Energy Efficiency in Utility Planning Regulations and Implementation in the Southeast

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SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

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About the Southeast Energy Efficiency Alliance (SEEA)

The Southeast Energy Efficiency Alliance (SEEA) is a 501(c)(3) nonprofit organization headquartered in Atlanta, Georgia. Established in 2007, SEEA is a Regional Energy Efficiency Organization (REEO) serving eleven states across the Southeast, including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

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Purpose

The purpose of the report is to better understand the extent to which energy efficiency is treated as a "least cost resource" in utility planning in the Southeast region, defined as the eleven states in Figure 1: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Figure 1: This report assesses IRP requirements in eleven Southeastern states.

Introduction

Utility integrated resource planning is a process in which utilities plan how they will meet their customers' energy needs reliably and cost-effectively over the long term. In integrated resource plans (IRPs), utilities forecast their demand over a planning horizon (typically 10-20 years) and model what resources they expect to deploy to meet that demand.[1] IRPs generally do not bind a utility to a course of action, but provide a framework for long-term decision-making, promote transparency between utilities, regulators, and customers, and offer a means for state regulators to ensure that utilities are meeting policy goals. In many states, resource planning requirements specify that utility IRPs identify the "least-cost" mix of supply-side and demand-side resources to meet customer demand.

Meta analysis across multiple energy cost studies indicates energy efficiency as a least cost resource,[2] even as the cost of other resources like wind and solar have fallen dramatically in recent years.[3] In 2018, the American Council for an Energy-Efficient Economy published a report comparing the average levelized cost of saved energy for utility-sector energy efficiency programs with the levelized cost of supply-side resources; as shown in Figure 2, the research demonstrated that energy efficiency was the lowest-cost resource on average. In addition to its low cost relative to supply-side resources, energy efficiency can also defer transmission and distribution investments[5] and can mitigate the risk that more stringent environmental laws may be enacted in the future.[6]

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[1] Id. at 6.

[2] William Prindle, *National Action Plan for Energy Efficiency: Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions* 3-1 (2009), ("Various potential studies, resource plans, and program reports and evaluations have estimated the cost-effectiveness of energy efficiency, both as an aggregate resource and as individual measures and programs. Overall, these analyses find that energy efficiency is relatively inexpensive, especially when compared with conventional energy supply resource options").

[3] Maggie Molina and Grace Relf, *Does Efficiency Still Deliver the Biggest Bang for Our Buck? A Review of Cost of Saved Energy for US Electric Utilities* 6-1 (2018).

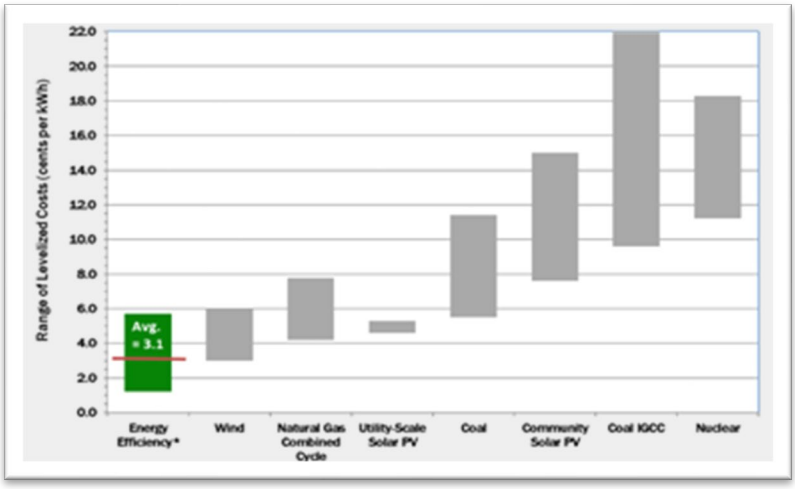

Fig. 2: Levelized electricity resource costs in the U.S. demonstrate the value of examining energy efficiency as a resource. Molina and Relf (2018).

As such, energy efficiency can play an important role in utility integrated resource planning, but the extent to which is does can vary considerably. In examining how energy efficiency is treated in utility planning, a regional approach can be useful. Resource, technical, institutional, and governance structures vary across utilities, but share commonalities across regions. In addition, the needs, interests, and demographics of stakeholders also align across regions. For that reason, it's possible to look to neighbors as leaders in development of long term, integrated least cost planning.

This report examines the utility resource planning requirements and associated practices in the Southeast to better understand the extent to which energy efficiency is treated as a least cost resource in the context of utility planning in the region. Specifically, this paper includes the following:

1. Background on least-cost planning and integrated resource planning, including its relevance to energy efficiency;
2. An overview of the integrated resource planning requirements in our states, particularly those requirements related to least-cost planning;
3. An analysis of how states in the Southeast assess energy efficiency in the context of least-cost planning efforts; and
4. Potential barriers and opportunities to promote energy efficiency through least-cost planning in the South.

Background

a. Integrated Resource Planning

Least-cost utility planning is a process for choosing the lowest-cost method for providing a given service. In the late 1970s, many public utility commissions began to adopt regulations requiring that utilities undergo long term least-cost planning to ensure that ratepayer dollars were not wasted as utilities decided how to meet future demand. Over time, the term "least cost planning" has been largely replaced by integrated resource planning out of recognition that reliability, public policy, and many other factors should be considered when determining the least-cost portfolio. These resource planning requirements are set out in statutes, regulations, or both, depending on the state.

A Typical IRP Process:

1. **Developing a Load Forecast:** The utility uses projections of factors such as expected population changes and economic considerations over the planning horizon to forecast future load.
2. **Identifying Potential Resource Options:** The utility identifies what resource options are expected to be available in the planning horizon. Regulators often require that both supply- and demand-side resources be identified at this phase.
3. **Determining an Optimal Resource Mix:** The utility uses scenario and optimization modeling to determine which available resources will satisfy its expected load requirements at lowest cost. The models should incorporate reasonable projections of changes in cost over time (such as changes in fuel prices or environmental compliance costs) and adequately account for risk and uncertainty. In some states, utilities are explicitly required to prioritize demand-side over supply-side resources in the planning process.
4. **Reviewing and Responding to Public Input:** Some states require that utilities accept public input during the development of the IRP. The nature and extent of public involvement varies by state and can range from very minimal to very extensive. Commonly, utilities may be required to hold public hearings or accept public comments; some states allow stakeholder input at many points in the process in order to promote transparency and better inform the process.
5. **Developing the IRP:** The specific requirements of an IRP depend on the resource planning rules in a given state, but an IRP typically must outline the utility's methodology and assumptions, examine several potential scenarios, and identify and explain the utility's proposed plan.
6. **Commission Review and Approval of IRP:** State utility commissions typically are required to review utility IRPs for consistency with established resource planning requirements. As with the public participation requirements, the nature of this review process varies by state. In some states, the utility commission plays a quasi-judicial role in which it reviews utility IRPs in a trial-like process that uses the rules of civil procedure and allows interested third parties—often environmental organizations—to intervene in the proceeding. Other states have less involved review processes that only allow for public comment, and some do not allow for public participation in the IRP review process at all.

a. Energy Efficiency in Integrated Resource Planning

Though most states require utilities to evaluate demand-side resources such as energy efficiency in their IRPs, in practice the level of energy efficiency evaluated in resource plans tends to be at the "lower end of the energy efficiency potential spectrum." Energy efficiency has traditionally faced a number of technical, methodological, and institutional barriers to its full integration into utility planning frameworks. Supply-side and demand-side resources are often treated differently in the IRP process due to historical challenges in measuring the long-term costs and benefits of energy efficiency resources and institutional structures that have incentivized utilities to increase sales rather than decrease consumption. Thus, IRP processes have often prioritized traditional drivers of

utility growth such as new investments in supply-side resources and electricity system infrastructure.

In recent years, technological advancements and improvements in the evaluation, measurement, and verification of energy efficiency savings better enable the incorporation of energy efficiency as a resource in resource planning. Utilities can treat demand-side resources in substantially the same way as any other resource in the IRP process, allowing energy efficiency to compete dynamically alongside other resources for utility investment. This approach improves the likelihood that the IRP process will result in the identification of a true 'least-cost' portfolio.

There are several technical and procedural practices that can be employed to thoughtfully incorporate energy efficiency as a resource in IRPs:

1. **Data Support for Credible Forecast and Reasonable Assumptions:** Ensuring that the data and assumptions underlying the IRP are reasonable, consistent, and up to date is critical to a successful IRP. Projections of future load should be based on reasonable and realistic assumptions, and planners need access to the best available information about the types and amounts of resources available to meet customer needs. There are well-established methodologies available for how to conduct energy efficiency potential studies, which provide essential data for understanding the opportunity for energy efficiency in an IRP. For variables associated with more uncertainty, IRPs can evaluate multiple alternative scenarios that use different assumptions about those variables' future value. As discussed below, stakeholder input can be used to gather data and ensure its credibility.
2. **Equivalent Methods for Evaluating the Availability of Supply- and Demand-Side Resources:** In IRPs, energy efficiency levels are sometimes capped due to budget, program cost-effectiveness tests, savings targets, or other metrics. However, the purpose of the IRP process is to identify the mix of resources that can meet forecasted demand at the lowest possible cost (taking into account other factors such as reliability), not cost relative to benefit. Notably, supply-side resources in the IRP process are not subject to cost-benefit analyses. The IRP process can be used to determine the level of energy savings to be met, and screening measures for cost effectiveness can then be implemented as part of program design, rather than prior to IRP modeling.
3. **Modeling Processes that Allow Energy Efficiency to Compete Against Other Resources:** An IRP will not truly identify a least-cost resource portfolio unless energy efficiency and demand-side resources are able to compete against both new and existing supply-side resources fairly. One way to do so is to create levelized cost curves for demand side resources that are comparable to those used for supply-side resources. These cost curves then allow the model used to choose the optimum level of investment in each type of resource under multiple scenarios.
4. **Robust Stakeholder Input Processes:** A robust stakeholder input process is necessary to (1) promote transparency among customers, regulators, and utilities; (2) to ensure that utilities are making decisions based on the best available data; and (3) to enable stakeholders to understand and respond to the utility's proposals. A stakeholder process is a useful tool to ensure that the

resulting plan reflects the best possible information available and represents the interests of customers and the public in the governance process. In addition to the utility perspective, consumer and environmental advocates, community leaders, scientists, and energy experts can all bring their expertise and perspective to bear to inform and improve the process.

Legal Framework

State	IRP Rule in Place?
Alabama	No
Arkansas	Partial-Guidelines
Florida	No
Georgia	Yes
Kentucky	Yes
Louisiana	Yes
Mississippi	No
North Carolina	Yes
South Carolina	Yes
Tennessee	No
Virginia	Yes

Table 1. Seven states in the Southeast have statutes or regulations in place establishing requirements for utility IRPs and setting forth a process for periodic regulatory evaluation of those plans. Four states do not.

a. Requirements for Integrated Resource Planning

Before exploring the relationship between least-cost planning and energy efficiency in the Southeast, it is first necessary to understand what legal requirements (statutory and/or regulatory) govern long-term utility planning in the region. As an initial matter, Table 1 details which states in the Southeast require regulated utilities to submit IRPs.

As the table shows, seven Southeastern states have an IRP rule in place. Florida does not require integrated resource planning, but instead requires utilities to submit Ten-Year Site Plans, which summarize utilities' expected resource needs over a ten-year period but do not include a modeling of future scenarios or energy resource options.[4] Three states—Alabama, Mississippi, and Tennessee—do not currently require regulated utilities to conduct any formal long-term planning,[5] though the vertically-integrated utilities in Alabama and Mississippi may voluntarily submit IRPs to their regulatory commissions.

Tennessee Valley Authority (TVA), a federally-owned utility that operates throughout Tennessee and in parts of six other states (Alabama, Georgia, Kentucky, North Carolina, Mississippi, and Virginia) also undergoes its own voluntary IRP process. Arkansas has not established formal rules for its regulated utilities but has adopted broad guidelines for utility planning.

[4] See Fla. Pub. Serv. Comm'n, *Review of the 2017 Ten-Year Site Plans of Florida's Electric Utilities* 8 (2017).
[5] The Mississippi Public Service Commission opened a docket in early 2018 to develop IRP rules for the state. The Commission accepted a first round of comments in August 2018, and the rulemaking process is ongoing.

While this paper will focus primarily on the requirements in those states with IRP rules or guidelines in place, the lack of IRP rules can act as a barrier to energy efficiency in those states without any long-term planning process in place. IRP proceedings can provide a forum for energy efficiency or other stakeholders to provide input into utility planning efforts, and where no such forum exists, there may be limited opportunities to engage with utilities or their regulators on issues related to energy efficiency.[6]

b. Cost Considerations in States with an IRP Requirement

In those states that require IRPs, statutes or regulations govern what utilities are required to include in those plans, as well as the process involved in the filing, consideration, and approval of the IRP by the regulatory commission. Among other requirements, these laws also govern how utilities are required to consider cost as they evaluate different resource options.

While most Southeastern states with IRP rules do require utilities to evaluate demand-side resources such as energy efficiency, fewer specifically require that utilities identify a resource portfolio that is specifically "least cost." Rather, many states have more flexible requirements for how utilities should evaluate cost. The following table shows the statutory and regulatory language governing how and to what extent that regulated utilities in the Southeast should consider demand-side resources and cost in developing their IRPs:

State	Regulatory Language
Arkansas	**Regulatory (Guidelines):** "The utility shall identify a preferred Resource Plan that provides a balance of risks of adverse outcomes to its customers and its own financial integrity, while providing flexibility to change as future conditions warrant. The evaluation should fully describe how the utility's preferred plan affects long term utility resource needs and costs…" Arkansas Pub. Serv. Comm'n Resource Planning Guidelines for Electric Utilities.

[6] See, e.g. David Schlissel and Anna Sommer, *Public Utility Regulation Without the Public: The Alabama Public Service Commission and Alabama Power* (2013).

State	Regulatory Language
Georgia	**Statutory:** "'Plan' means an integrated resource plan which contains the utility's electric demand and energy forecast for at least a 20 year period, contains the utility's program for meeting the requirements shown in its forecast in an economical and reliable manner, contains the utility's analysis of all capacity resource options, including both demand-side and supply-side options, and sets forth the utility's assumptions and conclusions with respect to the effect of each capacity resource option on the future cost and reliability of electric service." O.C.G.A. § 46-3A-1(7). IRP must "adequately demonstrate the economic, environmental, and other benefits to the state and to customers of the utility…" O.C.G.A. § 46-3A-2 (b)(3). Regulatory: IRP is defined as "[a] utility resource planning process in which an integrated combination of demand-side and supply-side resources is selected to satisfy future energy service demands in the most economic and reliable manner while balancing the interests of utility customers, utility shareholders and society-at large." Commission Rule 515-3-4-.02(25).
Kentucky	**Regulatory:** "This administrative regulation prescribes rules for regular reporting and commission review of load forecasts and resource plans of the state's electric utilities to meet future demand with an adequate and reliable supply of electricity at the lowest possible cost for all customers within their service areas, and satisfy all related state and federal laws and regulations." 807 K.A.R 5:058 "The plan shall include the utility's resource assessment and acquisition plan for providing an adequate and reliable supply of electricity to meet forecasted electricity requirements at the lowest possible cost. The plan shall consider the potential impacts of selected, key uncertainties and shall include assessment of potentially cost effective resource options available to the utility." 807 K.A.R 5:058.
Louisiana	**Regulatory:** "Integrated Resource Planning or IRP is a type of utility planning process that develops long-range resource plans by seeking the optimal combination of resources (including demand, supply-side, and possibly other options) to meet forecasted load requirements at the lowest reasonable total cost, subject to various objectives and constraints, including but not limited to reliability, planning, regulatory, environmental and operational requirements. At times, and with proper justification, a utility may select resource options that are not exclusively least cost, for example, if the utility is able to justify that such selection is consistent with reliability, planning, regulatory, environmental and operational objectives or constraints, and will reduce the risk of customers incurring higher costs under certain scenarios." La. Pub. Serv. Comm'n General Order R-30021.

State	Regulatory Language
North Carolina	**Statutory:** Each utility shall include an assessment of demand side management and energy efficiency in its integrated resource plan. G.S. 62-133.9(c). In addition, each utility's consideration of supply-side and demand-side resources, including alternative supply-side energy resources, and the provision of reliable electric utility service at least cost shall appropriately consider and incorporate the utility's obligation to comply with the Renewable Energy and Energy Efficiency Portfolio Standard (REPS). G.S. 62-133.8. Regulatory: Each utility shall develop and keep current an integrated resource plan, which incorporates, at a minimum, the following…(b) a comprehensive analysis of all resource options (supply-and demand-side) considered by the utility for satisfaction of native load requirements and other system obligations over the planning period, including those resources chosen by the utility to provide reliable electric utility service at least cost over the planning period. 04 NCAC R08-60(b).
South Carolina	**Regulatory:** "IRP filings shall contain…[t]he supplier's or producer's program for meeting the requirements shown in its forecast in an economic and reliable manner, including both demand-side and supply-side options." S. Carolina Pub. Serv. Comm'n, Order No. 98-502, Docket No. 87-223-E.
Virginia	**Statutory:** "'IRP' means a document developed by an electric utility that provides a forecast of its load obligations and a plan to meet those obligations by supply side and demand side resources over the ensuing 15 years to promote reasonable prices, reliable service, energy independence, and environmental responsibility." Va. Code Ann. §56-597. "An IRP should…[i]dentify a portfolio of electric generation supply resources, including purchased and self-generated electric power, that…is most likely to provide the electric generation supply needed to meet the forecasted demand, net of any reductions from demand side programs, so that the utility will continue to provide reliable service at reasonable prices over the long term…" Va. Code Ann. §56-598.

The cost requirements within the IRP rules in the Southeast fall into several categories:

1. **Least Cost Planning Specifically Required:** Kentucky and North Carolina's IRP rules explicitly state that utilities should demonstrate in their IRPs how they will meet demand using the least cost mix of resources. Even in these states, utilities must demonstrate how their plans will affect reliability, environmental factors, and other considerations.
2. **Least Cost Considering Reliability:** In Georgia and Louisiana, utilities are required to select the least cost mix of resources that satisfies other requirements such as reliability.
3. **Economical or Reasonable Cost:** Arkansas, Virginia, and South Carolina—require that IRPs demonstrate how the utilities plan to meet demand economically, or taking into consideration long-term costs, but do not specifically require that the approved IRP represent the least cost mix of resources available.

The following two sections will build on this legal context by providing information on (1) how these least cost principles are being applied to energy efficiency in IRPs for Southeastern utilities; and (2) whether that appears to affect the amount of energy efficiency in the region.

Examples and Trends

While Southeastern states have different requirements for how cost should be considered in the IRP process, the seven states with IRP rules all require that utility IRPs evaluate both supply-side and demand-side resources that are expected to be available within the specified planning period, given cost, reliability, and other requirements specified in their IRP rules. This legal backdrop provides a framework for how energy efficiency is treated in IRPs, but implementation of the process and its resulting impacts are also driven by regulatory practices.

This section will assess how Southeastern states treat energy efficiency at various phases of the IRP process, taking both legal and regulatory practice considerations into account, and identify trends within the region. This paper relies on the arguments made by utilities, intervenors, regulatory commission staff, and public service commissions during past and ongoing IRP review processes, rather than making independent evaluations.

a. Stakeholder Input into IRP Development

The data and assumptions used in energy efficiency potential studies, load forecasts, and simulation models act as a backdrop for how energy efficiency is treated throughout the IRP process. Because the data inputs to these studies are specific to the time, location, and utility at issue, it is challenging to identify trends across states. However, one issue commonly raised in IRP proceedings is related to stakeholder input. As discussed above, robust stakeholder input is important during IRP development to ensure that a full range of community expertise is incorporated into the decision-making process.

Intervenors in several Southeastern states have argued that greater stakeholder input, particularly at an early stage in IRP development, is needed. These intervenors noted that they did not have access to or an opportunity to evaluate or provide meaningful feedback on the inputs and assumptions used by utilities in their load forecasts, scenarios, and potential studies. In some cases, state IRP rules do not require that such data be made available to stakeholders. Arkansas has established guidelines that require utilities to submit IRPs, but these guidelines give broad discretion to the utility to "clearly state and support its objectives," including the focus of its plan, its duration, and other major features of the plan. Once filed, the plan is treated as informational in nature, and there is no process for public hearings, input, or formal Commission approval.

When able to participate, stakeholders have provided additional data on the cost of energy efficiency, market potential, or the risks associated with reliance on energy efficiency investments. However, stakeholders have still expressed some dissatisfaction with utilities' willingness to provide data or to update their proposed plans based on stakeholder input. While Georgia has in place a stakeholder collaborative to allow for input on issues related to demand-side management into

Georgia Power's IRP, intervenors have argued in the past that their suggestions were not meaningfully incorporated.

Another issue that arose in two IRPs concerned utility assumptions regarding potential participation rates. In Kentucky Power Company's 2016 IRP, the utility did not evaluate industrial energy efficiency programs on the grounds that those customers would "self-invest in EE measures…regardless of the existence of utility-sponsored energy efficiency programs," and that based on low participation rates in the past, industrial customers were not interested in those programs. In response, intervenor Sierra Club noted that the utility had only offered one small program for two years nearly a decade earlier; the Commission ultimately found Kentucky Power Company's decision to be reasonable. The issue around participation rates also arose in the context of Georgia Power's 2016 IRP; see the section below on preliminary limits or screens on energy efficiency for more details.

b. Preliminary Limits or Screens on Energy Efficiency

One practice common to most of the IRPs evaluated was the preliminary screening of energy efficiency measures using metrics that were not applied to other resources in the planning process. The way in which energy efficiency programs were screened varied by state. Several examples are shown below:

1. **Arkansas (Savings Target):** In Arkansas, only energy efficiency investments up to the level of regulatory savings targets are required to be modeled in the IRP; this amount of investment is then used as a decrement to the load forecast. Arkansas is the only state in the region with a mandatory energy efficiency resource standard, which was recently increased to require electric utilities to meet savings targets of 1.2% of 2018 baseline sales. IRPs in Arkansas are not required to model additional energy efficiency beyond required targets.
2. **Georgia (Budget and Cost-Effectiveness):** In its IRP process, Georgia Power establishes a predetermined budget that forms the basis for what energy efficiency programs it will include in its portfolio; these programs are also screened for cost-effectiveness (using the Rate Impact Measure test as one metric) and expected savings from these programs are then used as a decrement to the load forecast. In Georgia Power's 2016 IRP, there was also significant discussion regarding expected customer participation in the utility's proposed demand-side management programs and how participation rates would impact electricity rates. While Georgia Power argued that higher demand-side management budgets would have too large an impact on utility rates, intervenors responded by arguing that while EE programs may increase rates, they can decrease customer bills, and rate impacts are lessened when participation rates are higher. Ultimately, Georgia Power agreed to work with Commission staff to develop a methodology to conduct long-term studies of rate impacts.
3. **North and South Carolina:** In Duke Energy Carolinas 2016 IRP, the utility limited its analysis of energy efficiency only to those savings achievable at a cost of $.07 cents/kWh or less (which represented 60% of the achievable potential identified in its potential study). Those energy savings were then used as a decrement to load. The demand-side supply curve from

Duke Energy's potential study suggested there was potential for more cost-effective energy efficiency, but Duke did not model whether additional energy efficiency would be cost-effective when compared with supply-side resources.

4. **Virginia (Program Restrictions):** Both Dominion Energy and Appalachian Power Company only included pre-approved efficiency and demand-side management programs in their 2018 IRPs; neither utility included any scenarios that modeled expanded demand-side management. In both cases, expected savings from approved programs were used as a decrement to load.

c. Modeling Energy Efficiency as a Resource Alongside Supply-Side Resources

In the Southeast, rather than being modeled alongside supply-side resources, energy efficiency is commonly treated as a decrement to load. Where energy efficiency is used as a decrement to load, energy efficiency resources are only compared against new generation resources, and the IRP processes do not show whether demand-side resources such as energy efficiency could cost-effectively replace existing generation resources as well.

Conclusions and Questions

Based on our review, several conclusions can be drawn about the treatment of energy efficiency in IRPs in the region. First, the Southeast does not uniformly use integrated resource planning for utilities; four states use alternative planning methodologies, or do not require long-term planning at all. Second, in those Southeast states with IRP requirements, no state currently treats energy efficiency as a resource fully on par with supply-side resources. This is true even in those states with IRP rules explicitly requiring utilities to identify a least-cost portfolio in the IRP process. As such, regulatory practice, rather than only statutory or regulatory language, plays a role in how IRPs are conducted in the region, and there is opportunity for Southeastern utilities and regulators to more equitably incorporate energy efficiency into IRP processes and better enable least-cost planning.

Our research also raises additional questions for potential future research in the region. One question is the impact of IRP processes versus other energy efficiency policies on energy efficiency deployment in the region. For instance, while Arkansas only has guidelines for utility integrated resource planning, and no formal review process, it has the most substantial utility programs in the region due to its energy efficiency resource standard. Another question relates to how regulatory practices, such as the degree of stakeholder involvement allowed or the extent of regulatory oversight, affect how energy efficiency is ultimately treated. Further research into this issue could better identify whether there is opportunity in the region for greater education and engagement to improve regulators' understanding of energy efficiency and its role as an energy resource.