



Wholesale Electricity Markets Study Group Work Products

2020 NC Energy Regulatory Process

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WHOLESALE ELECTRICITY MARKETS STUDY GUIDANCE

SUGGESTED STUDY FRAMEWORK AND SCOPE FOR THE NCGA & NCUC FROM
THE NORTH CAROLINA ENERGY REGULATORY PROCESS

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ACKNOWLEDGMENTS

The authors thank the following individuals/organizations for offering their insights and perspectives on this work.

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This work was last updated on 12/21/2020.

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ABOUT THE NORTH CAROLINA ENERGY REGULATORY PROCESS

Governor Cooper's Executive Order 80 mandated the development of a clean energy plan for the state of North Carolina. The Clean Energy Plan recommended the launch of a stakeholder process to design policies that align regulatory incentives with 21st century public policy goals, customer expectations, utility needs, and technology innovation. The stakeholder process was launched in February 2020 and has led to policy proposals on energy reform.

About this document

This guidance document contains a detailed discussion of wholesale electricity market mechanisms with a specific focus on regional transmission operators, energy imbalance markets, and the southeast energy exchange market. It includes recommendations for the NCGA and the NCUC to consider if and when the NCGA authorizes the NCUC to conduct a study of wholesale electricity market reform. The document represents the consensus work of the NERP process stakeholders, however, NERP stakeholders do not necessarily endorse all of the ideas or recommendations herein.

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SUMMARY OF RECOMMENDATIONS

This document contains the recommended framework, authorization, context, and key elements of a study into wholesale electricity market reform for North Carolina developed by the North Carolina Energy Regulatory Process (NERP) participants. The primary intended audience is the NC General Assembly (NCGA) and the NC Utilities Commission (NCUC), as the NCGA may authorize the NCUC to conduct such a study. The document contains detailed descriptions of each wholesale mechanism reviewed by NERP: regional transmission operator (RTO), energy imbalance market (EIM), and the southeast energy exchange market (SEEM) defined below. NERP participants met throughout 2020 and developed the following guidance document to assist any study into wholesale electricity market reform for North Carolina.

Study scope

1. The study, and any resulting reform proposed or enacted, should be designed to provide for just and reasonable rates and be consistent with the public interest, including the goals of the Clean Energy Plan.
2. The study must be required to offer recommendations to the General Assembly as to whether any of the market structures should be pursued further.
3. The study must recommend whether legislation is to be brought forward to allow reform of the wholesale electricity marketplace.
4. The study must recommend a model for wholesale competition that should be implemented if applicable.
5. The study must recommend a stepwise approach to incorporating municipal and cooperative electricity generators and providers into wholesale market reforms, as needed.

NERP recommendations

NERP recommends the General Assembly of North Carolina direct the NCUC to conduct a study on the benefits and costs of the following wholesale electricity market reforms and implications for the North Carolina electricity system.

1. A regional transmission organization (RTO) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
2. An energy imbalance market (EIM) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
3. The Southeastern Energy Exchange Market (SEEM), defined below, and
4. Any other structures that the NCUC determines worth investigating, such as,
 - a. Joining an existing RTO,
 - b. Developing joint dispatch agreements (JDA) beyond the current Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) agreement to include additional utilities in neighboring states and/or regionally, and
 - c. Developing a customer choice program that allows large customers, either at a single site or as an aggregate of multiple sites, to choose an independent electricity provider over the existing provider.

INTRODUCTION

Purpose

The purpose of this document is to communicate the findings of the NC Energy Regulatory Process (NERP) to the NC General Assembly (NCGA) and the NC Utilities Commission (NCUC), as the NCGA may authorize the NCUC to conduct a study into the potential costs and benefits of wholesale electricity market reform and implications for the North Carolina electricity system. It may also be of interest to other parties who want more information on wholesale electricity market mechanisms or the NERP process that is provided in the companion fact sheet.ⁱ

Context and history

On October 29, 2018, Governor Roy Cooper issued *Executive Order 80: North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy*.ⁱⁱ The Order established the North Carolina Climate Change Interagency Council and tasked the Department of Environmental Quality (DEQ) with producing a clean energy plan.

DEQ convened a group of stakeholders that met throughout 2019. In October 2019, DEQ released the *North Carolina Clean Energy Plan: Transitioning to a 21 Century Electricity System* (CEP).ⁱⁱⁱ Recommendation B-1 of the CEP states: “Launch a NC energy process with representatives from key stakeholder groups to design policies that align regulatory incentives and processes with 21st Century public policy goals, customer expectations, utility needs, and technology innovation.” That process was launched as NERP, which met throughout 2020.

Although initiated by CEP: B-1, the CEP listed multiple recommendations related to the state’s wholesale market:

- B-4: Initiate a study on the potential costs and benefits of different options to increase competition in the electricity sector, including but not limited to joining an existing wholesale market and allowing retail energy choice.
- C-1: Establish comprehensive utility system planning process that connects generation, transmission, and distribution planning in a holistic, iterative, and transparent process that involves stakeholder input throughout, starting with a Commission-led investigation into desired elements of utility distribution system plans.
- C-3: Implement competitive procurement of resources by investor-owned utilities.
- D-2: Use comprehensive utility planning processes to determine the sequence, needed functionality, and costs and benefits of grid modernization investments. Create accountability by requiring transparency, setting targets, timelines and metrics of progress made toward grid modernization goals.
- H-1: Identify and advance legislative and/or regulatory actions to foster development of North Carolina's offshore wind energy resources.

ⁱ <https://deq.nc.gov/CEP-NERP>

ⁱⁱ Executive Order 80. <https://governor.nc.gov/documents/executive-order-no-80-north-carolinas-commitment-address->

ⁱⁱⁱ NC Dept. of Environmental Quality. “North Carolina Clean Energy Plan” https://files.nc.gov/governor/documents/files/NC_Clean_Energy_Plan_OCT_2019_.pdf

NERP

The NERP, facilitated by Rocky Mountain Institute and the Regulatory Assistance Project, brought together roughly 40 diverse stakeholders to consider four main avenues of utility regulatory reform:

- PBR
- Wholesale market reform
- Competitive procurement of resources
- Accelerated retirement of generation assets

These stakeholders identified ten desired outcomes of reform in North Carolina, as shown below in Figure 1. Of those, the wholesale committee focused on:

1. Reducing emissions to net-zero by 2050,
2. Maintaining affordability and bill stability,
3. Developing regulatory incentives that are aligned with cost control and policy goals, and
4. Improving integration of distributed energy resources (DERs) onto distribution and transmission systems.

Outcome Category	Outcome
Improve <u>customer value</u>	Affordability and bill stability
	Reliability
	Customer choice of energy sources and programs
	Customer equity
Improve <u>utility regulation</u>	Regulatory incentives aligned with cost control and policy goals
	Administrative efficiency
Improve <u>environmental quality</u>	Integration of DERs
	Carbon neutral by 2050
Conduct a quality <u>stakeholder process</u>	Inclusive
	Results oriented

Figure 1: PRIORITY OUTCOMES IDENTIFIED BY NERP

Wholesale Electricity Markets Study Group

A subset of NERP participants volunteered to serve on a wholesale market study group and began meeting in late May 2020 (see page 2 for a list of groups members). The group met regularly to advance research into wholesale electricity market mechanisms deemed relevant to North Carolina due to physical proximity or because said mechanisms were either proposed or technically possible in NC.

The study group presented a series of mechanism studies to the broader NERP group, detailing the potential implications of each market reform, and why further investigation into each reform is warranted. Feedback was received from NERP participants and incorporated into a proposed wholesale electricity markets reform study outlined detailed below.

NERP companion documents

NERP produced the following documents for dissemination, to inform subsequent policy discussions with various audiences:

Legislative Language Authorizing the NCUC to conduct a wholesale market reform study: A number of wholesale reforms are relevant to NERP stakeholder organizations, recent academic research, and adjacent state policies. The study authorized by this language considers the costs and benefits of wholesale electricity market reform at the state and regional level.

A Meta-Analysis of proposed market reforms. As each market reform features a number of similarities and points of comparison, the group provides a high-level review of key market criteria.

Market Structure Factsheets:

Each construct outlined in the meta-analysis are featured in 2-to-3-page factsheets which provide greater detail on the respective markets.

Definitions

The following terms are used throughout the document:

- Regional transmission organization (RTO) - (also known as an Independent System Operator (ISO)) - a nonprofit entity that independently manages the transmission system of participating utilities. RTOs/ISOs run energy markets and centrally dispatch energy subject to economic and reliability constraints. (Less flexible generation may also self-schedule to continuously run.) RTOs/ISOs sometimes also run capacity and other grid services markets. FERC has encouraged the creation of RTOs/ISOs but has not required them.
- Energy imbalance market (EIM) - a voluntary market for dispatching real-time energy across utility service territories. Each participating utility retains ownership and control of its transmission assets but opts to bid generation into a centralized dispatch authority.
- Energy exchange market (EEM) - a voluntary market for facilitating bilateral sales of real-time energy across utility service territories. Each participating utility retains ownership and control of its transmission assets but may buy or sell excess power from/to neighboring utilities.
- Southeastern Energy Market (SEEM) - A proposed 15-minute automated energy exchange market between balancing authorities of the southeastern U.S. involving over fifteen entities.
- Wholesale electricity market – a market where electric energy is bought and sold for resale. Under the Federal Power Act, wholesale electricity transactions including those conducted through organized markets are regulated by the Federal Energy Regulatory Commission.
- Retail electricity market – a market where electric energy is sold to end users/consumers. Under the Federal Power Act, retail electricity transactions are regulated by state public utility commissions.
- Distributed energy resources (DERs) - small electricity generators that are connected to the local distribution system or installed behind the meter of an electricity consumer. These resources may include rooftop solar, EV charging stations, smart appliances, and on-site fuel cells.
- Joint dispatch agreements (JDA) - a type of power pool arrangements where utilities agree to jointly dispatch generation resources to meet load requirements across their footprints. Here, one of the utilities will conduct the dispatch; by contrast, for an energy imbalance market or an RTO, an independent nonprofit entity is in charge of dispatch. Each participating utility retains ownership and control of its transmission assets.
- Greenhouse gases – air pollutants that trap and emit radiant heat, warming the earth's atmosphere.

STUDY SCOPE AND FRAMEWORK

Rationale

The large majority of the electric service in North Carolina is currently provided by vertically integrated utilities that provide electric generation, transmission and distribution services to customers in the state, including approximately 85% of the state's electricity generation.

The adoption of North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard (REPS) in 2007, enabled the state to:

1. Diversify its electricity resources with solar, wind and biofuels,
2. Offset over 10% of its electricity demand with renewable resources and energy efficiency measures,
3. Create over \$2 billion worth of new businesses and 4,307 jobs in renewable energy and energy efficiency, and^{iv}
4. Reduce emissions of carbon dioxide by 9%.

North Carolina seeks to

1. Expand its development of new, low-cost electricity resources in the state,
2. Encourage additional private investment in these resources as well as ancillary businesses,
3. Create new tax bases and economic opportunities, and
4. Accelerate the deployment of zero emitting resources.^v

The North Carolina Energy Regulatory Process (NERP) has identified that reforming the structure of the existing wholesale electricity market and electricity transmission services could potentially promote the development of, and access to, low-cost electricity resources for the benefit of North Carolina consumers.

The NERP also identified several key goals for North Carolina's electricity system, in addition to developing low-cost electricity resources, that could potentially be promoted with restructuring wholesale electricity markets and transmission systems including:

1. Reducing greenhouse gas emissions to net-zero by 2050,
2. Maintaining affordability and bill stability,
3. Developing regulatory incentives that are aligned with cost control and policy goals, and
4. Improving integration of distributed energy resources (DERs) onto distribution and transmission systems.

Discussions about a more competitive electricity market are not new. The North Carolina General Assembly enacted legislation in 1999 to study the use of wholesale and retail electricity markets in the state, which recommended a more competitive system but was never implemented. More recently, the South Carolina legislature authorized a study (SC HB 4940) to be completed on November 1, 2021 that examines the benefits of various restructuring options for electricity markets associated with electricity generators, transmitters and distributors in South Carolina including the following:

1. Creating a regional transmission organization (RTO) or an energy imbalance market (EIM) with energy providers in neighboring states to enable a competitive wholesale market for electricity, and
2. Separating the existing vertically integrated electric utilities into two distinct entities: companies that generate electricity and companies that transmit and distribute electricity, and
3. Giving customers in the state the ability to choose their electricity provider.

In a similar fashion, NERP participants have identified that a study of competitive markets in North Carolina be also conducted. Changes to the electricity sector regulatory framework, such as restructuring the existing wholesale electricity markets and transmission services may require changes to state law as well as federal authorization. The

^{iv} *The Solar Economy Widespread Benefits for North Carolina*, Center on Globalization, Governance & Competitiveness (CGGC), Social Science Research Institute at Duke University, February 2015, https://www.seia.org/sites/default/files/resources/Duke_CGGC_NCSolarEnergyReport.pdf

^v *North Carolina Clean Energy Plan*, North Carolina Department of Environmental Quality, October 2019, <https://deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-16>

purpose of this document is to define the study scope and describe elements to be examined that equips policy makers on the pros and cons of future decision making.

Study authorization

The General Assembly of the State of North Carolina would need to authorize the North Carolina Utilities Commission (NCUC) to conduct a study of wholesale competitive market structures, the respective transmission services, and their potential impact on achieving the NERP goals set out above for the state's electricity system, consumers, environment, and economy in a cost-effective manner while also providing low-cost electricity and other ancillary benefits to North Carolina electricity customers.

NERP recommendations

NERP recommends the General Assembly of North Carolina direct the NCUC to conduct a study on the benefits and costs of the following wholesale electricity market reforms and implications for the North Carolina electricity system.

1. A regional transmission organization (RTO) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
2. An energy imbalance market (EIM) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
3. The Southeastern Energy Exchange Market (SEEM),
4. Any other structures that the NCUC determines worth investigating, such as,
 - a. Joining an existing RTO,
 - b. Developing joint dispatch agreements (JDA) beyond the current Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) agreement to include additional utilities in neighboring states and/or regionally, and
 - c. Developing a customer choice program that allows large customers, either at a single site or as an aggregate of multiple sites, to choose an independent electricity provider over the existing provider.

Study Outputs

A study should determine the overall impacts due to changing wholesale electricity regulation in North Carolina to a more competitive market structure.

The study must be required to offer recommendations to the General Assembly as to whether any of these market structures should be pursued further. This includes:

1. Recommending whether legislation is to be brought forward to allow reform of the wholesale electricity marketplace,
2. Recommending a model for wholesale competition that should be implemented if applicable, and
3. Recommending a stepwise approach to incorporating municipal and cooperative electricity generators and providers into wholesale market reforms, as needed

Relevant context and potential study criteria

While not agreed to by all of the involved stakeholders, some stakeholders recommend that the following options should also be studied:

1. Join an existing regional transmission organization (particularly if this is an option studied in South Carolina),
2. Develop joint dispatch agreements (JDA) beyond the agreement that currently exists between Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) to include additional utilities in neighboring states and/or regionally, and
3. Develop a customer choice program that allows large customers, either at a single site or as an aggregate of multiple sites, to choose an independent electricity provider over the existing provider.

North Carolina recognizes the value of its existing nuclear resources to provide zero-greenhouse gas (GHG) emitting, reliable, base load electricity to North Carolina. Given this, the study should consider the impacts new wholesale market

structures would have on the ability of these resources to continue to provide electricity generation and remain financially secure.

North Carolina recognizes the value of ongoing efforts to modernize North Carolina's electricity transmission and distributions system and the study should address whether or not any of the market structures would impact that any improvements resulting from these efforts.

The North Carolina Clean Energy Plan recommended GHG emissions reduction targets of 70% by 2030 and net-zero GHG emissions by 2050 and Duke Energy's stated corporate-wide carbon dioxide (CO₂) emissions reduction targets of 50% by 2030 and net-zero by 2050. The NCUC should consider achievability of these emissions targets for each market structures studied. North Carolina is potentially pursuing other aspects of utility regulatory reform and environmental policy related to the electricity sector, including a policy to reduce GHG emissions from the electricity sector, and the study should consider these reforms and policies where possible, given the level of detail on the polices and reforms available when this study is conducted.

North Carolina values a) stakeholder input into electricity regulatory and policy development processes and b) social equity in providing utilities to all communities and customer classes. The NCUC should consider how to maintain these values when performing the study.

While developing the study criteria, the NCUC should consider: a) the "Study Commission on the Future of Electric Service in North Carolina dated May 16, 2000 b) the proposed legislation regarding Grid South developed in the late 1990's through 2002, and c) the current study authorized by South Carolina House Bill 4940.^{vi}

^{vi} South Carolina House Bill 4940 accessed at https://www.scstatehouse.gov/sess123_2019-2020/bills/4940.htm

STUDY SCOPE AND FRAMEWORK

The study should examine impacts, including quantifying costs and benefits where possible, to the following aspects of the electricity system:

- I. Electricity generation and capacity adequacy and diversity
- II. Transmission systems
- III. Customer service and rates
- IV. Environmental quality
- V. Economic opportunity
- VI. Affect on State regulatory authority of electricity systems.
- VII. A comparison of the costs, benefits and impacts between the current system and the various market structures.

Electricity generation and capacity adequacy and diversity

Competitive wholesale electricity markets create more competition primarily on the power generation side, where market participants are plentiful as opposed to transmission, which has very few providers due to its highly regulated nature and obligations to serve. Over time, wholesale market reform could have a major influence on the selection of which new energy resources get added to the electricity grid to serve North Carolina. Competitive markets create advantages for lower cost power plants that can be located inside or outside the former power company's territory. Some stakeholders believe that third party ownership lowers risk for ratepayers and creates opportunities for newer technologies. Other stakeholders are concerned that wholesale market reform structures would remove some of North Carolina's control over its sources of electricity.

There are different levels of wholesale markets reform. More modest levels of reform such as the proposed SEEM and an EIM maintain the current generation and transmission ownership structure and allow companies to participate in a limited wholesale power market to trade energy – an energy market. Others such as an RTO could create a level of separation between companies that generate power from those that transmit. If the size and type of the competitive market is expanded beyond the existing structure sufficiently, competition among base load power suppliers can also be created - a capacity market.

A larger, more competitive electricity grid system may also change how clean, intermittent energy is deployed. Lastly, it may impact the growth of electricity demand based on new or existing programs that create incentives to either increase or decrease electricity use.

The current wholesale electricity market structure must be evaluated against the three options discussed above, SEEM, EIM and RTO to develop the relative advantages and disadvantages for North Carolina electricity generators and electric customers. Areas to examine include:

1. Impacts to resource adequacy, or ensuring there are sufficient electricity generation resources to supply power to meet demand at any given time with adequate reserve margin,
2. Impacts to the existing power plants on the system and their parent companies, especially in regard to plant economics, financial security and depreciation,
3. Impacts from the new power plants which are built and their parent companies, especially in regard to clean generation such as solar, wind and storage systems,
4. Financial impacts and efficiencies from sharing generation resources outside of the current system, especially in regard to clean energy,
5. Impacts to wholesale prices in the existing region due to more competitive procurement, and
6. Impacts to energy efficiency and demand side management including both existing programs and any future goals, and
7. Impacts to future changes in electricity demand, especially in regard to “beneficial electrification”, which is a shift to the use of clean electricity over existing fossil fuel energy.

Transmission systems

Some wholesale market forms would functionally unbundle power generation from transmission services. Others market forms merely create opportunities to purchase and transmit generation from other systems. Regardless of the market type, there will be changes to how the electricity grid system currently operates including its physical, operational and financial aspects. Some market structure options will create new entities that are involved in generating and transmitting electricity. The impacts from this increased complexity of the electricity system must be examined including the following:

1. Cost and complexity versus economic benefit of managing of a larger regional transmission system with increased flexibility in generation procurement on a sub-hourly timeframe,
2. Impacts to the reliability of the power supply at all times, especially during peak demand times, extreme weather events, and physical/cyber-attacks
3. Impacts to the resilience of the whole power system to recover quickly from extreme events,
4. Impacts to technical aspects of procuring and managing generation for the grid and grid support services, including interconnection to new grid regions, integration of new generation resources, grid congestion, and system balancing and operation,
5. Impacts to financial aspects of procuring generation, including regional system operational efficiencies, wholesale power prices, financial security of transmission and distribution entities, shifting from bilateral electricity contracts to near real-time energy markets, regional tariffs, and
6. Impacts to planning and developing grid infrastructure, including efforts to modernize the electricity grid to integrate clean energy and distributed energy and to provide new customer-oriented data and services.

Customer service and rates

The primary reason for studying potential moving to regional competitive wholesale electricity markets is to examine the impacts and benefits to electricity consumers, including financial and environmental. This would occur as a result of allowing competitive bidding among electricity generators from a larger region. The largest cost benefit comes from reducing the need to build more power plants in North Carolina by functionally sharing power plants in other grid regions. While numerous studies point to the financial benefits for electricity consumers, North Carolina consumers have goals for the electricity sector beyond low electricity rates that must be examined. Therefore, this study should examine both the financial impacts as well as other customer-oriented requirements and goals for the electricity sector including:

1. Quantifying the rate impacts to all customer classes and areas of North Carolina,
2. Impacts to fairness and equity in both electricity pricing and access among all customer classes and all areas of North Carolina,
3. Impacts to consumer protections,
4. Impacts of increased access to data and other new services desired by consumers, and
5. Impacts of transparency in wholesale pricing for customers.

Environmental quality

Most environmental issues associated with electricity generation and procurement are not directly impacted by switching to competitive wholesale markets. One direct impact may be increased transmission infrastructure. Other environmental issues could be indirectly impacted. For instance, air emissions are decreasing in some RTO and EIM regions due to building lower cost, cleaner power plants. However, some of these market structures pose greater challenges in implementing state level environmental policy, specifically RTOs. Recently, the federal government has considered changes to existing RTOs regulations that would resolve some of the issues faced by states pursuing environmental goals within the RTO framework.

Economic incentives for lower cost electricity generation could influence a) the type of power plants constructed in the future and b) the type of power that is purchased to meet electricity demand in North Carolina. These economic decisions would impact environmental and public health outcomes not just inside North Carolina's borders, but outside our borders as well. Such impacts include the following:

1. Greenhouse gas emissions per megawatt-hour of electricity generated and/or consumed from the electricity system supplying power to North Carolina (i.e., both in-state and imported generation),
2. Impacts to air quality from the electricity system supplying power to North Carolina,
3. Impacts to land and water resources due to both building new power plants and transmission systems and decommissioning existing plants in North Carolina,
4. Public health outcomes from the increased/decreased operation of power plants supplying power to North Carolina, and
5. Impacts to the current or future use of clean energy resources to supply power to North Carolina, where these resources may be located either inside or outside the state,
6. Environmental justice and equity concerns where specific community impacts are identified, and
7. Just transition concerns to communities affected by retiring assets.

Economic opportunity

Competitive wholesale electricity markets could create economic opportunities in North Carolina due to independent power producers being able to more readily access North Carolina electricity markets as well as the potential impacts of lower electricity rates. However, there may be some negative economic impacts as well. Therefore, the study should quantify the economic impacts from the proposed wholesale market structures options including:

1. Impacts to the economy from changes to electricity technological and infrastructure investments,
2. Responses to changes in wholesale pricing of electricity for North Carolina businesses,
3. Impacts to the creation and/or retention of jobs in the state,
4. Impacts to rural and disadvantaged communities, and
5. Impact of competition on tax revenues and/or subsidies in various areas of North Carolina.

Impact on State regulatory authority of electric systems

Competitive markets, depending on their structure, would potentially create additional administrative entities within the electricity system. Combined, these entities would be responsible for overseeing the newly created market and electricity procurement and transmission to consumers across a wider grid region and at sub-hourly timeframes. At a minimum, it could require increased coordination among existing electricity generation and transmission entities. Therefore, there are administrative issues which must be studied that may result in impacts to the critical areas discussed above, as well as potential changes to the role of the NCUC. Administrative concerns that should be evaluated for the wholesale market structures include:

1. Electricity system governance structure and administrative costs versus benefits,
2. Delegation of authority,
3. Reciprocity between states,
4. Clarification of state and federal jurisdiction, including reliance on other states joining North Carolina to implement wholesale market reform options,
5. Impacts to energy regulatory and policy innovation, including stakeholder involvement in its development,
6. Responsibilities of owners and operators of electricity grid generation and transmission, and
7. Impacts to state government regulation of electricity supply, transmission and distribution.

Comparison of market approaches

Lastly, the study should clearly layout the fundamental differences between the current market structure and the three proposed competitive markets systems being studied. A key element in this comparison is determining the a) size of the region and b) level of competition that is necessary for benefits to outweigh the costs of the proposed reforms. Such differences should include the following:

1. Overall effectiveness of each mechanism in meeting NERP goals,
2. Comparison of costs, benefits, and risks for each mechanism,
3. Level of competition resulting from each mechanism,
4. Impacts to system adequacy and reliability,
5. Level of administrative impacts from each mechanism,
6. Level of transparency in procurement of electricity, wholesale pricing, and customer data for each mechanism, and
7. Implementation timelines for each mechanism.

CONCLUSION

To summarize, NERP recommends the General Assembly of North Carolina direct the NCUC to conduct a study on the benefits and costs of the following wholesale electricity market reform options and the related implications for the North Carolina electricity system:

1. A regional transmission organization (RTO) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
2. An energy imbalance market (EIM) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
3. The Southeastern Energy Exchange Market (SEEM), defined above,
4. Any other structures that the NCUC determines worth investigating, such as,
 - a. Joining an existing RTO,
 - b. Developing joint dispatch agreements (JDA) beyond the current Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) agreement to include additional utilities in neighboring states and/or regionally, and
 - c. Developing a customer choice program that allows large customers, either at a single site or as an aggregate of multiple sites, to choose an independent electricity provider over the existing provider.

Members of this NERP stakeholder group will continue to collaborate in early 2021 to assist the State and parties interested in the work conducted by this group.

APPENDIX

The following documents were prepared by the wholesale electricity markets study committee to supplement this guidance document and the proposed legislative language.

- RTO fact sheet
- EIM fact sheet
- SEEM fact sheet - produced by utilities sponsoring SEEM; included here to provide additional detail on this proposal
- Meta-analysis of market structures
- Wholesale electricity market reform study bill

NERP FACT SHEET

REGIONAL TRANSMISSION ORGANIZATION

A FACTSHEET PRODUCED BY THE WHOLESALE ELECTRICITY MARKETS STUDY GROUP

The 2020 North Carolina Energy Regulatory Process identified wholesale electricity market reforms that could potentially benefit North Carolina consumers.

WHAT IS REGIONAL TRANSMISSION ORGANIZATION?

A Regional Transmission Organization (RTO) is a type of electricity market over a large region that uses an independent operator to manage the transmission system of the utilities participating in the market. Some characteristics of RTOs include the following:

- Administers and operates the transmission system through an independent entity,
- Fosters competition among generators with an open-access approach to transmission,
- Provides centralized, automated, real-time balancing of supply and demand,
- Dispatches all electricity across the system using a least-cost approach, and

- Requires mandatory participation by utilities and independent power producers in the market.

A similar market system to an RTO is an Independent System Operator (ISO).¹ About two-thirds of U.S. customer electricity demand is served by RTOs or ISOs as shown in Figure 1.

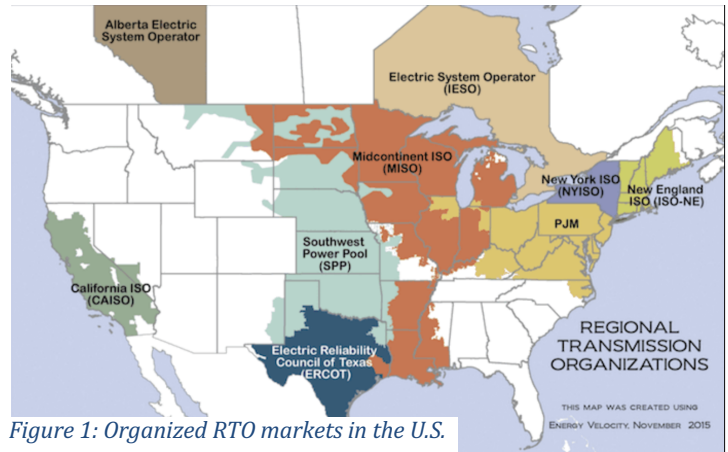


Figure 1: Organized RTO markets in the U.S.

¹ See <https://www.ferc.gov/industries-data/electric/power-sales-and-markets/rto-and-isos> for more information on RTOs and ISOs.

There are additional markets and services provided by RTOs. These include the following:

- Voluntary or mandatory capacity markets where generators commit to provide electricity in the future (also called the day-ahead market), and
- Voluntary ancillary markets related to grid operation such as voltage regulation.

HOW DOES THE ENERGY MARKET WORK?

RTOs create competitive wholesale electricity markets. A simplified overview of the market is outlined below.

1. RTO grid operators balance supply and demand for all electricity used in the market over 5-minute intervals in real-time using an automated system.
2. Each generator is required to supply a bid to the grid operator for a specific amount and price of electricity.
3. The grid operator puts together a set of bids, starting with the least-cost bids, until the demand for that interval is met. All other bids remain unfilled.
4. Less flexible nuclear and coal generation may still self-schedule to run continuously.
5. The grid operator must ensure a reliable supply of energy at all times and deal with any outages.

Recent FERC orders have directed RTOs to change their rules in a way that accommodates demand response programs (Order 745), energy storage (Order 841) and aggregations of distributed energy resources (Order 2222). Therefore, new market participants could develop to offer these products and services into the RTO's energy, capacity, and ancillary services markets.

HOW IS THE MARKET MANAGED?

RTOs and ISOs have an independent, non-profit entity with complete authority over the following aspects of the system:

- Transmission facilities and their operation,
- Transmission planning, expansion, administration and management,
- Non-discriminatory transmission service,
- Short-term reliability of the grid, and
- Fair, competitive energy market supplying least-cost generation.

RTOs and ISOs are regulated by Federal Energy Regulatory Commission (FERC) with specific rules and requirements for administering and operating these markets. Any changes to the market operation must be approved by FERC. Changes also require multi-state and multi-utility engagement in this process as well.

WHAT ARE THE BENEFITS OF AN RTO?

The primary benefit of an RTO is lowering wholesale energy costs and transferring these cost-savings to rate payers. Specific examples of these cost-savings are given below.

- PJM Interconnection estimates its services produce annual savings of \$3.2–\$4 billion.²
- Midcontinent Independent System Operator (MISO) estimates that its services produced savings in 2019 of \$3.2–\$4 billion compared to standard industry practice.³
- Southwest Power Pool (SPP) estimates that for 2018, its services provided \$2.2 billion in annual net benefits with a benefit-to-cost ratio of 14:1.⁴

Utilities have achieved cost savings from joining an RTO. For example, Dominion's economy energy purchases from PJM's day-ahead market saved about \$75 million in 2013 alone, compared to if Dominion had self-generated the same energy.⁵ Entergy, joined MISO in December 2013. Entergy has estimated the five-year savings realized by its customers from joining MISO to be about \$1.3 billion, an average of \$261 million annually.⁶

While there are cost-savings from joining an RTO, there may be costs associated with the transition into an RTO, and

² See, e.g., FERC Docket No. ER20-2100-000, Motion to Lodge of PJM Interconnection, LLC (Oct. 19, 2020), <https://www.pjm.com/-/media/documents/ferc/filings/2020/20201019-er20-2100-000-er20-1068-000.ashx>.

³ MISO Value Proposition 2019: Detailed Calculation Description, <https://cdn.misoenergy.org/2019%20MISO%20Value%20Proposition%20Calculation%20Details425713.pdf>.

⁴ Southwest Power Pool, 14 to 1: The Value of Trust (2019), <https://spp.org/documents/58916/14-to-1%20value%20of%20trust%2020190524%20web.pdf>.

⁵ "Potential Benefits of a Regional Wholesale Power Market to North Carolina's Electricity Customers", Prepared by Judy Chang, Johannes Pfeifenberger, John Tsoukalis, for the Brattle Group, April 2019, accessed at https://brattlefiles.blob.core.windows.net/files/16092_nc_wholesale_power_market_whitepaper_april_2019_final.pdf

⁶ Entergy Newsroom, "Entergy Utility Customers Realize Significant Benefits After 5 Years as MISO Member" (Dec. 16, 2019), <https://www.entergynewsroom.com/news/entergy-utility-customers-realize-significant-benefits-after-5-years-as-miso-member/>.

administering the RTO, which should be accounted for in any cost-benefit analysis conducted for North Carolina.

Another benefit of the RTO is creating economic incentives for new independent power producers. More equitable access to transmission allows these producers to enter the energy, capacity and ancillary services markets if they can provide a lower-cost power supply.

Lastly, an RTO can improve power system efficiency, reliability and flexibility. Fluctuations in supply and demand in the smaller balancing areas can be mitigated by pooling electricity resources from a larger area. Outages can be better supported as well.

RTOs do not create specific benefits to lower greenhouse gas (GHG) emissions. However, an RTO may decrease the use of fossil-fuel based resources and decrease GHG emissions by creating a more favorable market for low-cost, non-emitting energy resources.

WHAT IS THE GOVERNANCE STRUCTURE FOR THE MARKET?

RTO governance structures are not dictated by FEC, therefore, each of the RTOs/ISOs have the different governance structures. However, there are some commonalities presented below.

- A Board of Directors that is independent from the RTO/ISO management with 5 to 9 members who are nominated to serve by a committee, the governance board, stakeholders, or elected officials.
- Set of Standing Committees under the Board that oversee development of policies and performance of functional activities. Examples of committees include finance, audit, human resources, and legal.
- An Advisory Committee that receives, reviews, and adjudicates recommendations and concerns from stakeholder sectors.
- A Stakeholder Committee, which is a collection of members that advocate for various aspects of the electricity sector and public good while also respecting members' common interests within the broad diversity of RTO/ISO stakeholders. Members include representatives from transmission owners, generators, transmission users, other suppliers, state regulators and consumer organizations.

HOW ARE EXISTING UTILITIES IMPACTED BY THE MARKET?

Vertically integrated utilities (VIUs), those that own and operate generation, transmission and distribution systems, are most impacted by joining an RTO due to the independence of the transmission system. Utilities such as municipal and rural electric cooperatives can actually compete more fairly with VIUs in an RTO by both supplying and purchasing low-cost wholesale electricity. The impacts for utilities are discussed below.

- VIUs maintain ownership of the transmission system but cede control over its operation and planning to the independent RTO. Utilities continue to own, operate and expand their distribution systems and customers.
- Utilities might, or might not continue to own, operate and expand their generation resources. In some RTOs, but not all, utilities were required to sell their generation assets. Some RTOs have optional or mandated generation capacity markets that determine which generation resources enter and exit the market.
- Utilities' generating resources must compete with each other and independent power producers.
- Utilities can decrease their capacity reserves.
- Utilities with state-mandated environmental or clean energy goals can continue to meet these goals, however, least-cost dispatch may impact how these goals are met.

This fact sheet represents the work of stakeholders as of 12/18/2020.

About the North Carolina Energy Regulatory Process

Governor Cooper's Executive Order 80 mandated the development of a clean energy plan for the state of North Carolina. The Clean Energy Plan recommended the launch of a stakeholder process to design policies that align regulatory incentives with 21st century public policy goals, customer expectations, utility needs, and technology innovation. The stakeholder process was launched in February 2020 and has led to policy proposals on energy reform.

LEARN MORE

Contact Wholesale Market Reform Study Group Lead:
Chris Carmody, NCCEBA, director@ncceba.com
Access the NERP summary report and other NERP documents at:
<https://deq.nc.gov/CEP-NERP>

NERP FACT SHEET

ENERGY IMBALANCE MARKET

A FACTSHEET PRODUCED BY THE WHOLESALE ELECTRICITY MARKETS STUDY GROUP

The 2020 North Carolina Energy Regulatory Process identified wholesale electricity market reforms that could potentially benefit North Carolina consumers.

WHAT IS AN ENERGY IMBALANCE MARKET?

An energy imbalance market is a type of electricity market that uses an independent entity to manage the energy imbalances between supply and demand within multiple balancing authority areas (BAAs). Some characteristics of an EIM include the following:

- Administers and operates the market through an independent entity,
- Provides centralized, automated, and region-wide generation dispatch for imbalances,
- Fosters competition among generators using a least-cost approach to supply energy,
- Allows voluntary participation in the market by utilities and independent power producers.

There is currently only one EIM in the U.S., the Western Energy Imbalance Market operated by the California Independent System Operator (ISO). In 2021, the Southwest Power Pool (SPP) plans to launch a new energy imbalance service market

over a broader geographic area. Figure 1 presents the Western EIM and its active and pending participants.¹

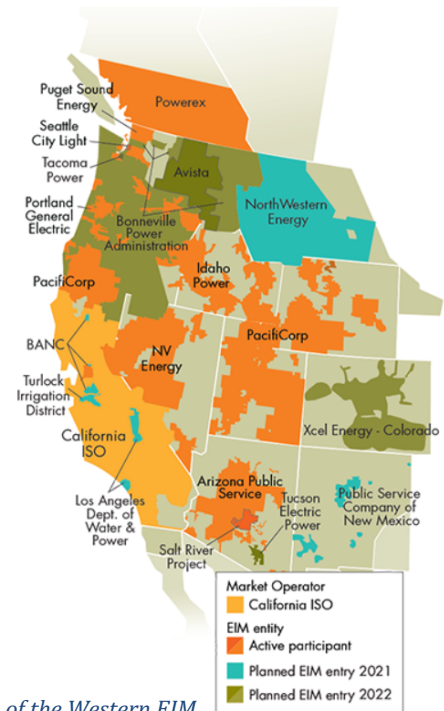


Figure 1: Map of the Western EIM

¹ Active and pending participants in the Western Energy Imbalance Market, accessed at <https://www.westerneim.com/Pages/About/default.aspx>.

An EIM does not provide day-ahead capacity markets. It may provide voluntary ancillary markets related to grid operation such as voltage regulation.

HOW DOES THE ENERGY MARKET WORK?

An EIM is a platform for balancing fluctuations in electricity supply and demand across multiple BAAs to meet real-time demand. A simplified overview of the market is outlined below.

1. The EIM platform balances supply and demand in the market over sub-hourly intervals in real-time using an automated system.
2. Each BAA voluntarily participates by issuing requests for energy to the EIM platform.
3. Generators volunteer to supply energy outside their balancing area via a bid in the market platform for a specific amount and price of electricity.
4. The platform matches least-cost energy bids with demand in each BAA until the demand for that interval is met.
5. Utilities/balancing authorities continue to control and schedule their generation resources as before.
6. The market is security-constrained, meaning transmission and reliability constraints must be honored.

Recent FERC orders have directed wholesale markets to change their rules in a way that accommodates demand response programs (Order 745), energy storage (Order 841) and aggregations of distributed energy resources (Order 2222). These orders could potentially extend to the voluntary participants in EIMs as well, and facilitate participants offering these products and services to the EIM's energy market.

If the Clean Smokestacks Act, Senate Bill 3, House Bill 589, and other landmark state clean energy legislation are any indication, further state legislative action will be crucial to the future of the state's clean energy transition. In particular, performance-based regulation can help catalyze clean energy innovation.

HOW IS THE MARKET MANAGED?

EIMs have an independent, non-profit entity with complete authority over the following aspects of the system:

- Non-discriminatory transmission balancing service,
- Short-term reliability of the grid, and

- Fair, competitive energy market supplying least-cost generation.

EIMs are regulated by Federal Energy Regulatory Commission (FERC) with specific rules and requirements for administering and operating these markets. Any changes to the market operation must be approved by FERC. Changes also require multi-state and multi-utility engagement in this process as well.

WHAT ARE THE BENEFITS OF AN EIM?

- Lowers wholesale energy costs by ensuring least-cost dispatch to meet energy imbalances in the market.
- Reduces costs for participants by lowering the amount of capacity reserves utilities need to carry, and more efficient use of the regional transmission system.
- The Western EIM has quantified the gross and annual cost-savings.²
 - Gross benefits for the entire EIM are \$1.11 billion between Nov 2014 through October 2020,
 - Annual benefits for 2019 were \$297 million,
 - Annual benefits for 2018 were 276 million, and
 - Annual benefits for 2017 were \$145 million
- Enhances reliability by increasing operational visibility across electricity grids and improves management of transmission line congestion.
- Creates a market where there is more efficient use and integration of renewable energy across a larger region.
- EIMs do not create specific benefits to lower greenhouse gases (GHGs). However, an EIM may decrease the use of fossil-fuel based resources and decrease GHG emissions by creating a more favorable market for low-cost, non-emitting energy resources.

WHAT IS THE GOVERNANCE STRUCTURE FOR THE MARKET?

Governing Body

The Western EIM has a five-member board nominated by participating members. Board members come from a variety of backgrounds, and include utility executives, regulators, and energy economists.

² See Western Energy Imbalance Market: Benefits at <https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx>

Regulatory Committee

The Western EIM has a regulatory committee made up of a utility commissioner from every participating state. Members are regularly briefed on EIM developments, plans, and results, and have input into decisions.

Transparency & Public Involvement

The Western EIM has a Regional Issues Forum held three times a year, which is a “public meeting for stakeholders to discuss broad issues about the Western EIM. The Forum encourages collaboration and helps shape policy and find solutions to challenges in the energy industry.”³

HOW ARE EXISTING UTILITIES IMPACTED BY THE MARKET?

Vertically integrated utilities (VIUs), those that own and operate generation, transmission and distribution systems, are not significantly impacted by joining an EIM. Utilities such as municipal and rural electric cooperatives can actually compete more fairly with VIUs in an EIM by both supplying and purchasing low-cost wholesale electricity to meet energy imbalances. The impacts for utilities are discussed below.

- Utilities continue to own, operate and expand their transmissions and distribution systems.
- Utilities continue to own, operate and expand their generation resources.
- Utilities’ generating resources must compete with each other and independent power producers.
- Utilities can decrease their capacity reserves.
- Utilities with state-mandated environmental or clean energy goals can continue to meet these goals, however, least-cost dispatch may impact how these goals are met.

WHAT IS BEING RECOMMENDED?

The North Carolina Energy Regulatory Process (NERP) has proposed a study, conducted by the NCUC, into the benefits and costs of wholesale market reform and implications for the NC electricity system.

A proposed study rationale, elements, authorization, and funding, titled North Carolina Wholesale Market Reform Study Scope and Criteria, accompanies this report. NERP recommends the following market structures be evaluated:

1. A regional transmission organization (RTO) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
2. An energy imbalance market (EIM) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
3. The Southeastern Energy Exchange Market (SEEM), and,
4. Any other structures that the NCUC determines worth investigating,

This fact sheet represents the work of stakeholders as of 12/18/2020.

About the North Carolina Energy Regulatory Process

Governor Cooper’s Executive Order 80 mandated the development of a clean energy plan for the state of North Carolina. The Clean Energy Plan recommended the launch of a stakeholder process to design policies that align regulatory incentives with 21st century public policy goals, customer expectations, utility needs, and technology innovation. The stakeholder process was launched in February 2020 and has led to policy proposals on energy reform.

LEARN MORE

Contact Wholesale Market Reform Study Group Lead:
Chris Carmody, NCCEBA, director@nceeba.com

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<https://deq.nc.gov/CEP-NERP>

Southeastern Energy Exchange Market (SEEM)

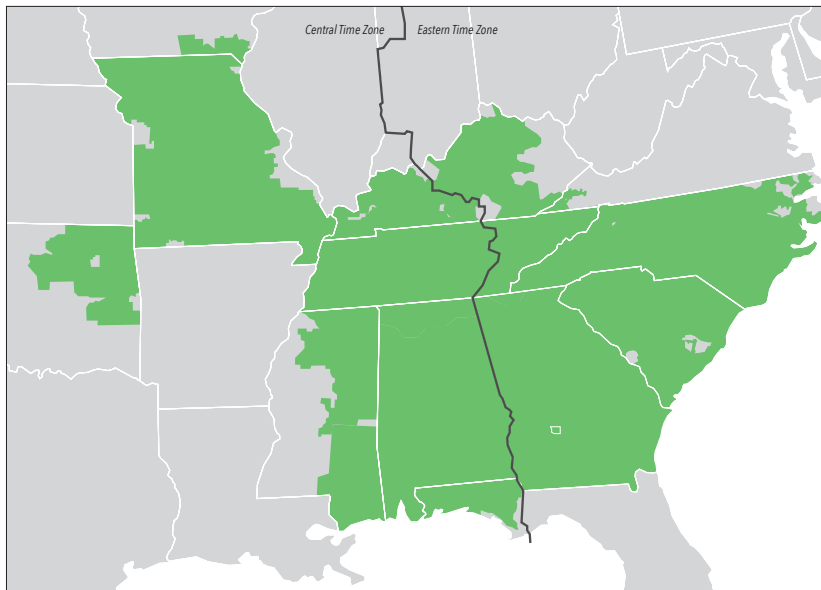


Fact Sheet

What is SEEM?

A group of energy companies serving electricity customers across a wide geographic region in the southeastern U.S. is exploring an integrated, automated intra-hour energy exchange with goals of lowering costs to customers, optimizing renewable energy resources and helping maintain the reliable service we provide today.

Companies exploring the energy exchange market include Associated Electric Cooperative Inc., Dalton Utilities, Dominion Energy South Carolina, Duke Energy Carolinas, Duke Energy Progress, Electricities of North Carolina, Inc., Georgia System Operations Corporation, Georgia Transmission Corporation, LG&E and KU Energy, MEAG Power, NCEMC, Oglethorpe Power Corp., PowerSouth, Santee Cooper, Southern Company, and TVA.



Members

- The members represent 16 entities in parts of 11 states with more than 160,000 MWs (summer capacity; winter capacity is nearly 180,000 MWs) across two time zones. These companies serve the energy needs of more than 32 million retail customers (roughly more than 50 million people).
- SEEM members would maintain existing control of generation and transmission assets, and membership is voluntary.

Benefits

- This is the first of its kind in our region and is a low-cost, low-risk way to provide immediate customer benefits through a shared market structure.
- SEEM would be a 15-minute energy exchange market that would use technology and advanced market systems to find low-cost, clean and safe energy to serve customers across a wide geographic area.
- Potential benefits include cost savings for customers and better integration of diverse generation resources, including rapidly growing renewables and fewer solar curtailments. An independent third-party consultant estimated that total benefits to grid operators and customers range from \$40 million to \$50 million annually in the near-term, to \$100 million to \$150 million annually in later years as more solar and other variable energy resources are added. (This is dependent, of course, on the number of member companies.)
- We expect customer savings to be realized through lower fuel costs as we're able to select lower-cost and more efficient generation resources to serve customer demand. As sellers identify a use for their excess energy, those profits also benefit customers.

Is SEEM an energy imbalance market?

No, while this market would share some of the same principles as an energy imbalance market (to assist with imbalances and reduce energy costs), it's less complex, less costly and less time intensive compared with setting up an EIM. It also does not rely on centralized unit dispatch.

How is SEEM similar or different from the Western Energy Imbalance Market?

	Western EIM	Southeast EEM
Resource Dispatch	5-minute nodal SCED market platform sends individual resource dispatch signals to participating resources every 5 minutes	15-minute block schedule via electronic interchange tags – BA/BA interface transactions – the Market Platform tool matches bids and offers to maximize benefit savings, while adhering to transmission capability (ATC) constraints
Complexity	Moderately complex due to establishing marketing system that also assesses security constraints	Simple due to leveraging existing bilateral trading processes
Costs	Significant startup costs	Low startup and ongoing costs
Transmission Service Charge	\$0/MWh	\$0/MWh
Ancillary Services	Limited	Limited
Manual/Automated	Automated	Automated
Day Ahead Market	No	No
Resource Offer into Market	Voluntary	Voluntary
Manages Imbalance	Directly	Indirectly

Regulatory approvals

FERC approval will be required to implement the SEEM. The FERC filing and approval process will provide an opportunity for the members of the SEEM to demonstrate the benefits of the proposed market design and for interested parties to provide feedback and comments for FERC to consider. State jurisdiction is limited to the affiliate component, if triggered, while FERC governs the structure and wholesale nature of the transactions.

What does this potential market mean for state utilities commissions and governing boards?

A primary objective is to maintain the same level of jurisdictional control and oversight as currently exists, where applicable, while facilitating more interchange transactions that support the cost-effective use of a diverse resource mix. FERC will have oversight authority as they do today to ensure those transactions occur with just and reasonable rates, terms and conditions.



Wholesale Electricity Markets Meta-Analysis: High-level comparison of market structures relevant to North Carolina

	Current State	SEEM	EIM	RTO
Scope	Business	Current state, plus the addition of Proposed SEEM	An EIM operating along the lines of the Western EIM	An RTO that meets the FERC definition
Examples	N/A – Baseline	None exists in US, one being developed	One EIM exists in US, one being developed	Seven RTOs exist in US, none developed after 2008
Customer Benefit <i>(For entire footprint – see notes)</i>		<ul style="list-style-type: none"> Forecasted net savings range from \$40 to \$50 million in early years, not net of costs¹ 	<ul style="list-style-type: none"> Western EIM self-reported energy savings in a recent year were \$296 million, not net of costs² 	<ul style="list-style-type: none"> RTOs self-reported net savings in a recent year ranged from \$2.2 to \$4 Billion each²
Time and Costs to Implement		<ul style="list-style-type: none"> 18-24 months, depending on regulatory approval One-time costs: estimated around \$5M 	<ul style="list-style-type: none"> 2-5 years (e.g., Western EIM took ~ 2 years, SPP WEIS > 2 years) One-time costs – SPP WEIS early estimate was \$65-75M 	<ul style="list-style-type: none"> 6-7+ years Benchmarks point to one-time costs of \$500-750M+ Brattle group estimate of \$59M annual operating costs for Duke’s NC system
Energy Market	<ul style="list-style-type: none"> Generation Offers: N/A Bilateral: day-ahead, hourly 	<ul style="list-style-type: none"> Generation Offers: voluntary Bi-lateral: day-ahead, hourly 15-minute bilateral transaction market 	<ul style="list-style-type: none"> Generation Offers: voluntary Bi-lateral: day-ahead, hourly 15-minute to 5-minute energy imbalance market 	<ul style="list-style-type: none"> Generation Offers: mandatory Real-time dispatch: day-ahead and sub-hourly market (varies: 15-minute to 1-minute)
Capacity Planning	Utility IRPs: States			RTO Design Dependent: <ul style="list-style-type: none"> If no capacity market, then Utility IRPs: States If in capacity market, then RTO: FERC
Support of Carbon Policies / Renewables	<ul style="list-style-type: none"> Carbon policy: Utilities aligned with state efforts RE Integration: Utilities aligned with state efforts 	<ul style="list-style-type: none"> Carbon policy: Utilities, aligned with state efforts Renewables Integration: Utilities aligned with state efforts More robust energy trading reduces needed curtailments of renewable resources 		If in capacity market, then resource additions subject to market pricing, RTO rules and FERC regulations; recent conflict re: FERC MOPR ⁴
Regional Allocation of Costs / Exit fees	N/A – Baseline	<ul style="list-style-type: none"> Operation: minimal Allocations for operations only Exit Charges: None 		<ul style="list-style-type: none"> Operation: substantial Substantial regional cost allocations, exit charges can be material⁵
Governance / Stakeholder Processes		<ul style="list-style-type: none"> No independent Board Platform Auditor Annual public stakeholder meeting⁶ 	<ul style="list-style-type: none"> Board with some independent members State regulators committee Stakeholders meetings 3X per year⁷ 	<ul style="list-style-type: none"> Independent Board State regulators committee Stakeholder approaches vary⁸
Pricing info/ transparency	FERC Electric Quarterly Reports (EQR)	<ul style="list-style-type: none"> FERC EQR SEEM aggregated data provided daily, monthly, quarterly 	<ul style="list-style-type: none"> FERC EQR Current pricing data provided by EIM 	<ul style="list-style-type: none"> Current pricing data provided by RTO

Note: See accompanying fact sheets on SEEM, EIM, and RTO’s for further details and explanation.

¹ SEEM benefit and cost information are projections.

² Benefit and cost information for EIMs and RTOs were taken from the most recent annual published statements of benefits from the existing markets. RTOs reported net savings, SEEM and EIM reflect energy savings, not net of costs.

None of the benefits figures were “scaled” to try to match just the NC or NC/SC market. Final market size and footprint is not determined yet and benefits will depend on the scale and diversity of region, resource mix, entities’ profiles, and EIM / RTO rules.

³ From “Potential Benefits of a Regional Wholesale Power Market to North Carolina’s Electricity Customers,” The Brattle Group, Table 3..

⁴ In recent years, public conflict between FERC MOPR and states’ climate and energy policies; subject to potential policy changes at FERC going forward.

⁵ Allocations for operations, transmission system expansion, compliance, enforcement of rules/penalties; exit charges can be substantial, particularly for Transmission Owners, based on design to keep the RTO financially whole on open commitments.

⁶ SEEM governance described more fully in the recently filed Southeast Energy Exchange Market Agreement.

⁷ EIM Governance info shown here was taken from Western EIM; actual governance in new EIM would be determined when created.

⁸ RTO Governance info shown here was taken from existing RTOs which all differ somewhat; actual governance in new RTO would be determined when created.

**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2021**

Short Title:

Sponsors:

Referred to:

A BILL TO BE ENTITLED

AN ACT TO (I) DIRECT THE NORTH CAROLINA UTILITIES COMMISSION TO CONDUCT A STUDY OF NORTH CAROLINA WHOLESALE ELECTRICITY MARKET REFORMS AND (II) ISSUE A REPORT TO THE NORTH CAROLINA GENERAL ASSEMBLY REGARDING PUBLIC BENEFITS AND ANY PROPOSED REFORMS

Whereas, much of the electric service provided in North Carolina is currently provided by vertically integrated providers of electric distribution and transmission services; and

Whereas, the State has adopted legislation including Session Law 2007-397 and Session Law 2017-192 to diversify the resources used to reliably meet the energy needs of consumers and provide economic benefits in the State; and

Whereas, North Carolina seeks to 1) expand its development of new, low-cost electricity resources in the state, 2) encourage additional private investment in these resources as well as ancillary businesses, 3) create new tax bases and economic opportunities, and 4) accelerate the deployment of zero emitting resources; and

Whereas, stakeholders that participated in the North Carolina Energy Regulatory Process (“NERP”) identified common outcomes to reduce greenhouse gas emissions, improve integration of distributed energy resources (“DERs”), improve customer choice of energy sources, provide energy affordability and bill stability, and align regulatory incentives with cost control and policy goals; and

Whereas, electricity sector regulatory framework changes to the wholesale electricity market may require changes to state law as well as federal authorization; and

Whereas, South Carolina legislature authorized a study (SC HB 4940) to be completed on November 1, 2021 that examines the benefits of various restructuring options for electricity markets associated with electricity generators, transmitters and distributors in South Carolina; and

Whereas, regional and interstate arrangements may require changes to laws in states other than North Carolina; Now, therefore,

The General Assembly of North Carolina directs:

SECTION 1. The North Carolina Utilities Commission (NCUC) to conduct a study and issue a final report to the General Assembly evaluating reform of the regulatory wholesale electricity market in North Carolina.

- (a) The proposed market structures to be evaluated by the NCUC in the study include:
- (1) A regional transmission organization (RTO) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
 - (2) An energy imbalance market (EIM) with the geographical boundaries of North Carolina and South Carolina or a larger area such as the southeast U.S.,
 - (3) The Southeastern Energy Exchange Market (SEEM) as defined in Section 4, and
 - (4) Any other structures that the NCUC determines worth investigating, such as,

- (i) Joining an existing RTO,
 - (ii) Developing joint dispatch agreements (JDA) beyond the current Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) agreement to include additional utilities in neighboring states and/or regionally, and
 - (iii) Developing a customer choice program that allows large customers, either at a single site or as an aggregate of multiple sites, to choose an independent electricity provider over the existing provider;
- (b) The NCUC is authorized to hire an independent consulting firm with experience and expertise in wholesale electricity markets to assist the NCUC with the study for \$500,000.
- (c) The study shall begin within one month of the legislation being enacted and the final report shall be delivered to the General Assembly within a reasonable timeline considering both SC HB 4940 and other ongoing activities occurring in North Carolina related to energy, environment, affordability, and other related policy goals.
- (d) The study shall address:
 - (1) The cost, benefits and risks to state and local government, utilities, independent power producers, businesses, and customers of all classes regarding the following aspects of the electricity system:
 - (i) Electricity generation and capacity adequacy and diversity;
 - (ii) Transmission systems;
 - (iii) Customer service and rates;
 - (iv) Environmental quality;
 - (v) Economic opportunity;
 - (vi) Affect on State regulatory authority of electricity systems.
 - (2) The legal and procedural requirements in North Carolina, at FERC, or in other states associated with adoption of any recommended electricity market reform measures, including identification of existing laws, regulations, and policies that may need to be amended in order to implement the electricity market reform measures;
 - (3) The impact to existing interstate and interregional arrangements from electricity market reform measures.
 - (4) 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 source of power while also providing significant employment and economic benefits, and this study is not intended to force divestiture of ownership or cessation of the operation of these nuclear power plants.
 - (5) The potential impacts, including costs and benefits, of electricity market reform measures on disadvantaged or vulnerable populations and/or communities.
 - (6) The NCUC should consider how to maintain the following values under the proposed wholesale market reform structures;
 - (i) Stakeholder input into electricity regulatory and policy development processes, and
 - (ii) Social equity in providing affordable electricity to all communities and customer classes.

SECTION 2. The NCUC shall develop recommendations for North Carolina's wholesale electricity market based on the study outcome. The recommendations shall be included in the final report submitted to the legislature.

- (a) The recommendations shall include the following information:
 - (1) Whether legislation is to be brought forward to allow reform of North Carolina's wholesale electricity marketplace; and
 - (2) What type of model of wholesale reform should be implemented.
- (b) If the NCUC recommends that the State take action, the report shall include draft legislation and identify applicable requirements and schedule that should be established such that the recommended wholesale market reform will result in net benefits without undue risk for the State, utilities, businesses, and residents.

SECTION 3. The NCUC shall appoint an advisory board to ensure the broad concerns of North Carolina are considered; at minimum the advisory board must be comprised of:

- (a) The Executive Director of the North Carolina Public Staff, or designee;
- (b) The North Carolina President of Duke Energy, or designee;
- (c) The North Carolina President of Dominion Energy, or designee;
- (d) Executive Leadership from municipal and cooperative utilities, or designees;
- (e) The North Carolina State Energy Director, or designee;
- (f) The North Carolina Attorney General, or designee;
- (g) Executive Directors of NCCEBA and NCSEA or their designees
- (h) A representative set of stakeholders from NERP selected by the NCUC, including but not limited to:
 - (1) Two representatives of residential consumers of electricity;
 - (2) Two representatives of commercial consumers of electricity;
 - (3) Two representatives of industrial consumers of electricity;
 - (4) Two representatives of power producers;
 - (5) Two representatives with subject matter expertise from the academic community;
 - (6) Two representatives of the environmental advocacy community; and
 - (7) Two representative of the social equity and justice community.

SECTION 4. For purposes of this Bill, the following definitions apply:

- (a) "RTO" means regional transmission organization or other entity established for the purpose of promoting the efficiency and reliability in the operation and planning of the electric transmission grid and ensuring nondiscrimination in the provision of electric transmission services meeting the minimum criteria established by the Federal Energy Regulatory Commission under 18 C.F.R. Section 35.34.
- (b) "EIM" means energy imbalance market, a voluntary market for dispatching real-time energy across utility service territories. Each participating utility retains ownership and control of its transmission assets but opts to bid generation into a centralized dispatch authority.
- (c) "SEEM" means southeastern energy exchange market, a proposed 15-minute automated energy exchange market between balancing authorities of the southeastern U.S. involving over fifteen entities.
- (d) "JDA" means joint dispatch agreement, a type of arrangement where utilities agree to jointly dispatch generation resources to meet load requirements across their footprints. Here, one of the utilities will conduct the dispatch; by contrast, for an energy imbalance market or an RTO, an independent nonprofit entity is in charge of dispatch. Each participating utility retains ownership and control of its transmission assets.