SPECIAL REPORT

ENERGY

ASSESSING THE SPECTRUM OF REFORM

How Collaboration & Competition in South Carolina Could Help Lower Some of America's Highest Electricity Bills

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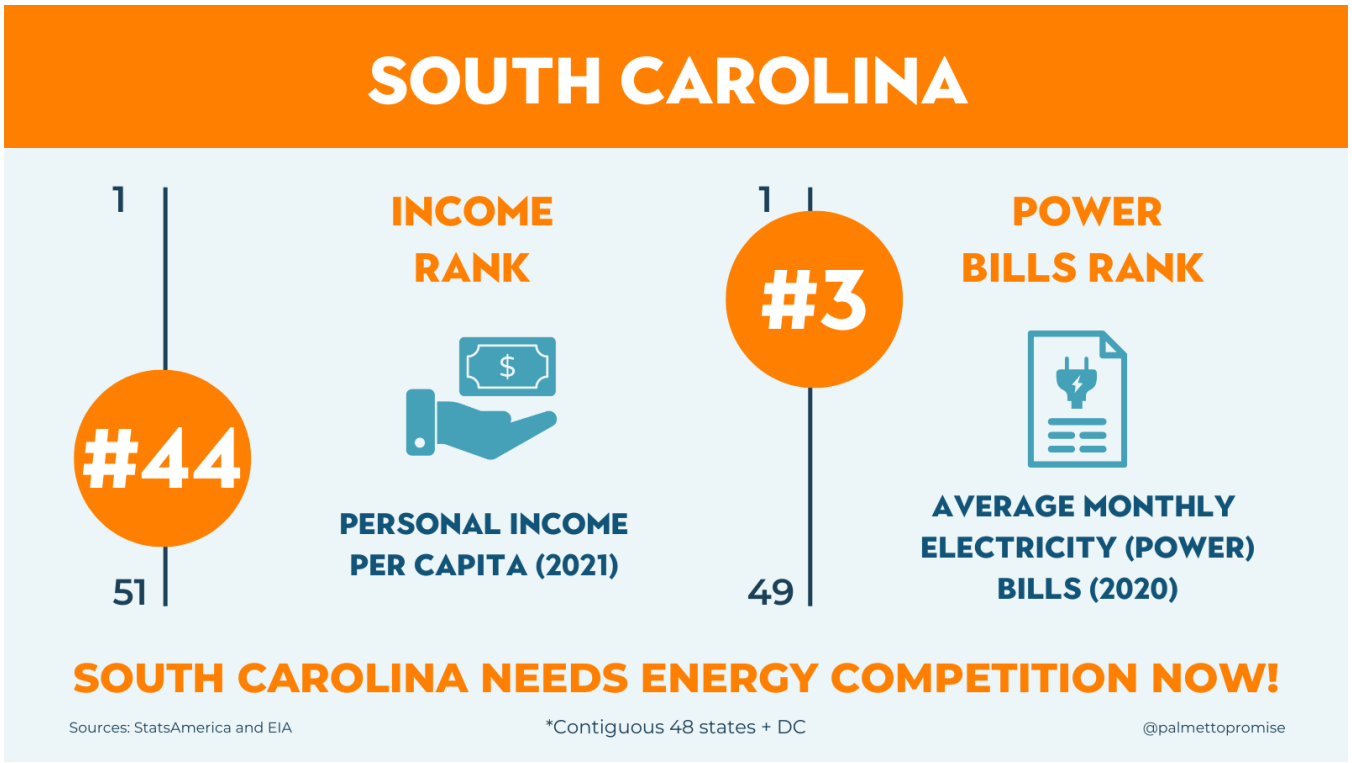
Monopoly, besides, is a great enemy to good management, which can never be universally established, but in consequence of that free and universal competition, which forces everybody to have recourse to it for the sake of self-defense.

—Alexander Hamilton quoting Adam Smith

South Carolina's current regulatory structure incentivizes investments that are not needed (using ratepayer dollars to build things). [Monopoly] utilities are writing their own destinies not subject to competitive pressure.

—International Energy Expert on Current South Carolina Market



EXECUTIVE SUMMARY

In the ongoing battle between the "bigs" and the "smalls," Palmetto Promise Institute has always been about the "smalls." We have favored entrepreneurs who have sought freedom in the healthcare market, and we work for economically disadvantaged parents who desire choice in education.

Healthcare and Education have moved up the policy ladder in the last two years because of COVID. People ask: "Why are telemedicine and education choice so restricted when people are stuck at home?" If a policy is bad during COVID, then it is just *bad*.

In the minds of the South Carolina voting public, Energy may not come to mind as a place for an infusion of free market capitalism. That is because the Palmetto State is situated in the most monopolistic energy market in the country. But, in this paper, we show that:

- South Carolina's power **bills** are among the highest in the country and its **rates** are some of the highest in the Southern region. p.12-16
- Even the baby steps that a number of states have taken toward **reform** have for the most part not gained significant traction in the Palmetto State. p.10-12
- The historical **vertically-integrated monopoly utility** with rigid assigned territories is no longer required or desirable for the generation and delivery of electricity due to changes in economy of scale and economy of scope. p.19-20
- The various models of **consumer choice** in electricity that exist around the United States (or could exist with legislative changes) could provide new options for South Carolina that would lower prices and shift risk away from ratepayers. p.18.
- The **Southeastern Energy Market (SEEM) proposal** is a weak gambit by "up and in" IOUs, not a path to a free market for the down and out ratepayer. p.21-23
- Situated in between several of the nine (9) highlighted models for the delivery of electricity, we describe viable steps in the direction of **wholesale purchase reform** (p.24) and **retail purchase reform** (choice). p.29
- The **Texas-ERCOT model** is an attractive option in terms of price and growing a renewables portfolio. p.38-41
- Our models show that Southern monopoly utility *residential* rates, touted by Southeast Energy Market (**SEEM**) proponents as more competitive than their *industrial* and *commercial* rates are higher than Texas residential rates. p.44-49
- In **Notes for Future Research**, our preliminary working model seems to show that monopoly-dominated states, particularly the Carolinas, are more likely to have gaps between generation nameplate **capacity** and actual **utilization**.

For utility and electricity market terminology, please see the Glossary on page 59.

THE SOUTH CAROLINA ELECTRICITY MARKET QUICK TAKE

In the not too distant past, 2016, the average South Carolinian paid more for electricity than citizens in any other state in the union. But there are innovations that can provide relief by shifting risk away from ratepayers. The experiences of other states show how electricity choice will also lower prices and improve customer service and innovation. This is a welcome solution for South Carolina, a state that in spite of its many providers, denies its citizens access to more than one option for power.

The most significant headline-grabbing unwelcome news for the South Carolina electricity customer, also known as the "ratepayer," was the failure of the V.C. Summer nuclear plant expansion exactly five years ago (July 31, 2017) that left customers exposed. But few energy customers are aware of the rest of the story: power costs and prices are high all over the Palmetto State.

- South Carolina is regularly in the top ten in consumer spending for electricity and has in recent years been #1 (2016). Palmetto State average utility bills currently rank #3 (2020) of the contiguous states and DC (49).
- South Carolina's prices for industrial, commercial, and residential use are higher than our neighbors and economic development competitors (North Carolina and Georgia).
- All utilities operating in South Carolina raise electricity rates regularly.
- There are a variety of options for wholesale and retail competition presented in this paper that will shift risk for capital projects and save ratepayers pain at the meter, but there must be enough political will to try them.

A PROSPEROUS ENERGY FUTURE

√ Lower customer rates across all three sectors; residential, industrial and commercial.

√ Lower generation and transmission costs.

√ More renewables/clean energy.

√ Shift risk away from ratepayers.

√ A liquid market to encourage more entry.

√ Competitive rates to attract and retain job-creators.

√ The fewest losers, the most winners as a result of reforms.

SPECTRUM OF REFORM: HOW ENERGY COLLABORATION & COMPETITION IN SOUTH CAROLINA COULD HELP LOWER SOME OF THE HIGHEST ELECTRICITY BILLS IN AMERICA

INTRODUCTION

In annual United States Energy Information Administration (USEIA) reports that collect average residential electricity bills by state, South Carolina is nearly always in the top five, sometimes number 1 (as in 2016).[1] We currently rank third highest in average residential utility bills (2020). There are a number of reasons for this dubious honor, including the Palmetto State's long hot summers and the long cold death march of the V.C. Summer nuclear expansion project that ended on July 31, 2017 that exposed customers to cost overruns through the Baseload Review Act.[2] But weather and mismanagement can be blamed for only so much of the power bill sticker shock experienced by some of the poorest ratepayers in America.[3]

Another source of high prices for electricity (or of any commodity) is, as any Economics 101 student could tell you, *lack of competition*. South Carolina is situated within a region of the United States that lives in the chokehold of monopolistic, vertically integrated utilities. While every other region of the nation, even the "left coast" has seen competitive elements introduced, the Deep South seems to have a high tolerance for the dominance of "the bigs" (the mega-utilities) over "the smalls," (rate-paying residential, industrial, and commercial consumers). Following the causal chain, it just so happens that nowhere are utility *lobbyists* more powerful with public service commissions and legislatures than in five monopoly states: the Carolinas, Georgia, Alabama, and Florida.

But in other spheres of state policy dominated by "the bigs," like education and healthcare, citizens are pushing back. Right here in South Carolina, hospital conglomerates are reeling at the legislature's hostility toward Certificate of Need laws that keep prices high, and healthcare rationed. In education, the concept of "school choice" that allows poor families the same range of options as rich ones has finally gotten traction. But the $13 billion public school industry and the $14 billion hospital sector[4] are public policy amateurs compared to the hold over regulators and legislators accomplished by public power (government) and Investor-Owned (IOU) monopoly utilities.[5]

Public opinion surveys of public school parents and public health customers (patients) show staunch support for opening up markets. Education was the first frontier for choice, healthcare the next, both of which were amplified by COVID. Parents watched as private schools they could not afford remained open with in-person instruction, while their public school opted for virtual education, to disastrous results for parents and teachers alike. States with little to offer in terms of telemedicine rights saw legislative email boxes fill with the frustrations of angry patients who felt trapped in no-man's land between doctors' offices full of contagious individuals and overly restrictive online care protocols.

It is only right that energy should be the next free market frontier. The spread of the novel coronavirus and the accompanying lockdowns meant more hours of heated and air conditioned space at levels set for the comfort of people who were suddenly at home. COVID-19 also sensitized Americans to the threat that disasters pose if there is no plan to prepare for one. The opinions of Americans on energy are not well-known, but surveys point to common ground. Not surprisingly, some energy issues divide Americans right down the middle,[6] but some visions for the future achieve overwhelming support[7]:

FIGURE 1. ENERGY PUBLIC OPINION POLLING

- **91% of Americans** believe the lessons of coronavirus **crisis** should be applied to energy
- **87% of Americans** believe that there should be more electric utility **competition** to give people a choice of what companies to buy their power from
- **88%-92% of Americans** favor protecting a **property owner's** right to produce energy on his or her own land
- **84% of Americans** support the government taking some kind of action to accelerate the development and use of **clean** energy in the United States

Source: Public Opinion Strategies

When offered three general strategies for increasing clean energy production to choose from, here is how they fared head to head:

FIGURE 2. CLEAN ENERGY OPTIONS RANKING

- **Energy Competition - 63%**
- **Government Mandates, Subsidies, and Quotas - 20%**
- **A Price or Tax on Carbon Emissions - 17%**

Source: Public Opinion Strategies

Broken down by party identification, the support for Energy Competition versus the other alternatives was 79% of Republicans, 45% of Democrats and 71% of Independents.

So, clearly there is public support for energy competition.

That begs the question of why there has been so little action in that direction politically. Part of the problem in the David vs. Goliath ratepayer versus utility struggle is the perceived lack of alternatives. In education, the Catholic Church has said it has the capacity to build a private school in the middle of nowhere[8] if the state can supply a few students on public scholarships. In healthcare, Ambulatory Surgery Centers (ASCs)[9] can pop up in no time and offer intricate procedures on a same-day basis if the state will simply get out of the way.

But what are the alternatives for electricity? Which options shift risk for "building stuff" away from poor ratepayers? If the South Carolina Public Service Commission (PSC) were to eliminate territories tomorrow, what kind of competition would even be possible? Would South Carolina become a “wild, wild West” of competition where networks of wires overlap, and utility poles proliferate like kudzu? Or are there other more modern alternatives to a 19th Century competitive model?

The purpose of this paper is two-fold, as are the two methods.[10]

One portion involves historical analysis, the policy and political state of play, and the numbers that help paint this picture. In this section we will seek to answer questions like: What is the lay of the land for electricity competition in America? What reforms could be enacted in South Carolina? Should we

limit ourselves to changes on the margins, or would a more aggressive approach gain traction? This will be the *spectrum* to which we refer in the title.

A shorter, statistical section involves robust modeling and seeks predictive power and suggests a pathway for additional research. The bottom line question would be: What is the estimated effect on consumer prices of some of the better national reforms?

In all that we do, we will seek to connect theories and models with the real world. In a time of instability in the world militarily and in the nation economically, what changes could be made in the energy sector that would have an effect on real Americans and real South Carolinians in terms of their prosperity?

ASSESSING THE SPECTRUM OF COMPETITION ALTERNATIVES IN AMERICA

FIGURE 3. TIMELINE: HOW WE GOT HERE

NATIONAL TIMELINE

1879	Thomas Edison Invents the Lightbulb
1882	Edison's New York Pearl Street Station Opens
1920	Federal Water Power Act (FWPA); Federal Power Commission (FPC)
1935	Public Utility Act (PUA); Public Utility Holding Company Act (PUHCA); Federal Power Act (FPA)
1965	Northeast Blackout (November 9: 13 hours)
1973	Oil Crisis (due to OPEC Embargo)
1977	Federal Energy Regulatory Commission (FERC) Established
1978	Public Utility Regulatory Act (PURPA), Power Plant and Industrial Fuel Use Act (PIFUA)
	Natural Gas Policy Act (NGPA)
1979	Three Mile Island Nuclear Accident (Pennsylvania)
1985	FERC Order 436 (requiring unbundling cost of natural gas from other costs charged to consumers)
1980s	United Kingdom (UK) Energy Reforms (relinquishing direct control of energy market)
1992	Energy Policy Act (encouraging alternative fuels, renewable energy)
1992	FERC Order 636 (requiring gas pipelines to decouple sales services from transportation services)
1996	FERC Orders 888/889 (non-discriminatory access to transmission)
1999	FERC Order 2000 (encouraging smaller transmission entities to join RTOs)
2001	California Energy Crisis (caused in part by capped energy prices)
2002	Electric Reliability Council of Texas (ERCOT) Launched
2003	Northeast Blackout (evening of August 14)
2004	State Renewable Portfolio Standards (RPS) Programs Begin

2005 FERC Order 668 (updating FERC accounting requirements for RTOs and ISOs)

2005 Energy Policy Act (reaffirming commitment to wholesale power competition)

2006 FERC Orders 681 and 679 (encouraging independent transmission organizations; reducing congestion)

2007 FERC Order 890 (transmission grid reform)

2008 FERC Order 719 (encouraging wholesale electricity markets)

2009 FERC Order 719-A and -B (affirming 719)

2020 FERC Order 2222 (enabling Distributed Energy Resources [DERs} to compete on a level playing field with utilities in markets run by regional grid operators using aggregation

SOUTH CAROLINA TIMELINE

2007 **April 2007:** SC General Assembly passes **S.431**, the Base Load Review Act, which makes it easier for utilities to raise rates to pay for nuclear reactors while they are under construction and easier to charge ratepayers for their investments in plants they do not complete. The bill becomes law on May 3 without Gov. Mark Sanford's signature. (The Act was key in the ability of SCANA to undertake VC Summer expansion but did not apply to Santee Cooper.)

2008 **May 2008:** SCE&G and Santee Cooper announce plans for $9.8 billion nuclear expansion project at the V. C. Summer plant in Fairfield County. SCE&G would pay $5.4 billion for construction, Santee Cooper $4.4 billion.

May 2008: SCE&G asks the Public Service Commission to approve the first of multiple rate increases to help fund the nuclear project. (Because Santee Cooper is a state agency, the PSC does not have to approve its rate plans.)

October 2008: The Public Service Commission grants permission for SCE&G to begin site work.

2012 **2012:** Duke Energy and Progress Energy (formerly Carolina Power & Light) merge to form Duke Energy Progress

2014 **2014:** South Carolina **Act 236** establishes voluntary renewables portfolio standards (RPS); net metering.

2015 **August 2015:** Obama Administration announces Clean Power Plan (CPP).

2017 **July 2017:** Santee Cooper and SCE&G announce they are abandoning work on the V.C. Summer nuclear project; the following day, SCE&G files an abandonment petition.

2018 **August 2018:** Legislatively-ordered SCE&G rate cut takes effect.

2019 **January 2019:** Dominion Energy acquires South Carolina Electric & Gas (SCANA Corporation).

March 2019: South Carolina Conservatives for Clean Energy advocacy group formed.

June 2019: Trump Administration EPA Administrator Andrew Wheeler signs the Affordable Clean Energy Rule (ACE), negating much of the Obama Administration Clean Power Plan.

May 2019: Governor McMaster signs South Carolina Energy Freedom Act (**Act 62**). The Act:

- Directs the Public Service Commission of South Carolina (PSC) to protect customers from rising costs and to provide customers with opportunities to reduce or manage their own energy usage.
- Grants customers the right to electric rates that enable energy efficiency, demand response, or onsite distributed energy resources (DERs) to reduce their electricity usage.
- Grants customers the right to obtain and use data collected by a utility on their individual energy consumption and, upon assent from the customer, allows data sharing with a third-party vendor.
- In cooperation with the SC Department of Consumer Affairs, directs the ORS to develop consumer protection regulations regarding the sale or lease of renewable energy generation facilities. This includes developing a formal complaint process, conducting an investigation into an alleged violation, issuing a cease-and-desist order against a further violation, imposing fines, and/or voiding agreements. This may also include requiring certain disclosure requirements by solar companies.

2020 **October 2020:** General Assembly passes **Act 187**, establishing the Electricity Market Reform Measures Study Committee to:

1. study whether to recommend any of a variety of electricity market reform measures, encompassing the full range of possible market reforms that may benefit South Carolina consumers including, but not limited to, the following:
   a. establishing a South Carolina Regional Transmission Organization or an RTO including South Carolina and other Southeastern states;
   b. joining an existing RTO;
   c. establishing an energy imbalance market;
   d. requiring vertically integrated electrical utilities to divest their generation or transmission assets, or both;
   e. enabling full consumer retail electric service choice;
   f. enabling partial consumer retail electric service choice such as nonresidential customer choice;
   g. authorizing community choice aggregation in South Carolina;
   h. redesigning the distribution system operator role in South Carolina to accommodate a modernized distribution grid featuring high levels of distributed energy resources, including exploration of establishing an independent distribution system operator and distribution-level electricity markets;
   i. measures to accelerate reductions in emissions associated with South Carolina's electricity supply;
   j. establishing joint dispatch agreements among state or regional utilities;
   k. other beneficial regulatory framework changes; and
   l. establishing or preserving consumer rate structures that more closely align consumer interests with electric system interests;

2. study whether the General Assembly should require any electrical utility, electric cooperative, or the Public Service Authority of South Carolina to take actions necessary to implement one or more of the studied electricity market reform measures; and

3. study the costs and benefits to consumers and the financial and operational impacts to integrated service providers of any market reform measures recommended.

2021 **June 2021:** General Assembly votes to reform Santee Cooper **(Act 90)**, puts off sale indefinitely.

A quick glance at our electricity policy timeline, which includes milestones to which we will refer in the following pages, shows that the path to the power outlet in our homes and businesses depends a great deal on *government policy.* It is no surprise that the political world does not always follow a logical progression, which is why major policy changes seemingly carved in stone on our timeline were shortly thereafter *un*carved.

Before Word War I, there was not much interaction of government and utilities. In most cases, local governments regulated utilities within their borders. But after The Great War, monopoly industries had their rates set by state agencies. This created various externalities[11] and distortions where industrial users often subsidized residential and commercial ratepayers, customers paid less than the cost of service during peak load usage, politically powerful customers fared better than diffuse unorganized ones, and inefficient or unwise generation capacity was constructed due to political incentives or lack of concern for actual cost or excessive capacity due to guaranteed "cost of service/"rate of return" regulatory principles. There was no incentive for efficiency, only for speculation.

In 1935, Congress passed the Public Utility Act (PUA) which included the Public Utility Holding Company Act (PUHCA) and the Federal Power Act (FPA). The Federal Power Administration became involved in some transactions, wheeling, and mergers, and the Securities and Exchange Commission (SEC) began to regulate public utility holding companies. Other regulatory functions still remained with public service commissions at the state level, but federal authority was creeping into energy matters.

From The New Deal until the 1970s, energy commodity prices mostly fell. Utilities petitioned for rate *decreases*. But when the price of fuel spiked due to actions by the OPEC cartel and Congress' enactment of Clean Air Act pollution controls in the 1970s, generation became more expensive, and prices rose. In the wake of the energy crisis of the early 1970s, Congress created a cabinet-level Department of Energy and the Federal Energy Regulatory Commission or FERC (1977), then passed PURPA, the Public Utility Regulatory Policy Act (1978). These actions were followed by the Energy Policy Act of 1992 and a landmark order from FERC enforcing it. The primary intent of PURPA was conservation. But the effect was to favor independent power producers (non-utility generators), smaller generation without discrimination based on scale, and the opening up (no matter how inefficient), and the opening up of utility networks to competitors. But the early momentum for choice only went so far.

Turning to government to set a price and to look over the shoulder of private industry leads to "regulatory capture" (the "capturing" of government regulatory agencies by those being regulated) and "regulatory failure" (the inability of government agencies to keep up with innovation).[12]

We will return to our history lesson shortly.

SOUTHERN STATE EFFORTS

In his recent article (June 2021) article,[13] Joshua Rhodes and his colleagues at the University of Texas highlight ten policy options that could be taken on the margins to make monopoly markets more competitive and accountable. None of these options should be taken lightly, but rather than a framework, they are mostly half-measures that would generate some progress, but not advance the ball very far toward actual competition.

That said, the accompanying "Competition Scorecard" is a good barometer for the state of play in each state. The ratings of South Carolina, North Carolina, Georgia, Alabama, and Florida—our five core states in the utility monopolistic South—were as follows based on a perfect score of **13** and a perfect grade of **A**:

FIGURE 4. ENERGY COMPETITION SCORECARD

	Score	Grade
South Carolina	3	F
North Carolina	4	D
Georgia	5	D
Alabama	1	F
Florida	3	F

SOUTH CAROLINA SCORECARD SPECIFICS

The Palmetto State scored as follows, stated as answers to key reform questions. The good news is sparse.

The Good

- Are RFPs for future generation expansion managed by an independent third party (independent evaluator)? **Yes**. But are there RFPs?
- Does the state allow revenue decoupling or a lost revenue adjustment mechanism for electric utilities? **Yes.**
- Does the state have compensation programs for distributed generation? **Yes**.

The Bad and The Ugly

- Does the state have competition at the wholesale market level? **No**.
- Does the state have competition at the retail market level? **No**.
- Are utilities required to utilize "All-source RFP's" when planning for future generation expansion? **Mostly No**.
- Do utilities have Performance Incentive Mechanisms (PIMs) to incentivize good behavior? **No**.
- Does the state have an aggregate capacity limit for participation in compensation programs for distributed generation? **Yes**.

To set the table for the spectrum, readers will wish to note that **4** states received a grade of "**A**" (Connecticut, Maine, *Illinois*, and *Ohio*) and **12** received an "**F**" (Alaska, *Alabama*, *Florida*, Idaho, Kansas, *Mississippi*, Nebraska, *South Carolina*, South Dakota, Tennessee, West Virginia, and Wyoming). If we toss out the northern most Northeastern states and the Western states, which have unique circumstances, as well as government power-dominated Tennessee, some patterns emerge to which we will return later.

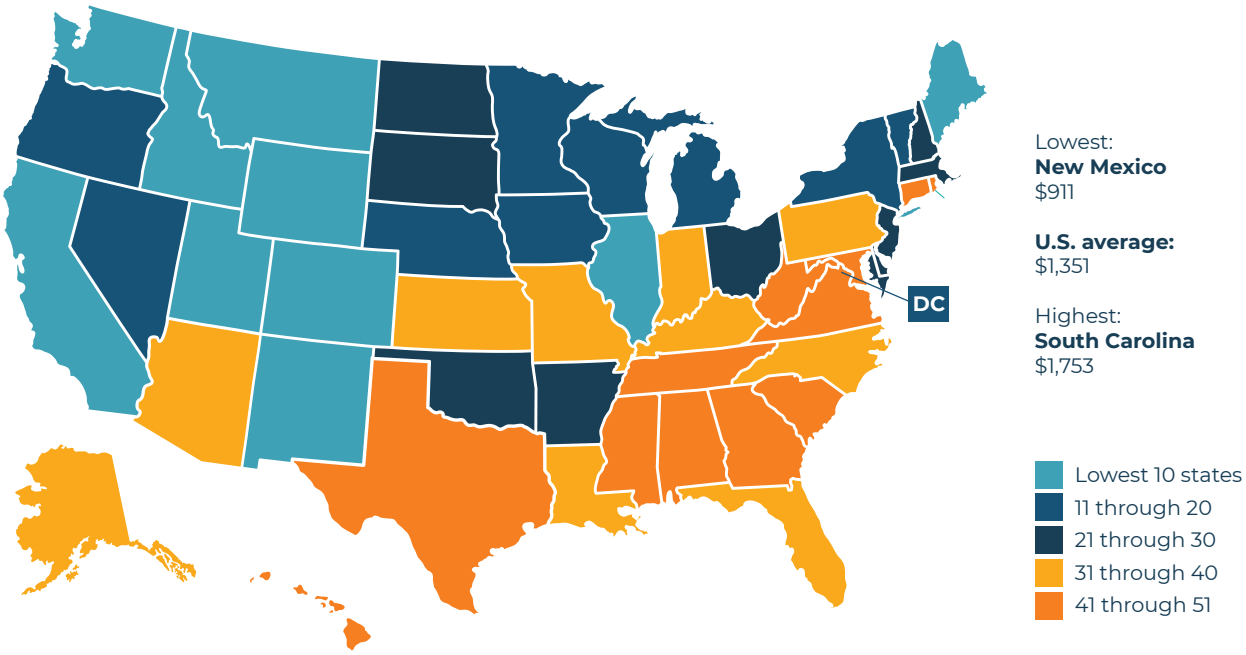
Though Texas, the Northeast, parts of the Midwest and to some extent Georgia have seen an expansion of consumer choice in the residential power market and growth of alternative generation in the industrial market (post PURPA), most of the American South, including South Carolina still relies on traditional, vertically-integrated utilities with government-awarded geographic monopolies and rates set by state agency rather than competitive market. A factor in the expansion of choice in the Northeast was the perpetually high prices in that region. In other parts of the United States, diversity of supply has operated as an impetus for choice.

But back In South Carolina, the Palmetto State ranks low on a "Competition Scorecard" that rates each state on *reformist* ideas that are not by any stretch real *reform*. In sports terms, we are being blown out in a play-in game to earn a spot in The Big Dance.

SOUTH CAROLINA ENERGY BILLS

So, just how high are South Carolina energy bills? The solid orange shading on this graphic is clarifying. Air conditioners run around the clock in blazing hot summers, and inefficient electric strip heaters still dominate poorer regions of the state, many of them in mobile or modular housing with poor insulation.

FIGURE 5. AVERAGE RESIDENTIAL ELECTRICITY EXPENDITURES PER CUSTOMER



Source: United States Energy Information Administration
(published 2018 using 2016 data)

The assumption about Southern electricity has been that the South has cheap rates but high usage which equal high utility bills. But within the South, when we compare rates for the three end-user sectors of electricity, South Carolina in the top five in every category.

FIGURE 6. AVERAGE PRICE OF ELECTRICITY TO ULTIMATE CUSTOMER BY END-USER SECTOR: RESIDENTIAL

	Residential	
Census Division and State	**January 2022**	**January 2021**
Florida	13.36	11.65
Alabama	12.86	12.38
South Carolina	**12.73**	**11.99**
Virginia	12.10	11.05
West Virginia	11.95	11.20
Kentucky	11.93	10.47
Georgia	11.63	10.94
Tennessee	11.51	10.38
Mississippi	11.48	10.88
Louisiana	11.20	9.58
North Carolina	10.88	10.60
Arkansas	10.33	9.42
Oklahoma	10.16	8.93

See Technical notes for additional information on the Commercial, Industrial, and Transportation sectors.

Displayed values of zero may represent small values that round to zero. The Excel version of this table provides additional precision which may be accessed by selecting individual cells.

Notes: - See Glossary for definitions. - Values are preliminary estimates based on a cutoff model sample.

See Technical Notes for a discussion of the sample design for the Form EIA-826.

Utilities and energy service providers may classify commercial and industrial customers based on either NAICS codes or demands or usage falling within specified limits by rate schedule.

Changes from year to year in consumer counts, sales and revenues, particularly involving the commercial and industrial consumer sectors, may result from respondent implementation of changes in the definitions of consumers, and reclassifications.

Totals may not equal sum of components because of independent rounding.

Source: U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report.

Longitudinal data shows that South Carolina residential rates have been consistently higher than neighboring states for the last decade.

FIGURE 7. AVERAGE PRICE OF ELECTRICITY TO ULTIMATE CUSTOMER BY END-USER SECTOR: COMMERCIAL

	Commercial	
Census Division and State	**January 2022**	**January 2021**
Alabama	12.47	11.77
Tennessee	11.46	10.40
Mississippi	11.34	10.70
Kentucky	11.31	10.12
South Carolina	**11.02**	**10.03**
Georgia	10.93	9.96
Louisiana	10.77	9.49
Florida	10.73	9.35
West Virginia	9.63	9.02
Arkansas	9.11	8.40
Oklahoma	8.78	7.71
Virginia	8.56	7.36
North Carolina	7.92	7.90

See Technical notes for additional information on the Commercial, Industrial, and Transportation sectors.

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Source: U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report.

Longitudinal data shows that South Carolina commercial rates have often been higher than neighboring states during the last decade.

FIGURE 8. AVERAGE PRICE OF ELECTRICITY TO ULTIMATE CUSTOMER BY END-USER SECTOR: INDUSTRIAL

	Industrial	
Census Division and State	January 2022	January 2021
Florida	8.34	7.44
Virginia	7.19	6.06
South Carolina	**6.91**	**5.61**
Kentucky	6.88	5.30
Georgia	6.75	5.56
Alabama	6.69	5.83
Louisiana	6.59	5.14
Mississippi	6.54	5.62
Arkansas	6.31	5.50
Tennessee	6.28	5.12
West Virginia	6.10	5.86
Oklahoma	6.10	4.32
North Carolina	5.32	5.75

See Technical notes for additional information on the Commercial, Industrial, and Transportation sectors.

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Totals may not equal sum of components because of independent rounding.

Source: U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report.

Longitudinal data shows that South Carolina industrial rates have been generally flat for the last decade.

FIGURE 9. AVERAGE PRICE OF ELECTRICITY TO ULTIMATE CUSTOMER BY END-USER SECTOR: ALL SECTORS

	All Sectors	
Census Division and State	**January 2022**	**January 2021**
Florida	11.97	10.48
Alabama	10.66	9.94
South Carolina	**10.40**	**9.48**
Tennessee	10.37	9.35
Georgia	10.33	9.46
Kentucky	9.97	8.56
Virginia	9.89	8.92
Mississippi	9.88	9.22
West Virginia	9.28	8.73
Louisiana	9.10	7.80
North Carolina	8.71	8.88
Arkansas	8.65	7.87
Oklahoma	8.48	7.12

See Technical notes for additional information on the Commercial, Industrial, and Transportation sectors.

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Totals may not equal sum of components because of independent rounding.

Source: U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report.

These high prices have a real, human effect. Many in the Southern region of the country report high levels of energy insecurity, meaning families are cutting back in other areas to pay for their utility bills.

FIGURE 10. ENERGY INSECURITY IN THE UNITED STATES

	Number of housing units (million)				
		Households reporting...			
	Total U.S.	Any household energy insecurity	Percentage Reporting Energy Insecurity	Reducing or forgoing food or medecine to pay energy costs	Percentage Reducing Food or Medicine
All homes	118.2	37.0	31%	25.3	21%
Census region and division					
Northeast	21.0	6.2	30%	4.0	19%
New England	5.6	2.0	36%	1.2	21%
Middle Atlantic	15.4	4.1	27%	2.8	18%
Midwest	26.4	7.4	28%	5.0	19%
East North Central	18.1	5.5	30%	3.7	20%
West North Central	8.3	1.9	23%	1.3	16%
South	44.4	15.4	35%	10.8	24%
South Atlantic	23.5	7.6	32%	5.1	22%
East South Central	**7.2**	**3.0**	**42%**	**2.5**	**35%**
West South Central	13.8	4.8	35%	3.3	24%
West	26.4	8.1	31%	5.5	21%
Mountain	8.5	2.1	25%	1.4	16%
Mountain North	4.2	1.0	24%	0.8	19%
Mountain South	4.3	1.1	26%	0.7	16%
Pacific	17.9	6.0	34%	4.1	23%

Source: U.S. Energy Information Administration.

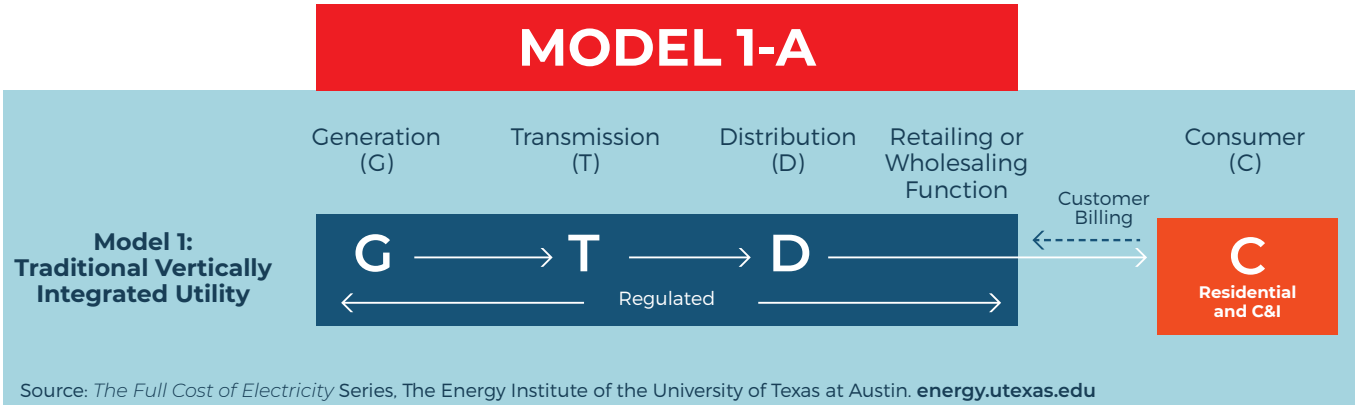
NINE REFORM OPTIONS ON THE SPECTRUM

FIGURE 11. THE SPECTRUM OF REFORM.

FINDING THE SWEET SPOT FOR SOUTH CAROLINA

1	Monopoly Muscle (current South Carolina)	p.19
2	SEEM Scheme	p.21
	Wholesale Market Reforms (Intermediate Steps Toward Wholesale Competition)	p.24
3	Regional Transmission Organization (RTO)	p.25
	Retail Market Reforms (Intermediate Steps Toward Retail Choice)	p.30
4	California	p.29
5	Retail Choice	p.30
6	Duopoly	p.34
7	Willing Buyer, Willing Seller (PPI)	p.35
8	Texas/ ERCOT	p.39
9	Full Electricity Choice (TOTAL FREEDOM)	p.44

FIGURE 12. MODEL 1A: TRADITIONAL VERTICALLY-INTEGRATED UTILITY (MONOPOLY MUSCLE)



After Thomas Edison invented the lightbulb, he went into the electricity business. The New York utility he co-founded still bears his name. That was in the Direct Current (DC) days, but as Alternating Current (AC) came into vogue after Tesla won that little competition, a unique set of circumstances found in American business made the delivery of electricity to its ultimate purchaser unlike any other product. In reality and in theory, sales of electricity as a commodity meant there would be "natural monopolies."

This was not the case with the telephone industry, however.

> *According to telecom industry historian Gerald W Brock, by the end of 1894 more than 80 new independent competitors had already grabbed 5 percent of total market share, and the number of independent firms continued to rise so dramatically that just after the turn of the century, more than 3,000 competitors existed. Illinois, Indiana, Iowa, Missouri and Ohio each had more than 200 telephone companies..."*[14]

Well into the 20th Century actual competition for telephone service was common in several jurisdictions in the United States. We do not have that many companies today due to mergers around the time of World War I. But South Carolina has enjoyed a diversity in franchise telephone services. Older South Carolinians will remember calling Southern Bell Directory Assistance for a number in Myrtle Beach only to be transferred to the company serving the Grand Strand, GTE.

But with electricity, as technology advanced, massive electricity generation units became possible (and required). Complicated financial instruments like "holding companies" were developed so that utilities could pay off those huge assets over time.

Politics entered the market as well, allowing for otherwise illegal monopolies and sanctioning holding companies to split risk. But government also openly discouraged independent operators of any portion of the emerging grid and encouraged mammoth vertically integrated electricity conglomerates that would not only *generate* power but *transmit* it at high voltage over long distances and *distribute* it at lower voltage locally to plants, stores, and homes. No customer class had any choice of their utility. This model includes Investor-Owned Utilities (IOUs) and government-owned utilities public power). In the New Deal Era, public power dammed Southern rivers and brought electricity to rural areas still in darkness. There the electricity market plateaued until the 1970s.

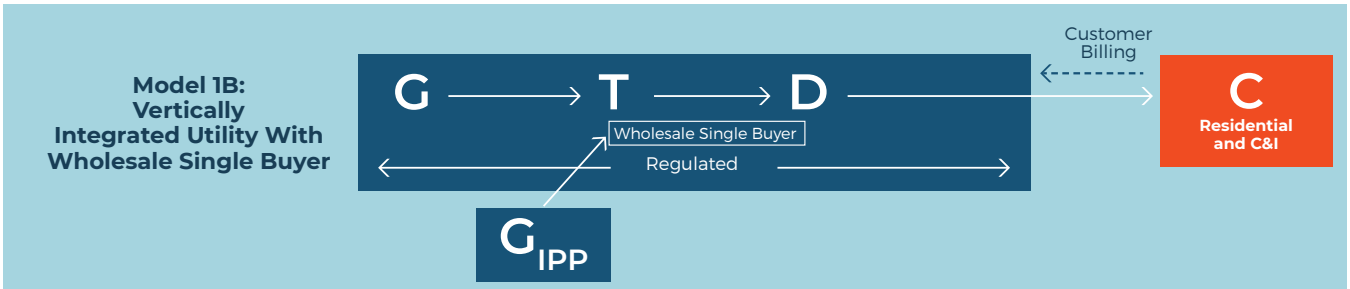
As with most every economic crisis since the Great Depression, the embargo by the cartel known as OPEC in 1973 brought government over-reaction based on faulty predictions of future conditions. Believing that demand for energy in America could only go up, that OPEC would continue to manip-

ulate the petroleum market at the level of the 1970s, that the era of domestic American oil exploration was over, and that natural gas supply in the world was spent, the federal government acted aggressively, withdrawing support for oil and natural gas generation and subsidizing construction of coal and nuclear generation. Ugh.

But all post-embargo policy was not unwise, as the creation of FERC led to opening the market to non-utility power generators (independent power producers), opening up the transmission grid to all, and encouraging the creation of ISOs (Independent System Operators) and RTOs (regional transmission organizations).

The Southeast remains the holdout against any electricity market reform or true shift of risk away from the backs of ratepayers. In the past, this has been due to a Southern trait—aversion to change, but also due to low prices in the Southeast. But high prices have become an issue of late.

FIGURE 13. MODEL 1B: TRADITIONAL VERTICALLY-INTEGRATED UTILITY WITH WHOLESALE SINGLE BUYER

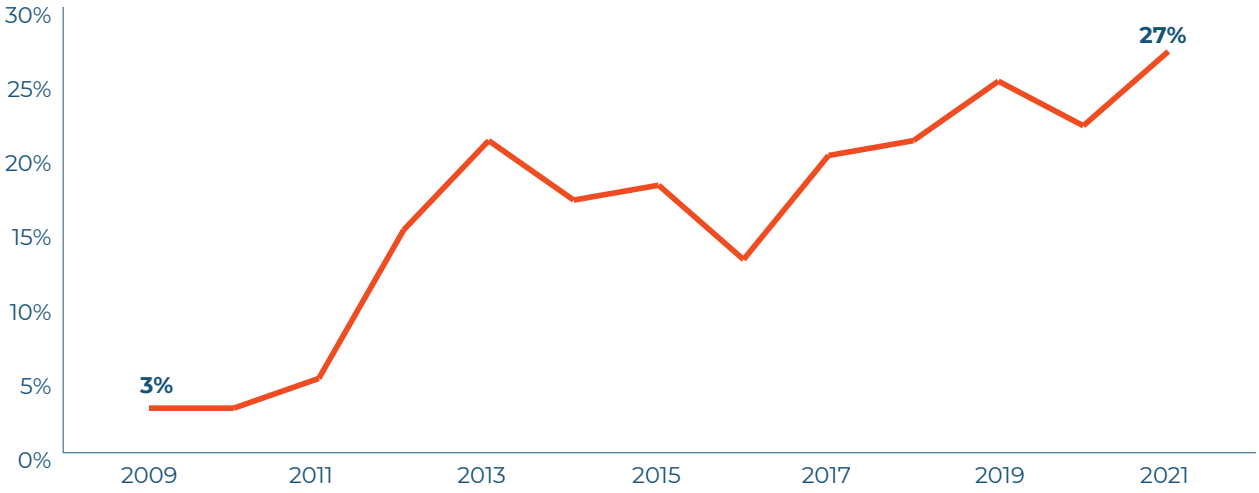


Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

A variation on this model is Single-Buyer, where a central purchaser of power is allowed to buy power from independent power producers as well as the monopoly generator. South Carolina's Santee Cooper and other government-owned utilities mostly fit this model. Santee Cooper has found it more prudent to purchase power rather than run its aging coal plants.

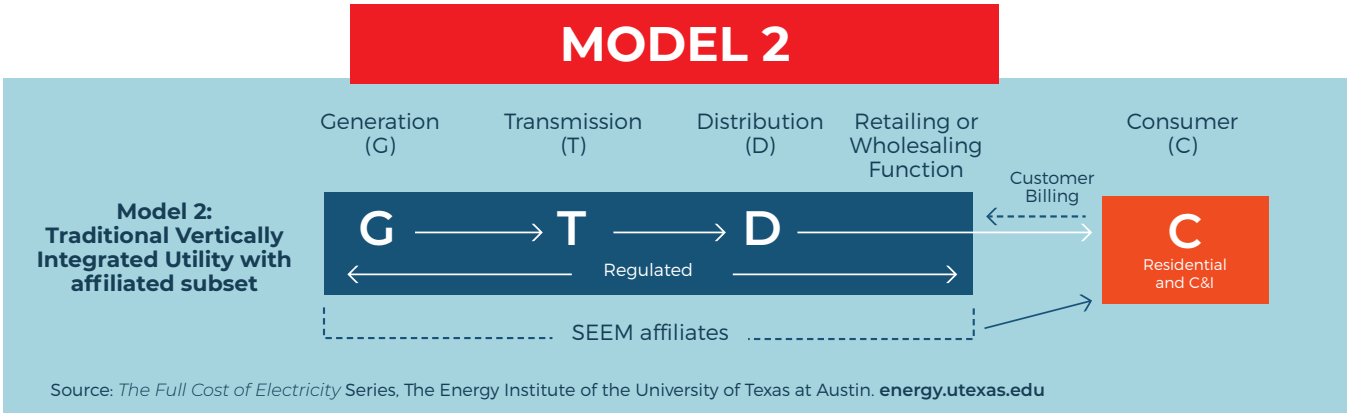
FIGURE 14. PURCHASED POWER

SANTEE COOPER PURCHASE/ NET INTERCHANGE PERCENTAGE (2009-2021)



Source: Santee Cooper Fingertip Facts

FIGURE 15. MODEL 2: SOUTHEAST ENERGY EXCHANGE MODEL (SEEM)

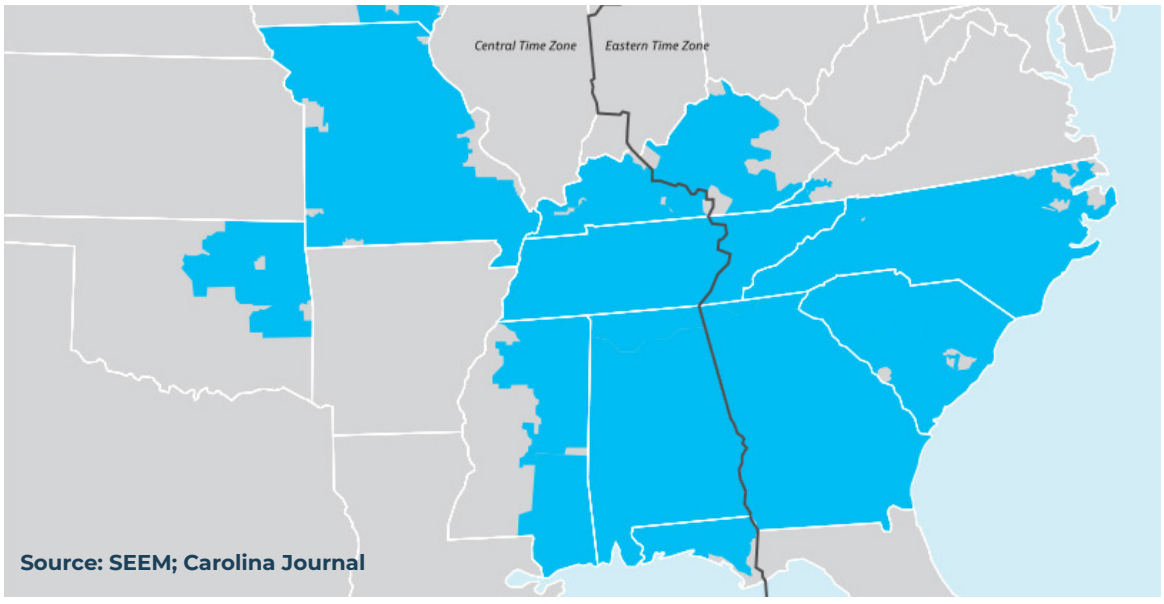


Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

For some time, the power players in the South have felt pressure from citizens and elected officials in their states who look longingly at ISOs (Independent System Operators) and RTOs (regional transmission organizations) for their ability to force utilities in a given footprint to pool transmission asset use and purchase wholesale power jointly. RTOs have taken hold in nearly every other part of the nation (see page 25). In response, the large Southeastern IOUs have attracted some junior partners to develop a proposal for a Southeast Energy Exchange Market (Southeast EEM or SEEM) that we are labeling the Southeast Energy Exchange Model.

The goal of SEEM in practice is to better facilitate excess energy sales by creating an exchange market using a bilateral spot trading platform that will match buyers and sellers and find transmission availabiliy to execute the transactions. (Many of these utilities sell power to each other already using less sophisticated methods.) We understand that SEEM is projected to raise power sales from about 5% to in the neighborhood of 7%. The founding members are in parts of 11 states with more than 160,000 MWs (summer capacity; winter capacity is nearly 180,000 MWs) and more than 32 million retail customers (roughly 50 million people). The major players are The Southern Company, Duke Energy, Dominion Energy and the Tennessee Valley Authority. The smaller players are mostly public power and electric cooperatives.

FIGURE 16. THE SEEM CLUB MAP



Source: SEEM; Carolina Journal

FIGURE 17. THE LIKELY SEEM CLUB ROSTER

LG&E and KU Energy	IOU	KY, VA
North Carolina Electric Membership Corp.	**co-op G&T**	**NC**
N.C. Municipal Power Agency No. 1	**municipal G&T**	**NC, SC, VA**
Duke Energy Carolinas	**IOU**	**NC, SC**
Duke Energy Progress	**IOU**	**NC, SC**
Dominion Energy South Carolina	**IOU**	**SC**
Santee Cooper	**government power**	**SC**
Dalton Utilities	government power	GA
Georgia System Operations Corporation	co-op Admin	GA
Georgia Transmission Corporation	co-op G&T	GA
MEAG Power	municipal G&T	GA
Oglethorpe Power Corp.,	co-op Generation	GA
Southern Company	IOU	GA, AL, MS
Tennessee Valley Authority	government power	TN, AL, GA, KY, MS, NC, VA
PowerSouth	co-op G&T	AL, FL
Associated Electric Cooperative	co-op G&T	MO, IA, OK

Source of utility list: SEEM

FIGURE 18. RANK ORDERING OF PRICES IN SECTORS BY RTO/SEEM

(ranked lowest to highest in cents/kWh)

Residential Prices	Industrial Prices	Commercial Prices
SW Power	New York	ERCOT
SEEM	ERCOT	PJM
ERCOT	SEEM	SW Power
Midwest	SW Power	Midwest
PJM	Midwest	SEEM
New York	PJM	New York
California	New England	New England
New England	California	California[15]

Source: SEEM

THE CASE FOR AND AGAINST SEEM

The proponents of SEEM see no reason for there to be a true RTO in the South. They argue that rates in the SEEM-affiliated utilities are competitive with RTOs in every sector. The "bargain" represented by Southeastern rates is not true for South Carolina and is diminished further when wage disparities across the regions are considered. Of the 50 states, DC, and Puerto Rico, Florida ranks 41st in income. South Carolina comes in at 45 and Alabama 46.[16] Even North Carolina and Georgia are in the lower half of disposable income. Less ability to pay takes the shine off of intermittently lower residential rates, and industrial and commercial prices are less competitive.

When SEEM was proposed, everyone did not salute. After FERC essentially approved SEEM, an action was filed against FERC in the United States Court of Appeals for the District of Columbia Circuit by Advanced Energy Economy, Clean Energy Buyers Association, Energy Alabama, Georgia Interfaith Power and Light, Natural Resources Defense Council, North Carolina Sustainable Energy Association, Partnership for Southern Equity, Sierra Club, Solar Energy Industries Association, Southern Alliance for Clean Energy, **South Carolina Coastal Conservation League**, Southface Institute and Vote Solar. The groups said SEEM was "likely to exacerbate the exercise of market power in the Southeast and produce rates that are unjust, unreasonable, and unduly discriminatory." [17]

One of the most articulate opponents of SEEM during the FERC process was FERC Commissioner **Alison Clements**. Her opposition rested on several major concerns about SEEM: it is a *multi-lateral* market construct (rather than an extension of the existing *bilateral* construct as its proponents claim), access to SEEM is not open, violating Order No. 888, SEEM's membership structure, market rules and governance are unduly discriminatory, and SEEM's lack of adequate market protections may result in unjust and unreasonable rates. This led to her conclusion that "creation of this market puts non-members at a permanent disadvantage in the Southeast." She wrote (emphasis ours):

> *The Commission's responsibility under section 205 of the FPA is to evaluate proposals to determine whether they will result in just and reasonable rates that are not unduly discriminatory or preferential. As my colleagues have emphasized,* ***the Filing Parties have not put forth an RTO proposal****, so in the context of this proceeding it is not the Commission's role to evaluate whether an RTO would deliver greater benefits than the proposal before us. By the same token, we cannot dismiss a failure of this proposal to abide by the Commission's bedrock principles necessary to guarantee just and reasonable and non-discriminatory rates simply because opponents of the proposal may prefer an RTO. We have an obligation under the Administrative Procedure Act to articulate a "rational connection between the facts found and the choice made." (Here, the choice being to allow the tariff to go into effect by operation of law via split vote.) My colleagues' failure to explain why they would have rejected protestors' detailed arguments that the proposal* ***imposes unduly discriminatory barriers to transmission access*** *and fails to safeguard the market against just and reasonable rates violates this obligation.*[18]

The criticism remains that under SEEM the market will be controlled by large power companies and the local utilities that are members. They will be able to use the market, the critics claim, to buy, sell and transport excess power at rates they get to set.[19] SEEM will be closed to non-utilities.

SEEM is not a true RTO (see page 25). It is not even a JDA or an EIM (see page 24). Further, SEEM will be run not by an independent entity or operator but by the utilities themselves, providing no truly independent third party. There will be no transparent "nodal" pricing either, preventing parties from contracting directly and freely for renewables in corporate power purchasing agreements.

SEEM is clearly a half measure developed by monopoly utilities to attempt to placate opposition.

Now, for intermediate options along the spectrum of reform: steps *approaching* wholesale competition.

INTERMEDIATE STEPS TO AN RTO OR OTHER WHOLESALE MARKET REFORMS

We will dive into the world of RTOs/ISOs in the next section, but first we must consider intermediate options between vertically integrated utilities with assigned territories that operate in silos (Models 1, 1A, and 2: Monopolies or "**Bilateral Markets**") and utilities of varying structures that have banded together to form independent entities dedicated to avoiding duplication, preventing excess generation, and negotiating wholesale prices in real time (Model 3: RTOs/ISOs "**Prescribed Markets**").

These intermediate wholesale modes are less ambitious (and frankly less impactful) than full wholesale competition, but at least these power pools remove barriers to regional trading and coordination. In a JDA or an EIA, vertically integrated utilities operate mostly as usual (bad) but operations are less prescriptive than an RTO (possibly good). Some researchers refer to these instruments as creating **"Emergent Markets"**:

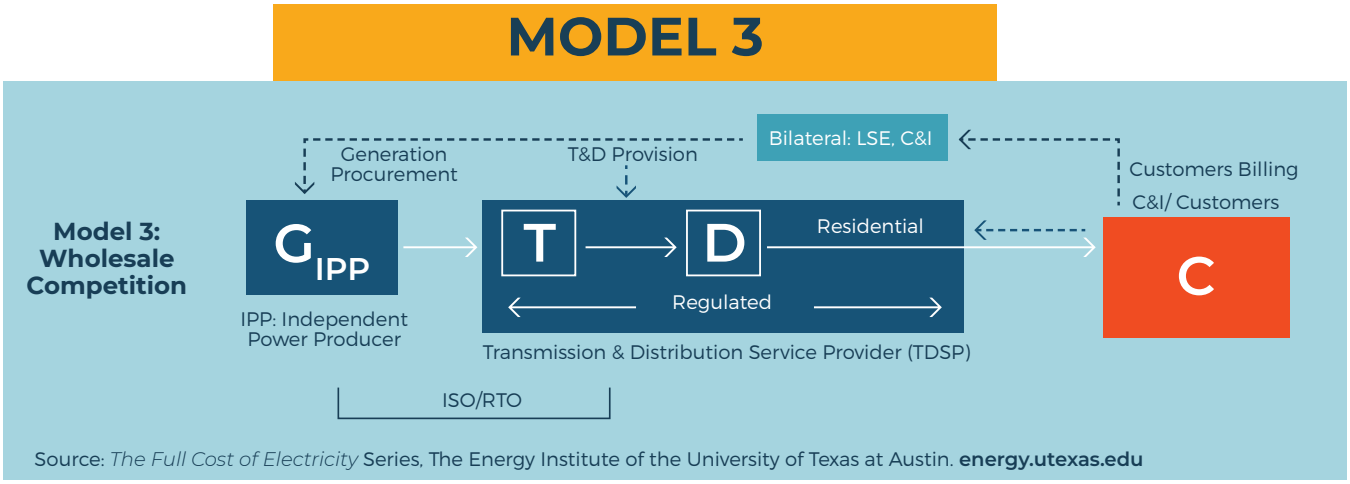
- **Joint Dispatch Agreement (JDA)**. In a JDA, a market operator optimizes or redispatches power in real time, not day ahead, to get the cheapest cost without fees for transmission. Addressing dispatch is the first step away from the monopoly-territorial model. Duke Energy Carolinas and Duke Energy Progress have a JDA. In that case, dispatching operations are conducted internally. PJM, the Atlantic seaboard RTO started as a JDA power pool between three utilities in the 1920s. With a JDA, distribution would still be maintained by each utility.

- **Energy Imbalance Market (EIA)**. This option could involve forming a South Carolina imbalance market or joining an existing imbalance market, so long as there is independent system operation and governance. A good example is the Western Imbalance Market, which has grossed $1.28 billion in benefits since its creation in November 2014. Savings were due to better resource procurement, lower peak capacity needs, more efficient dispatch, and less over generation. The California RTO (CAISO) does the dispatching. New participants in the Western market are expected to join in 2022 and 2023. EIAs typically balance demand every fifteen minutes and dispatch power plants every five minutes.

- **Capacity Market**. In a regulated market like South Carolina, utilities build plants and are guaranteed a rate of return based on that asset. Utilities factor into their future needs the ability to have extra generation capacity available for times when their needs are above peak demand. In a restructured (RTO) market, in order to have power at the ready during unanticipated spikes, an RTO might offer a power generator a capacity payment for electricity they have the *ability* to produce rather than for any power they actually receive from the generator.

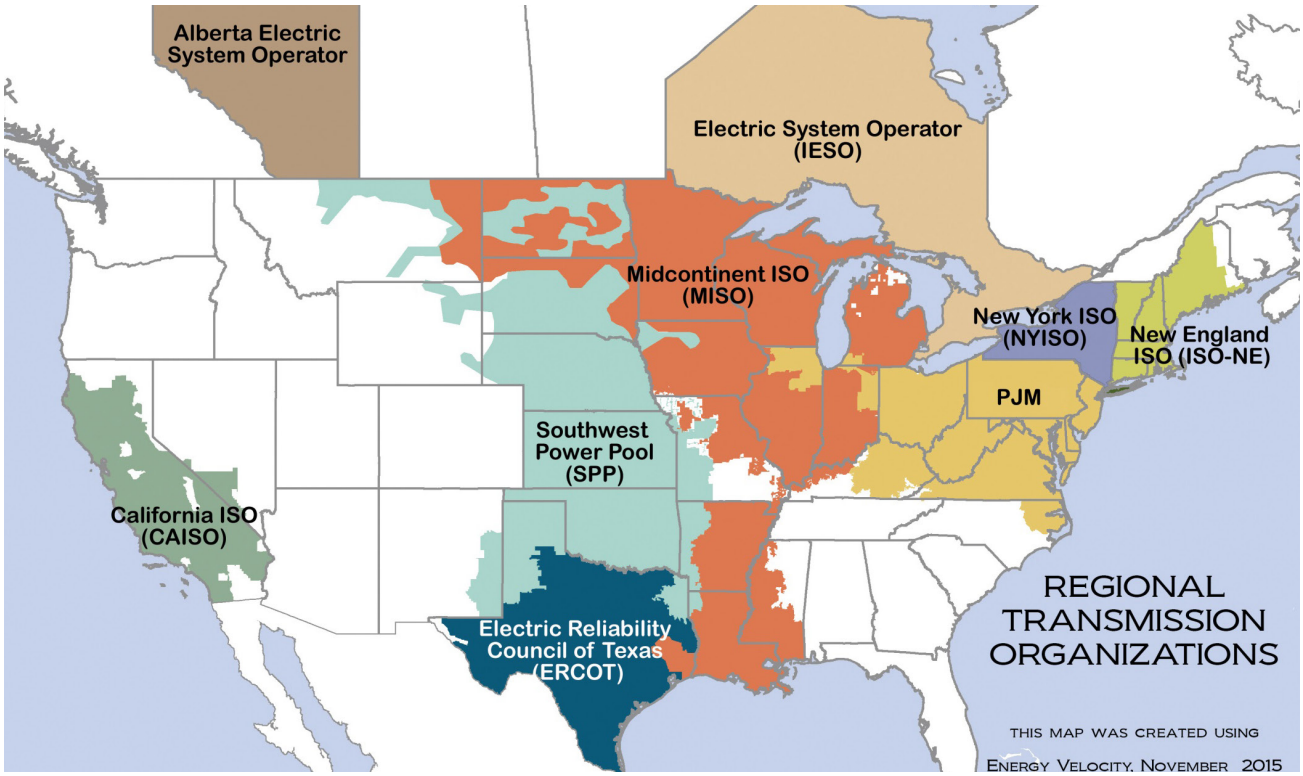
- Under state direction, utilities could be encouraged to find other ways to cooperate such as creating **power pools** to share operating reserves, or coordinating **transmission planning** and cost allocation.

FIGURE 19. MODEL 3: WHOLESALE COMPETITION (INDEPENDENT SYSTEM OPERATORS (ISO) AND REGIONAL TRANSMISSION ORGANIZATION (RTO) WHOLESALE ELECTRIC POWER MARKET MODEL)



Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

FIGURE 20. MODEL 3: WHOLESALE ISO-RTO COMPETITION MAP



When restructuring (often mistakely labeled "deregulation") first came to the power grid in the United States in the late 1990s, organizations were formed on a regional basis to pool transmission assets and to purchase wholesale power jointly. The United States has **seven** of these Regional Transmission Organizations/Independent System Operators (RTOs/ISOs)[20] that cover two thirds of the electric power grid in the United States. Canada has two ISOs. These RTOs/ISOs serve a **balancing function** to keep supply and demand stable. (In monopoly areas, each utility is a balancing authority.)

What RTOs Do[21]

- Provide independent transmission system access
- Deliver improved reliability coordination
- Perform efficient market operations
- Coordinate regional planning
- Foster a platform for wholesale energy markets

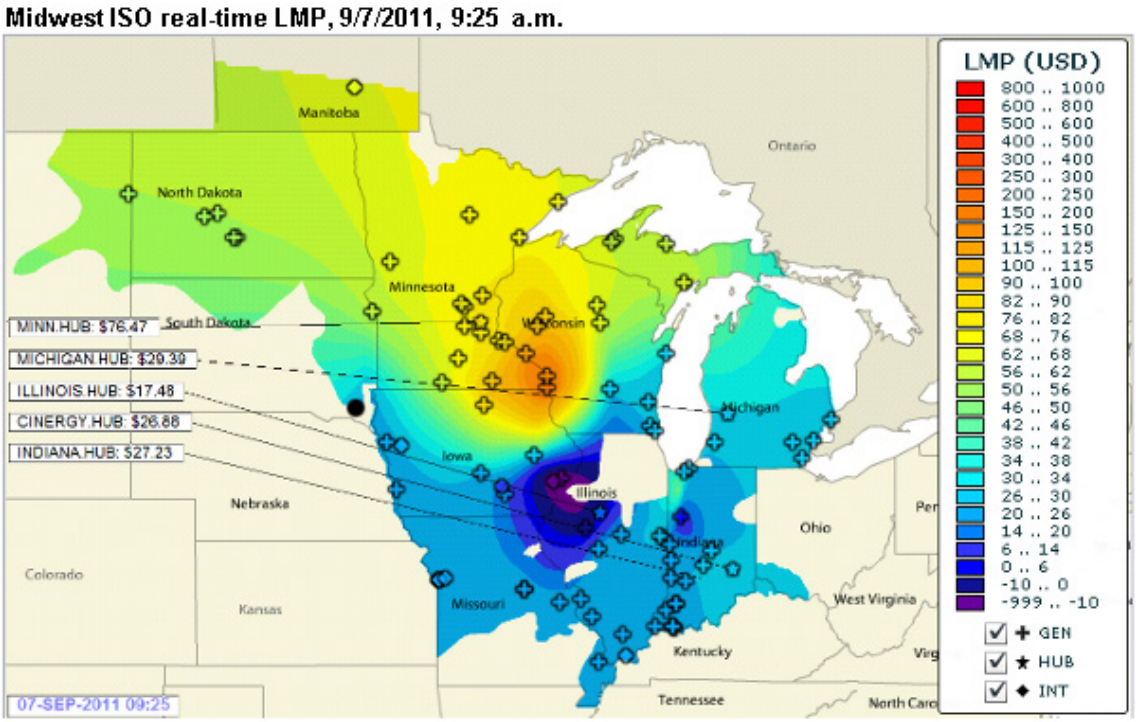
Implications of this role are:

- Equal and non-discriminatory access
- Regional reliability improvements
- Lower cost unit commitment, dispatch, congestion management
- Integrated system planning
- Encouragement of infrastructure investment, facilitation of regulatory initiatives

In the wholesale electricity market, prices change constantly, every five minutes.[22]

Here is a "price contour map" from the fall of 2011 in the Midcontinent (Midwest) ISO:

FIGURE 21. PRICE CONTOURS IN WHOLESALE COMPETITION MAP



RTOs

*More efficient dispatch * Reduction in generation capacity required *Integrated transmission needs planning

MORE ABOUT RTOs

Iowa and Arkansas utilities considered various reforms but joined MISO (in 2009 and 2013 respectively).

South Carolina Act 187 offers several RTO options for South Carolina: establishing its own RTO within the borders of the state, working to form a Southeastern RTO, or joining an existing RTO.

It should be noted that there is also a spectrum *within* RTOs.

- The weakest RTOs operate with mostly vertically integrated utilities (SPP, MISO)
- Next comes the RTO with Capacity [Long Term] Contracts (California).
- RTOs with Capacity Markets (PJM, ISO-NE, NYISO) are more fully restructured and have states with retail choice that have "wires only" companies that have separated generation from transmission and distribution.
- The Texas RTO is an Energy Only Market.
- States have less control over the governance of the RTO in PJM but more control in the Southwest Power Pool (SPP), New England (ISO-NE) and the Midcontinent ISO (MISO).

The rise of the RTO represented the appearance of an additional entity with an important role. Such a powerful new player could be disconcerting for Southern states, where public service commissions (which regulate maters such as rates, distribution, and utility strategic infrastructure planning/ Integrated Resource Plans [IRPs]) are the only game in town other than the utilities themselves. PSCs are elected by state legislatures in only two states: **South Carolina** and Virginia. Governors appoint in 37, and in 11 states the PSCs are elected directly by the public (voters).

Forcing an answer to the question of which electricity delivery functions still *require* a monopoly now and, in the future, is clarifying to the policy discussion for state legislatures. But the most ambitious reform options involve changes in ownership or control of assets, which is unfamiliar territory in the South.

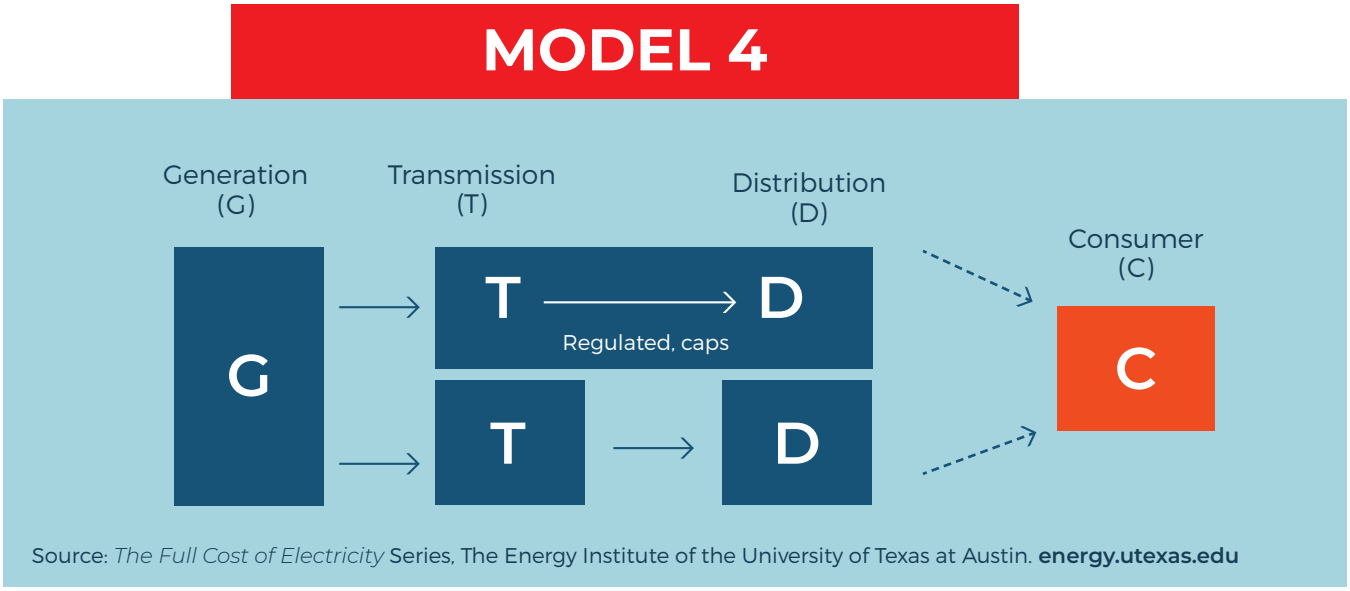
RTOs have control over *transmission* assets (under FERC regulations and NERC guidelines). In full retail choice states, there a wholesale RTO and *generation** is divested from transmission and distribution. In those states, the market determines what generation gets built, not utilities and government agencies. Market-based forces replace a guaranteed rate of return, which is attractive from a free market perspective but involves risk. Risk and politics do not coexist well. But, the likelihood of better rates for ratepayers (aka *voters*) can offset some political aversion to risk.

As Figure 20 indicates, the RTO that is closest to South Carolina geographically is PJM, which serves parts of thirteen states and the District of Columbia (Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the DC).

Opponents of RTOs paint with a broad brush, suggesting that all RTO concepts in play for South Carolina would lead to higher rates, unreliability (even "rolling blackouts") and handing over sovereignty to out of state boards or the federal government, or both. It would be the "wild, wild West" where any negative event that occured in ERCOT would most certainly occur here. This is hyperbole.

*Generation is not *unregulated*. FERC. NERC, and state agencies continue to have jurisdictional roles in the RTO Model.

FIGURE 22. MODEL 4: PLANET CALIFORNIA MODEL



Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

Returning to the Competition Scorecard as a marker, the State of California receives a “B” on the free market rating. How could "liberal" California receive such a respectable grade, the same grade as *Texas*? It could be that there were good intentions involved in that state's road to perdition.

Turns out, there is little relevance for the Palmetto State in the workings of the California energy market, except to serve as a reminder for how a bad apple (government control) can destroy the whole bushel (free enterprise and consumer choice). There were elements of competition in the crafting of the California model to be sure, but there are more warning signs for South Carolina than best practices.

California took steps in 1996 to restructure its energy market, which led to lower prices at the outset, but state leaders lost their nerve when prices jumped in 2000-2001. In came government and out went true competition. The peak of demand served by competition in California was never higher than 12%.

The reason for the California failure (in contrast to the Texas success that we shall discuss shortly) was over-regulation. Customers were guaranteed a lower rate, and sellers were offered little price flexibility at the retail level or long-term contracts at the wholesale level. Add the fact that little generation was built in California in the years before “competition” and the results were blackouts and bankruptcies of utilities. Government poisoned the well. In the words of one utility analyst, "[California] overlaid retail onto a broken market."

California does have a functioning wholesale market organization however. It is known as CAISO*.

The California Independent System Operator (CAISO) operates a competitive wholesale electricity market and manages the reliability of its transmission grid. CAISO provides open access to the transmission and performs long-term planning. In managing the grid, CAISO centrally dispatches generation and coordinates the movement of wholesale electricity in California and a portion of Nevada. CAISO was founded in 1998 and became a fully functioning ISO in 2008. —FERC

*CAISO is not always classified with other RTOs/ISOs becuase it is not independent.

INTERMEDIATE STEPS TO RETAIL MARKET REFORMS

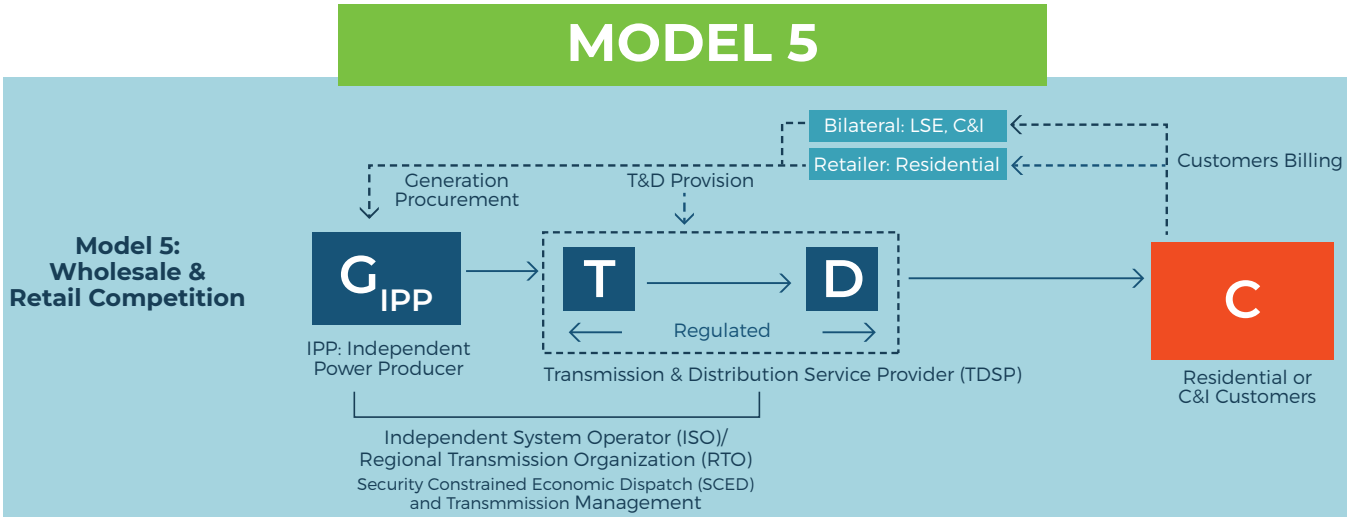
- **Partial Retail Choice (Non-Residential).** Georgia is referenced later, but Oregon, Virginia, and Michigan are other examples. Choice for commercial and industrial customers only. Full retail choice does not work without wholesale choice (RTO).

- **Community Choice Aggregation (CCA).** The term nearly defines itself. This is where residential customers band together and buy from the market or from a particular supplier, often for purchasing renewables. Some residential communities and municipalities (200 in California, mostly along the Pacific Coast) offer their residents/citizens the ability to participate in CCA.

- **Independent Distribution System Operators (DSOs).** We are not sure that this modernized independent distribution entity exists anywhere in the United States. A DSO works in distribution much like an RTO in transmission. The DSO is separate from the transmission operator and coordinates power coming onto and off of the grid at the more granular (distribution) level. DSOs are ideal structures for bringing more renewables online.

- **Regulatory Reforms.** The weakest of steps toward wholesale or retail choice would be reforming state regulations. This strategy was the focus of the Competition Scorecard on page 11 on which South Carolina received an "F."

FIGURE 23: RTO WITH RETAIL CHOICE MODEL*



Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

In nearly every sector of the economy but electricity, from 1976 to 1996, the United States has enjoyed an era of restructuring. This restructuring (and in some cases deregulation) has included airlines (1978), railroads (1976, 1980), interstate trucking (1980), crude oil and refined petroleum (1981), intercity buses (1982), telephone service (1982,1984), telecommunications (1996), and natural gas (1978, 1985, 1989, 1992). But though electricity pricing is competitive abroad (in Japan[23], the United Kingdom[24], and New Zealand[25] for example), only a comparatively few states in the United States have embraced it.

When a person familiar with how electricity is generated and sold in America is asked about "*retail* electricity competition," the likely response will involve the markets in 13 states and DC where this particular type of market exists.

In 1986, writing in *Public Utilities Fortnightly*, three officials associated with the Illinois Commerce Commission---Philip O'Connor, Robert Bussa, and Wayne Olson---called for greater competition in the electric utility industry. Their concern, coming true shortly after its publication, was that the utility industry would become less stable and riskier:

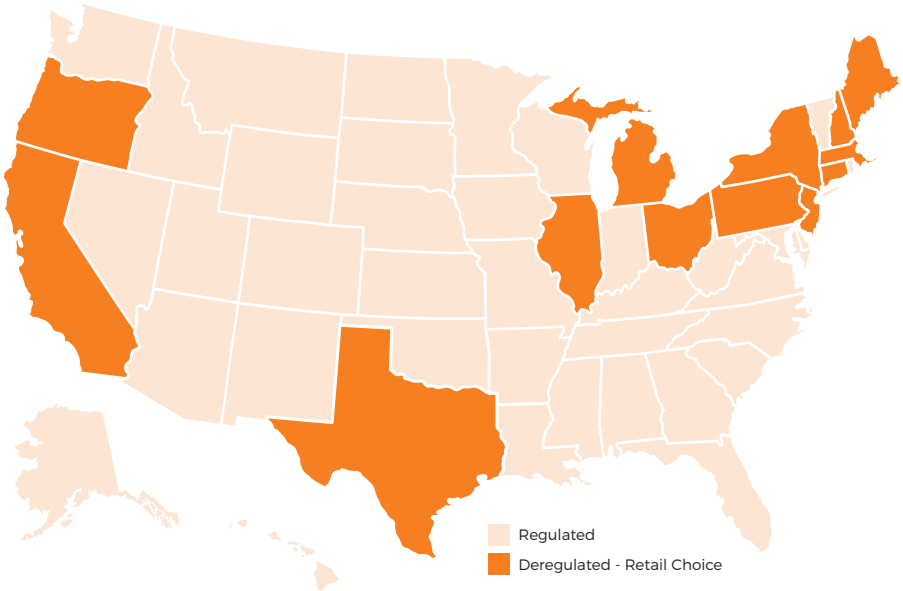
> ***In order to maintain the financial health of the industry, to assure reliability of supply, and to protect the interests of residential and industrial customers, a fundamental re-examination of traditional power delivery institutions is needed. The traditional rate base and rate-of-return regulation of electric generating capacity could be replaced by a framework that recognizes the incipient competitiveness of the electric market and, in fact, encourages competition in the generating sector. A greater reliance on market forces could correct one of the critical deficiencies of traditional regulation—its inherent inability to match end-user prices with the economic cost of production.***[26]

The plan presented in the article called for a central dispatch for utilizing a state's generation capacity more efficiently, requiring non-discriminatory wheeling of power between customers and producers, and unbundling and pricing electrical rate elements separately. Generation would be competitive but separated from the rate base. "Wires only" companies would concentrate on being good delivery service companies and be agnostic on generation. The scholars called for "open access to the system grid" that would create "numerous independent sellers competing for buyers" with a "separate industry that coordinates power usage through brokerage and central dispatch of power."[27] Large industries could own generation that could be used by the industry or re-sold.

It was an aggressive and controversial proposal.

In a thirtieth anniversary article, O'Connor, Bussa and Olson followed up (2016) claiming partial victory and offering a five-point plan for the future.[28] As for victory, they celebrated the level of generation being provided by non-utilities, the fact that 14 jurisdictions (states and DC) allow retail choice, and that electricity competition/consumer choice was taking hold internationally.

FIGURE 24. RETAIL ELECTRICITY CHOICE JURISDICTIONS



*There are no states with full retail choice that do not have wholesale competition.

Based on current market conditions, where from 1990-2015 electricity market growth increased just 1.28 percent compounded annually, they decried the fact that with flat consumption in a regulatory environment, prices go up, resulting in a scramble for favorable deals offered to industrial customers because of their price sensitivity to their bottom line. Doubling down, they called for *more choice*—getting past the false impediment of stranded cost recovery, unbundling rates, devolving generation, and using modern digital components for empowering customers with choice—the "'Uberization' of the electricity business."[29]

With the enactment of consumer choice in the 1980s, 1990s and 2000s, a model comparing price change in monopoly states versus choice states became possible. In the model, a *Choice* jurisdiction is defined as a jurisdiction (states and DC) where generation is separate and full, unbridled choice is available to all customers. *Monopoly* jurisdictions are the rest. According to "Evolution of the Revolution: The Sustained Success of Retail Electricity Competition," in the 14 competitive choice jurisdictions:

- **For 2003-2013, commercial & industrial accounts grew 524% and residential 636%.**
- **For 2003-2014, load grew 181% for commercial and industrial and 673% for residential.**
- **Average prices fell against inflation (versus exceeding inflation in monopoly states).**

For 2008-2016, inflation-adjusted weighted average prices declined in choice states while rising in monopoly states across all sectors, showing a marked divergence. Across all customers, of the fourteen states having an actual price drop, nine were in states with competition. Of the seventeen states seeing Commercial prices drop, twelve were competitive states.

Let us be clear, competition was not the sole reason for price drops, but competition was clearly a factor.[30]

According to the late eminent energy researcher Jerry Ellig, in 2008-2017 prices in monopoly states increased and prices in competitive states decreased. The decline in Industrial sector prices in competitive states was a solid 31%. But the challenge for researchers here is to determine what part of the price of electricity is due to competition and what portion is due to other factors like fuel costs and government price caps. [31]

The knock on this choice model is that prices in these competitive states is high. But prices started high *before competition*, and they have remained high due to higher infrastructure costs, including higher land and government costs (ex: permitting). The principle is that prices would have skyrocketed had it not been for competition. Their research is hard to contest.

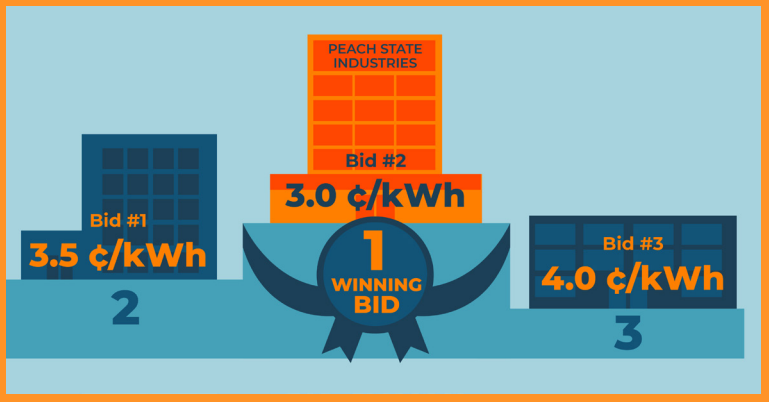
The dawn of competition meant that prices for electricity could be based on marginal, or "minute by minute" costs, which rely primarily on the price of fuel, rather than average costs that are essentially equal to whatever it costs a utility to run their generation assets. If utilities are forced to compete and shoulder risk, there will be an actual incentive to cut costs and innovate rather than take the automatic rate of return guaranteed by the public utility commission.

HOW COMPETITION ALMOST HAPPENED IN SOUTH CAROLINA

The South Carolina General Assembly passed the Territorial Assignment Act[33] effective July 1, 1969. The Act required the Public Service Commission to assign "beginning as soon as practicable after January 1, 1970...adequately defined boundaries which may be by reference to boundaries drawn on maps or otherwise..." of electric utility service areas. Soon after, as the authors of this work discovered reading some recent litigation,[34] utilities simply carved up counties according to their joint preference and submitted maps to the PSC for approval.

There was some limited choice[35] written in the statute, allowing a customer located "within three hundred feet of certain lines of an electric supplier and partially within a service area assigned to another electric supplier" to choose its supplier. But in most cases, this provision has not generated any significant competition in South Carolina. Some disputes have arisen, but territories are fixed, and choice has not flourished.

FIGURE 25. ELECTRICITY COMPETITION IN GEORGIA



Some retail competition has been present in Georgia since 1973 with the passage of the Georgia Territorial Electric Service Act. This Act enables customers with manufacturing or commercial loads of 900 kW or greater a one-time choice in their electric supplier. Larger companies are provided greater ability to plan for the future and often agree to "demand response" mechanisms that help power producers manage periods of intense demand by reducing the load to the large business. It also provides eligible customers the opportunity to transfer from one electric supplier to another provided if all parties agree. The Commission resolves territorial disputes and customer complaints involving customer choice and approves requests for transfer of retail electric service.[32]

It appeared that would change in early February 1997, when a corporation with national ambitions but a South Carolina headquarters appeared. Known as Electric Lite, and based in Greenville, the aggressive young company vowed to take on the big utilities with 20% lower rates for *residential* and small business customers through energy competition. Electric Lite would serve as an aggregator, buying electricity on the open market in large quantities through an infamous company known as Enron, and reselling it to its customers.

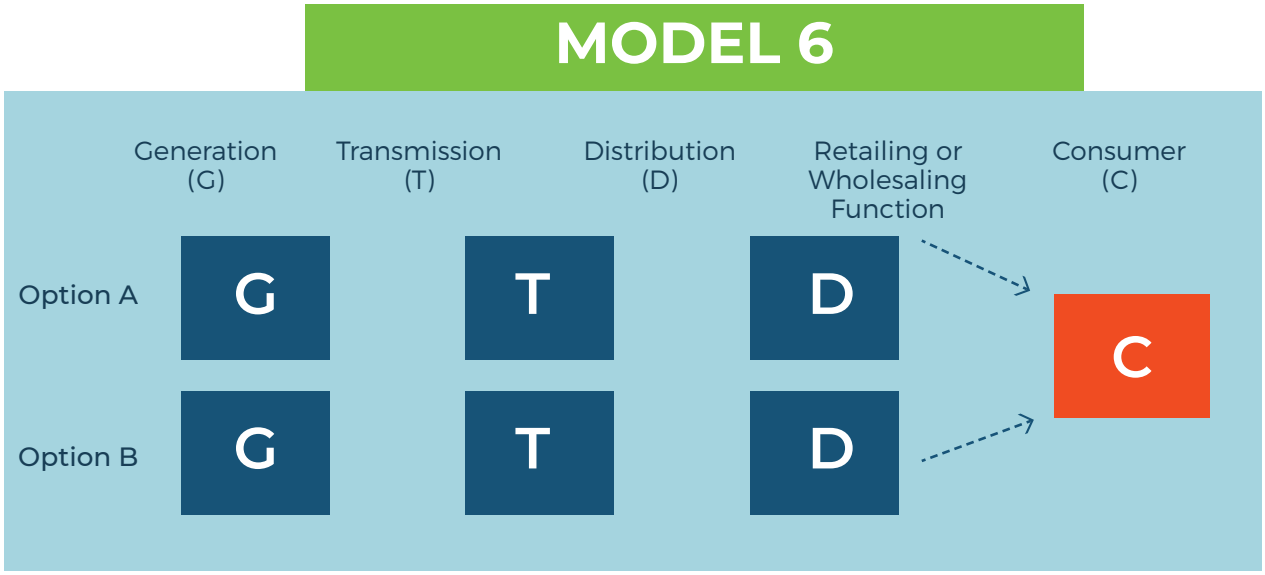
Companion bills known as the "Competitive Power Act" were filed in the South Carolina Senate and House that same month. Transmission access and stranded cost coverage were to have been addressed.

By April 1997, Electric Lite had signed up 17,000 customers who had signed a Customer Choice Agreement that would make them official customers upon passage of the Competitive Power Act. The value of the contracts was estimated at $33 million. Electric Lite signed a deal with Cinergy and DuPont to supply and manage bulk power.[36]

In 1998, Electric Lite became more aggressive, arguing that the larger power companies at that time, Duke Power, SCE&G and Carolina Power & Light, had a practice of negotiating rates and sources of power with large industrial customers, a benefit denied to residential and small business ratepayers. Electric Lite said that the reforms they were calling for were actually in place in the larger load customer sector, why not do the same for the little guy?

Based on this assertion, Electric Light called on the PSC to set up a pilot program where 50,000 customers for each of the three largest utilities would be allowed customer choice, a program that would be followed six months later with open choice for all ratepayers.[37] The PSC rejected Electric Light's petition.[38] When the General Assembly adjourned in the spring of 1998 and all legislation therefore not passed dying, the viability of Electric Lite in South Carolina ended and the company closed its doors in the fall of 1998.[39]

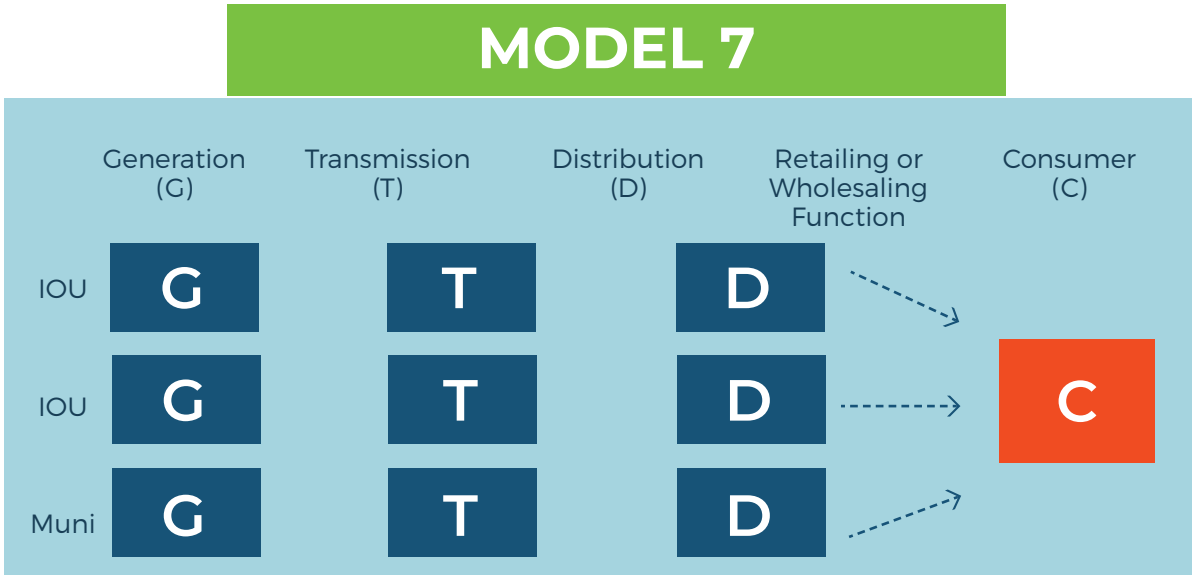
FIGURE 26. MODEL 6: DUOPOLY CHOICE MODEL



In Walter J. Primeaux's classic 1986 book *Direct Electric Utility Competition: The Natural Monopoly Myth*,[40] he lists 23 cities that due to overlapping or nearly overlapping territories had direct electric utility competition. Primeaux listed Greer, South Carolina as an example. But the case of Lubbock, Texas was the most famous. In that city, Lubbock Power and Light and Southwestern Public Service Company (later Xcel Energy) competed against each other for customers. And yes, there were two systems each with their own wires, poles, and substations. Rates were set by council, and they were the same. Once a customer decided to switch, his or her current provider would have 24 hours to persuade them to stay.[41] [42]

Sometimes two sets of infrastructure may be necessary, but in most cases, rights of way are shared with non-electric utilities like telecom, particularly when buried as in modern housing developments, so there is room. In other cases, utilities can sell territory to one other to prevent two sets of wires and poles.[43] No discussion of choice can exclude the duopoly, but its viability has come and gone.

FIGURE 27. MODEL 7: WILLING BUYER, WILLING SELLER CHOICE MODEL



There is one model that will most likely not appear in any energy research publication. That is the Palmetto Promise Institute-developed "Willing-Buyer, Willing-Seller" Model. The path to competition in this rubric is quite simple: allow IOUs, munis, and electric co-ops to use their independent vertically-integrated backbones to create competition. Legislatively, this would be accomplished by repealing the Territorial Assignment Act of 1969 (Section 58-27-640, "Assignment of service areas.")

South Carolina is home to numerous electricity providers—large investor owned utilities, electric cooperatives, municipals, and a state-owned utility. Currently, however, in South Carolina, providers must charge the rates set by the government (the South Carolina Public Service Commission or PSC) and may not serve customers outside their PSC-assigned territory.

As an economic principle, it is a simple fact that generation, transmission, and distribution of electricity is *not* a "natural monopoly." Practically, it has been proven that competition in the sale of electricity is working around the nation and the world using a number of methods to achieve a choice for industrial, commercial, and residential ratepayers.

With assigned territories repealed, price fixing and barriers set up by the PSC would disappear and overlapping utilities could serve any customer they wish who is willing to be their customer. Everyone in the Palmetto State with an electric meter would enjoy a "willing provider, willing customer" relationship with their electric utility.

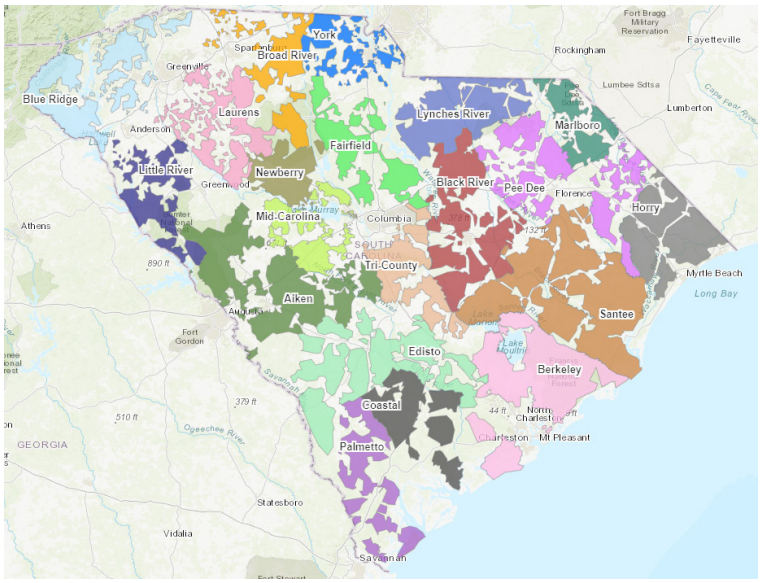
Businesses would flock to South Carolina knowing there would be competition for their business from rival utilities. The concept is not as foreign as it sounds. We discussed earlier how Georgia has a statute that requires those who consume large quantities or "load" of power to be able to choose their electricity provider. Competition there is fierce and has led to lower prices and better service for businesses even the size of a Target retail store or a Kroger grocery store.

Residential customers, what we might call "the little guys," would finally be able to stop subsidizing other customer classes (commercial and industrial) and recoup some of their losses due to recent rate increases.

A 1996 study found that “wires on wires” competition meant 16% lower costs, and 8% reduction in price and a 24% reduction in rates.[44]

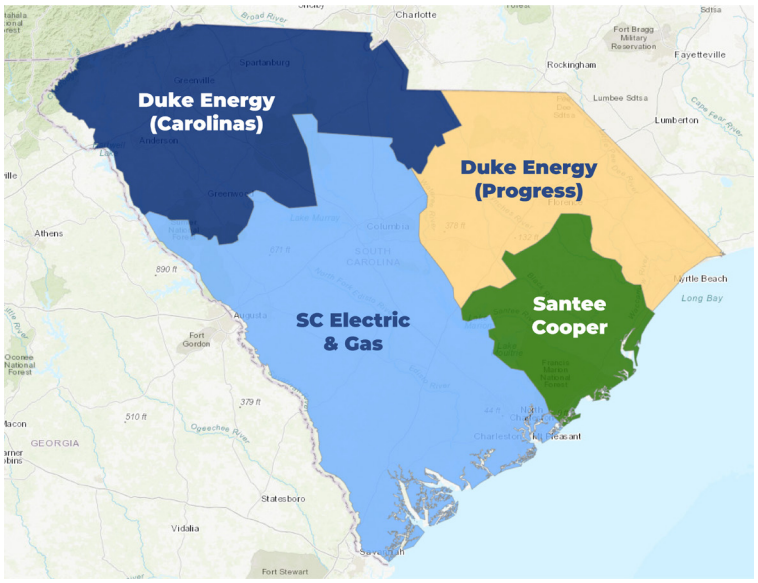
Figures 27-30 show in map form how Model 7: Willing Buyer, Willing Seller is possible due to the overlapping networks in South Carolina.

FIGURE 28. MODEL 7: WILLING BUYER, WILLING SELLER CHOICE MODEL



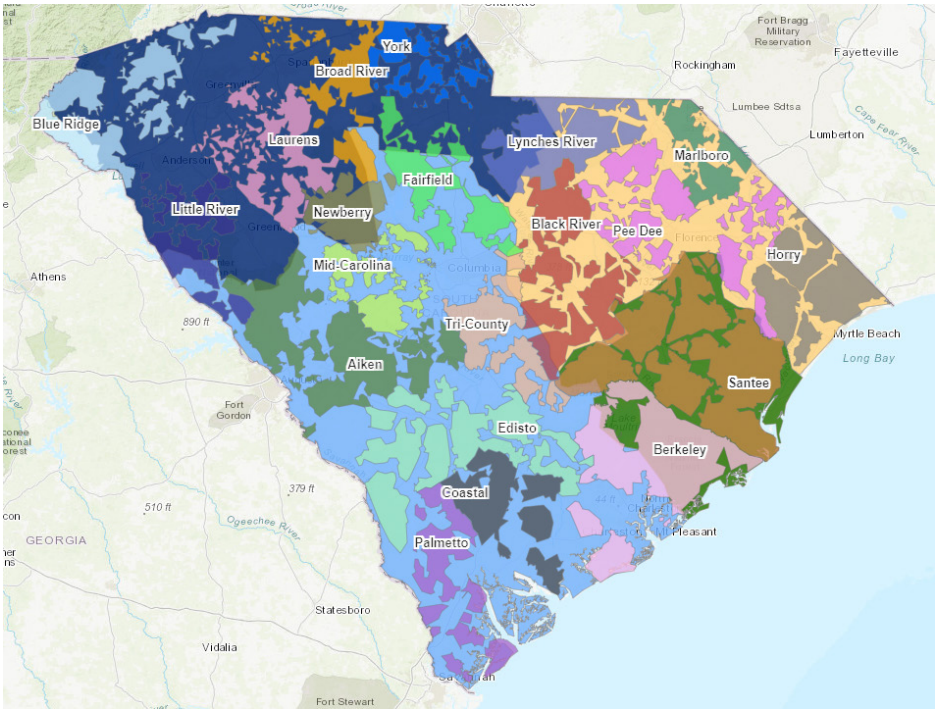
Source: SC Energy Office

FIGURE 29. TERRITORIES OF MAJOR ELECTRIC COMPANIES IN SOUTH CAROLINA



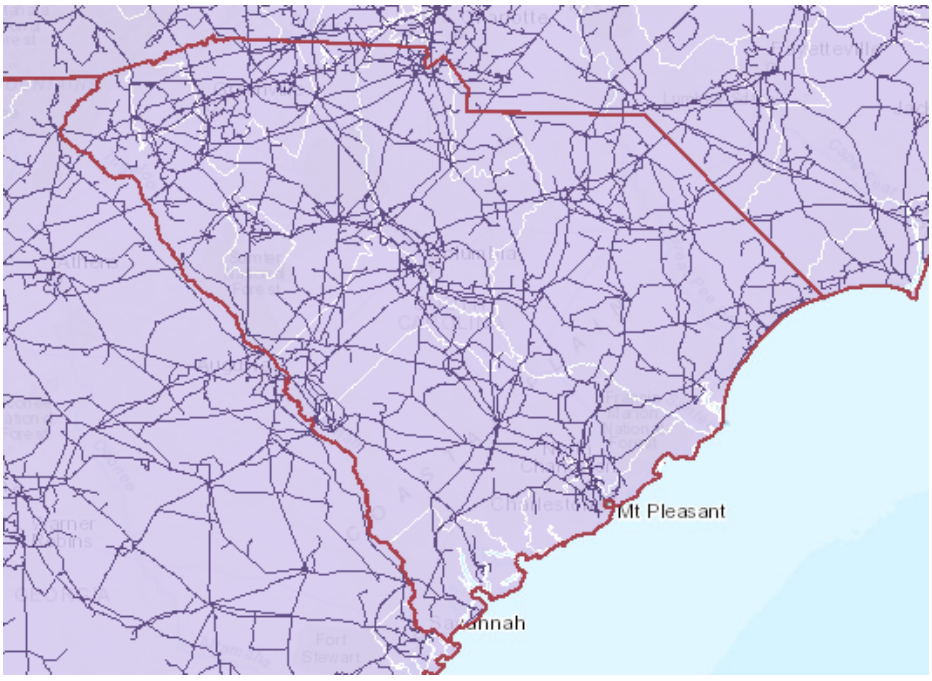
Note: See **Energy.sc.gov** for more precise mapping. Santee Cooper not to scale.

FIGURE 30. TERRITORIES OF ELECTRIC COOPERATIVES WITH MAJOR ELECTRIC COMPANIES IN SOUTH CAROLINA



Source: SC Energy Office

FIGURE 31. ELECTRIC TRANSMISSION LINES IN SOUTH CAROLINA



Source: SC Energy Office

THE POTENTIAL FOR UTILITY COMPETITION?: THE CASES OF GREER AND BATESBURG-LEESVILLE

As a kid growing up in Greer, I used to love to open my bedroom windows in the fall and enjoy the crisp, fall air. Sometimes in the summer, when the air wasn't so cool, I would help nature a bit by cranking up the attic fan. Remember those?

One evening after dark, through that open window, looking up from my homework, I saw the lightning flash. It turned out to be quite a storm. After a minute or two, I could see all the lights in the house next door go dark. In our house, the lights flickered, but the power stayed on. That seemed curious to my childish mind, so I hunted down my dad and asked a kid's favorite question: "Why?" Turns out, the neighbors (also named Smith, yes, it is a common name) were on Greer Municipal power while we were on Duke. One provider's substation or transformer failed (or was struck by lightning), the other's survived. Two homes side by side on different electricity providers. Even then, I thought that was pretty cool.

Fast forward twenty years. I had moved to the Midlands to serve in the Campbell Administration and eventually started a family of my own in Leesville (also known as Batesburg-Leesville or just "B-L"). There was a storm story here as well: every time it rained, telecommunications would fail. No matter what I tried, rain meant slow internet and scratchy landline phone service. Frustrated, I was able to do something few in South Carolina could do at the time: I switched to another phone provider. Both Bellsouth (now AT&T) and PBT (now Comporium) served my home. AT&T had a junction in my back yard right of way and PBT had cable running through the front.

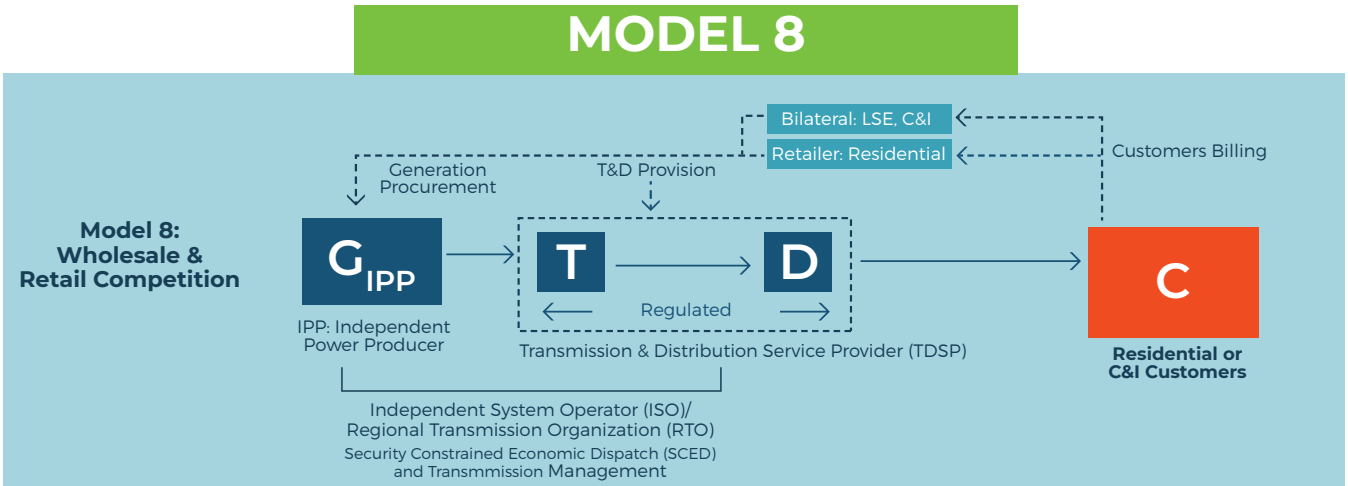
What are the chances? My childhood home had electricity choice and the place I raised my family had telecom choice.

Nearly every industry that has been deregulated---airlines, trucking, natural gas---has thrived. Prices have fallen and service has improved for sure. But even more attractive than price and service is the surety of innovation. For the entire time between when I lived as a child in Greer to the time I settled as an adult in B-L, cell phone technology was in existence. It was ready to go. But a phone in your pocket didn't exist while just one company controlled all telecom.

Imagine the price, service, and innovation that would come from multiple providers competing to generate, distribute and transmit electricity to you. Imagine multiple utilities competing for the electricity you might generate in the back forty turned solar energy farm! For families and for business, energy choice would be transformative.

—Oran P. Smith, PhD

FIGURE 32. MODEL 8: TEXAS-ERCOT MODEL



Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

Texas is always unique, and energy is no different. In January 2002, its energy restructuring legislation (Senate Bill 7) was enacted. That bill allowed competition in about 85% of the area of the state. Like the typical customer choice model, Texas separates the *generation* of energy from *marketing* of energy. But the size of the market, the wide range of choices in Texas (over 30 retailers and myriad plans) and the numerous entities needed to make the system work make ERCOT a most interesting model.

The entities charged with overseeing and providing electricity include:

The **Public Utilities Commission of Texas (PUCT)** regulates and enforces regulations for the Texas energy market.

The **Electric Reliability Council of Texas (ERCOT)**, manages and oversees the power grid in most of Texas. (There are four "interconnections" in North America and eight "regional reliability councils." Most of the territory of the State of Texas is in the reliability council known as ERCOT and all of ERCOT is in Texas.)

The **Transmission and Distribution Service Provider (TDSP)** which is similar to the typical utility in the typical state. The TDSP distributes electricity to the home or business and is responsible for connection and servicing.

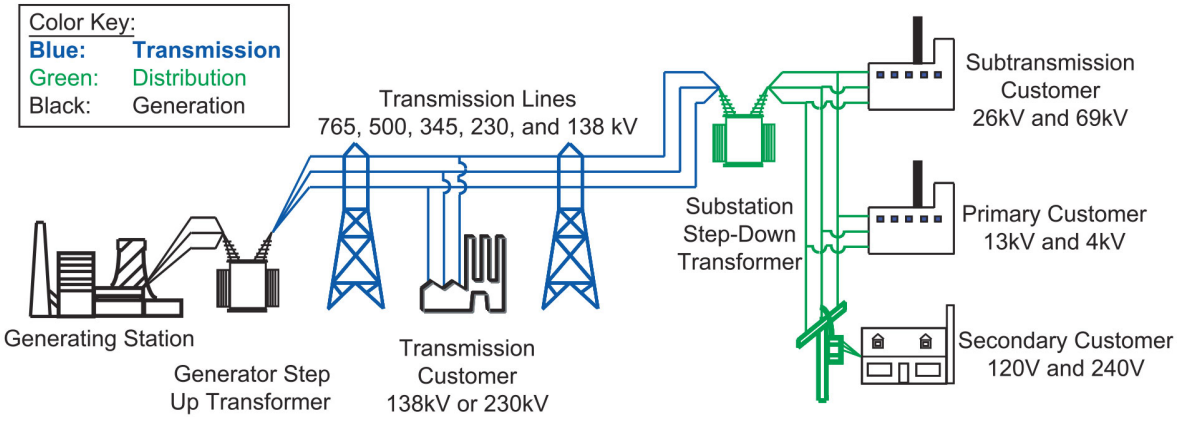
The **Retail Electricity Provider (REP)** offers a range of electricity plans, sells, and markets the plans, bills the customer, processes payments, and provides customer service. The PUCT lists 90 REPs registered to provide service across three service options available.

The Texas model represents the most choices for the consumer anywhere in the United States. According to Empower Texans, choice has a wide range of benefits no matter what one's perspective on generation sources:

> *Texas' light-touch regulatory approach combined with free market competition has led to five-times the amount of wind power California produces, and 29 percent more renewable power (excluding hydroelectric). Electric rates in Texas are also 89 percent lower than in California. The Texas approach illustrates perfectly how a largely hands-off model produces a more sustainable carbon-reduction solution that makes sense economically.*[45]

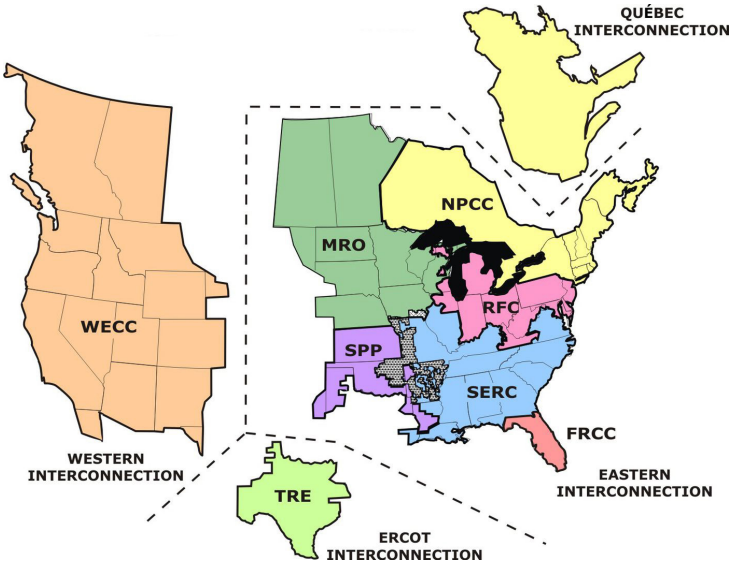
This "Most of Texas" Model, or ERCOT Model, has lessons to teach.[46] Only a dramatic sea change could explain how the state built on oil and gas could become known for wind-powered generation of electricity. In short, the Texas Model removes much of generation costs from residential electric rates, assures more efficient and competitive generation operations, focuses regulation on the transmission grid and protects consumers with a strong but limited regulatory agency. That means lower profit margins, less excess generation capacity, and more renewables.

FIGURE 33. ELECTRICITY GENERATION, TRANSMISSION, AND DISTRIBUTION



Note: Generation is the expensive piece of the process in the three-part electricity system. A South Carolina example is on point. When the future of Santee Cooper was being debated in the South Carolina Statehouse, the Central Electric Power Cooperative ("Central"), the South Carolina generation and transmission ("G&T") co-op of co-ops that serves as the bridge between generation providers such as Duke Energy and Santee Cooper and the distribution of the twenty Electric Cooperatives of South Carolina, pegged their generation expenses at **89%** of its costs, costs that it must pass along to its customers, the co-ops. Bulk transmission (switching stations, tap lines, radial lines, etc.) came in at approximately **10%**. Central's overhead costs were the remaining **1%**.[47]

FIGURE 34. NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL INTERCONNECTIONS



All was not rosy in the beginning, however. Texas picked both a perfect and a very imperfect time to launch the transformation of its energy sector.

Here is how it all came about. In 1999, the Texas legislature dropped a bombshell known as SB.7. That statute required that by January 1, 2002, all Investor-Owned Utilities (IOUs) in Texas were to divest their generation, transmission, and distribution (retail) sectors from each other. The linchpin, the transmission or "wires" network would remain a monopoly, but overseen by ERCOT, The Electricity Reliability Council of Texas. Generation and *retail* sales of electricity, the extreme ends of the grid, would become competitive. Government would focus on transmission. The entire system would be overseen by PUCT, the Public Utility Commission of Texas. ERCOT is an ISO, and as we discussed earlier, with an ISO there is near real-time trading of energy on the *wholesale* market as well.

Working in favor of these free enterprise reforms were the trends away from the need for economies of **scale** and economies of **scope** that had previously made large, vertically-integrated monopolies the only reasonable option. Monopolies traditionally had offered economy of scale to keep costs down, and economy of *scope* that kept energy production and energy demand in balance.

Then came increased efficiency of small-scale generation that undermined the need for scale. Increased sophistication of computerization and communication made scope less important. Once generation and consumption no longer had to be married up using crude analog instruments and processes, the need for housing all three pieces of the electricity market—generation, transmission, and distribution—under one monolithic corporate roof became as essential as a slide rule.

Also contributing to the success of ERCOT is the model's understanding of the crucial nature of the "wires" business (transmission, poles, transformers, etc.) to the stability of the other two pieces and the need for a clean break with the past. That is why in ERCOT, "wires" are under a coordinating agency, and there isn't any "I'll just stay with Ma Bell" option that left a monopoly in play along with free enterprise competitors. The monopolies were truly "decoupled," and generation, transmission, distribution, and retail sales went their (totally) separate ways, not even as subchapter corporations under a single umbrella.

As we noted earlier, all was not rosy at the beginning. Average retail power prices shot up in Texas in the first years of competition (2002-2008) and reached a peak of 2008 (see pages 47 and 48). Much of this early roller coaster was due to the the fact that there were market forces at work besides the competition in the generation and retail sales markets. Natural gas prices rose during that period, and the joy and the pain of competitive markets is that rises in price are felt ("passed through") in the form of higher retail prices more quickly than in monopoly markets. The opposite is true as well. When the cost of certain fuel drops, the consumer feels the benefit more quickly, much like at a gas station.

Since 2012, price trends for delivered price of electricity in Texas have trended lower than prices in monopoly states. According to Ellig, "[b]etween 2009 and 2016, commercial rates more closely track wholesale prices in the competitive markets, and commercial customers in noncompetitive markets are likely cross-subsidizing other customers."[48]

The five-year phase-in (2002-2007) itself took time to take hold as a legislated "price to beat" provided some guardrails, but the point in time for the restructuring was also a time of price volatility in energy markets.

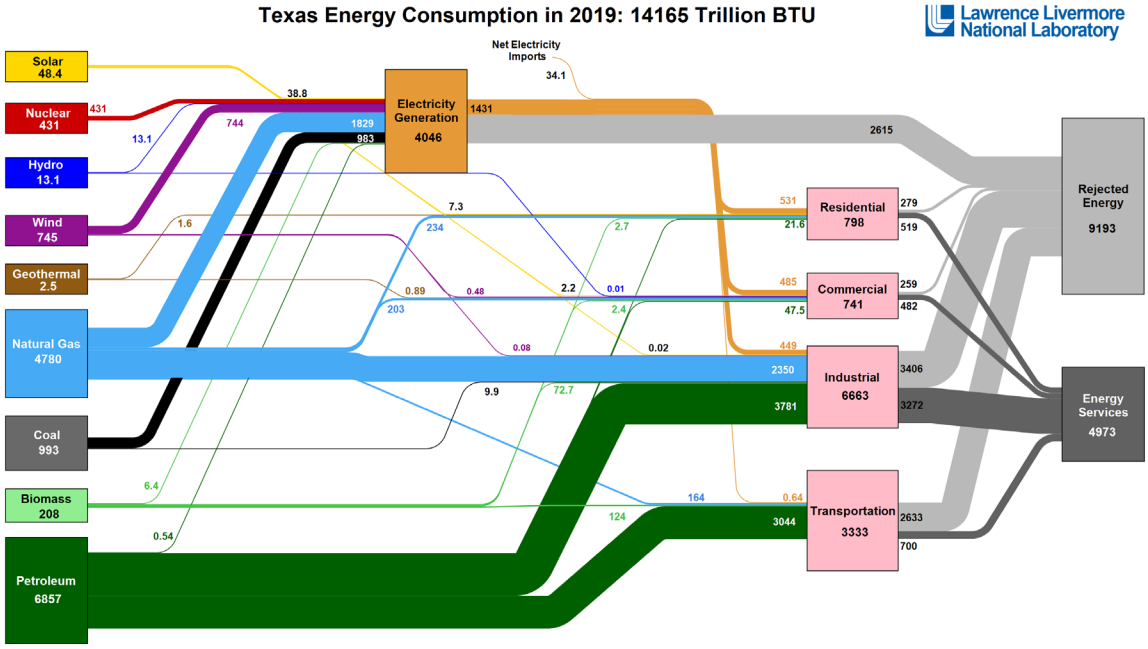
But Texas market reforms have not been all about what might be called "traditional conservative" policy. Both the original reform bill (SB.7, 1999) and the next phase (SB.20, 2005) included renewable

energy standards. Retail energy providers were required to meet renewable energy targets, and upgrades to the transmission grid must factor in the favorable locations of wind generation assets so that energy is not stranded or sold off for "negative prices." Upgrades to the grid, and more advanced energy storage capacity are planned to prevent generation from being trapped on the side of the state that *produces* most of it from the part of the state that *uses* more energy.

The level of customer choice in Texas is a bit overwhelming. Depending on the region, there are between 24 and 52 suppliers of residential service offering between 237 and 311 distinct products. [49]

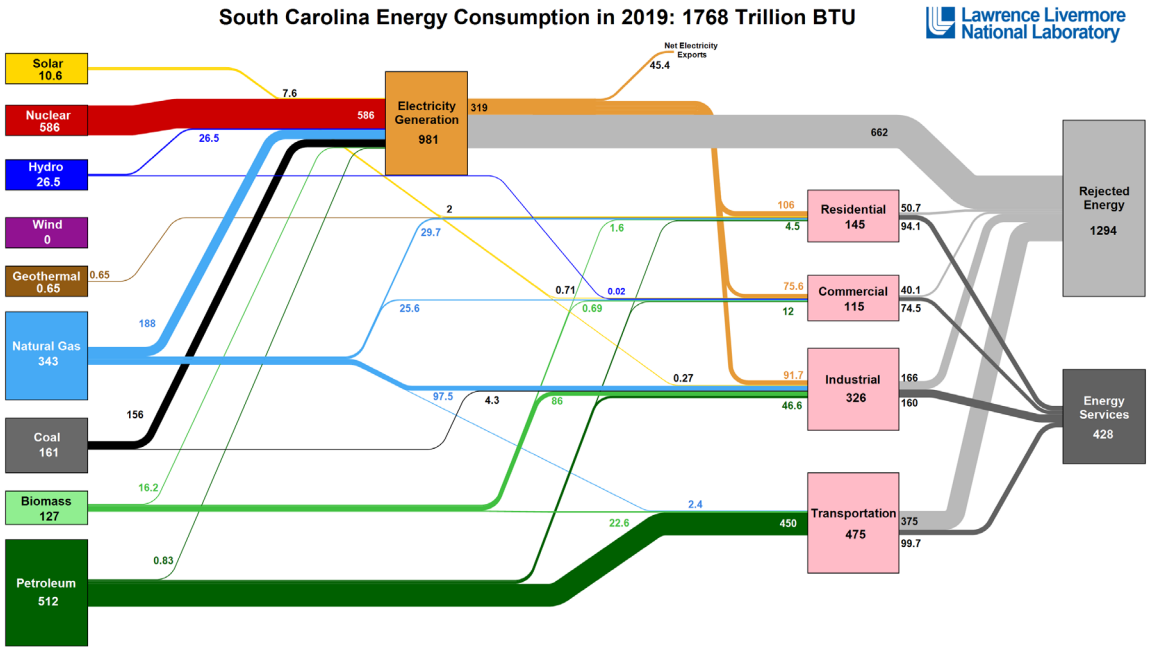
Energy consumption infographics from the Lawrence Livermore National Laboratory show how energy is generated and used in America. Here are the Livermore charts for Texas, South Carolina and the United States.

FIGURE 35. TEXAS ENERGY CONSUMPTION



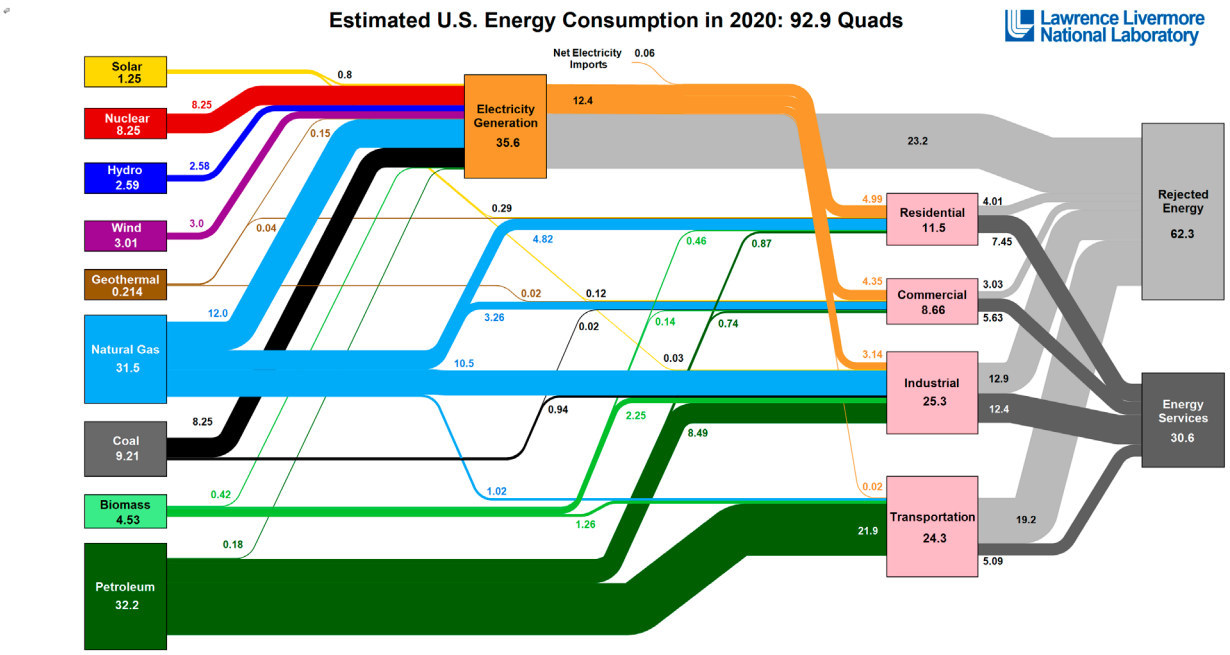
Source: Lawrence Livermore National Laboratory

FIGURE 36. SOUTH CAROLINA ENERGY CONSUMPTION



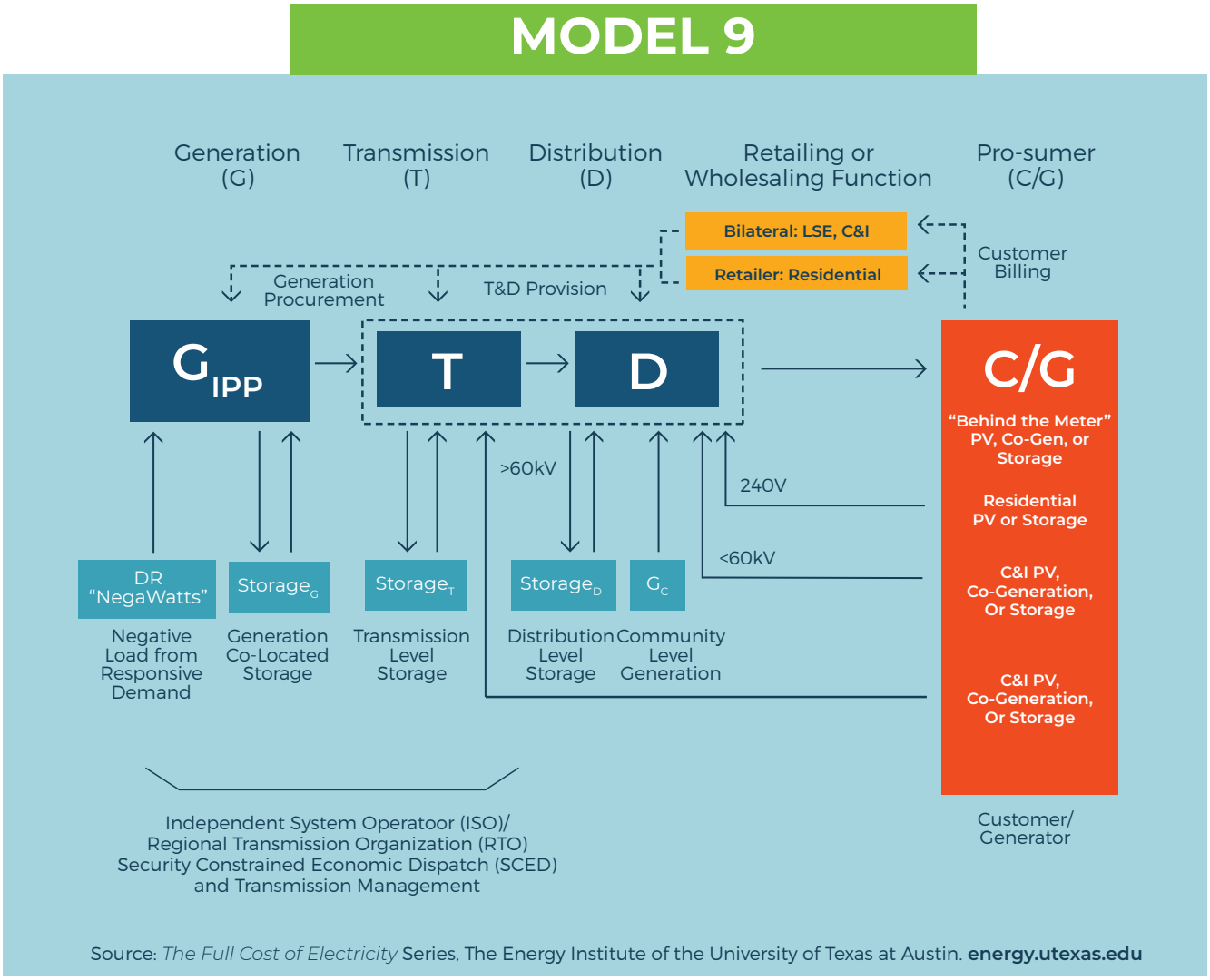
Source: Lawrence Livermore National Laboratory

FIGURE 37. UNITED STATES ENERGY CONSUMPTION



Source: Lawrence Livermore National Laboratory

FIGURE 39. MODEL 9: TOTAL FREEDOM MODEL



Source: *The Full Cost of Electricity* Series, The Energy Institute of the University of Texas at Austin. **energy.utexas.edu**

In their analysis of the various utility models that exist in the United States, Tuttle et al. refer to the first "disruptive" technologies that were introduced in the 1970s and 1980s. Their "21st Century Electricity Market Example" is certainly disruptive. This "full monty" known as the Disrupted Model following that of energy scholars at the University of Texas at Austin. It is a Total Freedom model.

Generation. In this wide open market, generation could be purchased from a wide range of small to medium-sized Independent Power Producers (**G-IPP**), not just a huge power plant. Using **technology** installed at various points in the system, Demand Response (**DR**) or *Negawatts* would occur when consumers conserve or restrict their energy use through reduced demand. **Storage-G** would be the opportunity presented by batteries and other devices to store energy for later use as it is being generated (like solar energy when the sun is shining).

Transmission (**T**). **Storage-T** shows how storage need not be co-located with generation; it could be at the transmission level as well. The already complicated grid would need an **ISO** or an **RTO** to balance generation and movement of the electricity across the transmission grid. Security-Constrained Economic Dispatch (SCED) is a methodology of ensuring that the electricity is dispatched using the most economical method to achieve the lowest price.

Distribution (**D**) would also enjoy storage capacity (**Storage-D**) as well as generation at the community level (**C-G**) as in a community or university solar farm.

Customers (**C**). Some of the greatest disruption would come at the Customer level, as customers also become generators (**C/G**) before the energy is transmitted to the grid ("behind the meter"). Rooftop solar **PV** (photovoltaic) is the best example, but it is not hard to imagine other consumer-level generation, especially at the industrial level. Power generated onsite by a commercial, industrial, or residential customer could be added back to the transmission (**T**) system, the distribution (**D**) system or stored onsite.

The marketing and selling of electricity could be handled at the residential level by **Retailers** and at the Commercial and Industrial level by LSEs (Load-Servicing Entities) who would serve as a middle person for **bilateral** (buyer-seller) agreements.

This model is truly the most desirable for the future, but for South Carolina, such an energy world would be the educational equivalent of attending high school directly from kindergarten—skipping eight grades at once.

ECONOMETRIC MODELING & ANALYSIS

MONOPOLY AND COMPETITIVE STATES RESIDENTIAL RATES VS. TEXAS RESIDENTIAL RATES

As we have seen in this survey of the "spectrum of reform," it turns out that the path to competition in energy markets is not a binary one. Unlike the metaphor in the Robert Frost poem of a road that forks—a stark divergence in a zero sum game—the options in play for energy policy freedom resemble more that of a mountain, for there are multiple paths for reaching the top.

Nevertheless, in recommending appropriate policies for South Carolina and the monopolistic Southern region of the United States, we should choose among options that are based on findings that show that as free enterprise is injected into a closed system there could be real economic benefits for citizens. Those benefits could flow directly in the form of lower residential rates, or indirectly through an expanded economy that is achieved through more attractive commercial and industrial rates.

This means we must use quantitative analysis to test the status quo against viable alternatives. For this econometric analysis, we have chosen to compare trends for residential electricity rates in South Carolina versus those rates in states that have wholesale and retail choice. We choose residential prices because in the SEEM proposal, SEEM proponents asserted that rates in the SEEM region for residential customers were better than those of the ERCOT (Texas) RTO (see p. 22).

How have electricity prices changed over time in regulated areas compared to competitive areas? We use data from the federal Energy Information Administration (EIA.gov). Data are monthly from 2008-2022 and include variables for state, capacity, residential price per kWh, and year. As an extension of much of the research of Phil O'Connor and Jerry Ellig, we use the same breakdown of "monopoly states" and "competitive states" as the basis of our comparisons.

The monopoly states of interest include South Carolina and its neighbors North Carolina, Georgia, Florida, and Alabama. The "competitive states" are those with retail choice. These are: Texas and New York (each of which is its own RTO/ISO), along with Washington D.C., Pennsylvania, Ohio, New Hampshire, Illinois, Massachusetts, Rhode Island, Connecticut, Maryland, New Jersey, Delaware, and Maine.

TEXAS: A TEST OF COMPETITION

On a scale of competitiveness, Texas aligns more closely with "full competition." It is not only its own RTO but exists as a separate interconnection [grid] (see map page 39). The rest of the competitive states fall somewhere between "regulated monopoly" and "full competition." For our purposes, we look at Texas and the other states with retail choice separately and refer to them as the "Competitive Benchmark" or "Competitive States." We refer to the regulated Southern States as "Monopoly States" and because South Carolina is of particular interest, we look at South Carolina on its own.

First, we perform a simple price comparison in Competitive states vs. Monopoly States over the period of interest (2008-2022, or 2009-2022, respectively). [50]

For this model, we focus on the dataset 2009-2022, to remove the influence of any lagging price impact from the "price to beat" era that ended December 31, 2007 but bled into 2008 electricity rates in Texas. The estimated model includes one independent variable, time (measured in months).

$$P_t=\beta_0+\beta_1\,(time)+\varepsilon$$

Where P_t is the residential price per kilowatt hour in a given State;

β_0 is the y-intercept;

β_1 is the coefficient on time (in months), and

ε is the error term.

There are 157 observations.
This model was repeated four times with different samples:

- Model 1: Texas
- Model 2: South Carolina
- Model 3: Monopoly States
- Model 4: Competitive States (excluding Texas)

FIGURE 40. ESTIMATES FOR THE INTERCEPT β_0 AND COEFFICIENT ON TIME β_1

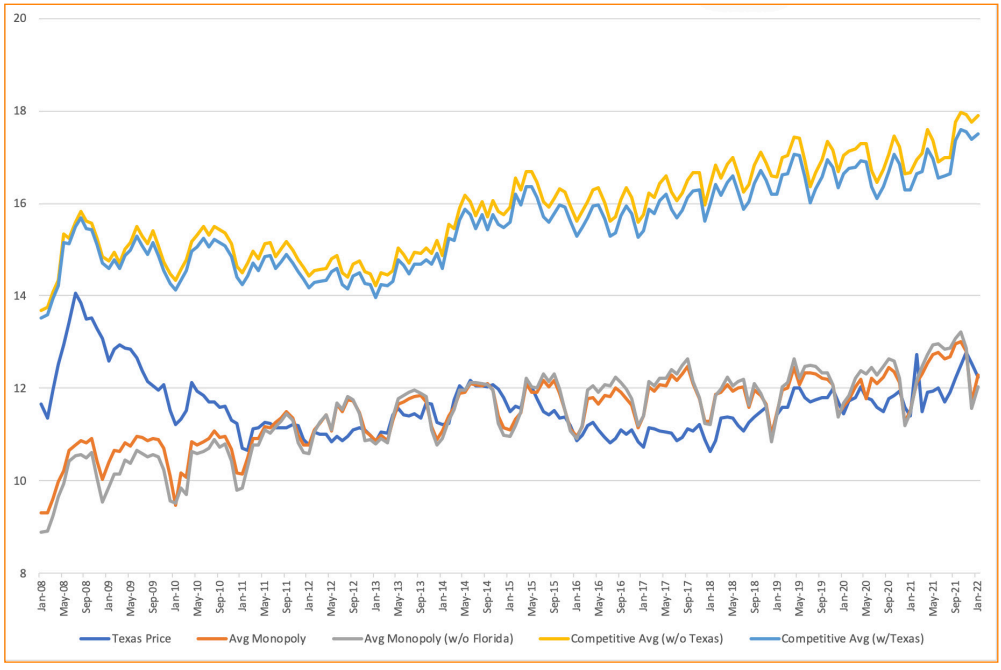
The following table provides the estimates for the intercept β_0, coefficient on time β_1 and R^2.

Model	Intercept	Coefficient on Time	R^2
Texas[51]	11.47**	0.00059	0.0027
South Carolina	10.53**	0.01808**	0.68
Monopoly States	10.55**	0.01123**	0.63
Competitive States (excluding Texas)	14.11**	0.0166** [52]	0.71

**Indicates significance at greater than 99%. See footnote on Texas[53]

We observe that Texas and the Competitive States initially had relatively high residential rates in comparison to the Monopoly States. The y-intercept for Texas and the Competitive Benchmark is 11.47 and 14.11 respectively (Texas began 2009 with mean residential prices of approximately 11.47 cents/kWh and the Competitive States charged 14.11 cents/kWh). Whereas the y-intercept for South Carolina and the Monopoly States is 10.53 and 10.55, respectively.

FIGURE 41: MEAN RESIDENTIAL ELECTRICITY PRICES 2008-2022 (TEXAS VS. MONOPOLY AND COMPETITIVE STATES, JANUARY 2008-JANUARY 2022).



The coefficient on time shows that residential electricity prices rise in all the states over time; however, Texas rates increase so little, the change cannot be statistically distinguished from zero. This is less than South Carolina increases, Monopoly State increases, *and* the Competitive State Benchmark increases. Texas rates increase by 0.00059 cents/kWh per month, whereas South Carolina rates increase by 0.018 cents/kWh/month and Monopoly States increased by 0.011 cents/kWh per month.

The Competitive State Benchmark begins with the highest average residential rates, and those rates increase more than the Monopoly State rates. This is counterintuitive to the expectation of competition reducing electricity rates, but had the competitive states not had some form of quasi-competition during 2009-2022, residential rates would have been even higher. How much higher depends on a number of factors, including how much monopoly customers pay on average for excess capacity (see next section), and how much excess capacity the states would have built if each were monopolized.

We ran a number of models and specifications but the variable for time, or a time-series approach seemed to provide the best fit given the limited econometric scope of this project and yields results which are consistent with past research by Phil O'Connor and Jerry Ellig.

TEXAS VS. MONOPOLY SOUTHERN STATES

Looking at the raw data over time, we observe that Texas rates decline and then remain relatively constant. This is consistent with the econometric analysis above which cannot distinguish Texas' price changes from zero over the time period. Also consistent with the econometric analysis, we observe that the monopoly states appear to increase slightly over time in the raw data. (Figures 42 and 43).

FIGURE 42. MEAN RESIDENTIAL PRICE (TEXAS VS. MONOPOLY STATES, JANUARY 2008-JANUARY 2022)

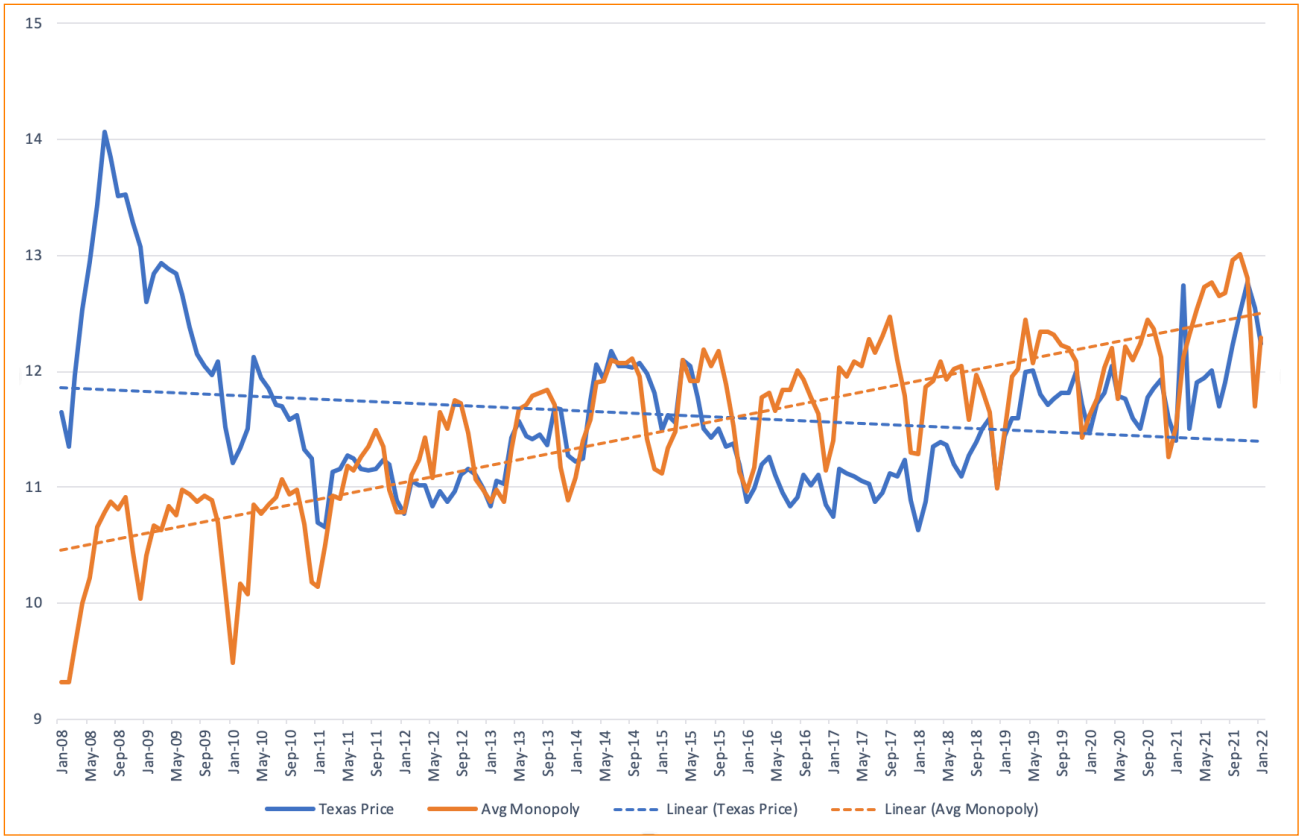


FIGURE 43. MEAN RESIDENTIAL PRICE (TEXAS VS. MONOPOLY STATES, JANUARY 2009-JANUARY 2022)

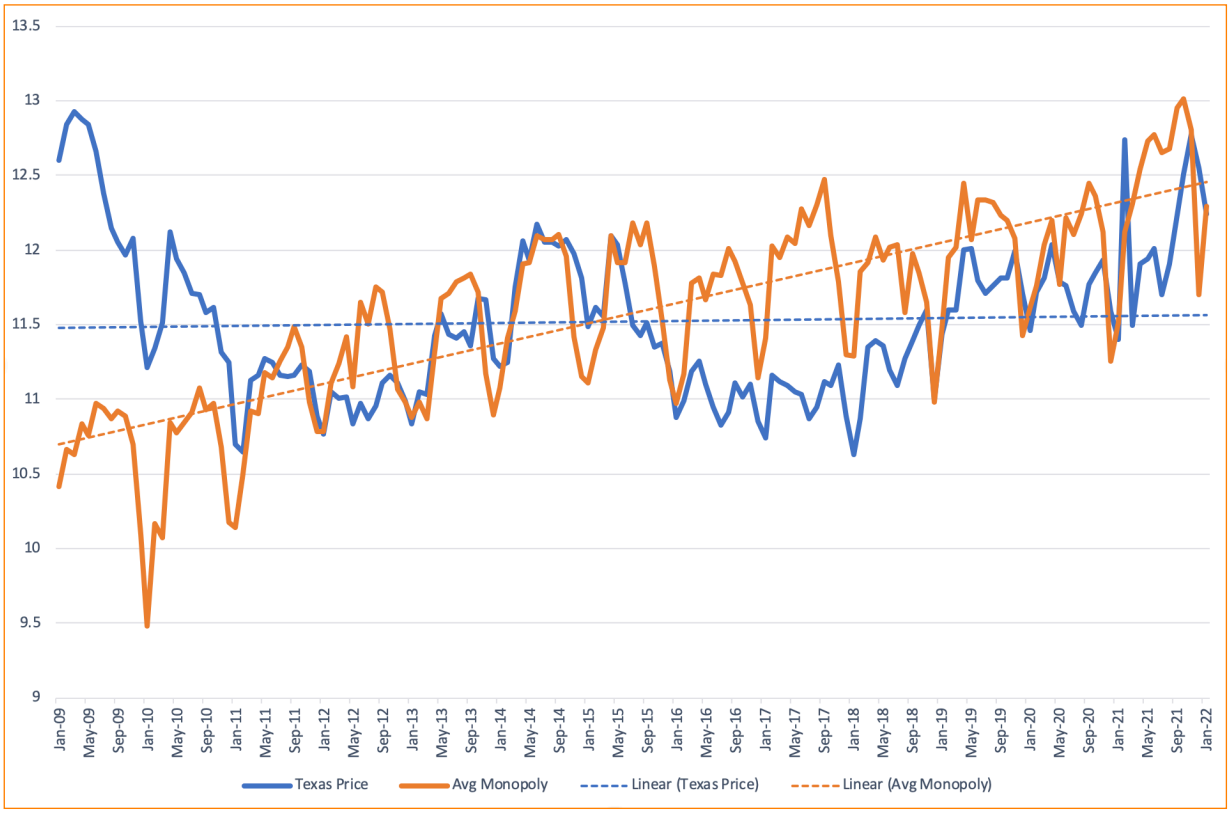
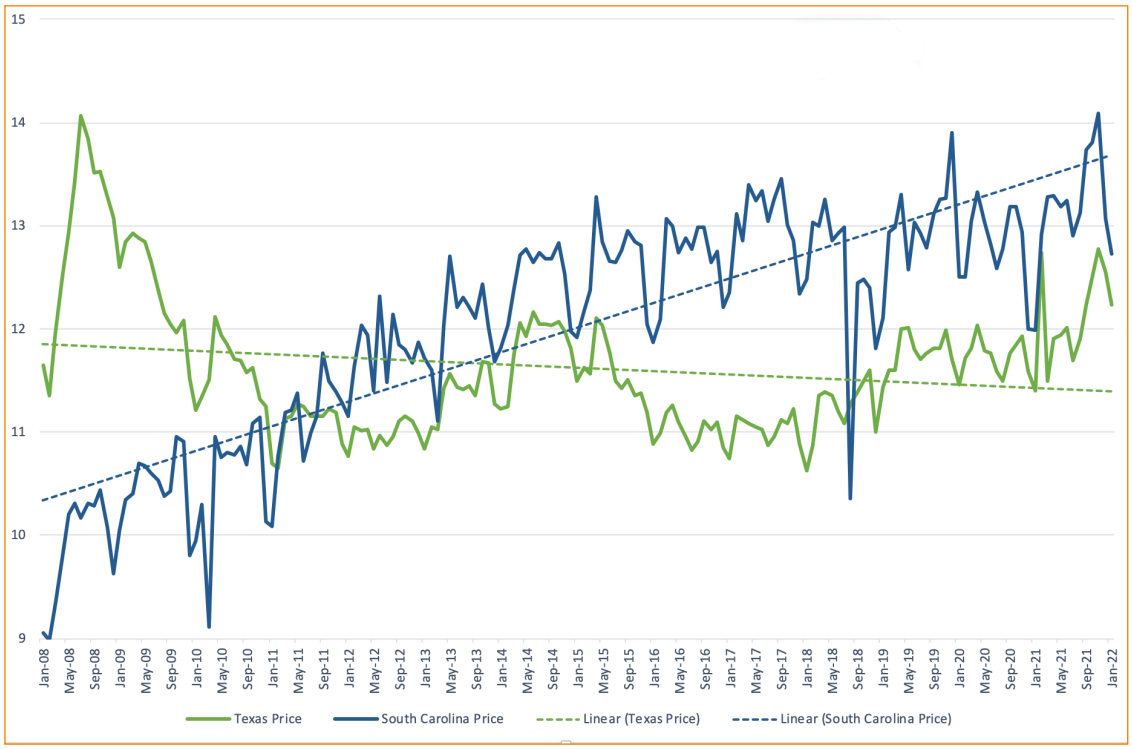


FIGURE 44. MEAN RESIDENTIAL PRICE (TEXAS VS. SOUTH CAROLINA, JANUARY 2008-JANUARY 2022)



TEXAS VERSUS SOUTH CAROLINA

The raw data for Texas and South Carolina is also consistent with the econometric analysis. The raw data show few instances of Texas residential prices exceeding South Carolina's on average except for the period of Winter Storm Uri that caused the failure of Texas energy infrastructure (February 10-20, 2021).

The performance of Texas on price versus South Carolina is due to a number of factors, but ERCOT's ability to provide for wholesale as well as retail competition seem to be significant drivers.

ASSESSING ANCILLARY ISSUES RELATED TO REFORM IN SOUTH CAROLINA

The Public Service Commission. There is no doubt that the General Assembly, if it chose to, could strengthen the role and powers of the South Carolina Public Service Commission. Reforms could take the form of those that South Carolina does not enjoy currently as graded in the Competition Scorecard (page 11). Legislation that moves in that direction could have a bumpy path if current bills are an accurate signal. The appendix includes a bill that though it passed the House attracted significant opposition. This does not bode well for legislating the regulatory authority to inject competition and revenue de-coupling in South Carolina.

Santee Cooper. The state-owned South Carolina Public Service Authority continues to refinance bonds as it has opportunity, but the *millions* in savings will not remove the *billions* in debt that can be borne only by its ratepayers as state agencies have no true investors. After the current freeze expires, somehow Santee Cooper will attempt to invest in needed infrastructure without raising rates.

Threat Levels. As the fallout from government COVID measures has proven, South Carolinians will make their voices heard when they sense threats to their private property rights or their communities from federal, state or local governments. Resistance to Big Energy could be the next citizen-led movement as utilities continue to raise rates on residential ratepayers.

The Repressible Conflict. Texas has certainly proven that a cleaner grid *and* lower electricity prices are not mutually exclusive.

CONCLUSION: THE OVERTON WINDOW AND ENERGY POLICY

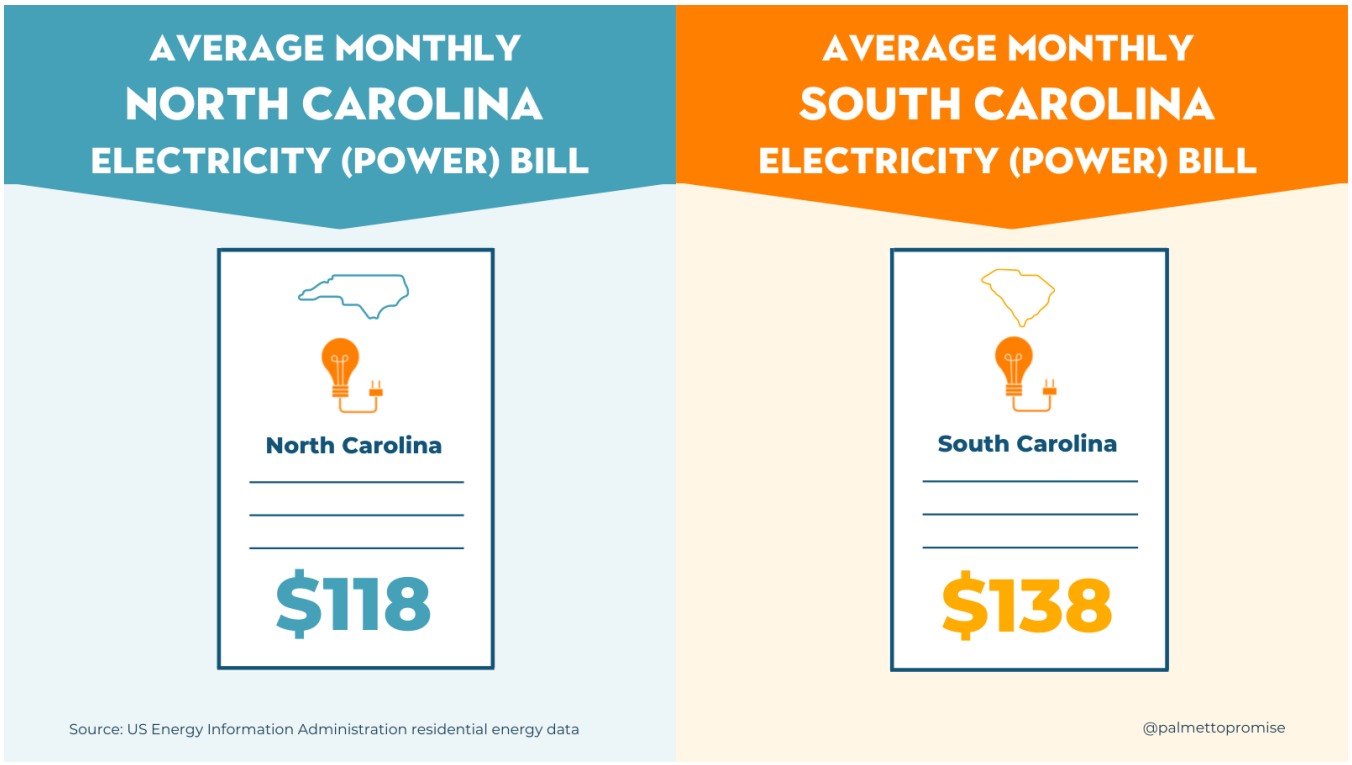
Many of the readers of this work will be familiar with the term "The Overton Window." Named for the leader of a center-right think tank, The Overton Window refers to the range of policy ideas that are actually within the realm of possibility. They have arrived in the Window because of a requisite level of support from the political grassroots and/or leaders in key elected offices. "Shifting The Overton Window?" Now, that is the rare combination of events, people and ideas that make the *im*possible suddenly *possible*.

The onset of COVID-19 has shifted The Overton Window for South Carolina.

Education Choice options that were in times past shelved in subcommittees have now passed both houses of the General Assembly by lopsided majorities. The state program that requires government approval for a private healthcare facility to be built or a service to be offered when challenged earned only 6 votes in the South Carolina Senate. Article V (Convention of States) passed the General Assembly overwhelmingly and was enthusiastically signed by the governor.

We believe energy policy could be the next frontier. South Carolina has comparatively high electricity prices and is located in the last redoubt of monopolistic vertically integrated utilities. Our tour of the spectrum of reform clearly shows that while all of the options that inject competition into the electricity market are interesting, reform must be real, not half-measures. Furthermore, our Clash of the Titans model pitting SEEM's most competitive customer sector (residential) against the most broadly competitive market (ERCOT-Texas) shows the former is not the bargain its advocates claim.

Energy freedom and its unlikely companion, clean energy, are in the Overton Window at last.



APPENDICES

KEY FEDERAL ENERGY REGULATORY COMMISSION (FERC) ORDERS RELATED TO INDEPENDENT SYSTEM OPERATORS (ISOS) AND REGIONAL TRANSMISSION OPERATORS (RTOS)

FERC Order No. 888 (April 24, 1996).

- Required public utilities to file open access non-discriminatory transmission tariffs
- Permitted public utilities to recover stranded costs.
- Goal of Order No. 888: "Remove impediments to competition in the wholesale bulk power marketplace and to bring more efficient, lower cost power to the nation's electricity consumers."
- Encouraged development of independent system operators ("ISOs")

FERC Order No. 889 (April 24, 1996)

- Required each public utility to implement standards of conduct to functionally separate transmission/wholesale power merchant functions
- Required each public utility to create or participate in an Open Access Same-Time Information System ("OASIS").
- OASIS: Provides information about available transmission capacity, prices, etc.
- Goal of Order No. 889: "[Ensure] that transmission customers have access to transmission information enabling them to obtain open access transmission service on a nondiscriminatory basis."

FERC Order No. 2000 (December 20, 1999)

- Sought to address certain problems that remained after Order Nos. 888 and 889.
- Amended its regulations under the Federal Power Act to advance the formation of RTOs
- Required each public utility to make certain filings with respect to forming and participating in an RTO
- Codified minimum characteristics and functions for RTOs
- Goal of Order No. 2000: "[P]romote efficiency in wholesale electricity markets and ensure that electricity consumers pay the lowest price possible for reliable service."

FERC Order No. 1000 (April 16, 2015)

- Requirement to create a regional plan
- Inter-regional Planning
- Facilitate evaluation of interregional facilities that may address the needs of neighboring regions

- Must incorporate a "beneficiaries pay" cost allocation methodology
- Costs cannot be allocated outside the region without external party consent
- Federal ROFR rights must be removed from tariffs
- Regions must create non-discriminatory selection criteria for competing projects/developers

—Summary Source: Bill Malcolm, MISO, Regional Transmission Organizations: A Primer, UW Public Utility Institute Energy Basics Program

SIGNS OF HOPE?: KEY RECENT SOUTH CAROLINA LEGISLATION

H.4940 (Act 187) by Reps Sandifer, Forrester, Ott, West, Toole, Norrell and Funderburk establishing an Electricity Market Reform Measures Study Committee was signed into law on September 29, 2020. It included the following preamble:

- Whereas, much of the electric service provided in South Carolina is currently provided by **vertically integrated providers** of electric distribution and transmission services; and
- Whereas, the State recognizes that existing nuclear power plant units in operation and located in this State or in the **balancing authority** of electrical utilities or public power agencies operating in this State provide an emissions-free generating source of power while also providing employment and economic benefits for a significant number of South Carolinians, and this study is not intended to force divestiture of ownership or cessation or operation of any nuclear power plant unit in operation; and
- Whereas, the State has adopted measures to **diversify the resources** used to reliably meet the energy needs of consumers in the State through Act 62 of 2019 and through other measures; and
- Whereas, the adoption of measures to **reform the structure** of the existing electric generation, transmission, or distribution service may further promote the development of and access to low cost, reliable resources for the benefit of South Carolina consumers; and
- Whereas, any electricity sector regulatory framework changes, the restructuring of existing electric transmission service, or joining an existing or creating a new **regional transmission organization (RTO)** may require changes to state law as well as federal authorization.

H. 4062, by Reps. Sandifer and West, has passed the House (2021) and was signed to a Senate Subcommittee (2022). It included the following language:

- "To the extent necessary to carry out commission responsibilities, the [South Carolina Public Service] commission is authorized to employ in an advisory capacity, through contract, qualified, **independent third-party experts** and consultants in carrying out its duties under this title. When the commission determines that the assistance of an expert or consultant will materially aid the commission in carrying out its duties under this title, the commission is authorized to retain professional expertise to provide advisory assistance to the commission for the purposes of a specific proceeding. Such professional expertise must be retained through a process that is transparent and designed to identify an expert who will be fair and unbiased and who will pro-

vide the commission with advice on an issue or issues as requested by the commission."

H.5252 by Reps. Sandifer and G.M. Smith passed the House (2022) but ran out of time in the Senate. In it, the General Assembly hereby finds and declares that:

- The economic and financial well-being of South Carolina and its citizens depends upon continued economic development and opportunities for employment;

- The cost of electricity and the availability of renewable energy sources for electricity are important factors in the decision for a commercial and industrial entity to locate or expand their existing establishments in South Carolina;

- Competitive electric rates, terms, and conditions and the ability to utilize renewable energy sources for electric power generation are necessary to attract prospective commercial or industrial entities to invest in South Carolina and to encourage and incent robust economic growth in the State;

- The Public Service Commission of South Carolina should weigh and consider any quantifiable net benefits that may result from economic development opportunities resulting from prospective commercial or industrial entities in determining whether rates, terms, and conditions proposed by an electrical utility as defined by Section 58-27-10(7) are reasonable, prudent, and in the best interest of the electrical utility's general body of retail customers; and

- Rates proposed by electrical utilities for prospective commercial or industrial entities that are at or greater than the electrical utility's marginal cost should be presumed reasonable.

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Adam Thierer and Wayne Crews, What’s Yours is Mine: Open Access and the Rise of Infrastructure Socialism (Washington, DC: Cato Institute, 2003), p. 27, quoting Gerald W. Brock.

David Tuttle, Gurcan Gulen, Robert Hebner, Carey W. King, David B. Spence, Juan Andrade, Jason A. Wible, Ross Baldwick, and Roger Duncan, “The History and Evolution of the US Electricity Industry,” White Paper UTEI.2016095-2, 2016, University of Texas at Austin Energy Institute.

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ENDNOTES

[1] "Last week [February 2018], the U.S. Energy Information Administration released a report showing S.C. residents, on average, pay more for electricity than their counterparts in every other state." "SCE&G Has Highest Electric Bills in the Country, New Analysis Shows," Sammy Fretwell, *The State*, February 22, 2018.

[2] No organization has written more about the impact of the collapse of the expansion of the V.C. Summer nuclear project than Palmetto Promise Institute. The customers of the two partners in the debacle, South Carolina Electric & Gas, and state-owned Santee Cooper (the South Carolina Public Service Authority) took the most direct hits. But at least SCE&G customers received significant relief when the utility was sold to Dominion Energy. The future of Dominion in South Carolina is now being written, but Dominion will no doubt defend its monopoly status in South Carolina as it has in Virginia.

[3] This phenomenon is often characterized as "energy poverty." This is when paying energy bills to avoid disconnection crowds out a family's ability to pay for essentials like food, shelter, and clothing.

[4] Total net patient revenue across all South Carolina hospitals, fiscal year ending June 30, 2018, NASHP.

[5] A recent bill to establish a mere study committee to research alternatives to the current monopoly system was opposed by one fourth of Republican members (see appendix for the preamble to this bill).

[6] Voters are split 50%-50% on whether owners of electric vehicles should pay a tax similar to the gas tax. Net [solar] metering finds 55-60% in support (net metering is fair) with 40-45% opposed (net metering is believed to be unfair).

[7] Clean Energy National Online Surveys, Public Opinion Strategies, December 16-22, 2020, and November 18-21, 2021, N=1000 Actual Voters, Credibility Interval= +3.53%

[8] John Paul II school, which opened in 2019, is located in Ridgeland, S.C.

[9] Alas, South Carolina is ranked 35 in the number of ambulatory surgery centers per capita. But that could change with new legislation.

[10] "Methods" is also a term used in academia to describe the courses in the sciences that train students how to use sophisticated mathematical formulas to test, among other things, the relationship of one or more variables to another. A concomitant or causal relationship of some level of strength can be claimed if the relationships are "statistically significant."

[11] According to EconmicsHelp.org, "*Externalities* occur when producing or consuming a good cause an impact on third parties not directly related to the transaction. Externalities can either be positive or negative."

[12] Thierer and Crews, p. 31-32 (citing the theories of Nobel Prize winning economists George J. Stigler and James Buchanan among others).

[13] "The State of Electric Competition in the United States of America," Joshua D. Rhodes, Aaron Nisman, William Wade, and Michael E. Webber, Webber Energy Group/University of Texas.

[14] Adam Thierer and Clyde Crews, *What's Yours is Mine: Open Access and the Rise of Infrastructure Socialism*, p. 27 (quoting Gerald W. Brock).

[15] Market Analysis: A Comparison of SEEM and the RTO Markets Across Various Metrics, SEEM, Summer 2021. https://southeastenergymarket.com/wp-content/uploads/RTO-SEEM-Market-Analysis-2021_final.pdf

[16] "Earnings by place of work: Average Earnings Per Job in 2018". www.statsamerica.org. Retrieved 2019-06-10.

[17] *Advanced Energy Economy, et al v. FERC*, Case Number 22-1018, Filed February 8, 2022.

[18] "Commissioner Clements' Fair Rates Act Statement on Southeast EEM (SEEM)," October 20, 2021, FERC Docket: ER21-1111-002, https://www.ferc.gov/news-events/news/commissioner-clements-fair-rates-act-statement-southeast-eem-seem#_ftnref76

[19] John Downey, "Critics respond after Duke Energy, partners defend proposed energy market," Charlotte Business Journal, April 15, 2021. https://www.bizjournals.com/charlotte/news/2021/04/15/duke-energy-defends-proposed-energy-market.html

[20] Independent System Operators (ISOs) and Transmission System Operators (TSOs) are similar to RTOs. An ISO is usually an entity that operates within a state whereas RTOs are interstate. An ISO can apply to FERC to become

and RTO. To be an RTO, the entity must meet certain minimum characteristics and minimum functions defined by FERC.

[21] Bill Malcolm, "Regional Transmission Organizations: A Primer," UW Public Utility Institute Energy Basics Program, October 2, 2012, MISO.

[22] Source: Toba Pearlman, "MISO and SPP Can Benefit from a More Connected Grid," March 3, 2021. Natural Resources Defense Council (NRDC). https://www.nrdc.org/experts/toba-pearlman/benefits-more-connected-grid-miso-and-spp

[23] Tatsuya Shinkawa, "Electricity System and Market in Japan," *Electricity and Gas Surveillance Commission*, January 22, 2018. http://www.emsc.meti.go.jp/english/info/public/pdf/180122.pdf

[24] "The Energy Market Explained," *EnergyUK*. https://www.energy-uk.org.uk/energy-industry/the-energy-market.html

[25] New Zealand Electricity Market explained, *PowerCo*, https://www.powerco.co.nz/about-us/our-business/nz-electricity-market/

[26] Philip R. O'Connor, Robert G. Bussa and Wayne P. Olson, "Competition, Financial Innovation, and Diversification in the Electric Industry." *Public Utilities Fortnightly*, February 20, 1986.

[27] O'Connor, Bussa and Olson, 1986.

[28] Philip R. O'Connor, Wayne Olson, and Robert Bussa. "A Five-Point Plan for the Next Wave of Electricity Restructuring." *Public Utilities Fortnightly*, May 2016, pp.28-33.

[29] O'Connor *et al*, 2016, p.30.

[30] Reinforcing our earlier analysis, South Carolina had the 16th highest price increase in Residential, the 17th highest for Commercial and 19th highest increase in Industrial rates during that period.

[31] Jerry Ellig, "Retail Electric Competition and the Natural Monopoly: The Shocking Truth," The George Washington University Regulatory Studies Center, May 2020. p.10.

[32] Georgia Public Service Commission description, http://www.psc.state.ga.us/electric/electric.asp

[33] South Carolina Code of Laws (1976) § 58-27-610-670

[34] In the South Carolina Supreme Court as *Duke Power Company, n/k/a Duke Power, a division of Duke Energy Corporation, v. The Public Service Commission of South Carolina, and Blue Ridge Electric Cooperative, Inc*., Opinion No. 25241, Heard October 3, 2000 - Filed January 24, 2001. https://www.sccourts.org/opinions/displayOpinion.cfm?caseNo=25241.

[35] South Carolina Code of Laws (1976) § 58-27-620(1)(d)(iii).

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[37] "S.C. Power Marketer Says Industrial Rate Deals Unfair to Other Customers," *Industrial Energy Bulletin*, January 23, 1998, p. 9.

[38] "S.C. PSC Rejects Electric Lite's Petition on Competition, Wheeling Scheduling," *Southeast Power Report*, February 6, 1998, p. 8.

[39] "Electric Lite turns lights out on S. Carolina," *The Energy Report*, September 28, 1998, Volume 26, No. 38.

[40] Walter J. Primeaux, *Direct Electric Utility Competition: The Natural Monopoly Myth*, New York: Praeger Publishers, 1986.

[41] Jan Bellamy, "Two Utilities are Better than One," *Reason*, October 1981, p.23-30.

[42] "Mayor Supports Competition for LP&L Electric Customers," *EverythingLubbock.com*

January 3, 2018.

[43] Jan Bellamy, "Two Utilities are Better than One," *Reason*, October 1981, p.23-30.

[44] Ellig, p.26; John Kwoka, Power Structure: Ownership, Integration, and Competition in the US Electric Industry (Boston: Kluwer Academic, 1996), 62-65.

[45] Salvador Alayah, "California Renewable Mandates are Proving Texas Model Right: The Texas Approach Produces a More Sustainable Carbon-Reduction Solution that Makes Sense Economically," that makes sense economically," *EmpowerTexans*, October 18, 2018. https://empowertexans.com/state/california-renewable-mandates-are-proving-texas-model-right/

[46] "The most advanced and cost-effective" according to British energy expert Stephen Littlechild.

[47] Central Electric Power Cooperative, presentation to Public Service Authority Evaluation and Recommendation Committee, September 26, 2018.

[48] Ellig, p. 18; Peter R. Hartley, Kenneth B. Medlock III and Olivera Jankovska, "Electricity Reform and Retail Pricing in Texas," Energy Economics 80 (2019), 1-11.

[49] Jerry Ellig, "Retail Electric Competition and the Natural Monopoly: The Shocking Truth," The George Washington University Regulatory Studies Center, May 2020, p.21.

[50] We estimate two models because technically Texas' "price to beat" transition ended December 31, 2007 but the uncertainty shows in the data through 2008. To account for this, we estimate the model once with data beginning in 2008 and again with data beginning in 2009. Through 2007, Texas was in the process of transitioning to the most competitive electricity market in the United States. Many authors argue that Texas's "price to beat" transition model created additional uncertainty in the Texas market and unintentionally disincentivized competition. The Texas level data support these claims with prices increasing in Texas during the transition period, peaking in 2008, and declining sharply beginning in 2009. Texas fully emerged from its transition in 2009 so that is the starting point for our data.

[51] The t-statistic for Texas' time coefficient is not significant at any meaningful level; however, the estimate is extremely close to zero, to the point that the hypothesis test cannot distinguish it from zero. Texas prices changed so little through January 2022. However, when we take the natural log of prices in an alternative specification, the coefficient on time for Texas is highly significant.

[52] The F-values for each analysis are highly significant at greater than 99%; except for Texas which is not significant at any meaningful level.

[53] In an alternative specification of the model, using ln(price) and 2008 – 2021 data, the coefficient on the time trend for the (ln(price)) is nearly significant at the 99% level. When estimating the coefficient using the 2009 – 2022 sample, the coefficient loses significance. This loss of significance is a result of trimming the data from 2008 where prices were more volatile and decreased at a faster rate. By 2009, the decline in prices had slowed and appear to follow a flat trend through the remainder of the sample. Having a time trend with a slope of practically zero will typically result in an insignificant coefficient because in regression analysis, "significant" means that the slope is not zero.

GLOSSARY OF ELECTRICITY MARKET TERMINOLOGY

Aggregator: Any marketer, broker, public agency, city, county, or special district that combines the loads of multiple end-use customers in negotiating the purchase of electricity, the transmission of electricity, and other related services for these customers.

Ampere: The unit of measurement of electrical current produced in a circuit by 1 volt acting through a resistance of 1 Ohm.

Average Revenue per Kilowatthour: The average revenue per kilowatthour of electricity sold by sector (residential, commercial, industrial, or other) and geographic area (State, Census division, and national) is calculated by dividing the total monthly revenue by the corresponding total monthly sales for each sector and geographic area.

Balancing Authority: The responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

Base Load: The minimum amount of electric power delivered or required over a given period of time at a steady rate.

Bilateral Energy Transaction: A transaction between two willing parties who enter into a physical or financial agreement to trade energy commodities. Bilateral transactions entail reciprocal obligations and can involve direct negotiations or deals made through brokers.

Bilateral Sale/Market/Contract: A bilateral contract in an electricity market is an agreement between a willing buyer and a willing seller to exchange electricity, rights to generating capacity, or a related product under mutually agreeable terms for a specified period of time. Most economists agree that such arrangements are crucial to the functioning of electricity markets, because they allow both parties to have the price stability and certainty necessary to perform long-term planning and to make rational and socially optimal investments. (Source: Synapse Energy Economics)

Bundled Utility Service: A means of operation whereby energy, transmission, and distribution services, as well as ancillary and retail services, are provided by one entity.

Capacity: The amount of energy and capacity available for purchase from outside the system.

Capacity Charge: An element in a two-part pricing method used in capacity transactions (energy charge is the other element). The capacity charge, sometimes called Demand Charge, is assessed on the amount of capacity being purchased.

Capacity Market: An energy-only market only compensates power that has been produced. A capacity market, on the other hand, compensates the mere readiness, or capacity, for power production. To ensure supply is guaranteed, the energy-only market is supplemented by various flexibility options, such as control reserve markets. (Source: Next Kraftwerke)

Commercial Sector: An energy-consuming sector that consists of service-providing facilities and equipment of businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups.

Community Choice Aggregation (CCA): Also known as municipal aggregation—programs allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utili-

ty provider. CCAs are an attractive option for communities that want more local control over their electricity sources, more green power than is offered by the default utility, and/or lower electricity prices. By aggregating demand, communities gain leverage to negotiate better rates with competitive suppliers and choose greener power sources. (Source: EPA)

Congestion: A condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules for electricity transmission simultaneously.

Cooperative Electric Utility: An electric utility legally established to be owned by and operated for the benefit of those using its service. The utility company will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility.

Cost-of-Service Regulation: A traditional electric utility regulation under which a utility is allowed to set rates based on the cost of providing service to customers and the right to earn a limited profit.

Customer Choice: The right of customers to purchase energy from a supplier other than their traditional supplier or from more than one seller in the retail market.

Day-Ahead Schedule: A schedule prepared by a scheduling coordinator or the independent system operator before the beginning of a trading day. This schedule indicates the levels of generation and demand scheduled for each settlement period that trading day.

Demand Response Programs: Demand response programs are incentive-based programs that encourage electric power customers to temporarily reduce their demand for power at certain times in exchange for a reduction in their electricity bills.

Demand-Side Management (DSM): A utility action that reduces or curtails end-use equipment or processes. DSM is often used in order to reduce customer load during peak demand and/or in times of supply constraint.

Deregulation: The elimination of some or all regulations from a previously regulated industry or sector of an industry.

Direct Access: The ability of a retail customer to purchase electricity or other energy sources directly from a supplier other than their traditional supplier.

Distributed Energy Resources (DER): Distributed energy resources are small, modular, energy generation and storage technologies that provide electric capacity or energy where you need it. Typically producing less than 10 megawatts (MW) of power, DER systems can usually be sized to meet your particular needs and installed on site. DER systems may be either connected to the local electric power grid or isolated from the grid in stand-alone applications. DER technologies include wind turbines, photovoltaics (PV), fuel cells, microturbines, reciprocating engines, combustion turbines, cogeneration, and energy storage systems. (Source: USDOE)

Distributed Generation (DG): A generator that is located close to the particular load that it is intended to serve. General, but non-exclusive, characteristics of these generators include: an operating strategy that supports the served load; and interconnection to a distribution or sub-transmission system (138 kV or less).

Distribution Network Operator (DNO). The traditional vertically integrated model of energy distribution, from high-voltage transmission networks to consumption points.

Distribution Provider: Provides and operates the wires between the transmission system and the end-use customer.

Distribution System: The portion of the transmission and facilities of an electric system that is dedicated to delivering electric energy to an end-user.

Distribution System Operators (DSO): DSOs are the entities responsible for distributing and managing energy from the generation sources to the final consumers. Digitalization is the key to securing the DSO model, which requires investments in automation, smart meters, real-time systems, big data and data analytics. The DSO model uses smart meters that allow bi-directional reading of the energy flow and real-time communication. This makes it possible to detect interruptions and restore the supply automatically, as well as facilitating the monitoring of customers' daily consumption through digital consultation platforms available to them. (Source: Iberdrola)

Divestiture: The stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Stripping off is most commonly associated with spinning-off generation assets so they are no longer owned by the shareholders that own the transmission and distribution assets.

Duopoly: A duopoly is a situation where two companies together own all, or nearly all, of the market for a given product or service. A duopoly is the most basic form of oligopoly, a market dominated by a small number of companies. A duopoly can have the same impact on the market as a monopoly if the two players collude on prices or output. (Source: Investopedia)

Economy of Scale: The principle that larger production facilities have lower unit costs than smaller facilities.

Economy of Scope: An economy of scope means that the production of one good reduces the cost of producing another related good. Economies of scope occur when producing a wider variety of goods or services in tandem is more cost effective for a firm than producing less of a variety, or producing each good independently. Investopedia

Electric Industry Restructuring: The process of replacing a monopolistic system of electric utility suppliers with competing sellers, allowing individual retail customers to choose their supplier but still receive delivery over the power lines of the local utility. It includes the reconfiguration of vertically-integrated electric utilities.

Electricity Broker: An entity that arranges the sale and purchase of electric energy, the transmission of electricity, and/or other related services between buyers and sellers but does not take title to any of the power sold.

Electricity Congestion: A condition that occurs when insufficient transmission capacity is available to implement all of the desired transactions simultaneously.

Electricity Generation: The process of producing electric energy or the amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatthours(kWh) or megawatthours (MWh).

Electricity Sales: The amount of kilowatthours sold in a given period of time; usually grouped by classes of service, such as residential, commercial, industrial, and other.

"Emergent" Market: A term some energy researchers use for markets that are not energy only markets but are not capacity markets either.

Energy Deliveries: Energy generated by one electric utility system and delivered to another system through one or more transmission lines.

Energy Imbalance Market (EIM). An EIM is a real-time energy supply market that offers electricity generation and transmission services. It automatically balances demand every 15 minutes and dispatches power plants to meet demand every five minutes with the lowest cost energy. EIM participants include multiple balancing authority areas and utility territories. This can increase the economic efficiency of the power system and provides centralized, automated and region-wide generation economic dispatch.

The new market is attracting additional participants and has the benefit of increasing benefits for all customers as diversity increases. (Source: PSE.com)

Energy Intensity: A ratio of energy consumption to another metric, typically national gross domestic product in the case of a country's energy intensity.

Energy Only Market: An energy-only market only compensates power that has been produced. A capacity market, on the other hand, compensates the mere readiness, or capacity, for power production. To ensure supply is guaranteed, the energy-only market is supplemented by various flexibility options, such as control reserve markets. (Source: Next Kraftwerke)

Energy Policy Act of 1992 (EPACT): This legislation creates a new class of power generators, exempt wholesale generators, that are exempt from the provisions of the Public Holding Company Act of 1935 and grants the authority to the Federal Energy Regulatory Commission to order and condition access by eligible parties to the interconnected transmission grid.

Exchange Market: A type of energy exchange in which one electric utility agrees to supply electricity to another. Electricity received is returned in kind at a later time or is accumulated as an energy balance until the end of a specified period, after which settlement may be made by monetary payment.

Exempt Wholesale Generator (EWG): Wholesale generators created under the 1992 Energy Policy Act that are exempt from certain financial and legal restrictions stipulated in the Public Utilities Holding Company Act of 1935.

Federal Energy Regulatory Commission (FERC): The Federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy and is the successor to the Federal Power Commission.

Federal Power Act: Enacted in 1920, and amended in1935, the Act consists of three parts. The first part incorporated the Federal Water Power Act administered by the former Federal Power Commission, whose activities were confined almost entirely to licensing non-Federal hydroelectric projects. Parts II and III were added with the passage of the Public Utility Act. These parts extended the Act's jurisdiction to include regulating the interstate transmission of electrical energy and rates for its sale as wholesale in interstate commerce. The Federal Energy Regulatory Commission is now charged with the administration of this law.

Federal Power Commission (FPC): The predecessor agency of the Federal Energy Regulatory Commission. The Federal Power Commission was created by an Act of Congress under the Federal Water Power Act on June 10, 1920. It was charged originally with regulating the electric power and natural gas industries. It was abolished on September 30, 1977, when the Department of Energy was created. Its functions were divided between the Department of Energy and the Federal Energy Regulatory Commission, an independent regulatory agency.

Generation: The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, expressed in kilowatthours.

Generator Nameplate Capacity (installed): The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer. Installed generator nameplate capacity is commonly expressed in megawatts (MW) and is usually indicated on a nameplate physically attached to the generator.

Gigawatt (GW): One billion watts or one thousand megawatts.

Gigawatthour (GWh): One billion watthours.

Independent Power Producer: A corporation, person, agency, authority, or other legal entity or instrumentality that owns or operates facilities for the generation of electricity for use primarily by the public, and that is not an electric utility.

Independent System Operator (ISO): An independent, federally regulated entity established to coordinate regional transmission in a non-discriminatory manner and ensure the safety and reliability of the electric system.

Industrial Sector: An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity manufacturing (NAICS codes 31-33); agriculture, forestry, fishing and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities. Various EIA programs differ in sectoral coverage.

Integrated Resource Plan (IRP): An integrated resource plan (IRP) is a long-range utility plan for meeting the forecasted demand for energy within a defined geographic area through a combination of supply side resources and demand side resources. Generally speaking, the goal of an IRP is to identify the mix of resources that will minimize future energy system costs while ensuring safe and reliable operation of the system. (Source: Energy.gov)

Integrated Energy Service Provider (IeSP): The integrated energy services provider (IESP) aggregates site energy services while ensuring that net-zero energy is financially attractive to vertical developers and tenants while collecting a steady, long-term return (comparable to infrastructure investment). The IESP can also interface with the regional transmission authority, the regional electric utility, and the customer to maintain day-to-day operations.

Interchange Authority: The responsible entity that authorizes implementation of valid and balanced Interchange Schedules between Balancing Authority Areas, and ensures communication of Interchange information for reliability assessment purposes.

Interchange Transaction: An agreement to transfer energy from a seller to a buyer that crosses one or more Balancing Authority Area boundaries.

Intermediate Load: The range from base load to a point between base load and peak. This point may be the midpoint, a percent of the peak load, or the load over a specified time period.

Interruptible Load: This Demand-Side Management category represents the consumer load that, in accordance with contractual arrangements, can be interrupted at the time of annual peak load by the action of the consumer at the direct request of the system operator. This type of control usually involves large-volume commercial and industrial consumers.

Investor-Owned Utility (IOU): A privately-owned electric utility whose stock is publicly traded. It is rate regulated and authorized to achieve an allowed rate of return.

Joint Dispatch Agreement (JDA). A Joint Dispatch Agreement specifies how the generation and long-term power contracts of the separate companies or divisions will be used to meet overall native load requirements. Native load includes both retail loads served under state Public Service Commission tariffs and wholesale loads that are either under contract or are served on a Federal Energy Regulatory Commission (FERC) tariff. This is the load that utilities are obligated to serve with their power supply resources. "Joint Dispatch" means the dispatch of the power supply resources owned by one or more utilities on a least cost basis. (Source: Missouri PSC)

Kilowatt (kW): One thousand watts.

Kilowatthour (kWh): A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu.

Load: An end-use device or customer that receives power from the electric system.

Load-Serving Entity: Secures energy and transmission service (and related Interconnect Operations Services) to serve the electrical demand and energy requirements of its end-use customers.

Market Clearing Price: The price at which supply equals demand for the Day-ahead or hour-ahead markets.

Market-Based Pricing: Prices of electric power or other forms of energy determined in an open market system of supply and demand under which prices are set solely by agreement as to what buyers will pay and sellers will accept.

Megawatt (MW): One million watts of electricity.

Megawatthour (MWh): One thousand kilowatt-hours or 1million watt-hours.

Multilateral Sale/Market/Contract: Multilateral System means any system or facility in which multiple third-party buying and selling trading interests are able to interact in the system.

NERC: See North American Electric Reliability Corporation.

Net Metering or Net Energy Metering (NEM): is a metering and billing arrangement designed to compensate distributed energy generation (DG) system owners for any generation that is exported to the utility grid. NEM allows utility customers with on-site DG to offset the electricity they draw from the grid throughout the billing cycle (e.g., one month). The utility customer pays for the net energy consumed from the utility grid. NEM customers directly use the electricity generated on-site by their DG systems. If the amount of electricity the NEM customer's DG system produces exceeds the amount of electricity that customer can use, the excess amount is exported to the utility's electric grid. If the NEM customer uses more electricity than his or her DG system produces, the customer imports electricity from the grid, and pays the full retail rate for that electricity, just like a traditional utility customer. (Source: USDOE)

Net Summer Capacity: The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, as demonstrated by a multi-hour test, at the time of summer peak demand (period of June 1 through September 30.)

Net Winter Capacity: The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, as demonstrated by a multi-hour test, at the time of peak winter demand (period of December 1 through February 28).

Nodal Pricing: Nodal pricing: Nodal pricing refers to prices paid for electricity consumed or generated at a given transmission node. Under this option, transmission constraints are explicitly observed while determining the optimal dispatch of the system and deriving the locational marginal prices. Nodal pricing better depicts the technical and economic effects of the network on the price of electricity as it implicitly includes the impact of grid losses and transmission congestion. For example, several independent system operators (ISOs) in the United States use nodal prices from which are derived the locational marginal price (LMP). (Source: Irena) (See Zonal Pricing)

North American Electric Reliability Corporation (NERC): A nonprofit corporation formed in 2006 as the successor to the North American Electric Reliability Council established to develop and maintain mandatory reliability standards for the bulk electric system, with the fundamental goal of maintaining and improving the reliability of that system.

Ohm: A measure of the electrical resistance of a material equal to the resistance of a circuit in which the potential difference of 1 volt produces a current of 1 ampere.

Office of Regulatory Staff, South Carolina (ORS): The South Carolina Office of Regulatory Staff (ORS) was created with the enactment of Act 175 of 2004. The ORS is responsible for many of the non-adjudicative functions associated with utility regulation that formerly fell under the authority of the Public Service Commission of South Carolina (PSC). The ORS represents the public interest of South Carolina in utility regulation for the major utility industries -- electric, natural gas, telecommunications, water/wastewater, and transportation -- before the PSC, the court system, the South Carolina General Assembly, and federal regulatory bodies. (Source: ORS)

Open Access: Federal Energy Regulatory Commission Order No. 888 requires public utilities to provide non-discriminatory transmission service over their transmission facilities to third parties to move bulk power from one point to another on a nondiscriminatory basis for a cost-based fee.

Peak Load Plant: A plant usually housing old, low-efficiency steam units, gas turbines, diesels, or pumped-storage hydroelectric equipment normally used during the peak-load periods.

Power Exchange: An entity providing a competitive spot market for electric power through day- and/or hour-ahead auction of generation and demand bids.

Power Marketers: Business entities engaged in buying and selling electricity. Power marketers do not usually own generating or transmission facilities. Power marketers, as opposed to brokers, take ownership of the electricity and are involved in interstate trade.

Power Purchasing Agreements (PPA): A Power Purchase Agreement (PPA) often refers to a long-term electricity supply agreement between two parties, usually between a power producer and a customer (an electricity consumer or trader). The PPA defines the conditions of the agreement, such as the amount of electricity to be supplied, negotiated prices, accounting, and penalties for non-compliance. Since it is a bilateral agreement, a PPA can take many forms and is usually tailored to the specific application. Electricity can be supplied physically or on a balancing sheet. PPAs can be used to reduce market price risks, which is why they are frequently implemented by large electricity consumers to help reduce investment costs associated with planning or operating renewable energy plants. (Source: Next Kraftwerke)

Power Pool: An association of two or more interconnected electric systems having an agreement to coordinate operations and planning for improved reliability and efficiencies.

Prescribed Market. A term used by some energy researchers to describe energy markets that are tightly controlled rather than nimble and open to innovation.

Public Service Commission, South Carolina (PSC): The South Carolina Public Service Commission (PSC) is a regulatory agency that regulates public utilities in the state of South Carolina, including electric power, telecommunications, natural gas, and water & wastewater. In addition, the PSC regulates common carriers, including motor carriers of household goods and taxicabs. (Source: PSC)

Public Service Authority, South Carolina (Santee Cooper): Santee Cooper is South Carolina's state-owned electric and water utility, the state's largest power provider, and one of the nation's largest public power utilities. Santee Cooper supplies electricity to more than 190,000 retail customers in Berkeley, Georgetown and Horry counties. We serve 27 large industrial facilities, Central Electric Power Cooperative, the cities of Bamberg and Georgetown, the Piedmont Municipal Power Agency (with 10 member cities in South Carolina), and the Alabama Municipal Electric Authority. Santee Cooper provides wholesale power to Central, which in turn distributes power to the state's 20 electric cooperatives. (Source: Santee Cooper)

Public Utility Regulatory Policies Act of 1978: The Public Utility Regulatory Policies Act of1978, passed by the U.S. Congress. This statute requires States to implement utility conservation programs and create special markets for co-generators and small producers who meet certain standards, including the requirement that States set the prices and quantities of power the utilities must buy from such facilities.

Rate Base: The value of property, upon which, a utility is permitted to earn a specified rate of return as established by a regulatory authority.

Ratemaking Authority: A utility commission's legal authority to fix, modify, approve, or disapprove rates as determined by the powers given the commission by a State or Federal legislature.

Regional Transmission Group [Authority]: A utility industry concept that the Federal Energy Regulatory Commission (FERC) embraced for the certification of voluntary groups that would be responsible for transmission planning and use on a regional basis.

Reliability Coordinator: The entity that is the highest level of authority who is responsible for the reliable operation of the Bulk Electric System, has the Wide Area view of the Bulk Electric System, and has the operating tools, processes and procedures, including the authority to prevent or mitigate emergency operating situations in both next-day analysis and real-time operations.

Renewables/Renewable Energy Resources: Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

Renewable Portfolio/Renewable Portfolio Standards (RPS): Renewable portfolio standards (RPS), also referred to as renewable electricity standards (RES), are policies designed to increase the use of renewable energy sources for electricity generation. These policies require or encourage electricity suppliers to provide their customers with a stated minimum share of electricity from eligible renewable resources. Although national RPS or other clean energy policies have been proposed, no federal RPS or similar policy is currently in place. However, most states have enacted their own RPS programs.

Reserve Margin: The amount of unused available capability of an electric power system (at peak load for a utility system) as a percentage of total capability.

Residential Sector: Consumers using gas for heating, air conditioning, cooking, water heating, and other residential uses in single and multi-family dwellings and apartments and mobile homes.

Restructuring: The process of replacing a monopoly system of electric utilities with competing sellers, allowing individual retail customers to choose their electricity supplier but still receive delivery over the power lines of the local utility. It includes the reconfiguration of the vertically-integrated electric utility.

Retail Sales: Sales made directly to the customer that consumes the energy product.

Retail Wheeling: The process of moving electric power from a point of generation across third-party-owned transmission and distribution systems to a retail customer.

Santee Cooper/S.C. Public Service Authority: Santee Cooper is South Carolina's state-owned electric and water utility, the state's largest power provider, and one of the nation's largest public power utilities. Santee Cooper supplies electricity to more than 190,000 retail customers in Berkeley, Georgetown and Horry counties. We serve 27 large industrial facilities, Central Electric Power Cooperative, the cities of Bamberg and Georgetown, the Piedmont Municipal Power Agency (with 10 member cities in South Carolina), and the Alabama Municipal Electric Authority. Santee Cooper provides wholesale power to Central, which in turn distributes power to the state's 20 electric cooperatives. (Source: Santee Cooper)

Scheduling Coordinators: Entities certified by the Federal Energy Regulatory Commission (FERC) that act on behalf of generators, supply aggregators (wholesale marketers), retailers, and customers to schedule the distribution of electricity.

Securitization: A proposal for issuing bonds that would be used to buy down existing power contracts or other obligations. The bonds would be repaid by designating a portion of future customer bill payments. Customer bills would be lowered, since the cost of bond payments would be less than the power contract costs that would be avoided.

Security-Constrained Economic Dispatch (SCED). The operation of generation facilities to produce energy at the lowest cost to reliably serve consumers, recognizing any operational limits of generation and transmission facilities. (Source: FERC)

Small Power Producer (SPP): Under the Public Utility Regulatory Policies Act (PURPA), a small power production facility (or small power producer) generates electricity using waste, renewable (biomass, conventional hydroelectric, wind and solar, and geothermal) energy as a primary energy source. Fossil fuels can be used, but renewable resource must provide at least 75 percent of the total energy input.

Spot Purchases: A single shipment of fuel or volumes of fuel purchased for delivery within 1 year. Spot purchases are often made by a user to fulfill a certain portion of energy requirements, to meet unanticipated energy needs, or to take advantage of low-fuel prices.

Stranded Benefits: Benefits associated with regulated retail electric service which may be at risk under open market retail competition.

Stranded Costs: Costs incurred by a utility which may not be recoverable under market-based retail competition.

System Operator: An individual at a control center (Balancing Authority, Transmission Operator, Generator Operator, Reliability Coordinator) whose responsibility it is to monitor and control that electric system in real time.

Terawatthour: One trillion watt hours.

Transmission: An interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.

Transmission System: An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between points of supply and points at which it is transformed for delivery over the distribution system lines to consumers or is delivered to other electric systems.

Vertical integration: The combination within a firm or business enterprise of one or more stages of production or distribution. In the electric industry, it refers to the historical arrangement whereby a utility owns its own generating plants, transmission system, and distribution lines to provide all aspects of electric service.

Watt (W): The unit of electrical power equal to one ampere under a pressure of one volt. A Watt is equal to 1/746 horsepower.

Watthour (Wh): The electrical energy unit of measure equal to one watt of power supplied to, or taken from, an electric circuit steadily for one hour.

Wheeling Service: The movement of electricity from one system to another over transmission facilities of interconnecting systems. Wheeling service contracts can be established between two or more systems.

Wholesale Competition: A system whereby a distributor of power would have the option to buy its power from a variety of power producers, and the power producers would be able to compete to sell their power to a variety of distribution companies.

Wholesale Power Market: The purchase and sale of electricity from generators to resellers (who sell to retail customers), along with the ancillary services needed to maintain reliability and power quality at the transmission level.

Wires Charge: A broad term referring to fees levied on power suppliers or their customers for the use of the transmission or distribution wires.

Zonal Pricing: A pricing zone is defined as the largest geographical area within which market participants are able to trade energy without capacity allocation, i.e., an area where grid congestion is assumed to be low. These zones are defined by the regulator and/or the transmission system operator (TSO) and hence the price differentials between the zones reflect the grid congestion between the zones. (Source: Irena) (see Nodal pricing)

Source: U.S Energy Information Administration (EIA) unless noted otherwise.
Some definitions shortened for space.

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ABOUT CONSERVATIVE ENERGY NETWORK

Formed in 2016, the Conservative Energy Network (CEN) is a 501(c)(3) non-profit coalition of 21 state-based conservative clean energy organizations advocating policy solutions that emphasize market competition, consumer choice, and innovation.

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