

WHO'S THE BUYER?

RETAIL ELECTRIC MARKET STRUCTURE REFORMS

IN SUPPORT OF RESOURCE ADEQUACY AND CLEAN ENERGY DEPLOYMENT



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EXECUTIVE SUMMARY

Who is responsible for ensuring the availability of generation resources to meet peak electricity demand in states with retail competition? Electricity markets in Texas, Australia, the UK, and New Zealand follow the approach in typical markets, where consumers themselves have procurement responsibility. In many states, there has never been a clear answer to the procurement question. In general, the “hybrid” retail competition models implemented outside of Texas have not placed a priority on long-term contracting for generation resources. No entity in those markets has both the **incentive** and **ability** to procure power, given the rules and structures currently in place. This omission contributes to a free-rider problem, or what is also labeled a public good or “missing money” problem, where supply is under-procured and under-paid. That is one reason RTOs in those areas stepped into the resource adequacy role with mandatory capacity markets. States have an opportunity to facilitate better resource procurement and benefit customers by ensuring there are entities equipped to hedge on behalf of customers, enabling less reliance on capacity markets.

Some states may respond to current tensions with RTO capacity markets by attempting to bypass, reform, or replace them. At least five states began proceedings over the last year to back out of capacity markets (NY, CT, NJ, IL, and MD), and California has always resisted ceding the resource adequacy function to the FERC-regulated CAISO. If states wish to rely less on capacity markets, they will need to make sure their retail markets are designed to handle resource procurement.

A major challenge has always been making retail and wholesale markets fit together when they are regulated by different entities. Neither federal nor state policy makers are solely to blame for disconnects

We identify two key flaws in retail market structures that hinder resource procurement: rules around default service provision that undermine retail suppliers' incentive to sign long-term contracts, and insufficient creditworthiness of retail suppliers. States can improve retail structures by:

- 1. LEVELING THE PLAYING FIELD BETWEEN DEFAULT AND COMPETITIVE SERVICE;**
- 2. ENSURING RETAIL SUPPLIERS ARE SUFFICIENTLY CREDITWORTHY TO EXECUTE LONG-TERM CONTRACTS.**

Together these recommendations to improve retail structures both improve their performance and enable beneficial wholesale market reforms.

between state and federal policy. As the resource mix changes, states have a much greater interest in making sure both the wholesale and retail designs both work, and work together. States must recognize how flaws in their retail competition programs affect wholesale markets.

INTRODUCTION

The clean energy transition will require a tremendous amount of investment in new generation sources. ACORE estimates the US requirement to be \$1 trillion between 2018 and 2030 for clean energy and supporting infrastructure.¹ Investment will be required both in the one-third of the country with retail competition and the other two-thirds that have different industry structures. This paper focuses on investment in states with retail competition.

Generation investors have generally pursued a range of risk-management options, including long-term power purchase agreements for the sale of electricity, in order to provide investors and lenders with an acceptable degree of revenue certainty. While not strictly necessary, voluntary contracts provide revenue certainty that supports investment and reduces the cost of capital which ultimately benefits customers. When competitive retail states restructured, there was insufficient focus on designing the market structure to support long-term contracting. Expansion of renewable energy and issues with wholesale capacity markets now require a focus on the competitive retail entities' incentive and ability to procure power.

RETAIL COMPETITION AND THE EVOLVING RESOURCE MIX

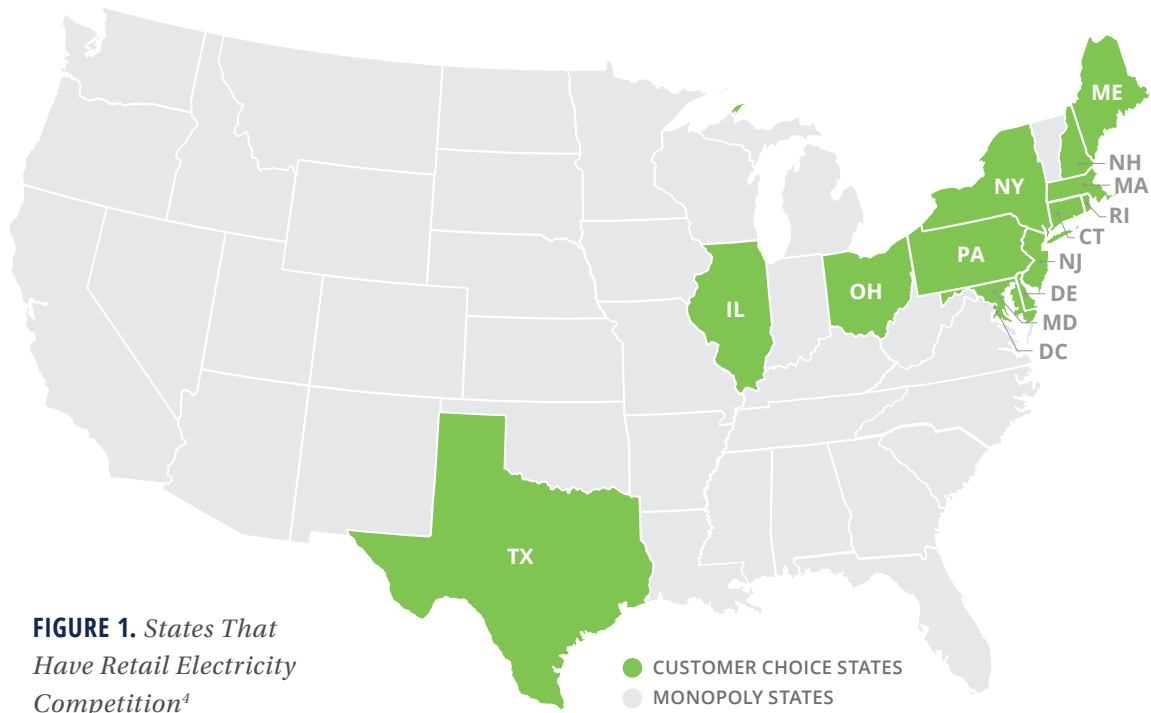
Vertically-integrated utilities have traditionally performed resource procurement where generation needs and supply options were determined by state economic regulatory commissions. A consensus emerged in the 1990s that generation should be competitive while transmission and distribution should remain fully regulated natural monopolies.² Some states determined that the retail service function could also be opened to competition.

Twenty-one states opted for retail competition in some form, then seven of those backtracked and closed the retail competition programs. Of the 14 states that continue to allow retail choice, the resource procurement function is often not clearly specified, and it has shifted over time. The 14 jurisdictions that have retail competition are shown in the map in Figure 1 below. Around one-third of residential customers in these retail markets have opted to have their electricity provided by competitive suppliers, while higher percentages of commercial and industrial customers have switched to competitive suppliers.³

1 ACORE (2019), [\\$1T 2030: The American Renewable Investment Goal](#), June 2019.

2 Joskow and Schmalensee (1983), [Markets for Power](#), MIT Press, November 1983.

3 See Appendix E.

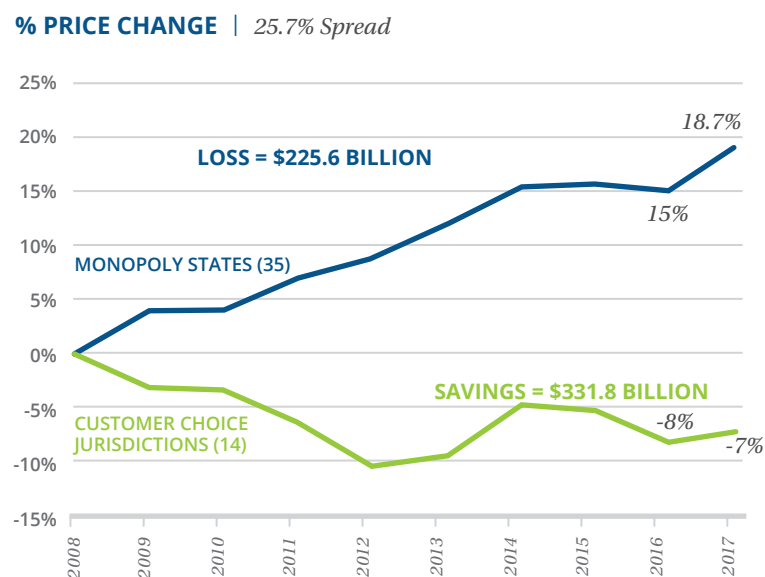


Emerging data from the generally well-functioning Texas market illustrate that flexible resources including demand response are being developed at a faster pace with retail competition. Competitive retailers can seek a wide variety of arrangements with different types of retail electricity users to reduce consumption in response to prices and system conditions. In this market, approximately 1.25 million customers⁵ out of 7.45 million⁶, or 16.8 percent, are on price-responsive products. These innovations may be more likely to happen when customers are exposed to some price risk as they are in fully competitive retail markets, and retailers have an ability to manage that risk for customers. With the diversity of electricity uses by various types of customers, this “31 flavors” approach is likely to access much more demand response than the single “plain vanilla” flavor currently offered by ISO/RTO capacity markets.

Retail competition may save consumers money, allowing for lower-cost de-carbonization. For the first decade of retail access, rates held relatively flat. More recently, as wholesale prices have fallen, customers in retail choice states have experienced much lower rates than those in states that stayed regulated, as shown in Figure 2 below. This decline is largely due to wholesale competition in the regions where there is also retail competition, the fact that lower wholesale prices tend to pass through to retail customers more quickly where there is retail choice, and the relatively higher reliance on natural gas in the states with retail competition.

4 O'Connor and Khan (2018), [The Great Divergence in Competitive and Monopoly Electricity Price Trends](#), September 2018, p. 4.
 5 ERCOT (2019), [2018 Annual Report of Demand Response in the ERCOT Region](#), March 2019, p. 10.
 6 Texas PUC (2019), [2019 Scope of Competition in Electric Markets in Texas](#), January 2019, p. 3.

FIGURE 2. Prices Over Time in Regulated vs De-Regulated US States
(All sector weighted average retail rates)



Retail competition may also provide greater access to renewable energy. Wind and solar energy have grown in Texas to the point where it is the top wind state⁷ and 4th ranked state in solar energy.⁸ The Texas PUC review of retail competition noted, “The matured competitive market offers a variety of products to customers. As of September 2018, plans are available that offer 100 percent renewable electricity, time-of-use pricing such as free electricity on the weekends, and prepaid plans that allow customers to better budget. Contract terms vary from one month to as long as 60 months.”⁹ One could argue that vertically integrated utilities with wholesale competition and integrated resource plans can also achieve renewable energy growth, but retail

markets are likely to deliver to consumers the specific products that they desire in a competitive manner. Competitive retail electricity markets cover a large portion of US electricity consumption and have the potential to expand, so it is important to make sure they support investment in the evolving resource mix.

WHOLESALE COMPETITION AND THE EVOLVING RESOURCE MIX

There are physical engineering and economic reasons to have large regional wholesale markets. High renewable energy penetration requires system operation at a large regional level. Two universal aspects of variable wind and solar energy make this true: (1) most of the high quality resources are located remote from population centers, and (2) large regional markets cancel out fluctuations in electricity demand and output from renewable generators due to geographic diversity in weather. Large regional trading platforms are required to enable wide-area power exchange. A report for the Wind-Solar Alliance articulated the need for system operation that is “flexible, fair, far, and free.”¹⁰ RTOs and ISOs operate across “far,” or wide areas; using “fast” or frequent 5 minute re-dispatch; on a “fair” or technology neutral basis; and with procurement of the “flexible” resources needed to operate with renewable energy as a large part of the portfolio. Each ISO/RTO has improvements to make, but the basic platform of an ISO/RTO energy market is arguably a necessary component of a clean energy portfolio. RTO spot markets can serve as residual balancing markets that complement bilateral contracting. In Texas, approximately 85-90 percent of energy is transacted bilaterally,¹¹ and 10-15 percent is traded on the spot market, illustrating one workable model of spot and bilateral transactions and wholesale and retail competition fitting together. Data on US renewables investment supports the case for the benefits of regional ISO/RTO markets,¹² with 81 percent of cumulative wind deployment located in RTO markets as of the end of 2018.¹³

7 AWEA (2020), “[Wind Energy in Texas.](#)”

8 SEIA (2019), “[Top 10 Solar States.](#)”

9 Texas PUC (2019), p. 3.

10 Goggin, Gramlich, Shparber, and Silverstein (2018), [Customer-Focused and Clean: Power Markets for the Future](#), November 2018.

11 Potomac Economics (2019), [2018 State of the Market Report for the ERCOT Electricity Markets](#), June 2019, p. 26.

12 Pfeifenberger, Chang, Aydin, and Oates (2016), [The Role of RTO/ISO Markets in Facilitating Renewable Generation Development](#), December 8, 2016.

13 AWEA, U.S. Wind Industry Annual Market Report Year Ending 2018, p. 48

BENEFITS OF LONG-TERM CONTRACTS

Long-term contracts are not strictly necessary in commodity markets. Some consumers may be comfortable remaining exposed to spot market prices¹⁴ and some investors may wish to preserve their up-side profit potential or create a hedge against gas market price risk by selling electricity on a pure merchant basis.¹⁵ Over the 20-year history of electricity markets, merchant power has fallen in and out of favor with investors. Recent trends indicate that pure merchant investment is again becoming possible.¹⁶

Developers and their lenders will rarely finance the capital costs of 20-40 year assets only on the basis of expected future hourly prices. That creates too much “merchant risk” for the lender, which is difficult to hedge within the power sector as power prices tend to be highly positively correlated across markets over the long-term. The International Energy Agency (IEA) reports that globally, 95 percent of generation is under some form of long-term contract or regulatory regime.¹⁷ Long-term contracting allows developers to share revenue uncertainty risk with other business entities. Developers can sign contracts with credit-worthy wholesale buyers (also called “counterparties” or “off-takers”), which were traditionally load-serving utilities but are increasingly large electricity users, or with intermediaries and financial participants. There is no single definition of “long term.” The length of contracts needed for lenders can cover a wide range from months to decades, though lenders and investors always prefer longer-term certainty and in many cases insist on it.

Long-term contracting is important for renewable energy.¹⁸ Contracts are particularly important for renewable energy for three principal reasons:

1. **Renewable resources are very capital-intensive.** They are almost all capital cost, and have minimal ongoing costs. Pre-arranged contracts provide the certainty necessary to finance those capital costs at a reasonable rate before the investment is made.
2. **Renewable penetration can depress spot energy prices at certain times, and contracts provide up front revenue certainty for lenders prior to committing capital.** Long-term contracts tend to be based on a resource’s average cost, including capital cost, so lenders can recover their investments that way without depending on the residual day to day spot markets for most of their capital cost recovery requirements. Many observers are debating how electricity markets should be designed for a future with high penetrations of zero production cost renewable resources. Long-term contracts are a key solution to this challenge.¹⁹

14 See www.gogriddy.com for an example of an electricity retailer that advertises its lack of contracts and pricing based solely on spot market prices. Some customers may not have been aware about the risks of such an approach.

15 Merchant hedges have been a popular financing mechanism for renewable generators in markets like ERCOT where gas generators set wholesale prices the vast majority of the time. Investors who own non-electric sector assets with exposure to increasing gas prices can hedge that risk by investing in renewable generators whose output is more valuable when higher gas prices drive electricity prices higher.

16 For a survey of the status of pure merchant investment, see Argus (2019), “[Finance for Fully Merchant Projects Take Shape in Spain](#),” September 12, 2019, Yaneva (2019), “[New Forms of Finance to Aid Merchant Renewable Energy Projects](#),” April 2, 2019, (“with power purchase agreement (PPA) terms getting shorter and shorter the market appears to be slipping towards a merchant model,”), and Caplan (2017), “[Is Increase in Merchant Generation Capacity a Positive?](#),” February 3, 2017.

17 IEA (2019), [World Energy Investment 2019](#), p. 134 and 136.

18 See, eg, IEA (2019), p. 137.

19 Gramlich and Hogan (2019), [Wholesale Electricity Market Design for Rapid Decarbonization: A Decentralized Markets Approach](#), June 2019.

3. Tax equity investors, who have provided much of the investment for renewable projects in the U.S., disfavor risk.²⁰ If renewable tax credits phase out, this factor becomes less important.

Long-term contracts also benefit customers by reducing generation market power. Dr. Frank Wolak explained:

“Fixed-price forward contract commitments sold by generation unit owners reduce their incentive to exercise unilateral market power in the short-term energy market because the generation unit owner only earns the short-term price on any energy it sells in excess of its forward contract commitment and pays the short-term price for any production shortfall relative to these forward contract commitments. This logic argues in favor of the regulator monitoring the forward contract positions of retailers as part of its regulatory oversight process to ensure that there is adequate fixed-price forward contract coverage of final demand.”²¹

FERC has long recognized the importance of bilateral long-term contracting. While much attention of FERC, RTOs, and stakeholders tends to be on the spot market and central capacity auction design, the agency has recognized the key role of long-term contracts in the market and how they fit together with spot markets:

“It is important that wholesale sellers and buyers have adequate opportunities to sell and buy electric power through long-term power contracts to allow them to manage their exposure to uncertain future spot market prices. Sellers and buyers should also have the opportunity to sell and buy electric power in the spot market. The Commission believes that it is important for buyers and sellers in organized markets to be able to choose a portfolio of short-term, intermediate-term, and long-term power supplies. Having portfolio choice allows market participants to manage the risk that comes from uncertainty. Forward power contracting by buyers combined with purchases from a spot market with demand response can be an efficient and low-cost way of meeting customer needs because both buyers and sellers can hedge risk as well as adapt to actual real-time supply and demand conditions. Competitive forward power contracting allows many sellers to compete to provide electric service, and greater reliance on long-term power contracting could decrease the incentive for sellers to exercise market power in the spot market if there is reduced opportunity to profit from such action.”²²

Industrial electricity customers who were the leading political force for competitive markets have always emphasized long-term contracts: “In a real competitive market, power prices would be set by negotiated transactions between willing buyers and sellers, not dictated by RTOs or regulators or ‘organized markets.’ In a real competitive market, suppliers would be seeking out customers, offering longer-term bilateral contracts, and striving to add value through innovation.”²³

Well-functioning long-term contract markets also provide a potential way out of the litigation and dysfunction currently plaguing capacity markets. In PJM, NYISO, and ISO-NE, capacity payments make up around 30 percent of the value of the total wholesale energy market.²⁴ RTOs use capacity obligations

20 According to Himanshu Saxena, CEO of the Starwood Energy Group, “tax equity does not want to take any risks and, without tax equity, you can’t do these deals.” See Emehelu (2019), [“Financing an Era of Shorter PPAs,”](#) August 8, 2019.

21 Wolak (2019), [“Wholesale Electricity Market Design,”](#) November 20, 2019, p. 35.

22 FERC (2007), [“Wholesale Competition in Regions with Organized Markets Advanced Notice of Proposed Rulemaking,”](#) 119 FERC ¶ 61,306, Docket Nos. RM07-19-000 and AD07-7-000, June 22, 2007, p.55.

23 Joint Comments of the PJM Industrial Customer Coalition, Industrial Energy Users-Ohio, West Virginia Energy Users Group, NEPOOL Industrial Customer Coalition, Southwest Industrial Customer Coalition, and Coalition of Midwest Transmission Customers, FERC Conference on Competition in Wholesale Power Markets, Docket No. AD07-7-000. March 13, 2007.

24 See market monitoring reports as summarized in Gramlich and Goggin (2019), [“Too Much of the Wrong Thing: The Need for Capacity Market Replacement or Reform,”](#) November 2019, p. 5.

and capacity markets to address revenue certainty and “missing money” problems.²⁵ Well-functioning wholesale and retail markets that support long-term contracts are alternative solutions to those problems.²⁶ Placing responsibility on private market participants means it need not be socialized across all load anymore. As Dr. James Bushnell stated in a recent review of capacity markets, “it may be possible to retreat from the axiomatic belief that reliability is a public good. Certainly within short operational time frames, shared responsibility for operating reserves will be necessary for the foreseeable future. However, over longer planning horizons it may be possible to identify control areas or individual Load-Serving Entities who have failed to provide adequate resources and to isolate involuntary load curtailments to only the customers of the responsible LSEs.”²⁷ Dr. Bushnell is using the term “public good” as it is used in economics which means a good that is non-rival (one’s consumption does not reduce another’s) and non-excludable (a non-paying customer cannot be prevented from using it) and noting that these conditions may no longer exist in electricity as they did when capacity obligations were originally put in place. States wishing to bypass, reform, or replace capacity markets can improve their chances with retail structures that support resource procurement.

The experience of California in its initial attempt to restructure provides strong support for long-term contracts. In the original California approach, no entity was given resource procurement responsibility, and there were strict prohibitions on forward contracts for the incumbent utilities for the initial years of market operations. Left unhedged, consumers and the utilities had to pay elevated prices when a low hydro year caused scarcity and market design flaws enabled market manipulation. The state stepped in and paid \$8 billion for power in five months of 2001 and when it belatedly signed long-term contracts in a seller’s market, it committed \$60 billion over ten years, and a nearly 20-year litigation process ensued. There were many aspects of the initial California design that contributed to the situation—the disconnect between wholesale prices and retail rates was another major issue—but perhaps none was more important than the failure to hedge through long-term contracts. As MIT economist Dr. Paul Joskow stated after the California experience, “a good retail procurement framework ... must assure that a large fraction of retail demand is being met with longer-term fixed price contracts and only a small fraction fully exposed to the spot market.”²⁸

TYPES OF CONTRACTS AND STRUCTURES THAT DRIVE THEM

Contracts take many forms. In the 1980s and 90s, there were “full requirements,” “slice of system,” “firm,” and “non-firm” and other simple types of contracts. Contracts under PURPA were very long-term and covered all costs and risks, and were appealing from an investor perspective. There are now a wide variety of contracts including physical power purchase agreements (PPAs) for energy, virtual PPAs, forwards, futures, and swaps.²⁹ As long-term utility PPAs which take all risks off of the developer are becoming scarce, other forms of contracts are being pursued.³⁰ Many renewable projects now sell their output through contracts with large corporate energy users, which have rapidly surpassed utility PPAs. The essential feature of contracts for purposes of this paper is that they commit a revenue stream to the developer to reduce some of the developer’s financial risk before committing capital.

25 FERC explained, “as long as regional resources are made available to all regional load-serving entities and their customers during a shortage, such entities have the incentive to lower their supply costs by depending on the resource development investments of others, a strategy that leads to systematic under-investment in infrastructure by all load-serving entities in the region,” FERC (2002), [Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design](#), 18 CFR Part 35, Docket No. RM01-12, August 29, 2002, par. 461, citing Stoft, (2002), [Power System Economics](#), New York, NY: Wiley-IEEE Press, 2002. That proposed rule was never finalized but the policy determinations applied to each of the ISO/RTOs. Capacity markets were intended to be temporary transitional mechanisms to address this market failure.

26 Gramlich and Goggin (2019).

27 Bushnell, Flagg, and Mansur (2017), [Capacity Markets at a Crossroads](#), April 2017, p. 53.

28 Joskow (2001), “[California’s Electricity Crisis](#),” Oxford Review of Economic Policy, Volume 17, Issue 3, September 2001, pp. 365–388.

29 IEA (2019), p. 138 and AER (2009), [State of the Energy Market 2009](#), p. 90.

30 Bartlett (2019), [Reducing Risk in Merchant Wind and Solar Projects Through Financial Hedges](#), February 2019.

There are known industry structure models that can achieve generator finance. Appendix A reviews three market structures that lead to long-term contracting: vertically integrated utilities, full competitive wholesale and retail markets, and mandated long-term contracts. Notably, each approach includes entities with the **incentive** and **ability** to sign long term contracts.

LONG-TERM CONTRACTING IN HYBRID COMPETITIVE RETAIL MARKETS

Fourteen states have restructured their retail electricity markets to allow for customer choice of electricity suppliers. Only one – Texas – has implemented the “Competitive Retail Provider” model described in the appendix. The other thirteen states operate what could be called “hybrid” competitive energy markets.

In a hybrid market, many of the incumbent utilities’ native customers are provided with “Default Service” on a sustained basis. As the name implies, it is the “default” option for those customers who do not choose to purchase their electricity from a Retail Energy Provider (“REP”). Default Service is also variously called “Provider of Last Resort,” “Standard Offer Service,” “Basic Service,” or some other close variation. While Texas has a Provider of Last Resort for situations where a customer is left unserved, it is not offered by the utility and not intended to be a long-term provider. The market is designed in a way to discourage its use. This default service customer option is a policy based on many states’ perceptions that most residential and small commercial customers have no interest in choosing their supplier or they do not have the tools to make educated choices. With this model, consumers still get the benefit of competitive wholesale generation markets but the benefits are indirectly accessed through the default supplier. The details of the default service directly interfere with the ability and incentive of entities, including customers and REPs, to enter into long-term contracts.

These thirteen hybrid restructured states are in areas with wholesale markets under FERC jurisdiction and where RTOs or ISOs operate the wholesale markets. Thus, there is a split of jurisdiction between federally regulated wholesale rates and state-regulated retail rates. Within these restructured states, policy makers have expressed a preference for a range of resource types including renewable and zero carbon electricity resources.

Mandatory capacity obligations and markets in PJM, NYISO, and ISO-NE are intended to fill the void left by a lack of the ability and incentive of REPs to engage in long term resource procurement. As a result, the responsibility for resource adequacy has shifted over time towards RTO/ISOs and FERC, and away from states. It is more challenging in these hybrid areas to make sure wholesale and retail designs fit together than it is in Texas, the UK, Australia, and the New Zealand markets where there is a single regulator overseeing their respective electricity markets.

In the thirteen hybrid restructuring jurisdictions, as in Texas, the traditional investor-owned utilities have functionally separated their wires companies from the other traditional utility operations. The wires companies may now have wholesale and/or retail affiliates, but those affiliate companies operate on a competitive basis. The wires companies typically are forbidden from building, owning, or operating power plants, which were removed during the functional separation.³¹ Unlike Texas, which required incumbent utilities to divest generation assets, most restructured states permitted the parent company to spin-off an affiliate company for generation assets. This creates a financial stake for the parent company to use default service in a manner that benefits its generation affiliate. The host utilities in these hybrid markets are usually not financially neutral to default service.

31 While this is not an absolute definitive statement, it is generally the case that the wires companies in restructured markets are “wires-only”. Some have carried with them long-term contractual relationships with generation resources. Some have been granted approval to invest in relatively small amounts of renewable capacity, but generally, the wires companies in the restructured markets do not own or invest in generation resources.

The terms of default service can harm the competitive electricity market and limit the products and services that REPs can provide, undermining their incentive to sign long-term contracts with generation providers. At the onset of state-level restructuring, policy makers faced pressure, and in some instances legal mandates, to provide customers with lower rates than what they were receiving before restructuring. The policy of low rates and mitigated price volatility has continued to be the predominant policy objective of retail market regulators. The continuation of that policy direction has inhibited customer choice and the development of robust competitive retail electricity markets. The price mitigation policies adopted in the hybrid restructured states have mitigated the incentive for customers to switch out of default service. As articulated by Ashley Brown of the Harvard Electricity Policy Group, “The objective is promotion and sustenance of competition. Attractive default service is a barrier to achievement of the objective.”³²

“In principle, producers and retail choice consumers could mitigate electricity price risks through long-term contracts. In practice, however, such long-term contracts are a rarity”

- MOREY AND KIRSCH

The hybrid model is not fundamentally incapable of supporting long-term contracting. Whoever wins the right to provide default service should be able to sign long-term deals to serve the default load amount, and retail providers could sign long-term contracts to cover their commitments to retail customers who choose them as a supplier. As Morey and Kirsch observed, “In principle, producers and retail choice consumers could mitigate electricity price risks through long-term contracts. In practice, however, such long-term contracts are a rarity.”³³ They noted that “long-term contracting in retail choice states has been hindered by customers’ ability to switch suppliers, by customers’ ability to switch from alternative retail providers to the incumbent utility’s standard offer or Provider of Last Resort (POLR) service whenever the competitive market price rises above the regulated rate, by public policies that protect buyers from service curtailments when there is a power shortage and their own contracted supplies are insufficient to meet their load obligations, and by asymmetries in the positions held by buyers and sellers in retail choice markets.”³⁴ PJM studied generation investment and found, “Evidence suggests that buyers and sellers are hedging their respective capacity price risks through bilateral contract in reasonably small volumes...Several factors may explain the reluctance to fix prices bilaterally...retail choice regimes in several PJM states deter competitive retail providers from long-term wholesale contracting because end-use customers under such regimes typically are committed to six-month or one-year contracts with their suppliers.”³⁵

With poorly designed default service, customers may have an incentive to leave retail choice altogether, undermining the REP’s business plans. REPs are in a precarious position. If they purchase power and capacity to supply their load under long-term contracts with resource owners while they are unable to enter long-term contracts with retail customers, they face the risk that retail customers may switch to default service providers, leaving them unable to recover the costs of their long-term contracts with resource owners. Similarly, utilities that provide default service (and their regulators) can have the same disincentive to enter into long-term contracts for the same reason. If market alternatives become more attractive to consumers, the utilities could be burdened with what might be considered another stranded asset for which they will seek recovery from ratepayers. In contrast to the Texas market, there is not a robust market of intermediaries in the thirteen hybrid states because the customers may move freely back to default service, leaving the market altogether such that the intermediary would be stuck with

32 Brown (2007), “[Retail Procurement: Default Service vs. Monopoly Service Considerations](#),” October 4, 2007.

33 Morey and Kirsch (2016), [Retail Choice in Electricity: What Have We Learned in 20 Years?](#), February 11, 2016, pp. 52-53.

34 Morey and Kirsch (2016), p. 55.

35 PJM (2016), [Resource Investment in Competitive Markets](#), May 5, 2016, p. 28.

excess power and no customer to whom it can sell. “Merchant generators operating in the reformed wholesale markets consequently are unable to readily find either retail providers on the buy side of the market or power marketers on the sell side of the market interested in long-term deals.”³⁶

The details of market structures that lead to customer switching and the relative attractiveness of default service have a large impact on the long-term contracting REPs can make. The following section addresses those market structures.

RETAIL MARKET DESIGN FEATURES THAT SUPPORT LONG-TERM CONTRACTING

This paper identifies retail market attributes that, if not designed properly, will disincentivize REPs from voluntarily entering long-term contracts for generation resources. Most of the market design features relate to remedying the distortions that exist when consumers have a free option to return to the monopoly-provided default service. The free option to return to a utility default service undermines retailers’ incentives to plan to serve customers over any significant and sustained period of time. The barriers, pervasive in the markets for residential customers, are also present in the competitive energy markets for commercial and industrial customers. The economic distortions are not as significant as they are in the residential markets because the C&I customers are generally larger and more informed buyers. Regardless, the subsidies, free options and other market barriers in the competitive electricity markets bias customers toward utility service and serve as disincentives to having REPs enter into long-term contracts for generation resources. To properly incentivize long-term contracting in these partially competitive retail markets, certain market features should be present:

A. Unsubsidized Default Service – A full allocation of costs of all utility services utilized in the delivery of default service is required to remove the pricing bias between default service and competitive supply. A full allocation of retail operating costs would include costs for the incumbent utility’s billing system, accounting, regulatory, legal and other shared utility resources used in providing default service. Today, these costs are recovered in the host utility’s distribution rates, including the pass-through to ratepayers of unhedged risk exposures such as capacity and other costs. The subsidy currently in effect for monopoly default service providers in each of the deregulated states other than Texas creates a material commercial disadvantage for competitive service providers that directly impacts their incentive and ability to make long-term supply commitments.

Typical default service rates for electricity supply will carry only the cost of wholesale energy supply, some uncollectible expenses, and perhaps the costs of auctions and credit to secure wholesale supply. Utilities do not include in default service rates any costs for billing or billing systems, rents, computers, accounting services, call centers or any other business functions required to deliver default service. This results in a subsidy of about 1-2 cents per kWh³⁷ that suppliers must overcome in order to compete with the default service pricing. In the absence of equitable pricing of default service, suppliers can only attempt to time dips in the wholesale market to earn customers, but these anomalies do not allow for long-term relationships with customers. In Baltimore Gas and Electric’s (“BGE”) latest rate case (Order issued in December 2019), the cost of providing default service was estimated by various experts to be approximately \$170 million of which BGE proposed to pass on only \$12.3 million to default service customers.³⁸ The remainder (\$158 million) of the cost to provide default service was embedded in BGE’s distribution rates, which are paid by all customers, including

³⁶ Morey and Kirsch (2016), pp. 53-54.

³⁷ See [PECO rate case](#) (2018), [PSEG rate case](#) (2018), [BGE rate case](#) (2019), Lacey (2019), “[Default Service Pricing - The Flaw and the Fix: Current Pricing Practices Allow Utilities to Maintain Market Dominance in Deregulated Markets](#),” *The Electricity Journal*, 32(3), April 2019, pp. 4-10.

³⁸ [Direct Testimony of Jason Manuel](#), In the Matter of the Application of Baltimore Gas and Electric Company for Adjustments to Its Electric and Gas Base Rates, before the Maryland Public Service Commission, Case 9610, May 24, 2019.



competitive supply customers. These costs should be reflected in the supply costs for rates paid by default service customers to avoid biasing the choice of electricity provider.

Prices for default service should also move with the market as they do for competitive supply. While many stakeholders have argued that “low and stable” prices are better for consumers, stakeholders disagree generally on the definitions of “low and stable” and the lengths to which default service providers should go to encourage those prices. Many stakeholders, including market, environmental and efficiency advocates are tending to push for less stable price signals so that consumers will curtail or shift purchases for flexible end uses from periods of tight supply to periods of ample supply, increasing overall efficiency of the electric system. In order to support long-term contracting for generation resources, including renewable resources, default service prices should be set in a manner that generally reflects the market costs of whatever the terms under which the service is offered. With the right retail market structure, REPs are well-suited to provide customers with rates that move in real-time and at the same time, provide the customers with technologies that will enable them to curtail loads and otherwise manage electricity consumption and costs in real-time, greatly increasing the overall efficiency of the electric system.

Default service prices generally trail the prevailing market pricing trends. This pricing lag allows customers to game electricity markets such that they can move to a stable default service rate in times of rising market prices. Similarly, they can move away from default service and into the competitive marketplace when market prices are falling. This free option to move to and away from the utility default service (discussed in more detail below) creates a “boom/bust” cycle for REPs, which works contrary to the adoption of long-term contracts. Additionally, because the price signal to default service customers is muted for months or years at a time, customers are not incentivized to conserve during periods of increasing market prices and do not understand the costs associated with their

choice until long after they've made it. This free option leads to an outcome where customers are free to over-consume during constrained electric grid conditions, potentially exacerbating pricing and environmental conditions that customers themselves are shielded from.

- B. Unbiased Initial Placement** – Default service that is automatic for customers is really a “Provider of First Resort” as opposed to the “Provider of Last Resort” that was originally envisioned when competitive energy markets were being designed. Many legacy tariff attributes result in the default service utility becoming the provider of first resort for customers. For example, when a customer starts utility service, taking default service for electricity supply is a requirement in many jurisdictions. If customers were compelled to choose a supplier when enrolled for new service, they would be empowered with many options, including the option to purchase renewable energy. Removing the Provider of First Resort feature would lead to less biased choices between default service and competitive service in which REPs can undertake long-term contracting for customers they serve.
- C. No Free Option** – Consumers in hybrid restructured states have been provided with a “free option” to move back to default service at any time. The saying about nothing being free, however, applies here. The option imposes costs on default service wholesale providers (they lose load when market prices decline because the default service price decline lags the market) and onto REPs and onto other entities that provide customer services (REPs lose load to default service when market prices increase because the default service price increase lags the market). The free option eliminates the incentive for REPs to procure power on a long-term basis on a customer’s behalf.

It is not important that the retail market be large. The largest retail jurisdiction would not incentivize long-term investments if the free option to switch to a default service existed. Similarly, smaller jurisdictions can stabilize their own markets with effective default service policies. Additionally, the breadth of RTO/ISO energy markets provides further scale. In a market without this free option, the REPs could trade power obligations amongst themselves. Utility default service obligations are contracted years in advance in highly timed and structured auction process, outside of a “free market” framework. To have proper incentives, there should be a stable structure with reasonable certainty about the total size of the retail market. Implementing conditions limiting customers’ ability to move back to a default service would help ameliorate the instability faced by REPs. This is not to say there should be limits on switching; for example, in Texas, load can shift between suppliers, but there is not an option to leave the market altogether. The free and fast option to do so prevents REPs from making long-term supply commitments.

- D. Customer Relationships** – REPs do not necessarily require a long-term retail contract to support every long-term wholesale contract. REPs need a market design that will ensure a long-term supply of customers in the market that it can offer and provide services to on a competitively neutral basis. Allowing long-term customer relationships stabilizes REPs customer bases and allows longer term resource commitments. If an REP establishes a relationship with a customer, it needs to be able to keep that relationship intact if the customer re-locates within the host utility service territory or even within the same state.

Direct billing to the customer is also critical. REPs must be allowed to maintain direct billing relationships with their customers so as not to bias the choice between REPs and utility default service. In the hybrid model deployed today, the distribution company sends REP charges on distribution invoices on behalf of dozens (possibly hundreds) of differentiated suppliers, each offering different products, services and prices. The supply portion of the distribution invoice is comprised of one or two lines allowing for scant amounts of information to be delivered to the supply customer. For most other products in our economy, the differentiated suppliers sell products and bill a single line item for the transportation charges. The current model embedded in utility default service markets

is akin to shopping for retail goods through a shipping company's website, then having the shipping company send a two-page bill that details the path that the product took, the warehouses it was stored and moved around, the tolls and taxes that were paid along the way and then a simple line item that says "retail goods — \$100.00."

This approach implemented in the hybrid restructured markets minimizes the suppliers' branding, messaging and pricing detail. For example, in today's utility-billed markets, a 100 percent renewable energy customer who utilizes smart thermostats and other home management devices sees the same line item that a legacy generation customer would see. When utilities are allowed to control the billing relationships, it biases customers toward utility products and services including default service. REPs should be enabled to establish a billing relationship with a customer to educate the customer about the impacts of its relationship, including the value derived from any investments the REP is making on the customer's behalf, like an investment in renewable energy. Utility default service providers have claimed that REPs can send a bill for energy alone, but customers have resoundingly rejected the concept of getting two separate invoices to pay for what it is paid with one bill today.

- E. Creditworthiness** – Creditworthiness standards are unrelated to the other features which all have to do with default service rules. Creditworthiness standards are important to ensure REPs are capable of making the long-term resource commitments needed to serve the load they commit to serve. The standards need to be high and enforced. As Billimoria and Poudineh stated, "In a contestable retail market, nonintegrated market participants may lack the creditworthiness or capital adequacy to access suitable financing or provide the necessary offtake to underpin new generation investment."³⁹ To address this problem and "to protect consumers from financially weak suppliers, most states required retail energy suppliers to obtain licenses for which they must offer evidence of financial soundness. A few states also require surety bonds or letters of credit from suppliers."⁴⁰ Appropriate credit standards can ensure REPs are properly incentivized to manage their businesses in a prudent manner and capable of procuring the power they need to serve the customers they commit to serve.

The Texas level of financial assurance, while high relative to the other states analyzed, may still be too low given experiences with supplier bankruptcies there. A future area of research should evaluate whether bankruptcies were a function of improper management and whether more stringent creditworthiness standards would help. As shown below, however, relative to the other markets analyzed, Texas receives a grade of "A" for its credit standards because they are significantly greater than those implemented in other states. While low credit standards may facilitate market entry from REPs, they don't necessarily facilitate prudent management practices, including long-term contracting to support contracted load obligations. For example, Texas requires either net worth standards or letters of credit for REPs to be licensed. The other states reviewed require only a surety bond for licensing. The difference between the approaches is stark, with the Texas market more fully incentivizing prudent management approaches. A surety bond is essentially an insurance policy that costs from 1 to 3 percent of the total bond requirement.⁴¹ As described in the appendices, the \$250,000 surety bond requirements in Maryland, Pennsylvania and New Jersey can be met for as little as \$2,500 per year (or only \$7,500 in higher risk circumstances). A letter of credit, on the other hand, is secured by company assets, in addition to a premium paid for the letter. The \$500,000 letter of credit requirement will cost the REP about \$5,000 out of pocket, but the REP will also have to pledge \$500,000 in assets to the

39 Billimoria and Poudineh (2018), *Decarbonized Market Design: An Insurance Overlay on Energy-Only Electricity Markets*, October 2018, p. 2, citing Nelson and Simshauser (2013), "Is the Merchant Power Producer a broken model?" *Energy Policy*, 53, 298–310, Simshauser, Tian, and Whish-Wilson (2014), *Merchant Firm Boundaries in Energy-Only Markets: Who Gets a Credit Rating—Pure Play vs. Vertical?*, August 2014, and Tian (2015), *Risk Management and Industrial Organisation in the Australian National Electricity Market*. Thesis, Griffith University. Queensland, Australia.

40 Morey and Kirsch (2016), p. 19.

41 Schmalz & Associates (n.d.), "[Surety Bond Education](#)."



bank that issues the letter. In other words, in Texas, the REP has the full value of the security at risk.⁴²

- F. Utility Neutrality from Default Service** – Utilities receiving profit from providing default service likely causes utilities to steer customers towards default service. “Utilities have a natural business incentive to shift costs from non-regulated competitive operations to regulated monopoly operations since recovery is more certain with captive ratepayers.”⁴³ Utilities’ incentives with respect to default service range from maintaining customers, earning returns on assets used to support default service and, in some cases, earning a financial return on default service. In its latest distribution rate proceeding, it was projected that BGE will earn \$8.3 million annually above its approved distribution revenue requirement from providing default service. Texas receives a grade of “A” below in this category because Texas has removed utilities from the role of default service provider.
- G. Regulatory Risk Needs to be Minimized** – REPs need to be able to count on only normal business practice expectations and not face excessive regulatory risk resulting from unhappiness with normal market changes and reasonable business decisions.
- H. Move-In/Move-Out Bias** – REP’s ability to maintain their customer base is eroded where new customers or moving customers are automatically placed on utility default service. In most jurisdictions, customers who have entered into contracts and move within a utility’s service territory are by default enrolled with the utility for electricity service when they turn on service at new location. Approximately 10 percent of customers relocate every year (more in some regions/utility territories), leaving suppliers with a natural churn rate they have to overcome.

42 Kagan (2019), “[Letter of Credit](#),” September 24, 2019.

43 NARUC (n.d.), “[Guidelines for Cost Allocations and Affiliate Transactions](#),” section D, p. 3.

ACCOMPANYING WHOLESALE DESIGN FEATURES TO SUPPORT LONG-TERM CONTRACTS

Wholesale markets need to be “flexible, fair, far, and free,” as described above for a high renewable penetration portfolio. The RTO and ISO energy markets generally do provide those attributes. One key market design element that is not widely used yet but is important to ensure retail providers have the incentive to sign long-term contracts, as well as to provide appropriate long- and short-term incentives for efficient behavior, is to accurately price energy at times of scarcity. In Texas, prices can rise to \$9000/MWh at these times, as they did in the summer of 2019. This feature along with the rest of the Texas structure appears to be working to achieve supply-demand balance.⁴⁴ Supply adequacy requires either scarcity pricing (and the risk management incentives such pricing creates) or some additional payment such as for capacity sales. Prices in competitive markets are set more by demand value than by the marginal operating cost of supply when there is scarcity.⁴⁵ Ideally that demand valuation will be set by actual demand bids in the future. In the meantime, administrative setting of prices for energy and operating reserves (through an Operating Reserve Demand Curve, or ORDC, which seeks to ensure energy prices include the assumed opportunity cost of the reduction in reserves caused by incremental demand in a tight market), is a best practice design element that should be employed by ISOs and RTOs. Scarcity pricing and ORDCs serve to penalize those retailers who do not do their job of procuring sufficient energy in advance to meet their load, or who allow sufficiently well-capitalized retailers to take the risk of coming up short. The ORDC charges can be thought of as speeding tickets—you only pay them if you choose to speed. Effective wholesale scarcity prices are the antidote to the oft-cited concern about retailers “leaning on the system.” Most load never pays them because their suppliers hedge with long term contracts. The ORDC in a multi-state RTO must reflect some common reliability standard or valuation of reliability. Ideally the RTO will have physical control of customers so they can choose and pay for their desired level of reliability, and that privatization of the public good can dramatically improve incentives. In the meantime, the financial penalty of scarcity pricing can suffice to induce efficient behavior by retail suppliers.

It is beyond the scope of this paper to address capacity markets, though we do contend that both the retail and wholesale market reforms suggested herein provide much greater opportunity to address capacity market reforms addressed in other studies.⁴⁶

Lastly, wholesale market regulators (FERC and the PUCT) should consider requiring more transparency on bilateral contracts, given their key role in the market.⁴⁷ Transparency provisions could include contract price, term, location, and other factors that are valuable to market participants and regulators, while concealing commercially sensitive terms and delaying release to avoid use of the information for anti-competitive purposes.

44 Gramlich (2019), [“ERCOT 2019: Final Proof of a Successful Market Design?”](#) RTO Insider Stakeholder Soapbox, October 15, 2019.

45 Economists recognize that “demand value” in a workably competitive market is a reflection of the marginal propensity to consume the commodity, not the marginal production cost which is the basis for the supply curve.

46 Gramlich and Goggin (2019).

47 For a good discussion of regulating financial electricity products and the integration with electricity markets, see AER (2009), p. 90.

ASSESSMENT OF NEW JERSEY, MARYLAND, AND PENNSYLVANIA RETAIL MARKET STRUCTURES

To provide real-world examples of the dynamic we address in hybrid retail market structures, we evaluate three specific states. Many of the features are common across these states, and across the rest of the 13 states with hybrid structures, inside and outside of the PJM region.

The following table summarizes the ability of the retail structures of three states in the PJM region to incentivize and enable long-term contracting for generation resources, based on the criteria outlined above. In general, the hybrid retail choice models, as implemented in the northeast markets, have not been designed with long-term contracting for generation resources as a priority. The priorities for the states have largely been readily accessible, low and stably-priced default service. If that priority were to transition to one of market-based contracting between REPs and generation suppliers, state energy regulators have within their domain many tools that would facilitate that change. The table below summarizes ten key market design constructs discussed above and discusses briefly how New Jersey, Maryland and Pennsylvania have implemented these market parameters. The table is color coded where red shading indicates a practice that is contrary to long-term contracting between a REP and a generation resource provider, yellow shading indicates a neutral implementation and green shading indicates a practice that will facilitate long-term contracting between REPs and generation resources. The market design features should not be viewed independently, but rather as a comprehensive design framework. In other words, progress in one category may be important, but by itself, improvement in one area is not likely to change the overall outcome.

Appendices A, B, and C discuss in more detail how each of these states have implemented these market parameters.



Summary of Retail Market Attributes Conducive to Long-term Contracting for Generation Resources

	TEXAS	NEW JERSEY	MARYLAND	PENNSYLVANIA
<i>Market Reflective Pricing</i>	Texas does not offer a Default Service. Last Resort Service is available to customers whose providers go out of business. It is a short-term service.	Default service is served by three-year laddered wholesale contracts.	Default service is served by wholesale contracts procured from four auctions held over a two-year period.	Default service served by “prudent mix” of spot market purchases, short-term contracts, and long-term purchase contracts.
<i>Unbiased Initial Placement</i>	Customers must choose an electricity supplier to receive electric service	Customers were defaulted to utility service.	Customers were defaulted to utility service.	Customers were defaulted to utility service.
<i>Stable Market Size</i>	There is no optional Default Service for customers to switch to.	Free option for customers to move to default service.	Free option for customers to move to default service.	Limited option for customers to move to default service. The commission can review mass migrations to default service for market gaming to protect wholesale providers of default service.
<i>Non-discriminatory Rate Design</i>	There is no utility-offered rate, so rate design is not a competitive impediment.	Limited set of direct costs of default service assigned to Customers in some of the NJ utilities. One market has no costs other than energy assigned to default service. A recent analysis suggests the PSE&G should allocate \$190 million per year to its default service. Instead, it has assigned less than \$1 million per year to default service. The difference is borne by distribution rate payers.	Limited set of direct costs of default service assigned to customers. A recent analysis suggests that BGE should allocate \$173 million to default service annually. Instead, it has proposed in its most recent rate proceeding to assign only \$12.3 million per year to default service. The difference is borne by distribution rate payers.	Limited set of direct costs of default services are assigned to customers. A recent analysis suggests that PECO should allocate \$101 million to its default service to residential customers. Instead, it allocates no costs to provide default service to its customers. The difference is borne by distribution rate payers.
<i>REP Billing</i>	REPs own the billing relationship. Bills can be tailored to the REPs business strategies. Wires charges are included in the REP invoice. The utility customers are the REPs, not the end users of electricity.	REP billing is not available.	REP billing has been approved in principle. The Commission-approved implementation timeline suggests September 2022 as the start date for REP billing.	The Pennsylvania Commission has entertained the concept of supplier billing. In early 2018, it accepted comments from stakeholders and hosted an en banc hearing on the issue. It has taken no action since the en banc hearing.
<i>Creditworthiness</i>	\$500,000 letter of credit or tangible net worth of greater than \$100 million.	\$250,000 surety bond	\$250,000 surety bond	\$250,000 surety bond
<i>Utility Neutrality from Default Service</i>	Utilities do not offer Default Service.	No direct profits from default service.	MD utilities profit directly from providing default service. Based on data from its most recent rate proceeding, BGE is projected to earn \$8.3 million in profit annually from providing default service.	No direct profits from default service.
<i>Regulatory Risk</i>	Market is generally devoid of regulatory interference.	Market is generally devoid of regulatory interference.	Hostile regulatory environment driven by inaccurate comparisons of suppliers’ charges to default service rates.	Market is generally devoid of regulatory interference. The Commission has taken specific regulatory and legal actions against individual companies for behaviors it deems inappropriate.
<i>Long-term Customer Relationships</i>	All end-user customer relationships are owned by the REP. The utilities’ customers are the REPs.	No direct market interference in customer relationships.	MD is taking some proactive steps to enable longer-term customer relationships, including allowing for REP billing.	No direct market interference in customer relationships.
<i>Move-in/Move-out Bias</i>	Customers must choose an electricity supplier to receive electric service. When customers move, they keep their service. There is no Default Service Option.	Moving customers are placed on default service.	Moving customers are placed on default service.	Moving customers are placed on default service.

- Market construct dis-incentivized REPs entering long-term contracts with generation resources
- Market construct neutral to incentivize REPs to entering long-term contracts for generation resources
- Market construct incentivizing REPs to enter long-term contracts with generation resources

The table below provides “grades” for each of the states analyzed for each of the market attributes discussed above. Texas ranks the highest in all categories and while some of the hybrid states are making progress toward a fully robust market design, a lot of work is required to achieve markets where REPs are incentivized to enter into long-term contracts with generation developers.

RETAIL MARKET RULES AND THEIR IMPACT ON COMPETITIVE RETAIL ENERGY PROVIDERS’ INCENTIVE TO INVEST IN GENERATION RESOURCES

Summary Scorecard

	NEW JERSEY	MARYLAND	PENNSYLVANIA	TEXAS
Market Reflective Default Service Pricing	F	D	D	A
Unbiased Initial Placement	F	F	F	A
Stable Market Size	F	F	D	A
Non-discriminatory Rate Design	F	F	F	A
REP Billing	F	C+	D	A
Creditworthiness	D	D	D	A
Utility Neutrality from Default Service	C	F	C	A
Regulatory Risk	A	D	B	A
Long-term Customer Relationships	D	C	D	A
Move-in/Move-out Bias	F	F	F	A

RETAIL MARKET REFORM AND CAPACITY MARKET BYPASS

Five states are evaluating pulling out of ISO/RTO capacity markets—New York, Connecticut, Maryland, New Jersey, and Illinois. If they do, they will need to structure some alternative means of procuring resources. They will have certain options:

- a. **State agency procurement on behalf of all load.** For example, the Illinois Power Agency could perform this function for that state. Legislation would be required for this option.
- b. **Monopoly utility procurement on behalf of all load.** The state-regulated distribution company could be given this role, under rules established by state regulators. Legislation would likely be required, depending on current state PUC authorities.
- c. **REP procurement for the load they commit to serve. In this option, retail providers procure their share of capacity needed to serve their load.** Legislation may be required, depending on current state PUC authorities.

This last option would preserve retail competition and provide a policy vehicle to fix past flaws with retail competition and a pathway to relying less on capacity markets. The RTO/ISO definitions in the tariff may need to evolve over time because they would still be binding on the states under current RTO/ISO rules given a set of court decisions about how they are mandatory regardless of state policies and preferences. As discussed above, the success of this option in driving efficient incentives for retail providers to prudently manage risk on behalf of their customers will rely, in part, on ensuring that wholesale energy market prices fully reflect the value of energy during scarcity events.

CONCLUSION

An important yet under-appreciated aspect of the clean energy transition is to make sure the market structure includes entities with the **ability** and **incentive** to sign long-term contracts. In the 13 states with retail competition outside of Texas, there is some degree of a market flaw where responsibility for resource procurement has not been clearly assigned to customers or their load-serving entities. These states have “hybrid” competitive retail structures where there is a monopoly default service provider offering rates that are subsidized to varying degrees and some form of a free option for customers to move in and out of competitive service. This dynamic reduces the incentive for retailers to procure supply. In addition, these hybrid retail states generally have insufficient creditworthiness standards that affect the ability of retailers to procure supply. Finally, wholesale markets in these areas lack some of the essential features of the ERCOT wholesale market that drive efficient incentives for retail providers to prudently manage risk. Each state, including the three we evaluated here — New Jersey, Pennsylvania, and Maryland — have improvements to make sure the structure incentivizes and supports effective long-term contracting. We have identified a number of specific reforms that would improve the operation of the retail markets and enable broader wholesale market improvements.

APPENDIX A

INDUSTRY STRUCTURES THAT SUPPORT LONG-TERM CONTRACTING

Model 1: Vertically integrated monopoly utility

The traditional model of the vertically integrated utility is one structure that allows for long-term contracting. In that case, the utility proposes to a state commission to build, own, and operate a new generator. The state commission will generally approve the new generation if it finds the need exists and the resource can support reliable service at least cost. At that point the asset goes into the utility's "rate base" so it can recover the capital cost and a return on the investment from retail customers. Customers have no ability to leave the monopoly supplier. The state may require some form of competitive procurement for the generation but generally that is not the case. The utility also owns and operates the transmission and distribution systems. Vertically integrated utilities may be in a region where an RTO is the provider of transmission service and a spot market (as in MISO, SPP, and parts of PJM), but the investment in generation is not market-based; it remains regulated. Generation investment risk is fully borne by captive ratepayers, once authorized by the state regulator. This model, while still in use in more than half of the country, does not capture for consumers the benefits of competitive generation. It does, however, provide the market with a credit-worthy entity with the responsibility, incentive, and ability to finance new generation resources.

Model 2: Competitive retail provider

In this model, end-users choose their supplier from a set of Retail Electric Providers ("REP"), as they are called in Texas. (Several states use their own name for competitive retail electricity providers. For ease of reference, we use REP.) In this model, there is either no monopoly-provided default service option, or it is offered at a high "price to beat" rate making it less attractive than choosing a supplier. As such, there are few if any distortions created by providing a free option for consumers to shift back to the default service. State regulatory commissions require these providers or suppliers to have met certain codes of conduct and creditworthiness standards.⁴⁸

Texas, New Zealand, and the United Kingdom follow this model of full wholesale and full retail competition. All customers have the ability to choose their supplier and there is no default service provided (no Provider of First Resort or Last Resort). In these markets, customers have no option to "stay with the utility" for electricity supply. The utility provider does not offer electricity services other than wires services. The approach follows the public policy principle of "quarantining the monopoly."⁴⁹ The REPs own the customer relationship and handle the billing and administration, with the relationship sustaining even as customers may change residences ("move-in/move-out" is allowed).

In this model, long-term contracting is the responsibility of the REPs. It is not a mandated regulatory requirement; rather it is a requirement brought on by effective market design, competitive market forces and prudent risk management. If they do not procure what they need in advance they must buy it in real time, at potentially high prices. While data on long-term contracts are not as widely available as one might hope for research and transparency purposes, occasionally market participants announce their contracts. NRG Energy Inc. signed 1.3 GW of PPAs for solar energy just last year to serve their retail load.⁵⁰

48 "In states sanctioning retail competition, all energy marketers and suppliers (and sometimes community aggregation suppliers) are required to be certified through the state's Public Utilities Commission. To be certified, companies are usually required to meet the regulators' strict financial, managerial, and structural guidelines. There are also codes of conduct with which the CRES suppliers must comply," see Gonzalez (2016), [Restructured States, Retail Competition, and Market-Based Generation Rates](#), citing [Ohio Admin. Code § 4901-1-21](#).

49 Giberson and Kiesling (2017), "[The Need for Electricity Retail Market Reforms](#)," *The CATO Journal*, Fall 2017.

50 Motley Fool (2019), "[NRG Energy Inc \(NRG\) Q2 2019 Earnings Call Transcript](#)," August 7, 2019.

REPs are **incentivized** to secure a certain amount of power on a long-term basis so they can avoid having to pay high scarcity-based spot prices during peak demand periods. Scarcity based prices can reach \$9,000 per megawatt-hour (MWh) in Texas and \$14,000/MWh in Australia. Those prices can be thought of as speeding tickets or penalty payments for those who leave themselves too exposed by failing to procure the resources they need.

REPs are **able** to sign the contracts because the regulator (e.g., the Public Utility Commission of Texas) maintains creditworthiness standards. These standards are intended to avoid the free-rider problem where REPs could declare bankruptcy without anyone having procured the resources needed to serve the load they committed to serve.⁵¹ In Texas,

“A retail service provider must demonstrate and maintain: (i) an investment-grade credit rating; or (ii) tangible net worth greater than or equal to \$100 million, a minimum current ratio (current assets divided by current liabilities) of 1.0, and a debt to total capitalization ratio not greater than 0.60... or ... an irrevocable stand-by letter of credit payable to the commission with a face value of \$500,000 for the purpose of maintaining certification (PUCT 2017a).”⁵²

The creditworthiness requirements do not in and of themselves protect the company from bankruptcy, but they provide 1) a commitment that is sizable enough to encourage prudent management practices such as hedging load-serving obligations with energy contracts; and 2) some level of protection for customers should the REP enter bankruptcy and no longer be able to deliver on its contractual commitments to its customers. As long as the REPs are financially capable of securing adequate resources, the market motivates them to do so. It is debatable whether the creditworthiness standards in restructured states are high enough, but they do exist and are enforced. In theory, state regulators could simply require reporting for customers of retailers’ credit-worthiness, allowing consumers to factor that into their choice of supplier, but credit analysis is likely much more complicated than customers can be expected to handle, at least retail customers.

Since REPs are never sure how much of their contracted customer load will stay with them from year to year, there is a role for another sort of entity to share in the risk of long-term contracting. Intermediaries that are financial players will often directly sign the contracts with generation on one side, and with REPs on the other side. As end-users shift from one REP to another, the intermediary experiences little risk, because the load still exists and is willing to buy the power they own.

Contracts for power can be traditional PPAs, which are contracts where one party agrees to pay the other for physical delivery of power at a specified time and location. Many other contract flavors exist that share the risk, enabling the generator to secure financing and proceed to development. Contracts may include hedges, swaps, contracts for differences, and vesting contracts.⁵³ Basic forward contracts are widely used across the country; there are 165 actively traded electricity futures in North America.⁵⁴ Recently large corporate energy users have made a significant entry into the market for long term power contracts. Suppliers generally prefer longer terms, for 15 years or more if they can get it. Buyers generally prefer shorter terms, under ten years. Contracts generally do not need to be more than ten years in length to finance new generation, but the financing cost increases the shorter the term, because investors must place a higher risk premium on their equity investments when there is less contract coverage and

51 For examples of this dynamic, see Business Wire (2019), “[Agera Energy, LLC Files Chapter 11 Protection, Enters into Agreement to Sell Its Retail Assets to Constellation](#),” October 4, 2019, Washington Post (2014), “[Owner of Texas’s Largest Retail Electricity Provider Files for Chapter 11 Bankruptcy](#),” April 29, 2014, Ring (2019), “[Retail Supplier Files Bankruptcy Petition](#),” February 15, 2019, and Pilon (2019), “[Electricity Supplier Enters Ch. 11 Bankruptcy, Owes State \\$8.2M](#),” October 7, 2019.

52 National Renewable Energy Laboratory (2018), “[An Introduction to Retail Electricity Choice on the United States](#),” p. 4.

53 See, e.g. Bartlett (2019). See also Open Electricity Market (n.d.), “[Vesting contracts](#).”

54 Inter-continental exchange (n.d.), “[North American & European Power Futures](#).”

higher merchant risk. The market is evolving through this natural tension between buyers and sellers.⁵⁵ New wind, solar, gas, and storage resources have been entering the Texas market using these various contracting tools. The NRG Energy Inc. recent solar PPAs in ERCOT average 10 years in length.⁵⁶

These financeable generation contracts are available to customers and suppliers, without any involvement by the grid operator in this structure. In Texas, ERCOT's job is operating the transmission system and spot markets, more like an air traffic controller. ERCOT also manages retail data and information such as customer switching and meter data, which is an advantage that having a single-jurisdiction market with one regulator affords.⁵⁷ ERCOT does not require capacity obligations or enforce resource adequacy standards. This system works because the responsibility for long-term contracting (and the risk of not entering into long-term contracts) is clear and the REPs have the incentive and capability to perform this function. Reserve margins are produced because suppliers build enough to cover their obligations under contracts to deliver to their REP customers, and the REP customers have the incentive and ability to pay for enough capacity to cover various scenarios including generator outages.

Model 3: Regulated wires company with mandated renewable energy contracts

A third model that has been implemented to ensure long-term contracting is for state policy makers to simply mandate that utilities undertake them. As states have considered Renewable Portfolio Standards (RPS) and the best means of achieving clean energy growth at low costs to consumers, long-term contracting requirements are usually considered. Three states in New England, Connecticut, Rhode Island, and Massachusetts have paired their renewable energy targets with mandatory bilateral contracting requirements on their jurisdictional distribution companies. California also requires long-term contracts for renewables to comply with its clean energy goals. The contracts allow the financing of renewable generation with relatively low-cost capital. And with offshore wind energy goals and mandates becoming particularly popular in these states, it is not likely that these states will meet their targets without long-term contracts.

55 Roselund (2019), "[Beyond the PPA](#)," October 8, 2019.

56 Motley Fool (2019).

57 Anderson (2014), "[Convergence of Wholesale and Retail Markets: The Texas Experience](#)," June 12, 2014.

APPENDIX B

REVIEW OF NEW JERSEY'S RETAIL MARKET STRUCTURE AND LONG-TERM CONTRACTING

Default Service Price Formation

New Jersey developed an innovative approach to serving the mass retail market, now followed in four other states in the PJM region, including Pennsylvania and Maryland, whereby tranches of load are competitively bid at the wholesale level.⁵⁸ The approach is sometimes called “load slice auctions.” The tranches of load are staggered, or “laddered,” such that in New Jersey, one-third of load is procured each year for a period of three years. The auctions are split into separate procurements for larger and smaller customers and the larger ones have a more flexible retail rate to reflect wholesale market prices. The three-year default service contract term utilized in New Jersey is the longest term utilized in default service procurement (there are some exceptions in states for certain preferred resources that comprise a small percentage of the default service portfolio).

Initial Placement

Customers in New Jersey were placed on default service at the beginning of restructuring and the utilities have become the “providers of first resort.”

Stable Market Demand

Customers in New Jersey have a free option to move between default service and competitive supply. Because the pricing lag is significant in New Jersey, customers have a valuable opportunity to capitalize on price decreases when the market price is falling by moving to REPs and significantly delay exposure to price increases in rising price markets by moving back to default service.

NON-DISCRIMINATORY RATES

The New Jersey utilities do not allocate any shared costs (rent, billing, IT, etc.) to default service. While most of the New Jersey utilities burden default service with the costs of running auctions and managing procurement, one utility, Rockland Electric (“RECO”) “assigned no directly-incurred costs to [Default Service] Administrative Costs during the audit period.”⁵⁹ PSE&G assigned less than \$1 million of directly incurred costs to default service.⁶⁰ In PSE&G’s most recent rate proceeding, it was estimated that PSE&G should have allocated approximately \$190 million in costs incurred to provide default service to its customers.⁶¹ That \$190 million is embedded in distribution rates and therefore it artificially lowers default service rates, erecting a significant barrier to REPs developing long-term relationships with consumers.

REP Billing

Supplier consolidated billing is not available in the New Jersey utilities currently. Additionally, a quick review of this New Jersey utility bill will show that REPs have little space to deliver appropriate billing messages to customers. The sample bill from Jersey Central Power and Light highlights 11 different sections. Section H is the only section dedicated to competitive supplier charges. As is clearly visible in this image, there is more blank space on this bill than there is space allocated to supplier charges.

58 Loxley and Salant (2004), “[Default Service Auctions](#)”, *Journal of Regulatory Economics*, 26(2), September 2004, pp. 201-229, and Fox (2005), “[New Jersey’s BGS Auction: A Model for the Nation](#)”, *Fortnightly Magazine* [Public Utilities Fortnightly], September 2005, pp. 16-19.

59 Liberty Consulting Group (2018), [BGS Auction Administrative and Other Related Expenses of New Jersey EDCs](#), July 25, 2018.

60 Liberty Consulting Group (2018).

61 [Direct Testimony of Frank Lacey](#), In the Matter of Public Service Electric and Gas, BPU Docket Nos. ER 18010029 and GR 18010030, August 6, 2018.

New Jersey assessment

The free option for customers to leave the competitive market in New Jersey creates risk for REPs that disincentivizes their willingness to perform the long-term contracting function. The laddered contract approach utilized in New Jersey, while reducing customer risk of relying too much on prices available at one point in time, does reduce the value of customer choice relative to other models. The flatter prices provide customers with a more attractive option in default service than they otherwise would have, potentially steering customers out of the competitive market and thereby reducing retailers' incentive to engage in long-term contracting.

Approximately 15 percent of residential customers switch in New Jersey, well below the average of retail competition states of around 33 percent.⁶⁴

Each default and competitive supplier must comply with the New Jersey RPS on percent of retail sales served by class 1 and 2 renewable energy sources.⁶⁵

64 Littlechild (2018), [The Regulation of Retail Competition in US Residential Electricity Markets](#), February 28, 2018, p. 39.

65 [A.B 3723, 218th Legislature, §2 \(2018\)](#).

APPENDIX C

REVIEW OF MARYLAND'S RETAIL MARKET STRUCTURE AND LONG-TERM CONTRACTING

Default Service Price Formation

Maryland's "Standard Offer Service" is available to all customer classes met by utility auctions held four times per year for two-year terms.⁶⁶ While this auction structure presents Maryland customers with a bit more volatility than the design in New Jersey, the general outcome is the same. In rising price markets, when a long-term contract could become profitable for a REP, its customers are incentivized to move back to the less market responsive default service. This default service procurement structure therefore disincentivizes REPs from entering into long-term generation supply contracts.

Initial Placement

Customers in Maryland were placed on default service at the beginning of restructuring and the utilities have become the "providers of first resort."

Stable Market Demand

Customers in Maryland have a free option to move between default service and competitive supply. Because the pricing lag is significant in Maryland, customers have a valuable opportunity to capitalize on price decreases when the market price is falling by moving to REPs and significantly delay exposure to price increases in rising price markets by moving back to default service.

Non-Discriminatory Rates

The Maryland utilities do not allocate any shared costs (rent, billing, IT, etc.) to default service. Maryland utilities have deployed a more sophisticated approach that would allow them to assign direct costs to a default service "Administrative Charge" and also allow them to allocate shared costs associated with providing default service to customers to an "Administrative Adjustment." The utilities, however, have not yet implemented fully either of the two tools. As such, the Maryland utility default service rates are similarly subsidized by distribution ratepayers. In BGE's most recent distribution rate proceeding, it was estimated that BGE failed to allocate \$173 million to its default service customers.⁶⁷ BGE has proposed moving only \$12.3 million to its default service customers. It has argued to keep the remaining \$161 million in distribution rates, creating a subsidy that erects a barrier to long-term relationships between REPs and customers. Because Maryland utilities do not allocate costs to serve default service to its customers, a significant disincentive to long-term contracting exists in Maryland.

REP Billing

The Maryland PSC has recently approved implementation of supplier consolidated billing.⁶⁸ The supplier billing work group has presented an implementation timeline to the Maryland Commission, which it has accepted, that will enable supplier billing beginning in September 2022. This is a significant step forward in the Maryland market. Under REP billing, the REP can design its own invoice, messaging to customers

66 Public Service Commission of Maryland (2018), [Report to the Governor and the Maryland General Assembly on the Status of Standard Offer Service, the Development of Competition, and the Transition of Standard Offer Service to a Default Service](#), December 31, 2018.

67 [Testimony of Chris Peterson](#), In the Matter of the Application of Baltimore Gas and Electric Company for Adjustments to Its Electric and Gas Base Rates, before the Maryland Public Service Commission, Case 9610, September 10, 2019.

68 [Order Authorizing Supplier Consolidated Billing](#) (2019), In the Matter of the Petition of NRG Energy, Inc, Interstate gas Supply, Inc., Just Energy Group, Inc., Direct Energy Services, LLC and Engie Resources, LLC for Implementation of Supplier Consolidated Billing for Electricity and Natural Gas in Maryland, Maryland Public Service Commission Order No. 89116, May 7, 2019.

product attributes, such as renewable features, efficiency results and other messages consistent with its relationship with its customers. REP billing is a significant move toward allowing REPs to develop long-term relationships with its customers.

Creditworthiness

Maryland has a few different creditworthiness obligations that it places on suppliers before it will license a supplier. The Commission will grant creditworthiness based on certain credit standards granted by PJM. But in the absence of that, the Commission will grant a license if the REP provides a \$250,000 surety bond.⁶⁹ As in New Jersey, this is a relatively inexpensive obligation for a REP, perhaps costing the REP as little as \$2,500. It is not likely that this level of financial requirement will incentivize prudent management practices or long-term hedging and contracting. Additionally, Maryland requires “A. An applicant who intends to collect or an electricity supplier who collects a deposit or prepayment for electric supply from a customer shall post a bond as required under this regulation. B. The initial bond requirement for an applicant or electricity supplier who intends to collect a deposit or prepayment from a customer shall be \$50,000.”⁷⁰ While this is another form of financial assurance, there appears to be little correlation to REPs who are charging customers a deposit to long-term contracting.

Neutrality from Default Service

The Maryland utilities have a significant financial incentive to keep customers on default service. In the Maryland markets, the utilities earn an explicit “return” component on the provision of default service. It is a per kilowatt-hour fee and it varies between the utilities and customer classes. In its most recent rate proceeding, it was revealed that BGE will receive \$8.3 million in risk-free return if customer migration to competitive suppliers remains at its current level. This return is in addition to the return on equity that it is authorized to earn in its distribution rates. The other Maryland utilities earn similar “returns” on their default service. The profit incentive on default service is unique to the Maryland utilities. This return component erects barriers to long-term contracting between REPs and generation providers in that it creates a strong incentive for the utilities to maintain market share of energy customers through its default service.

Regulatory Risk

There is a debate in Maryland about whether REPs are over-charging residential customers based on comparisons between supplier charges and default service rates. This comparison is flawed for several reasons, including the lack of detail included on utility bills for suppliers’ charges, and the lack of costs being allocated to default service. Regulatory risk from any policy action based on this comparison could derail efforts to forge long-term contracts.

Long-Term Customer Relationships

Maryland has not actively interfered with the ability of REPs to maintain long-term customer relationships; however, the default service price formation practices discussed above, allow for the free option back to default service. Maryland is taking some proactive approaches to enable more lasting customer relationships, including the implementation of supplier billing.

Move-In/Move-Out Bias

In Maryland, customers who sign up for utility service, including those who were on competitive supply

⁶⁹ [Code of Maryland Regulations \(COMAR\), 20.51.02.08.](#)

⁷⁰ [Code of Maryland Regulations \(COMAR\), 20.52.03.03.](#)

service but move residences, are returned to utility default service.

Maryland assessment

Maryland is a net importer of electricity, and at the same time, has lofty renewable energy goals. It has established a framework for competitive energy markets that if implemented fully, would facilitate long-term contracting between REPs and generation developers. The state has approved supplier billing which is a key parameter to developing long-term relationships between REPs and customers. It has before it currently a proceeding in which it might remove default service subsidies from distribution rates and place them on default service customers. Maryland utilities are allowed to earn a return on default service as a matter of law. The Commission could only change the level of return. Implementing changes as discussed in this paper will facilitate long-term contracting between REPs and generation developers which will in turn, support Maryland's renewable energy goals.

APPENDIX D

REVIEW OF PENNSYLVANIA'S RETAIL MARKET STRUCTURE AND LONG-TERM CONTRACTING

Default Service Price Formation

Pennsylvania's default service varies between the utilities in the state. In all utilities, default service is available to all customer classes. The load is served by "a prudent mix of the following: (I) Spot market purchases. (II) Short-term contracts. (III) Long-term purchase contracts, entered into as a result of an auction, request for proposal or bilateral contract..."⁷¹ The Commission has generally interpreted long-term purchases to be for terms longer than one year, but not more than two years.

While this auction structure presents Pennsylvania customers with a bit more volatility than the design in New Jersey, the general outcome is the same. In rising price markets, when a long-term contract could become profitable for a REP, its customers are incentivized to move back to the less market responsive default service.

Initial Placement

Customers in Pennsylvania were placed on default service at the beginning of restructuring and the utilities have become the "providers of first resort."

Stable Market Demand

Customers in Pennsylvania have a free option to move between default service and competitive supply. One difference, however, is that the Pennsylvania utilities have adopted provisions that might call a customer out for "gaming" this option. For example, a supplier is not allowed to move customers back to default service to capitalize on levelized prices available to customers in the summer months.⁷²

Non-Discriminatory Rates

The Pennsylvania utilities do not allocate any shared costs (rent, billing, IT, etc.) to default service. In the Philadelphia area utility PECO's most recent rate adjustment proceeding, it was estimated that PECO failed to allocate \$101 million to its residential default service customers.⁷³ The PA PUC approved PECO's proposed allocation of \$0 to default service. This decision was appealed to the Commonwealth Court of Pennsylvania. The Court's decision is expected in early- to mid-2020.

REP Billing

The Pennsylvania PUC has entertained the concept of supplier billing. In early 2018 the Commission accepted comments from stakeholders and in June 2018 hosted an en banc hearing on the issue of supplier billing. The Commission has taken no action since the hearings in June 2018.

Creditworthiness

Pennsylvania has a vague statutory requirement for supplier financial assurance. The creditworthiness requirement are as follows: "no energy supplier license shall be issued or remain in force unless the holder ... Furnishes a bond or other security approved by the commission in form and amount to

71 [66 Pa. C.S., §2807\(e\)\(3.2\)](#).

72 Duquesne Light Company (2017), [Electric Generation Supplier Coordination Tariff](#), June 1, 2017, §14.4.

73 Testimony of Chris Peterson, *Pennsylvania Public Utility Commission v. PECO Energy Company*, PA PUC Docket No. R-2018-3000164, June 26, 2018.

ensure the financial responsibility of the electric generation supplier and the supply of electricity at retail in accordance with contracts, agreements or arrangements.”⁷⁴ The Pennsylvania Commission has interpreted this provision to require a \$250,000 surety. This includes “a bond, letter of credit or proof of bonding to the Commission in the amount of \$250,000...or another initial security for Commission approval, to ensure financial responsibility, such as a parental guarantee, in the amount of \$250,000.”⁷⁵ While no formal analysis has been performed in this paper on the cost of a parental guarantee, it is just that – a statement from the parent company that it will stand by the obligations of the REP. It can come at little to no cost. A surety bond for \$250,000, as discussed in other sections, can be obtained for as little as \$2,500. These minimal surety standards do not provide adequate incentives to REPs to prudently manage risks associated with electricity supply businesses, including entering into long-term contracting arrangements with renewable generation resource providers.

Neutrality from Default Service

The Pennsylvania utilities do not profit directly from the provision of default service.

Regulatory Risk

To date, the Pennsylvania electricity market has been generally devoid of interfering with competitive retailer businesses.

Long-Term Customer Relationships

Pennsylvania has not actively interfered with the ability of REPs to maintain long-term customer relationships; however, the default service price formation practices discussed above, allow for a generally free option back to default service.

Move-In/Move-Out Bias

In Pennsylvania, customers who sign up for utility service, including those who were on competitive supply service, default to utility service.

Pennsylvania Assessment

Pennsylvania has the largest retail market outside of Texas with 143 terawatt-hours of annual consumption. They adopted a default service approach so “that retail customers who do not choose an alternative electricity generation supplier (EGS), or who contract for electric energy that is not delivered, have access to generation supply procured by a Default Service Provider (DSP) pursuant to a Commission-approved competitive procurement plan. The Electric Distribution Company (EDC) (i.e., the incumbent utility) or other approved entity shall fully recover all reasonable costs for acting as a default service provider of electric generation supply to all retail customers in its certificated distribution territory.”⁷⁶ The procurement is “pursuant to a Commission-approved competitive procurement plan. The electric power acquired shall be procured through competitive procurement processes and shall include one or more of the following: (1) Auctions (2) Requests for proposals (3) Bilateral agreements entered into at the sole discretion of the default service provider.”⁷⁷ There are rules on affiliate participation and Commission review of the process and pricing. In practice, most of the power has been procured via the auction, similar to New Jersey.

74 [66 Pa. C.S., §2809\(c\)\(1\)](#).

75 Pennsylvania Public Utility Commission (n.d.), “[Application Form for Parties Wishing to Offer, Render, Furnish, or Supply Electricity or Electric Generation Services to the Public in the Commonwealth of Pennsylvania](#),” p. 11.

76 [66 Pa.C.S., §2807\(g\)](#), Default Service, issued and amended under the Electricity Generation Customer Choice and Competition Act.

77 [66 Pa. C.S., §2807\(e\)\(3.1\)](#).

Pennsylvania, because of the size of its electricity market, has become a very desirable market for REPs. Well over 100 REPs are currently licensed and operating in Pennsylvania.⁷⁸ The Pennsylvania competitive market is also very robust, with enabling legislation that is favorable to sustainable long-term competitive energy markets. With effective leadership, the Pennsylvania Commission could implement changes, many of which have already been presented to them, that would facilitate long-term relationships between REPs and customers which would in turn, facilitate long-term contracting between REPs and generation resource developers. The issues outlined above provide solid guidance to achieve these objectives.

78 Pennsylvania Public Utility Commission (2018), [Retail Electricity Choice Activity Report](#), p. 19.

APPENDIX E

PERCENT OF CUSTOMERS OPTING FOR COMPETITIVE RETAIL SUPPLIERS

On average around 70 percent of industrial customers have switched suppliers, and 40 percent of residential customers have switched.⁷⁹ That number is inflated, however, due to the inclusion of Texas, in which all customers are included whether they wanted to switch or not. Removing Texas yields about 33 percent of residential customers opting for competitive suppliers, based on 2015 data.⁸⁰

STATE	RESIDENTIAL	
	ELIGIBLE CUSTOMERS	SWITCHED IN 2014
Texas	5,959,000	5,959,000
Illinois	4,524,000	2,744,000
Ohio	4,195,000	2,253,000
Pennsylvania	4,980,000	1,794,000
New York	5,811,000	1,325,000
Massachusetts	3,347,000	598,000
Connecticut	1,401,000	486,000
Maryland	2,028,000	485,000
New Jersey	3,377,000	464,000
Maine	767,000	172,000
New Hampshire	427,000	85,400
Rhode Island	493,000	36,000
DC	243,000	34,400
Delaware	273,000	28,800
TOTAL	31,866,000	10,505,600
% SWITCHED	33%	

79 O'Connor & O'Connell-Diaz, (2015), [Evolution of the Revolution: The Sustained Success of Retail Electricity Competition](#), July 2015, p. 4, Figure 4.

80 Distributed Energy Financial Group LLC (2015), [Annual Baseline Assessment of Choice in Canada and the United States](#), July 2016, p. 2.



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