STATE OF IOWA
BEFORE THE IOWA UTILITIES BOARD

IN RE:	)	
	)	DOCKET NO. RPU-2017-0001
INTERSTATE POWER AND LIGHT COMPANY	)	
	)	

DIRECT TESTIMONY
OF
GRAEME MILLER

On Behalf of

Environmental Law & Policy Center and Iowa Environmental Council

August 1, 2017

Q. What is your name and business address?

A. My name is Graeme Miller. I am an Energy Policy Analyst with the Energy Resources Center (ERC) located in the College of Engineering at the University of Illinois at Chicago. The offices of the ERC are located at 1309 South Halsted Street, Chicago, Illinois 60607.

Q. On whose behalf are you testifying today?

A. I am testifying on behalf of the Environmental Intervenors, specifically the Iowa Environmental Council (IEC), and the Environmental Law and Policy Center (ELPC).

Q. Please describe your background.

A. I graduated cum laude from Grinnell College in 2006 with a Bachelor of Arts degree. I have received my Masters of Urban Planning and Policy in 2012 from the University of Illinois at Chicago. Between 2007 and 2009 I was employed with Integrys Energy Services as an account and purchasing specialist.

In 2010 I joined the Energy Resources Center as a Graduate Assistant. In 2011 I was promoted to Program Assistant. I assumed my current position as Energy Policy Analyst in 2012.

The ERC is an interdisciplinary public service, research, and special projects organization dedicated to improving energy efficiency and the environment. Based out of the College of Engineering at the University of Illinois at Chicago (UIC), the ERC was established in

1973 by the Board of Trustees as an approved Illinois Board of Higher Education center. The ERC is also the home of the U.S. Department of Energy (DOE) sponsored Midwest Combined Heat and Power Technical Assistance Partnership (Midwest CHP TAP). The Midwest TAP was established in 2001 as a regional resource to provide targeted education, unbiased information and technical assistance in the areas of Combined Heat and Power (CHP), Waste Heat to Power (WHP), and District Energy Systems. The Midwest TAP provides these services to the 12-State Midwest region, which includes the State of Iowa.

Q. Please describe your experience in the field of electric utility regulation and specifically in standby rates.

A. I work on energy policy issues for the U.S. DOE Midwest Combined Heat and Power Technical Assistance Partnership. My current research focuses on identifying, quantifying, and addressing barriers to clean distributed generation technologies such as combined heat and power (CHP), waste heat to power (WHP), district energy (DE), and energy efficiency (EE) installations. I have specifically focused on how utility rates affect combined heat and power deployment. I have written research papers on CHP, energy efficiency, energy security and utility rate policy for the U.S. DOE Midwest CHP TAP, the Illinois Department of Commerce and Economic Opportunity, the Illinois Emergency Management Agency, the Iowa Office of Consumer Advocates, the Iowa Environmental Council, the Minnesota Department of Commerce, the Missouri Department of Economic Development, the Michigan Agency for Energy, and the Environmental Law and Policy Center. I have also submitted expert witness testimony and comments in utility rate cases and efficiency filings before the Iowa Utilities Board, the Missouri Public Service Commission, the Minnesota Public Utilities Commission, and the Indiana Utility Regulatory Commission. Additionally, I have presented on CHP and utility rate topics before the Indiana State Senate.

I am a member of the International District Energy Association (IDEA), the U.S. Combined Heat and Power Association, the Alliance for Industrial Efficiency, and the Midwest Cogeneration Association where I sit on the policy committee.

Q. Have you previously given testimony to the Iowa Utilities Board?

A. Yes. I have given testimony in both EEP-2012-0001 and EEP-2012-0002, Interstate Power and Light Company (IPL) and MidAmerican Energy Company's 2014-2018 energy efficiency plan dockets. My testimony covered the benefits and varied methodologies of including CHP in energy efficiency portfolios. I have also given testimony in RPU-2013-0004, discussing MidAmerican Energy Company's standby rate.

Q. What previous experience do you have with IPL's standby rate?

A. I have co-authored two studies on utility rates in Iowa (Exhibits GM-1 and GM-2) which analyzed Iowa standby rates and their impact on CHP implementation. Additionally, I have met with IPL staff multiple times, most recently in 2015, to discuss possible modifications to the standby rate in order to remove structural tariff barriers towards CHP customers. At the time, my recommendations focused on harmonizing the cost of capacity between full requirement customers and standby customers. To date these issues remain unaddressed.

Q. What is the purpose of your testimony today?

A. The purpose of my testimony is to identify how IPL's proposed Standby Power Service tariff, Electric Large General Service – Supplementary Power tariff, and related tariffs create a significant financial barrier to otherwise economically-viable applications of combined heat and power. I do not analyze the impacts of IPL's proposed rates on other types of distributed energy resources, but the barriers may transfer to those resources as well.

Q. Please provide a brief summary of your recommendations

A. I provide four recommendations.

- IPL should readjust their definition of standby usage so that capacity and energy purchased through the Electric Large General Service – Supplementary Power tariff cannot also be classified as standby usage.
- Remove the limit of 964 hours for unscheduled standby service.
- Harmonize standby usage rates with supplemental usage rates so that the cost to provide capacity remains the same on both tariffs.
- Introduce seasonality into the standby tariff charges in order to further harmonize the supplemental and standby tariffs.

Q. What is combined heat and power?

A. Combined Heat and Power, also known as cogeneration, is an efficient and clean approach to generating electricity and useful thermal energy from a single fuel source at the point of use. Instead of the conventional method of utilizing electricity produced at a central station power plant (normally produced at a delivered efficiency of approximately 33% for coal units and other steam plants, up to perhaps 45% for the very best combined-cycle units at ideal conditions) and burning fuel in an on-site furnace or boiler to produce the required thermal energy (normally at an energy efficiency of approximately 80%), an industrial or commercial facility can utilize an on-site CHP system to provide both their thermal and electricity requirements from a single fuel source with a higher efficiency. An on-site CHP system sized properly for the thermal load of the facility can provide both electricity and thermal energy at an efficiency of 65% to 75% versus the combined efficiency of the conventional method which is approximately 45%. In addition, CHP systems provide significant emission advantages over the conventional methods of providing our electricity and thermal requirements.

Q. Is this a new or emerging technology?

A. No. Combined Heat and Power applications have existed ever since Thomas Edison's Pearl Street Station. While CHP has been in use in the United States in some form or another for more than 100 years, it remains an underutilized resource today. CHP currently represents approximately 8 percent of U.S. generating capacity compared to over 30 percent in countries such as Denmark, Finland and the Netherlands. Its use in the

U.S. has been limited, particularly in recent years, by market and non-market barriers including standby rates.

Q. How does CHP work?

A. There are two types of CHP systems —topping and bottoming cycle CHP. In a topping cycle CHP system (sometimes referred to as conventional CHP), fuel is combusted in a prime mover such as a gas turbine, microturbine, reciprocating engine, or fuel cell for the purpose of generating both electricity and thermal energy. The thermal energy, which comes from using the heat that would otherwise be lost in the prime mover's hot exhaust or cooling systems, is recovered to provide process or space heating, cooling, and/or dehumidification. Optimally-efficient topping cycle CHP systems are typically designed and sized to meet a facility's baseload thermal demand.

In a bottoming cycle CHP system, also referred to as waste heat to power (WHP), the CHP system takes advantage of heat that is generated as part of the industrial process and is normally vented to the atmosphere. In these applications, no additional fuel is required to produce the needed electricity or thermal energy; however, additional fuel may be added to the process in order to produce greater amounts of electricity or thermal energy. In the WHP process, a portion of the heat rejected from the industrial process is recovered and typically used to produce high grade steam through a heat recovery steam generator, and then the steam is utilized in a steam turbine to generate the electricity. WHP systems are a particularly-beneficial form of CHP because they utilize heat that would otherwise be wasted as a result of an existing thermal process to produce electricity without directly consuming additional fuel.

Q. What are the benefits of combined heat and power?

A. As an energy efficiency technology, CHP can provide benefits to both U.S. businesses and utilities. For businesses, properly-sized and installed CHP systems can:

- Make them more competitive by reducing their overall energy costs;
- Reduce the risk of electric grid disruptions by enhancing electricity reliability;
- Provide stability in the face of uncertain electricity prices; and
- Reduce overall greenhouse gas and other harmful emissions.

For utilities, CHP systems can:

- Offer a low-cost approach to new electricity generation capacity;
- Decrease the need for new transmission and distribution infrastructure;
- Enhance power grid security;
- Contribute to meeting energy efficiency targets.[1]

Q. Are there CHP units currently operating in Iowa?

A. Yes. The Department of Energy maintains a CHP installed site database.[2] According to DOE information, there are 35 active CHP sites in Iowa with a total capacity of 766 MW.

[1] Currently IPL allows bottoming cycle CHP units to qualify for efficiency rebates.
[2] https://doe.icfwebservices.com/chpdb/

Q. Is there additional potential for combined heat and power in Iowa and IPL's service territory?

A. Yes. In 2016, the U.S Department of Energy published a study on the technical potential of CHP throughout the United States. This report concluded that Iowa contains 1,993 MW of CHP potential spread across over 3700 sites.[3]

Q. Has the Midwest CHP TAP provided assistance to any entity in Iowa?

A. Yes, we have. The DOE CHP TAP programs divide assistance into three categories: technical assistance (providing end-users technical expertise to help explore CHP), end-user education (educating end-users on the potential benefits of CHP) and policy-maker education (educating policy-makers on the potential benefits of CHP). Over the past 4 years, the Midwest CHP TAP has provided assistance to 40 sites including end-users, policy makers, equipment representatives, and others.

Q. How many customers with CHP does IPL currently have in their territory?

A. While I cannot say for certain how many CHP sites are within IPL's service territory, I do know that IPL has only three customers on their current standby rate. These three sites all have CHP units. (IPL Response to EI DR 7, attached as Ex. GM-3.)

[3] https://www.energy.gov/sites/prod/files/2016/04/f30/CHP%20Technical%20Potential%20Study%203-31-2016%20Final.pdf

Q. Can you draw any conclusions from that fact?

A. When Iowa has 35 active CHP sites and the additional technical potential to support another 3,700 sites while IPL only has 3 customers on its standby rate, that indicates that the tariff structure poses a barrier to CHP implementation in IPL's service territory.

Q. Are you aware of any site or sites that were prevented from implementing CHP based on IPL's standby rate?

A. Yes. In the course of providing technical assistance to potential CHP end-users in Iowa, I have seen directly how IPL's standby rate has prevented otherwise-economically-viable CHP applications from being realized. As a first step in assessing CHP feasibility, the Midwest TAP completes a CHP qualification screening for any interested end-user. To my knowledge, none of the qualification screenings within IPL's service territory have shown CHP equipment paybacks within accepted tolerances.

I will give one illustrative example. In 2013, Luther College approached the TAP to analyze CHP feasibility for the college. Our initial assessment found a CHP system payback of 55 years – well over the life span of the equipment. The single largest factor in this high payback window was IPL's standby rates which only allowed Luther College to avoid, at most, 70% of their full requirements charges.[4] In order to demonstrate the degree to which IPL's standby rate created a financial barrier, the TAP reran our analysis using the newly approved rider SPS from MidAmerican Energy Company. Under this analysis, the system payback dropped to 15 years – within the life span of the proposed

[4] The avoided rate or avoided rate percentage measures the financial impact of standby rates. The percentage represents the amount of the aggregate cost of electricity a customer is able to avoid after the installation of CHP or other DG technologies.

equipment and within the acceptable payback window of Luther College. According to our analysis, had Luther College been in MidAmerican's territory, there was a good chance this project would have moved forward.

Q. What is a standby rate and how might it hinder CHP development?

A. Standby rates, otherwise known as partial service rates, constitute a subset of retail electric tariffs that are intended for customers with on-site, non-emergency distributed generation such as CHP. They are the rates utilities charge to provide backup electricity to an operator of CHP during both scheduled and unscheduled outages, in addition to the cost to reserve such service. This service could be a tariff that replaces the standard full requirements tariff or an additional rider that applies on top of the standard tariff for certain special types of service. Utilities that provide these services in their tariffs typically distinguish among three types of partial requirements service: supplemental, backup, and maintenance.

- Supplemental service provides additional electricity supply for customers whose on-site generation does not meet all of their needs. In many cases, it is provided under the otherwise applicable full requirements tariff.
- Backup service supports a customer's load that would otherwise be served by CHP, during unscheduled outages of the on-site generation.
- Scheduled maintenance service is taken when the customer's CHP is due to be out of service for routine maintenance and repairs.

Q. Are standby rates necessary?

A. Standby rates are necessary when and if the full requirements rate cannot accurately recover the fully-allocated embedded costs that the utility incurs to provide backup and maintenance service to customers with on-site generation like CHP. Unlike full requirements customers, partial service customers will usually put their full facility load onto the grid only when their generator goes offline. Generator outages can usually be grouped into two categories: planned and unplanned. Planned outages (maintenance outages or maintenance events) are planned weeks to months ahead of time and are generally scheduled at times when the utility has excess capacity or is otherwise not at system peak. However, unplanned outages (or forced outages) can occur anytime and require the utility to serve the additional load placed on the grid with little to no warning. Because these outages occur randomly and infrequently, it can be difficult to recover the utility's incurred capacity costs through full requirements rates.

Q. How can standby rates pose a barrier to CHP?

A. Standby rates are an important factor in determining the relative feasibility of CHP applications as compared to taking full requirements service from an electric utility. Charges or terms and conditions of a standby tariff that result in excessive costs for standby service discourage CHP development, an inherently more energy-efficient technology than taking traditional central station steam generated utility power. Standby rates with large fixed charges often pose the biggest obstacles because they do not allow a customer to avoid charges when not taking service. Generally speaking, standby rates built on fixed charges do not provide accurate price signals reflecting the differences in costs for serving customers with generation. For example, the cost for a utility to provide standby service can differ greatly between the on and off peak periods; however, inflexible fixed charges usually do not reflect this cost difference**.** The impact of such standby structures is that these customers pay nearly the same amount regardless of how much utility-supplied energy they use or what time of day or season of the year that they use utility-supplied energy.

In addition, a CHP customer would not be able to take full advantage of the efficiency improvements and energy savings provided by CHP because only a small portion of their charges would be based on energy consumption. If a customer will pay virtually the same energy cost whether or not they install CHP, there is little incentive to undertake a CHP project.

Q. In the tariff proposal in RPU-2017-0001, how is IPL's standby rate structured?

A. In its tariff proposal, IPL has created a separate customer class for standby customers. There are two specific rates within IPL's proposal that comprise standby service:

- Electric Large General Service – Supplementary Power (Rate Codes: 800, 807, 810, 817) ("supplementary power rate")
- Standby Power Service (Rate Codes: 790/840) ("standby rate")

The standby rate covers the customer's behind-the-meter-generation and provides for service during scheduled or unscheduled generator outages. The supplementary power rate provides service to the customer at levels above that being generated on site.

Q. Please describe how IPL's proposed standby rate works.

A. IPL employs a monthly reservation charge structure to recover the cost to provide standby service. Under this structure a standby customer will pay a monthly $/kW charge (the reservation charge) representing the cost incurred for the utility to reserve, but not supply, needed capacity during a customer's CHP outage. There are two primary components in this structure: the monthly reservation or unavoidable charges and the usage charges.

Monthly fixed/unavoidable charges:

Every month, regardless of whether a standby customer takes utility-supplied standby service, this customer will be billed a customer charge and a reservation charge. The customer charge is a flat fee based on the voltage in which a customer receives service (transmission, primary, secondary). The reservation charge is a $/kW charge broken down into a two overarching categories (firm, non-firm) and three service categories (generation, distribution, transmission). This charge ostensibly allows IPL to recover the cost to reserve capacity during a standby customer's generator outage. A customer taking firm standby service would need to pay for the generation reservation charge as well as the distribution and transmission reservation charges rates. A non-firm customer would only need to reserve distribution and transmission service. Note, a customer receiving service at transmission voltage will not need to reserve distribution service. The $/kW transmission reservation charge is provided in rider RTS.

The monthly reservation charge is calculated by multiplying the chosen reservation components (generation, distribution, transmission) by the customer's contract standby capacity.

Contract standby capacity is defined as the maximum amount of standby capacity IPL is required to provide during a generator outage. This contract standby capacity will not be less than the maximum load actually served by the Customer's generation during the current month. It can also differ between summer and winter.

Usage Charges

There are two categories of usage charges: those for scheduled outages and those for unscheduled outages. Scheduled outages are scheduled in advance with IPL during a qualified period. IPL requires an annual projection of scheduled maintenance from the customer but this schedule can be modified based upon "sufficient notice." A scheduled outage may not last longer than 6 weeks in any 12 week continuous period unless otherwise mutually agreed upon. All other outages are considered unscheduled. Scheduled outages are billed at a daily on-peak \$/kW charge delineated by the voltage at which a customer receives service and a \$/kWh energy charge delineated by seasonal on and off-peak periods. See IPL's standby usage rates below,

Standby Usage Rates:	
Daily Demand Charge	
Per kW for each daily maximum	
On-peak Standby demand	
Secondary Rate	$0.74
Primary Rate	$0.72
Transmission Rate	$0.62
Non-fuel energy charges per kWh:	
On-peak Summer	$0.04961
Off-peak Summer	$0.03169
On-peak Winter	$0.03169
Off-peak Winter	$0.01371

Unscheduled outages include all scheduled outage charges listed above plus an unscheduled standby energy adjustment charge. According to the tariff, the price for unscheduled outage sales shall be based on each hourly kW priced at the Midcontinent Independent System Operator (MISO) ALTW.ALTW node real-time LMP price plus a 10% adder for any incremental administrative and MISO-related charges but not less than the monthly energy adjustment clause. Though it is not stated in the proposed Standby Rider, according to David Vognsen's testimony, "IPL limits the amount of power a customer can take as unscheduled energy to 964 hours per year." (Vognsen Direct Testimony, page 33)

Assessing Standby Usage

IPL defines standby usage as the differential between a standby customer's contract standby capacity and the actual generator output. (IPL Response to EI DR 5, attached as Ex. GM-4.) For example, if the contract capacity is 10 MW and the generator is only operating at 8 MW, then the amount of actual capacity supplied to the site up to the difference – 2 MW in this case – will be billed as standby usage. Because of this, IPL requires metering equipment on all generators covered under its standby rate.

Q. Please describe how IPL's proposed supplementary power tariff works.

A. The supplementary power rate largely resembles the proposed Large General Service Rate although it is only available to customers with on-site generation. According to the tariff, supplementary power shall be used by a Customer having additional power requirements beyond that provided by its self-generation.

This rate provides service for standby customers in amounts above that being generated on site. Similar to the LGS rate, the demand component is divided into blocks and the energy component uses time of use pricing.

For the purposes of my testimony, the most important aspect of the supplementary rate is its billing demand ratchet. A demand ratchet is a mechanism that locks a customer's maximum capacity placed on the grid for a certain period of time, in this case for one year. This results in a customer paying for a level of capacity that is, in most cases, rarely reached through normal operation. According to IPL's supplemental tariff, a customer's supplemental billing demand will never decrease below 75% of the maximum billing demand determined during the previous months of June, July and August.

Q. Do you consider these proposed standby and supplementary power rates to be a significant barrier to CHP applications?

A. Yes, as proposed, these rates pose significant financial barriers to otherwise-economically-viable CHP systems.

Q. What are your greatest concerns with how IPL's proposed standby rate as structured?

A. My greatest concerns involve:

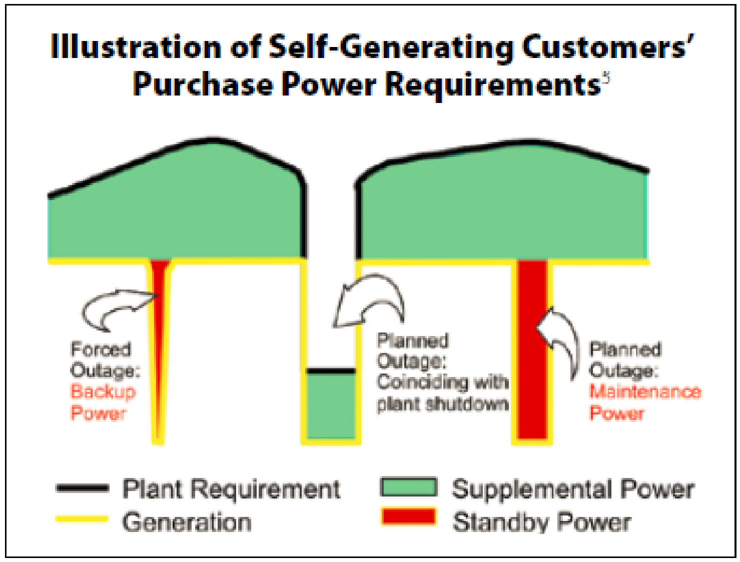
- IPL's definition of standby usage;
- The elevated costs of standby daily usage rates;
- The allotment of 964 hours of unscheduled outage service;
- The lack of adequate price signals to provide incentives to improve operation of on-site generating units and use utility resources more efficiently.

Q. Why is IPL's proposed standby usage definition problematic?

A. The method by which IPL defines standby usage overcharges a standby customer for capacity that is already consumed and purchased under the supplemental tariff. According to IPL, **s**tandby usage is defined as the differential between generator output and standby contract capacity. (Ex. GM-4.) More precisely, in any hour in which the customer is operating its generation at less than the contract demand, the power flowing through IPL's billing meter up to the difference between the contract demand and the generator's actual hourly generation is considered standby service regardless of the customer's total site load. (Ex. GM-4; see also IPL Response to EI DR 71, attached as

Ex. GM-5.) Any load above the standby contract capacity is then labeled as supplemental service and billed as such. This means that the demand charged to the supplemental tariff equals a facility's total metered capacity (inclusive of on-site generation) minus the standby contract capacity. While a seemingly logical method of calculating standby usage rates, this method removes all operational flexibility from on-site generation and bears little relation to cost causation from standby customer outages.

This is an important issue because the diminished output of a CHP unit should not necessarily incur standby usage charges. Standby usage service should only apply to the capacity and energy provided above the level at which a customer takes – and pays for – supplemental service from the utility while their generation is operational. For example, if a standby customer were to take a CHP unit offline while at the same time removing equivalent load from the site (through a variety of load reduction measures) – this should not incur standby usage charges since the customer's demand to the utility remains at the level at which they were previously assessed supplemental charges. The Regulatory Assistance Project provides an example of how standby ought to work.



[5]

According to RAP, "The standby tariff terms and conditions should make a clear distinction between the purchase of standby power and supplemental power. Without this clear distinction, a customer could be charged for backup power when the power requirement should actually be met through the customer buying supplemental power."[6] Unfortunately, IPL does not define standby usage using this approach and, instead, has created a standby structure where an identical level and amount of capacity can be defined and billed as both supplemental and standby usage capacity.

Q. Can you provide an example of how IPL's standby usage definition operates?

A. Yes. To provide an example of how this works please see Table 1, below. For a customer with 20 MW total demand and 10 MW of CHP standby contract capacity, the demand for supplemental service under IPL's proposed supplemental tariff would be 10 MW (=20 MW total load – 10 MW standby contract capacity). If in the preceding months that

[5] "Standby Rates for Combined Heat and Power Systems: Economic Analysis and Recommendations for Five States," prepared by Brubaker & Associates and the Regulatory Assistance Project for Oak Ridge National Laboratory, page 8.
[6] Ibid.

same customer had required less total capacity and had removed equivalent load from their CHP unit to reflect this decreased need, IPL would classify charges as follows:

	Total Site Load	CHP Output	Daily Standby Usage Capacity	Supplemental Demand	Supplemental Billing Demand	Actual Demand on IPL's Grid
June	20,000 kW	10,000 kW	0 kW	10,000 kW	10,000 kW	
July	18,000 kW	8,000 kW	2,000 kW	8,000 kW	8,000 kW	
August	16,000 kW	6,000 kW	4,000 kW	6,000 kW	7,500 kW	**10,000 kW**
September	14,000 kW	4,000 kW	6,000 kW	4,000 kW	7,500 kW	
October	12,000 kW	2,000 kW	8,000 kW	2,000 kW	7,500 kW	
November	10,000 kW	0 kW	10,000 kW	0 kW	7,500 kW	

Table 1: Standby capacity assignment under IPL's Standby Service Tariff

Throughout these six months the total capacity placed on IPL's grid remains the same; however, the classification and cost recovery of that capacity changes drastically. In June this fictional customer purchases 10 MW of capacity and related energy through the supplemental tariff; however, six months later that same 10 MW of capacity is now classified and charged entirely as standby service, which is much more expensive for the customer. Assessing this 10 MW of capacity under the standby usage pricing structure is financially onerous for standby customers especially if treated as an unscheduled outage, in which case the customer would be responsible for potentially significant MISO LMP charges. In this case, the customer is being charged for standby service when their power requirement is actually being met through the supplemental power the customer consistently uses.

The inclusion of a 75% summer demand ratchet within the supplemental rate makes this point more apparent. In November, under the above scenario, this fictional customer would be paying for 10 MW at the standby contract reservation rate, 10 MW at the standby usage rate, and 7.5 MW at the supplemental demand ratcheted rates; all while only placing 10 MW of capacity on the grid. The same 10 MW was placed on the grid in June and treated solely as supplemental billing demand.

Standby rates should be structured to recover the costs to provide energy, capacity and related infrastructure to customers at levels above that already recovered under the supplemental tariff. Standby rates should provide flexible approaches for standby customers to meet their own needs. By defining standby usage as the differential between generator output and contract capacity the ability of and incentive for standby customers to self-supply standby power through load reductions, backup generation resources, or other approaches is largely unavailable. From a cost recovery position, if a customer regularly purchases an amount of capacity through the supplemental tariff, there is no need to recover identical costs under a standby rider. This leads to double charging for capacity. An identical level and amount of capacity placed on IPL's grid should not be allowed to be both classified and billed as standby demand and as supplemental demand. This approach has no cost recovery justification and seems to exist only to prevent customers from installing behind the meter generation like CHP.
As one familiar with CHP in Iowa, it unfortunately seems to be succeeding.

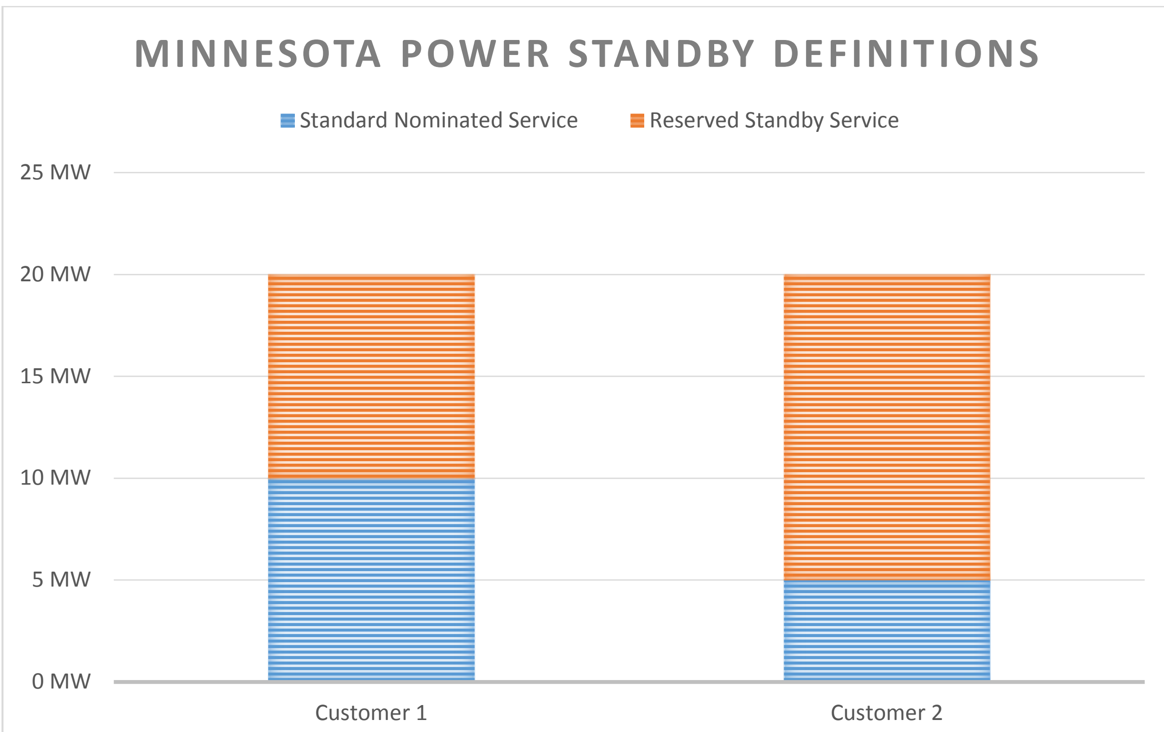
Q. How might this barrier be resolved?

A. Standby service ought to be defined as the level and amount of capacity above which a customer already takes – and pays for – utility service through their supplemental rates. Standby usage rates should only apply when a customer exceeds a capacity threshold under which the costs to provide service is already recovered under the supplemental tariff. This method can simplify the rider language and remove the need for a utility meter on the customer's generation. A number of utilities already use this approach. While there are some variants of this approach a precise example comes from Minnesota Power.

Minnesota Power in their most recent rate case (Docket No. E015/CI-15-115) created three tiers of standby service: nominated standard service, reserved standby service, and excess standard service. The standby usage service demand outlines how Minnesota Power assesses standby usage. The following are definitions provided from Minnesota Power's standby tariff:

- Nominated Standard Service – Billed demand up to the level specified in the Standby Service Agreement under the Customer's standard rate schedule.
- Reserved Standby Service – Maximum Scheduled Outage or Unscheduled Outage service allowed under this Rider for Standby Service as stated in the Standby Service Agreement. The contracted Reserved Standby Service shall not exceed the nameplate capacity of the Customer's distributed generation system.
- Excess Standard Service – Demand utilized in excess of the aggregation of the Customer's Nominated Standby Service and Reserved Standby Service billed on the Customer's standard rate schedule.
- Standby Usage Service Demand - Measured demand during Scheduled Outages greater than the Nominated Standard Service that is not Excess Standard Service.

The tariff works in the reverse of IPL's proposed standby tariff. Instead of defining supplemental capacity as that above the standby contract capacity, Minnesota Power defines supplemental capacity ("standard nominated service") using a contracted capacity. The usage under this service is billed under a customer's standard rate schedule (or, for IPL purposes under the supplemental tariff). As long as the contract capacity threshold designated in the standard nominated service is not exceeded, the customer is not considered to use standby service. Anything over the standard nominated service contract capacity is considered standby service, up to the standby contract capacity. Any capacity above the combined contract capacities is considered Excess Standard Service and is then added to the Standard Nominated Service contract capacity.



There are many benefits to this approach. The first and primary benefit is that it doesn't allow the utility to double charge for capacity. A standby customer pays for capacity within their standard nominated service contract capacity under full requirements tariffs (or, in the case of IPL, under the supplemental tariff). As the cost to provide this level and amount of capacity is already being recovered through full requirements rates, there is no need to incur standby usage charges. However, when the standard nominated contract capacity is exceeded, the customer is clearly using reserved standby capacity and should be billed for that use. Under this approach there is no confusion about how a standby customer's capacity is treated and billed.

Further, this approach only requires one billing meter between the utility and the customer and avoids requiring a billing meter on the customer's generator. This simplifies the tariff and reduces the costs imposed on the customer.

Q. Describe how IPL's allotment of 964 hours of unscheduled service poses a significant barrier to CHP.

A. The restriction of total unscheduled outage time to 964 hours per year is arbitrary and does little to incentivize efficient consumption by standby customers.

According to IPL, "the limit for customers to take unscheduled energy up to 964 hours per year is based upon an expected annual forced outage rate of SSPS customers' generation at approximately 11% per year, as accepted by the Board in Docket No. TF-06-336. The 11% forced outage rate, multiplied by the annual number of hours in a year (8,760), results in the 964 hours per year amount available for unscheduled energy usage." (IPL Response to OCA DR 17, attached as Ex. GM-6.)

However, nowhere else in the standby tariff is this 11% forced outage rate (FOR) mentioned. In fact, it isn't even mentioned in the tariff itself, only in related testimony.

Further, IPL does not even track the forced outage rate of standby customers. (IPL Response to IBEC DR 36, attached as Ex. GM-7.).

This restriction is unlike any other standby rate I have encountered. Usually when an hourly limit on standby service is included in a standby tariff, there is a similar hourly reprieve from unscheduled usage charges (or a portion thereof). The rationale being that the utility's cost to serve unscheduled service up to the capped amount is built into the monthly reservation charge. While including an hourly limit on standby service with a reprieve from unscheduled usage is still a flawed structure, it has an internal logic – there is an hourly limit because that is all that the customer purchased as part of purchasing standby service. However, IPL does not use such an approach. IPL limits unscheduled standby service to 964 hours while also charging usage charges during unscheduled outages (which, depending on the daily demand peak reached during an outage, can be a combination of daily as-used usage charges, energy charges, and MISO LMP charges). Either the costs to IPL to provide unscheduled standby service for 964 hours is built into and recovered through a combination of reservation charges and usage charges (up to 964 hours per year), or the inclusion of a 964 hour cap is arbitrary. If the first option is correct then we know that any standby customer requiring less than 964 hours of unscheduled outage service will overpay for service they will not use. This is already occurring. According to Mr. Vognsen the three standby customers in the test year used unscheduled outage service 330 hours, 192 hours, and 269 hours respectively. (IPL Response to Environmental Intervenors DR 7, attached as Ex. GM-3.)

If IPL isn't recovering the costs to provide 964 hours of unscheduled outage service through the reservation rates and usage rates, then the cap is arbitrary. Either way, an hourly cap for unscheduled service is a flawed structure that does not incentivize the efficient consumption of utility services.

Q. What do you recommend?

A. IPL should remove the cap and instead recover the costs to provide standby service through usage rates regardless of the amount of unscheduled outage service required.

Q. Describe why IPL's standby usage daily demand rates poses a significant barrier to CHP.

A. If an outage were to last an entire month, the capacity costs incurred by a standby customer would resemble a full-requirements customer.[7] However, the daily demand charges within IPL's standby tariff often exceed those found in the accompanying supplemental tariff when extended out for a month.

$ / kW	Standby Daily Demand Charge	Standby Monthly Demand Charge (when extended out)	Supplemental Demand Charge (first kW Block) - Summer	Supplemental Demand Charge (first kW Block) - Winter
Secondary	$ 0.74	$ 16.03	$ 20.85	$ 10.97
Primary	$ 0.72	$ 15.60	$ 20.85	$ 10.97
Transmission	$ 0.62	$ 13.43	$ 20.68	$ 10.00

Table 2: Daily Standby Charges vs. Supplemental Demand Charges[8]

When combined with the monthly reservation charges for which a standby customer would still be responsible, the combined payments for standby capacity (both reserved

[7] Ibid, 14.
[8] Monthly demand charges were calculated as following: 5 x 52 / 12 in order to arrive at the average number of on-peak days during an average month.

and used) would be far greater than if that capacity were purchased through the supplemental rate. Please see table 3 below.

	Primary Daily Demand Charge	Monthly Demand Charges - Summer	Firm Standby Reservation Charge	Monthly Demand Charges
10 MW Standby	$ 0.72	$ 15.60	15.34	$ 309,400.00
10 MW Supplemental	N/A	$ 20.43	N/A	$ 204,314.00

Table 3: Standby vs Supplemental Monthly Demand Charges

In the above scenario a 10 MW standby customer would pay over $100,000 more during a month in which a scheduled outage were to last the entire month. If this were an outage in winter the differential would be far greater. This approach seems punitive and intended to only prevent the implementation of CHP applications. Moving the standby usage rate in line with the supplemental demand rates would ensure consistency between the two tariffs and increased fairness for standby customers.

Q. Describe why IPL's standby reservation charge should be differentiated by season?

A. Currently, the reservation demand charge is a flat $/kW-month charge for the entire year. However, all of the demand charges on the supplemental tariff schedule are seasonal. The energy charges in the supplemental tariff are also seasonal. Introducing seasonality into the design of the reservation demand charge, the standby usage charges and the standby energy charges ("non-fuel energy charges") would ensure consistency with the design of other rate components in IPL's tariff. This rate design modification would also more accurately reflect the seasonal variations in IPL's cost of service.

As currently structured, a firm standby customer would pay a greater $/kW rate to reserve capacity during the winter than a supplemental customer would to consume that capacity. It should not cost a standby customer a greater amount to reserve capacity than it would for a supplemental or full requirements customer to consume that capacity.

Q. Please summarize your concerns and recommendations

A. Since I have been working on CHP issues, IPL's standby tariff has always been a significant barrier to CHP implementation. In its proposed iteration, the primary barriers towards CHP within IPL's standby and supplemental tariffs include the classification of standby usage, the unequal cost of capacity between standby and supplemental tariffs, and the seemingly arbitrary limit of unscheduled outage service. These structural barriers force standby customers to pay nearly the same amount regardless of how much utility-supplied energy they use or what time of day or season of the year that they use utility-supplied energy.

Well sited and maintained CHP systems can save IPL in transmission costs, potential line upgrades, and other related expenses by removing load from the grid for the vast majority of the year. This savings can then be passed on to the rate base so that all customers can benefit from increased CHP deployment. Yet such a scenario is unlikely under IPL's proposed standby and supplemental tariffs. In order to reduce the barriers within the standby rate I recommend that IPL:

- Reclassify standby usage as the capacity and energy consumed above a threshold under which the costs to provide service is already recovered under the supplemental tariff.
- Remove the arbitrary limitation on unscheduled outage service and instead recover all usage costs through usage charges.
- Harmonize the price of capacity between standby and supplemental rates so that standby customers do not pay more for capacity than supplemental customers.
- Introduce seasonality into the standby rate in order to better conform to the pricing structure within the supplemental tariff.

Q. Does this conclude your testimony?

A. Yes.