



Figure 2. Percentage change of retail price from previous year in non-retail vs. retail states

Source: EIA (2017)

that are compatible with the retail service offerings (Morey and Kirsh 2016). As Figure 2 illustrates, the average retail price of electricity tends to be more volatile in states with full retail markets (states with partially open retail markets are not included) than non-restructured states. In particular, retail price in states with retail markets saw a much steeper climb from 2003 to 2008, followed by a price decline in some retail states (especially Texas and New Jersey) for several years until recently, which coincides with the gas price movements in the past two decades. Scholars argue that while competition has brought considerable efficiency improvement at the plant level, the impact of natural gas price and new technologies have had a far larger impact (Borenstein and Bushnell 2015).

Renewable Energy Procurement with Retail Electricity Choice

Even though the price impact of retail electricity choice is somewhat uncertain, it created a competitive environment in which suppliers turn to renewable energy offerings as a way to differentiate themselves from their competitors. Table 1 reflects a number of different ways for end users to procure green power, including retail electricity choice (shown as “competitive suppliers” in the table).

Within the approximately 77.9 TWh of green power sold to about 4.3 million electricity customers in 2015, 15.4 TWh was purchased as a result of retail electricity choice. Retail electricity choice also enables customer adoption of an off-site voluntary power purchase agreement (PPA). Community choice aggregations (CCAs) are allowed in six states, wherein the local government can make decisions on behalf of an aggregated group of residential and small commercial customers with regard to the sources of the electricity supply; many of the CCAs have chosen renewables for their supply.

As Table 1 illustrates, the purchase of green power is not limited to retail electricity choice through competitive suppliers. In response to large customers’ (mainly industrial and commercial) demand for green power, utilities now offer green power purchasing mechanisms such as green pricing and unbundled renewable energy certificates (RECs), including new and innovative options such as utility green tariffs and community solar projects. Large customers are leading the way in the green power movement so they can meet corporate sustainability goals and take advantage of favorable financial mechanisms, such as PPAs, that provide stable electricity costs. Large customers’ interest in long-term agreements for renewable

Table 1. Voluntary Green Power Participation and Sales in 2015

Green Power Options	Participants	Sales (MWh)
Utility green pricing	789,000	7,512,000
Utility green tariffs	<10	380,000
Competitive suppliers	1,506,000	15,419,000
Unbundled renewable energy certificates	69,500	42,490,000
Community choice aggregations	1,940,000	7,420,000
Voluntary power purchase agreements	175	4,690,000
Community solar	15,000	180,000
Total*	4,300,000	77,900,000

Source: O’Shaughnessy et al. (2016)

energy, either through retail electricity choice, PPAs, or utility green tariffs, is expected to continue to grow (O’Shaughnessy et al. 2016).

In Nevada, consumer demand for renewable energy is driving the state to deregulate retail electricity. The Energy Choice Initiative bill, also known as “Question 3,” seeks to break up NV Energy’s monopoly and establish an “open, competitive retail electric energy market” (State of Nevada 2016). This proposed state constitutional amendment, financially backed by a data center company and a casino company, was passed overwhelmingly in 2016 and will face a confirming vote in 2018 before the amendment becomes final. A few customers (including MGM and Wynn, which represent 6% of NV Energy’s customer base) have left NV Energy in spite of hefty exit fees in pursuit of an alternative energy provider to meet their corporate sustainability goals and to obtain lower prices. Because Nevada is not part of a full restructured wholesale market, if it establishes a retail market,[†]

NV Energy would perform security-constrained economic dispatch of its own generation fleet and all independent generators in the state in order to meet the demand from the retail suppliers (load serving entities).[‡] There would be a “firewall” limiting direct communication between NV Energy’s generation business and its dispatch and strict rules and standards of conduct that impose heavy penalty for misconduct, along with rigorous market monitoring.

Relationship Between Wholesale and Retail Electricity Markets

In the United States, there is a divide between wholesale and retail electricity. A number of states that are part of restructured wholesale markets do not have full retail access, such as Kansas, Oklahoma, and Minnesota. It is also possible for states to have retail electricity choice but not participate in a wholesale electricity market. For example, Georgia and Oregon both have retail electricity choice for large commercial and industrial consumers, but those states are not part of any restructured wholesale power market.

A central issue in the restructuring of the U.S. power industry has been whether competition should be restricted to the wholesale power market or extend fully to the retail side (Bohi and Palmer 1996). This debate arises from the fact that while the benefits of wholesale restructuring are fairly concrete and obvious, quantifying the potential gain from retail electricity choice has been somewhat elusive. In general, researchers have shown that with an open retail market, individual consumer preferences are more likely to be served, the range of products and services offered would be greater, and innovations would happen faster. In the wholesale-only market, transaction costs are likely to be lower and investment in transmission capacity is more likely to occur at a socially desirable level. However, the realization of full benefits of the retail electricity choice depends on the real competitiveness of the retail market (Bohi and Palmer 1996).

* Totals exclude community solar because many community solar customers do not retain the renewable energy certificates associated with their purchase.

[†] NV Energy joined the Western Energy Imbalance Market (EIM), based in California Independent System Operator (CAISO), which allows the participating balancing authorities to trade the final few megawatts of power in real time. But the majority of the energy is dispatched through NV Energy’s own security-constrained economic dispatch—not through CAISO.

[‡] NV Energy has indicated that it is not interested in serving as the provider of last resort, which is the power provider when the customer’s retail provider exits the market for any reason (NV Energy 2017).

Lessons Learned from U.S. Retail Market Experience

Over the past two decades of retail electric power market experience in the United States, three important lessons may help inform other countries contemplating retail restructuring.

1. Stringent market entry rules are essential.

Most retail markets have a rigorous certification, licensing, and registration process for retail electric service providers. In Texas, for example, 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).

2. Fair, transparent, and strict market rules with effective market monitoring and swift penalties for misconduct can help avoid deceptive practices and ensure competition.

In New York, it has been relatively easy to set up an Energy Service Company (ESCO) that provides retail electricity services (for instance, there is no financial requirement) (NY DPS 2017). At the same time, the New York ESCOs are not subject to many rules and regulations (such as Article 4*) that govern the traditional energy corporations, nor is there sufficient penalty to prevent "substantial overcharges and deceptive practices by the ESCO industry" (NY DPS 2016a). The situation has become problematic enough that the New York Department of Public Service (DPS) has launched a formal investigation of the retail market after the DPS's initial attempt to revamp consumer protection (known as the "Reset Order") was remanded by the court (NY DPS 2016b).

In contrast to New York, retail electric service providers in Texas are subject to Chapter 25 Rules, which include strict provisions on customer

protection and establish a range of penalties that may be assessed for each class of violations (PUCT 2017a). The Texas Public Utility Commission (PUC) enforces the rules and statutes in its jurisdiction "to protect consumers, the electric market, and the reliability of the electric grid and to promote fair competition," using mechanisms such as administrative penalties and invoking a company's certificate to operate (PUCT 2017b).

3. A competitive retail market is crucial to achieve the promised benefits of retail reform.

One of the main reasons for Texas's noticeable retail price decline in recent years is because Texas has the most competitive retail electricity market in the United States. As of September 2016, 109 retail energy providers were operating in the Electric Reliability Council of Texas and 97 products with 100% renewable energy were available to consumers (PUCT 2017b). The Texas PUC designates providers of last resort (POLR) as back-up electric service providers in each area for when the customer has not yet identified a service provider (i.e., is in the process of choosing between retail service providers or has discontinued service). The POLR price is designed to be relatively expensive in order to push customers to the retail market. If the incumbent utility continues to be the POLR and has a relatively low regulated price, it would not be able to weather the price shocks from the wholesale market.

To conclude, when considering retail electricity market, it is important for policymakers to factor in the following issues:

- The objective of a reliable, efficient, resilient, and clean energy supply as well as the objectives for public and social welfare
- The evolving roles of the incumbent utility and emerging energy service industry in financing infrastructure and creating innovation but also in ensuring basic energy access for all
- The multi-agency effort (e.g., market rules, market monitoring, legal framework, and customer education) needed to ensure a fair, just, and competitive market.

* New York Article 4 "Provisions Relating to Gas and Electric Corporations; Regulation of Price of Gas and Electricity" consists of, among other things, important regulations on power sector safe and adequate service, just and reasonable charges, energy conservation, net energy metering, and customer protection.

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