (TOU) rate in June of 2009 as an option for members to use to help control their electric bill. Implementation of this type of rate design prior to 2009 was not beneficial as our energy provider, South Mississippi Electric Power Association (SMEPA), did not have a wholesale time of use rate program in effect. The goal of a TOU rate is to reduce coincident peak demand (billed demand) thereby reducing cost of purchased power. Another benefit of a successful TOU rate is that generation capacity is reduced; therefore, future capacity additions are delayed or eliminated. Using rates as an incentive/deterrent creates a voluntary, member controlled demand management program instead of a utility controlled program. A time of use rate also creates a voluntary demand management program instead of one being forced on the consumers by the utility. Consumers are able to choose whether to pay the higher cost of energy during peak times or defer using energy when there is less demand on the generation resources. From a consumers perspective managing their electric bill on a TOU rate is as simple as changing the time they heat their water, wash dishes and wash and dry clothes. Some may even choose to be more aggressive and alter when they heat and cool their home.

The rollout of our TOU program was slow as special meters had to be individually programmed to capture the necessary data. Also Coast was still manually reading meters so people had to be trained to recognize which meters were TOU as well as how to interpret the data. Another deterrent to the early TOU program was the design itself. The peak time in the wholesale rate from SMEPA was very broad to cover all possible peaking times (table 1) and the rate differential was not significant enough to encourage participation. By the end of April 2010 (pre-award) only 65 members were participating in the program.

Table 1	SMEPA peak times	Coast peak times	Coast Residential TOU Rates	Coast Standard Residential Rate
Summer Peak	May – October 3:00pm – 8:00pm	May – October 3:00pm – 8:00pm	18.133 cents/kWh	9.629 cents/kWh
Winter Peak	November – April 6:00am – 8:00am and 3:00pm – 8:00pm	November – April 6:00am – 8:00am and 3:00pm – 8:00pm	18.133 cents/kWh	9.629 cents/kWh
Off-Peak	All remaining hours	All remaining hours	6.117 cents/kWh	9.629 cents/kWh

While this program did provide individual members the ability to significantly reduce their electric bill, the low participation rate did not produce any real benefit to Coast. Our challenge moving forward was twofold: make the program easier to implement and reduce the peak hour range to the smallest necessary.

In 2009 Coast entered into a proof of concept agreement with Landis & Gyr for an Automated Metering Infrastructure (AMI) system. In addition to obtaining daily meter reads, it was expected this system would enhance the implementation of our TOU program by allowing us to gather usage and demand during specific time intervals and complete meter configurations remotely. In May of 2010 Coast joined SMEPA in participating in the American Reinvestment and Recovery Act's (ARRA) Smart Grid Investment Grant (SGIG) program to accelerate implementation of our AMI system.

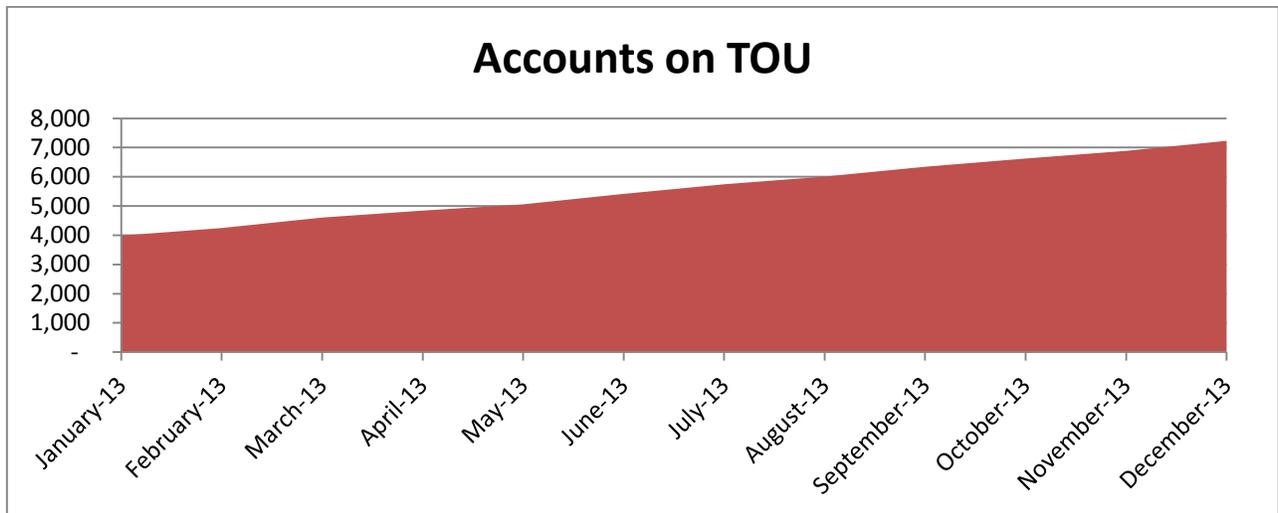
In early 2011 we were able to review our TOU program using information gathered from our meters along with data from SMEPA and make some significant enhancements that made the program more attractive for our members. Specifically we determined the following:

- SMEPA generation is split between their owned resources and purchased power with regard to peaking times.
 - The peaking times in some months are very different between the SMEPA owned resources and the purchased generation.
 - Coast is served primarily by the purchased resources (87% of kWhs purchased)
 - Peak time is very predictable in most months
- In the previous 20 years our generation resources had:
 - Rarely peaked on weekends.
 - Never peaked on Thanksgiving, Christmas or New Years day.

Armed with this data, we felt comfortable excluding weekends and the above mentioned holidays from the peak times. Effective April 1, 2011 our residential TOU rate was changed as follows (Table 2):

Table 2	SMEPA peak times	Coast peak times	Coast Residential TOU Rates
Summer Peak	May – October 3:00pm – 8:00pm	May – October 3:00pm – 6:00pm Monday through Friday	21.800 cents/kWh
Winter Peak	November – April 6:00am – 8:00am and 3:00pm – 8:00pm	November – April 6:00am – 8:00am and 5:00pm – 8:00pm Monday through Friday Excluding Thanksgiving, Christmas and New Years day	21.800 cents/kWh
Off-Peak	All remaining hours	All remaining hours	5.433 cents/kWh

Since the changes made in 2011, participation has increased dramatically. In 2013 alone the number of residential accounts participating nearly doubled. As of March 2014, approximately 10% of our residential membership is participating in this program.



In November 2013 the rate was modified again (Table 3) to make it even more attractive to members and to create an even greater incentive to avoid peak generation times.

Table 3	SMEPA peak times	Coast peak times	Coast Residential TOU Rates
Summer Peak	May – October 3:00pm – 8:00pm	April – October 3:00pm – 6:00pm Monday through Friday	32.000 cents/kWh
Winter Peak	November – April 6:00am – 8:00am and 3:00pm – 8:00pm	November – March 6:00am – 8:00am Monday through Friday	32.000 cents/kWh
Off-Peak	All remaining hours	All remaining hours	5.433 cents/kWh

Our members have seen significant savings both individually and as a group. Those who choose to fully participate and install timers on water heaters, HVAC systems, swimming pools and other appliances are reaping savings in excess of 30% on their electric bill. As a group, our residential TOU accounts have realized a 17% savings on their electric bills.

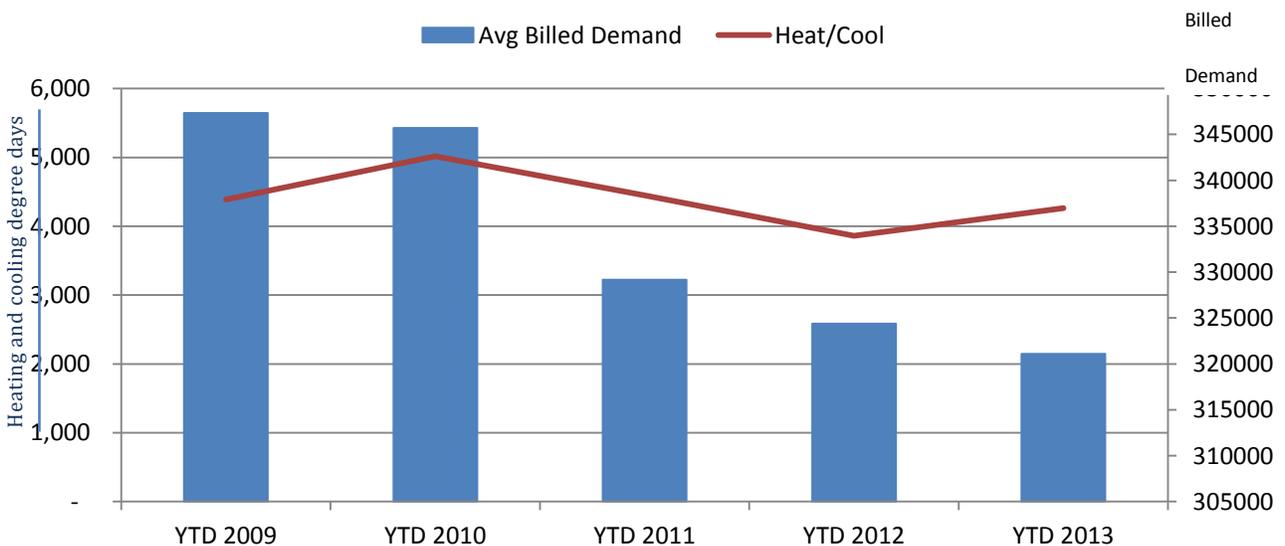
Month	# of Accounts	kWh Sold	Revenue on TOU Rate	Revenue on Standard Rate	Savings to member
January 2013	3,986	5,883,134	\$576,084	\$677,105	
February 2013	4,247	5,859,140	\$590,177	\$670,623	
March 2013	4,605	5,547,186	\$565,226	\$667,565	
April 2013	4,843	5,717,160	\$598,712	\$686,362	
May 2013	5,057	5,194,291	\$548,669	\$645,969	
June 2013	5,416	7,683,923	\$729,002	\$893,082	
July 2013	5,744	9,453,392	\$846,852	\$1,078,996	
August 2013	6,008	10,458,322	\$940,809	\$1,184,122	
September 2013	6,344	10,663,792	\$969,983	\$1,207,760	
October 2013	6,626	9,528,929	\$887,435	\$1,111,044	
November 2013	6,888	7,754,982	\$814,808	\$939,748	
December 2013	7,233	10,598,112	\$972,009	\$1,231,752	
Total					

When properly managed, this program benefits both the consumer and the utility. Below is an example using actual data obtained from our AMI system (2013 rates are used in this example).

This consumer requires 17.25 kW at any one time to meet their needs. Through proper management and programmable control devices, this consumer was able to move their load to a time when generation resources are not in high demand. During the “peak” hours, this consumer required only 0.98kW. For Coast, the approximate savings was \$237.22. The benefit to the member was a reduction in their electric bill of \$117.06.

<ul style="list-style-type: none"> • CEPA standard rate \$0.09629/kWh • CEPA Residential TOU rate <ul style="list-style-type: none"> – Peak \$0.218/kWh – Off-peak \$0.05433/kWh • Comparison • 31 days in billing cycle • Total kWh 3,283 <ul style="list-style-type: none"> – 3,166 off-peak kWh – 117 peak kWh – Off-peak demand 17.25kW – Demand during generation peak 0.98 kW 	<ul style="list-style-type: none"> • Standard Residential Rate <ul style="list-style-type: none"> Amount billed to mbr \$343.69 Cost to CEPA \$339.94 Margin \$ 3.75 • Residential TOU Rate <ul style="list-style-type: none"> Amount billed to mbr \$226.63 Cost to CEPA \$102.72 Margin \$123.91 <ul style="list-style-type: none"> • Savings to member \$117.06 • Savings to CEPA \$237.22
	Increased margin for CEPA \$120.16

The effort to lower billed demand has been successful. The graph below indicates average monthly billed (peak) demand has decreased dramatically since 2009. Certainly weather has play a role in this reduction, but even in years where heating and cooling degree days increased (2010 and 2013), average generation peak demand has been down. This has been accomplished even with the number of meters being served increasing each year.



A great example of the effectiveness of this program is a comparison of January 2010 to January 2014. In January 2010 our service area experienced severe cold weather (low temperature of 15 degrees) and set an all-time peak demand of 510,376 kW NCP and 502,287 kW CP. Very similarly in January 2014 we again experienced extremely low temperatures (17 degrees) and set a new system peak of 527,589 kW NCP (an increase of (3.37%) and 503,981 kW CP (an increase of 0.34% over January 2010). Since January 2010 our membership grown from 76,701 to 79,000 (a 2.6% increase).

	January 2010	January 2014	% increase
Number of Members	76,701	78,897	2.87%
Low Temperature	15 degrees	17 degrees	
Non-coincident peak	510,376 kW	527,589 kW	3.37%
Coincident peak	502,287 kW	503,981 kW	0.34%

Having a time of use rate in place members helped reduce generation demand during the peak time, saving themselves and Coast money.

By using data obtained from SMEPA and our meters, Coast has been able to target generation peak times and create rates that allow members to live the lifestyle they desire, but encourage them to avoid expensive generation peaking times. Members are more aware of how demand for capacity affects the price of electricity and are able to decide if they are willing to pay the higher cost of peak energy. Coast's residential members have benefited greatly from the TOU program, saving an average of 17% on their electric bill. The density of members participating has increase to a level the Association is seeing benefits from the program. The challenge going forward is to continue to recruit participation and to make sure members keep their timers programmed to avoid peak times.