STATE OF SOUTH CAROLINA

BEFORE THE
PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

In Re:	)	
	)	
Dominion Energy South Carolina, Inc.'s 2026 Integrated Resource Plan (IRP)	)	
	)	**Docket No. 2026-9-E**
	)	
	)	

DIRECT TESTIMONY OF SABINE CHAVIN

ON BEHALF OF SIERRA CLUB

August 26, 2026

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1. Introduction and Purpose of Testimony

Q Please state your name and occupation.

A My name is Sabine Chavin. I am a Senior Associate at Synapse Energy Economics, Inc. ("Synapse"). My business address is 485 Massachusetts Avenue, Suite 3, Cambridge, Massachusetts 02139.

Q Please describe Synapse Energy Economics.

A Synapse is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission and distribution system reliability, ratemaking and rate design, electric industry restructuring and market power, electricity market prices, stranded costs, efficiency, renewable energy, future of gas utilities planning, environmental quality, and nuclear power.

Synapse's clients include state consumer advocates, public utilities commission staff, attorneys general, environmental organizations, federal government agencies, and utilities.

Q Please summarize your work experience and educational background.

A At Synapse, I conduct analysis and write publications on a variety of topics related to resource adequacy, power plant economics, and integrated resource planning. I regularly support the development of comments and testimony in litigated dockets across the country, including performing analyses of electric power systems using industry-standard models such as EnCompass and spreadsheet tools. I also regularly conduct independent analyses using resource adequacy models such as the Strategic Energy Risk Valuation Model ("SERVM").

I hold a Bachelor of Arts in Physics and a Master of Science in Physics from the University of Pennsylvania. I also hold a certificate in Power System Engineering from the University of California, San Diego. A copy of my current resume is attached as Exhibit SC-1.

Q On whose behalf are you testifying in this case?

A I am testifying on behalf of Sierra Club.

Q Have you previously testified before the Public Service Commission of South Carolina ("Commission")?

A No, I have not previously testified before this Commission.

Q What is the purpose of your testimony in this proceeding?

A In my testimony, I summarize the results of the independent SERVM analysis I conducted to evaluate the resource adequacy of Dominion Energy South Carolina ("DESC" or "the Company")'s Preferred Portfolio from its 2026 Integrated Resource Plan ("IRP"). I focus on 2035, the first year that both Wateree Station ("Wateree") and Williams Station ("Williams") are offline, consistent with their current retirement dates. I assess whether the Preferred Portfolio meets DESC's reliability standard of one loss of load event in 10 years and confirm that the system will continue to meet reliability standards following the retirement of the coal plants. I also analyze whether DESC could reliably serve higher-than-forecasted loads in 2035 while maintaining the modeled retirement dates of 2032 and 2034 for Wateree and Williams, respectively. In addition, I assess the DESC Reserve Margin and Effective Load Carrying Capability ("ELCC") report that DESC filed as an exhibit to its 2026 IRP. I also assess how the Company used the results of this report in its capacity expansion modeling. Finally, I suggest potential improvements to the Company's resource adequacy modeling and planning framework.

Q How is your testimony structured?

A In Section 2, I summarize my findings and recommendations for the Commission.

In Section 3, I summarize the Company's current forecasts for the Williams and Wateree retirement dates in its 2026 IRP.

In Section 4, I discuss the Company's resource adequacy modeling framework, including how it incorporates its reliability standard into calculations of its reserve margin, resource accreditation, and capacity expansion modeling.

In Section 5, I present my independent SERVM resource adequacy analysis of DESC's system following the projected retirements of Wateree and Williams.

In Section 6, I discuss my concerns with the Company's modeling framework.

Q What documents do you rely upon for your analysis, findings, and observations?

A My analysis relies primarily upon the workpapers, exhibits, and discovery responses provided by DESC, as well as publicly available data.

Q **Are you sponsoring any exhibits?**

A Yes. I am sponsoring my resume as an exhibit, which is attached as Exhibit SC-1.

2. FINDINGS AND RECOMMENDATIONS

Q **Please summarize your findings.**

A My primary findings are the following:

1. My independent SERVM analysis finds that:
   a. DESC's Preferred Portfolio, which retires Wateree and Williams by year-end 2032 and 2034, respectively, meets DESC's reliability standard, and in fact exceeds this standard under the reference load forecast; and
   b. DESC's Preferred Portfolio continues to meet DESC's reliability standard in 2035 under DESC's High Demand forecast, without the need for any new resources beyond those included in the Preferred Portfolio.
2. DESC's decision to use a fixed 20 percent reserve margin throughout the entire planning period may result in portfolios that exceed its reliability requirement as DESC's and its neighbors' systems evolve.

3. DESC's resource adequacy and capacity expansion modeling framework underestimates the future firm capacity value of battery storage.
    a. DESC's Reserve Margin and ELCC Study models the projected 2028 system. The study recommends that "the SERVM simulations should apply for the next *two to five years*, assuming that resource mixes and market structures do not change drastically."[1]
    b. However, DESC held the reserve margin and ELCC results constant as inputs into its capacity expansion modeling *through 2050*. This may lead to underestimation of storage ELCCs in future years with higher peak loads.
    c. DESC imposes a cumulative build limit of 1,200 megawatts ("MW") of four-hour battery storage in its capacity expansion modeling throughout the entire study period. This build limit is based on when the battery storage marginal ELCC value drops below 50 percent, as calculated in the DESC Reserve Margin and ELCC Study, which used 2028 load and resource conditions.

Q Please summarize your recommendations.

A Based on my findings, I offer the following recommendations:

1. My analysis supports Sierra Club Witness Lucy Metz's recommendation that the Company commit to retire Wateree as soon as the Canadys

[1] Direct Testimony of Cole Michael Benson on Behalf of Dominion Energy South Carolina, Exhibit CMB-1: Dominion Energy South Carolina Reserve Margin Study and Effective Load Carrying Capability Report at 11 (June 3, 2026) [hereinafter "Reserve Margin and ELCC Study"] (emphasis added).

combined-cycle plant comes online and Williams by year-end 2034, consistent with DESC's 2026 IRP Preferred Plan.[2]

2. My analysis also supports Witness Metz's recommendation that the Commission should ensure the Company is proactive about procuring planned replacement capacity to enable the retirements of Wateree and Williams by their projected retirement dates.[3]

3. The Company should validate the resource adequacy of its portfolios in future years, beyond 2028, to ensure that it is not over-building relative to its reliability standard. In particular, the Company should ensure it does not maintain an unnecessarily high reserve margin by keeping its coal plants online past their current projected retirement dates, which would impose unnecessary costs on ratepayers.

4. In the next refresh of the Reserve Margin and ELCC Study, the Company should evaluate ELCC values for solar and storage further out in the study period, to understand how the results might change with a higher peak load and as other system conditions evolve.

5. The Company should not arbitrarily limit four-hour storage builds in its capacity expansion modeling when the marginal ELCC value declines below 50 percent. Instead, it should offer the model tranches of resources with declining firm accreditation values that can continue to be selected based on resource economics.

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[2] Direct Testimony of Lucy Metz on Behalf of Sierra Club at 11 (Aug. 26, 2026) [hereinafter "Metz Direct"].

[3] *Id.*

3. SUMMARY OF DESC'S PROPOSAL

Q What retirement assumptions does DESC model for the Wateree and Williams coal plants in its 2026 IRP?

A As described in Witness Metz's testimony, DESC programs in a retirement date of year-end 2032 for Wateree and year-end 2034 for Williams in all nine core cases.[4] In all five sensitivity cases, DESC continues to program in a retirement date of year-end 2034 for Williams, but changes the Wateree retirement date to year-end 2034 in the Near-Term Load Growth and Aggressive Regulation sensitivities. In the Reference Optimized Retirements build plan, the model selects to retire Wateree at year-end 2032 and selects to retire Williams by year-end 2046.[5] In the High Load Optimized Retirements build plan, the model selects to retire Wateree by year-end 2044 and Williams by year-end 2046.[6]

Q What has the Company stated regarding its commitment to retire Wateree and Williams by the currently planned dates?

A The Company has not firmly committed to its planned retirement dates. Rather, DESC has maintained that the retirement decisions are subject to continued review based on future system conditions. As discussed in Witness Metz's testimony, this is concerning based on the Company's history of repeatedly extending the retirement dates of Wateree and Williams beyond their previously

[4] *Id.* at 14-15.

[5] Dominion Energy South Carolina 2026 Integrated Resource Plan at 10 [hereinafter "DESC 2026 IRP"].

[6] *Id.*

planned retirement dates, which has already imposed millions of dollars in environmental compliance costs on ratepayers.[7]

Q What are your concerns with keeping online aging coal units?

A DESC has acknowledged that continuing to operate the plants beyond their projected retirement dates would pose economic and reliability risks to DESC and its ratepayers. As discussed in greater detail in Witness Metz's testimony, these risks include higher maintenance costs, an increased likelihood of major forced outages, fuel supply risks, and reduced availability of replacement parts as U.S. coal generation declines more broadly.[8]

Q What is the Company's projected reserve margin under the Preferred Portfolio scenario?

A In 2035, the first year following the retirement of these coal plants, DESC projects a reserve margin of 20 percent.[9]

Q How would DESC's reserve margin change if the Company were to decide not to retire Wateree and Williams by their planned retirement dates?

A If the Company does not retire Wateree and Williams by their planned retirement dates, assuming the load forecast and other planned resources come online, DESC would have a reserve margin of 44 percent in 2035. Keeping Wateree and

[7] Metz Direct at 19.

[8] *Id.* at 25-34.

[9] DESC Response to ORS Data Request No. 1-08, "2026 IRP Load and Resource Balance.xlsx." The Company's response to ORS Data Request No. 1-08 and the associated attachment contains voluminous spreadsheet data and can be provided to the Commission and properly-authorized parties upon request.

Williams online beyond 2035 would lead the reserve margin to remain above 40 percent through 2040.[10] This would far exceed the Company's modeled reserve margin requirement, which would impose unnecessary costs on ratepayers.

Q Could DESC monetize any excess firm capacity that it maintains in the future beyond its reserve margin requirement, given national-level forecasts for increased demand due to data centers?

A It is not prudent to maintain capacity for highly speculative purposes. While data centers are driving high national-level forecasts, there is significant uncertainty around the quantity of actual data center load that will materialize. In addition, aging coal units are not reliable sources of firm capacity, so it is unlikely that DESC would find commercial off-takers willing to sign contracts for firm capacity from these plants. Finally, there are locational constraints on the ability of these coal plants to serve new loads. New loads would need to be located within the resources' deliverability area or otherwise would incur additional costs to build new transmission connections.

4. DESC'S RESOURCE ADEQUACY MODELING FRAMEWORK

Q What reliability standard does the Company plan around?

A DESC has a reliability standard of one loss of load event every 10 years, which is also referred to as a Loss of Load Expectation ("LOLE") of 0.1.[11] A loss of load event is defined as an inability to serve load due to insufficient generation availability.

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[10] Metz Direct at 22.

[11] DESC 2026 IRP at 24.

Q Describe the Company's resource adequacy and capacity expansion modeling framework, including how it incorporates this reliability standard.

A DESC's 2026 IRP modeling framework relies on two key electric sector models: SERVM and PLEXOS. SERVM is a probabilistic model that evaluates a system's resource adequacy under a range of possible weather and load conditions to estimate firm capacity and reserve requirements. PLEXOS is a capacity expansion and production cost model. In contrast to the SERVM model, capacity expansion models such as PLEXOS are deterministic and used to identify the least-cost resource portfolio to serve load under a single, typical weather condition.

In DESC's analysis, the Company uses SERVM to generate reserve margin and resource accreditation results, which it then uses as inputs into the PLEXOS capacity expansion modeling. SERVM can also be used iteratively in a subsequent step to validate the resource adequacy of future resource portfolios generated in PLEXOS. However, DESC did not include this final validation step in its analysis. DESC's decision to leave out this validation step means that it did not confirm whether the reserve margin and ELCC assumptions developed in the context of its 2028 system continue to be valid throughout the study period.

Q How did DESC carry out the modeling for this most recent IRP?

A DESC hired PowerGEM to refresh its 2023 Reserve Margin Study and ELCC Determination Study.[12] For the 2028 study year, PowerGEM uses SERVM to calculate that a 20 percent winter reserve margin is needed to meet DESC's

[12] *Id.* at 23.

reliability standard of 0.1 LOLE.[13] PowerGEM also uses SERVM to calculate a set of ELCC values for solar and battery storage for the 2028 study year.

Q Explain PowerGEM's ELCC capacity accreditation analysis.

A ELCCs measure a resource class's firm capacity contributions and reflect the expected reliability contribution of the resource class during system stress events. Adding solar and storage resources in different MW combinations will lead to interactive effects between these resources in the ELCC results. Pairing solar with storage ensures there is sufficient energy for the storage to charge, leading to greater reliability contributions than standalone storage can provide. PowerGEM captures this interactive effect between solar and storage by producing ELCC surfaces.

ELCC surfaces are smoothed-out representations of the accreditation values that get calculated for different discrete combinations of solar and storage resources. For example, Table 1 shows the discrete four-hour storage average ELCC results from PowerGEM's Reserve Margin and ELCC Study, which PowerGEM subsequently uses to construct an ELCC surface. These results demonstrate the interactive effects between battery storage and solar resources. For example, when there is no solar on the system, 800 MW of battery storage has an ELCC value of 85.8 percent. When 1,600 MW of solar is added to the system, the same 800 MW quantity of battery storage now has an ELCC value of 89.8 percent, because there is more energy available for the battery storage to charge from, so it can better contribute to reliability.

[13] Reserve Margin and ELCC Study at 6.

Table 1. Winter four-hour storage surface average ELCC from Reserve Margin and ELCC Study[14]

Storage Value		Solar MW								
		0	400	800	1,200	1,600	2,000	2,400	2,800	3,200
BESS MW	0									
	400	94.3%		96.8%						
	800	85.8%		88.3%		89.8%				
	1,200	77.1%			80.3%			81.7%		
	1,600	69.0%				72.7%				
	2,000	62.0%					65.8%			
	2,400	56.4%						60.2%		
	2,800	52.2%							55.8%	
	3,200	48.8%								52.2%

Note that this table shows average ELCCs and the axes represent total resource capacity on the system, effectively including any existing resource capacity as well as hypothetical new build resources. Average ELCC values represent the average reliability contribution of an entire resource class, while marginal ELCC values represent the reliability contribution of the marginal resource that is added within a class. PowerGEM subsequently converted these average ELCC results to marginal values for each battery storage tranche. DESC then used the marginal ELCC values to define a cumulative build limit for battery storage additions in its capacity expansion modeling. DESC's 1,200 MW cumulative build limit for batteries is based on the crossover point where the marginal ELCC for battery storage drops below 50 percent.

PowerGEM conducted this ELCC analysis for a 2028 study year. This means it calculated these ELCC values under the load level and resource portfolio that DESC projected for 2028. Therefore, the PowerGEM study caveats its results by stating that the modeling results are only applicable for the next two to five years,

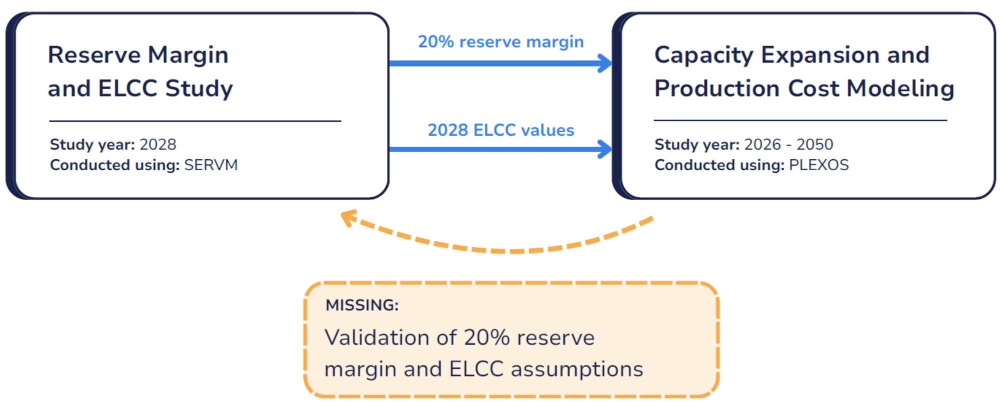
[14] Reproduced from the Reserve Margin and ELCC Study at 29, Table 22.

"assuming that [the] resource mixes and market structures do not change drastically."[15]

Q How are the ELCC and reserve margin modeling results used in the Company's subsequent capacity expansion modeling?

A DESC uses the reserve margin and ELCC results from the PowerGEM SERVM modeling as input assumptions into its PLEXOS modeling, which extends through 2050. Figure 1 below illustrates the Company's modeling framework and the relationships between these two models. DESC applies the 20 percent winter reserve margin in each year of its capacity expansion modeling. DESC also uses the ELCC results to define strict limits on the model's ability to add new four-hour battery storage.

Figure 1. DESC modeling framework



[15] Reserve Margin and ELCC Study at 11.

Q What are your concerns with the Company's decision to exclude a validation step from its resource adequacy modeling?

A ELCCs and reserve margins are dynamic values that will change over time. As load shapes and resource portfolios evolve, the timing of when critical periods occur will change, leading to different resources being more or less able to provide reliability contributions. By holding these values constant over time, DESC is over-simplifying its assessment of whether it is cost-effectively meeting its reliability standard. DESC should evaluate the resource adequacy of its projected portfolios in future years to ensure that its input assumptions are continuing to generate resource portfolios that satisfy its reliability standard, without adding unnecessary firm capacity. It is particularly important to conduct this verification step for scenarios and time periods where system conditions are expected to change drastically (for example, following periods of load growth or major changes to its resource portfolio).

5. SYNAPSE RESOURCE ADEQUACY MODELING

Q Describe your resource adequacy analysis and how it supplements the Company's analysis.

A My analysis assesses the projected resource adequacy of the Company's system following the planned retirements of Wateree and Williams, under both baseline and unexpectedly high load conditions. My analysis also evaluates DESC's decision to hold the 2028 reserve margin (*i.e.*, 20 percent) and capacity accreditation modeling results constant through the planning period. Effectively, I conduct the verification step that is missing from the Company's analysis, described in the section above.

I evaluate the resource adequacy of the Company's Preferred Portfolio in 2035, following the retirement of Wateree and Williams by year-end 2032 and 2034, respectively. In addition, I evaluate the resource adequacy of the Company's Preferred Portfolio in 2035 under the Company's high load forecast to assess the ability of this portfolio to satisfy the Company's 0.1 LOLE reliability standard under higher-than-expected load growth. My results confirm that the Company can retire both coal plants prior to 2035 and reliably serve both the reference load forecast and a higher-than-expected load forecast.

My analysis provides a detailed view of reliability in 2035 and incorporates projected changes to the DESC system's conditions, including changes in load, resource portfolio, and DESC's ability to rely on its neighbors.

Q What models and data sources did you use to conduct this analysis?

A I use the SERVM model to conduct this analysis. This is the same model used by PowerGEM to conduct the Reserve Margin and ELCC Study on behalf of DESC. I started with the database that PowerGEM developed for the Reserve Margin and ELCC Study. I then layered in changes to extend both the DESC system and the representation of neighboring regions through 2035. My updates to the neighboring regions are based on public IRP data for those utilities. My updates to the Company's load forecast and resource portfolio are based on the Preferred Portfolio results from DESC's 2026 IRP.

I use the same scenario settings that PowerGEM used for the Reserve Margin and ELCC Study, including the number of weather years. The only key change I made to the PowerGEM database settings was to increase the hurdle rates, which represent the incremental cost of transferring energy between regions. Increasing the hurdle rates produces a model with reduced economic energy transfers between different utility regions. I made this change to model a more conservative view of the extent to which DESC will rely on imports from its neighbors in the future.

Q Describe the scenarios that you model.

A I analyze two scenarios.

In the first scenario, I model the Company's Preferred Resource Portfolio with the reference load forecast for 2035, which includes the retirements of Wateree and Williams, in SERVM and validate that the system meets the Company's reliability standard of 0.1 LOLE in that year, under the reference load conditions.

In the second scenario, I use the same supply-side resource portfolio from the Company's Preferred Resource Portfolio in 2035, but increase the load forecast to the Company's high load forecast. This scenario evaluates the Preferred Resource Portfolio's ability to reliably serve a higher-than-expected load forecast, while maintaining the planned retirement dates for Wateree and Williams. Table 2 below summarizes both scenarios.

Table 2. Synapse modeled scenarios

Scenario	Resource builds	Load forecast
Scenario #1	DESC 2026 IRP Reference Case	DESC 2026 IRP reference load forecast
Scenario #2	DESC 2026 IRP Reference Case	DESC 2026 IRP high load forecast

I use a study year of 2035 for both scenarios, since this is the first year that both Wateree and Williams are projected to be offline. The representation of neighboring regions is held constant across both scenarios.

Q What are the results of your analysis?

A I find that both the first scenario and second scenario are compliant with the Company's reliability standard of 0.1 LOLE. The first scenario has a LOLE of 0.02 in 2035, exceeding the Company's reliability standard by 80 percent. The second scenario with the higher load forecast has a LOLE of 0.1, complying with the Company's reliability standard. Table 3 below summarizes these results.

Table 3. 2035 LOLE results

Scenario	2035 DESC Loss of Load Expectation (days per year)
Scenario #1	0.02
Scenario #2	0.10

Q What does your analysis indicate about the Company's Preferred Portfolio?

A My analysis indicates that the Preferred Portfolio significantly exceeds the Company's reliability standard in 2035, assuming the reference load forecast materializes. In addition, my analysis indicates that the generating resources in the Preferred Portfolio could reliably serve even the Company's high load forecast. This confirms that the Company could safely retire both Wateree and Williams by 2035 without seeing adverse resource adequacy impacts, even under a higher load future. This also indicates that the Company's decision to maintain the 20 percent reserve margin requirement and 2028 ELCC results from the PowerGEM study is an overly simplistic approach to modeling forward-going resource adequacy standards.

Q How are the generating resources in the Preferred Portfolio able to reliably serve the high load forecast, especially in winter peak conditions?

While both scenarios satisfy the statistical LOLE reliability standard, examining performance for a winter risk week provides greater insight into how the system dispatches to serve load during high stress periods. The fourth week of 2014 represents the highest DESC peak load in the last 20 years and provides an illustrative example of an extreme winter risk period. Using the outputs from my independent SERVM analysis, I examined how the model dispatches resources to serve 2035 load for both scenarios, under the weather conditions from this historical 2014 week.

Figure 2 shows the hourly dispatch of Scenario 1 for these weather conditions. In Scenario 1, solar resources can serve substantial quantities of load during the day, meaning the gas combined-cycle plants cycle up and down throughout the day. In reality, ramping constraints on the combined-cycle plants might lead these plants to operate at more consistent levels throughout the week and solar energy would likely be exported.

Figure 2. Scenario 1 hourly dispatch during Week 4 of 2014 weather year

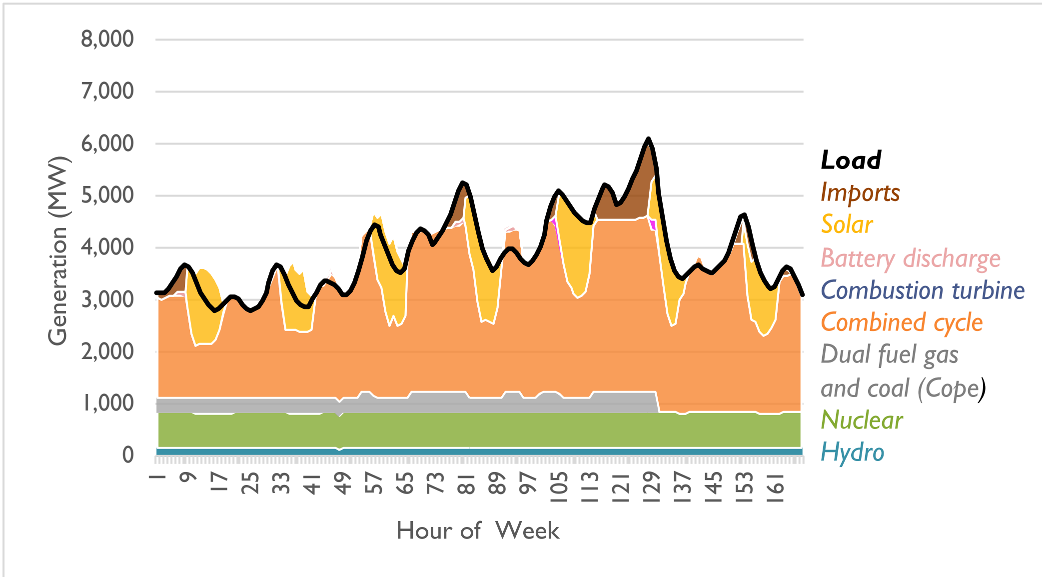
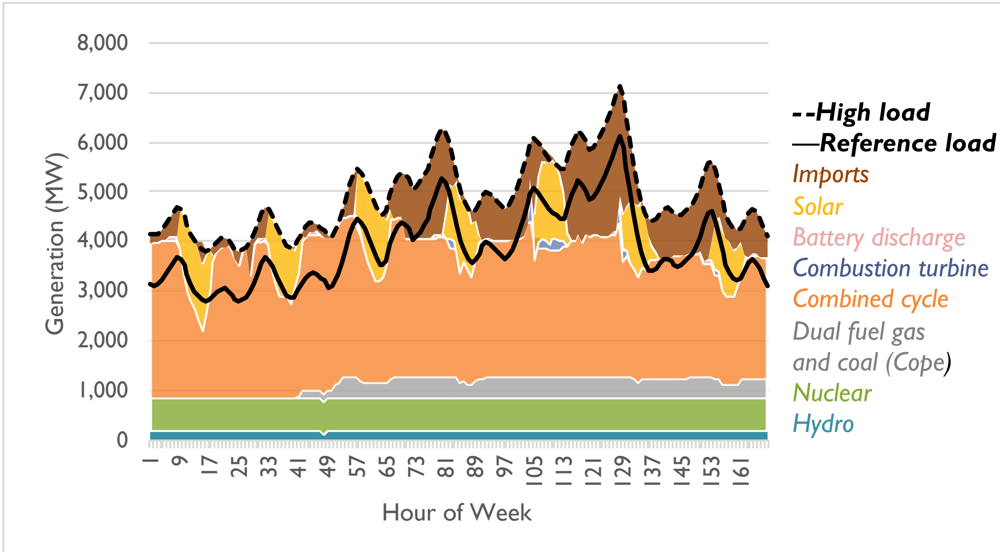


Figure 3 shows the hourly dispatch of Scenario 2 during this week. In Scenario 2, gas combined-cycle plants ramp up to operate at consistently higher levels throughout the day. In the second half of the week, which has the highest loads in the 20-year weather period, DESC's system relies on imports from neighboring regions to meet load during periods where solar is offline.

Figure 3. Scenario 2 hourly dispatch during Week 4 of 2014 weather year



These figures show that the Preferred Portfolio, including the retirements of Wateree and Williams, would be able to reliably serve 2035 load during an extreme winter risk period, albeit with different degrees of reliance on imports from neighboring regions. Below, I discuss how reasonable it is to assume that these imports will be available, as well as the types of technologies that are best suited to mitigate risks associated with import availability.

Q **To what extent does your model capture future market dynamics that would impact DESC's ability to import energy from neighboring utilities during a peak winter week?**

A My modeling accounts for both load growth and new planned resource additions through 2035. While several of DESC's neighboring utilities are projecting load growth over this period, they are also planning on adding substantial quantities of new capacity, which will enable them to continue providing support to DESC. I use data from public IRPs to update the representation of the neighboring utilities, relative to the model that PowerGEM used for the Reserve Margin and ELCC

Study. Different utilities will have different load profiles and their resources will experience forced outage events at different times. This is why the interconnectedness of the region provides a meaningful reliability benefit to all utilities in the region.

Q How do your assumptions for import availability compare with the Company's assumptions?

A I use the same assumptions for transmission line ratings between regions as PowerGEM used in the Reserve Margin and ELCC Study.

To benchmark the extent to which the Synapse scenarios are relying on imports from neighboring regions, I compared the expected maximum hourly imports from each neighbor in my 2035 modeling to the expected maximum hourly imports in 2028, based solely on the Company's own model. Relative to 2028, I see moderate increases in DESC's reliance on imports from some neighbors, but reduced reliance on imports from the Southern Company region. To cost-effectively mitigate any future risks associated with regional resource adequacy issues, the Company could increase deployment of short- to medium-duration storage (*e.g.*, four- to eight-hour batteries), paired with solar.

To determine the expected maximum hourly imports for 2028, I used the same SERVM model setup the Company used for the Reserve Margin and ELCC Study, absent any load or resources adjustments that it used to calculate ELCC or reserve values. This enabled me to examine how the Company is projecting its system may operate in 2028. Table 4 shows the probability-weighted expected maximum hourly imports from each neighbor in 2028, as well as the two Synapse-modeled 2035 scenarios. Relative to the 2028 benchmark year, there are moderate increases in the expected maximum imports from the Duke Energy zones in both Scenarios 1 and 2. Santee Cooper provides slightly less support in Scenario 1 relative to the energy it exported in the 2028 model, and slightly more support in Scenario 2. In both scenarios, the Southern Company zone provides no imports in 2035, likely due to high projected load growth for Georgia Power.

My analysis determines that this quantity of imports will be available, based on the neighboring utilities' most recent IRP planning documents. If, in the future, the Company determines that the regional energy balance is worse than current forecasts and higher-than-expected load materializes, it may be prudent to build out the types of resources that are most cost-effectively able to avoid imports during peak periods. Given the nine-year look-ahead period to 2035, the Company has the flexibility and ability to continue monitoring the resource adequacy of its neighbors' systems, as well as its own, and conduct continued analysis of the most targeted, cost-effective resources to address any risks that do materialize.

As I discuss in more detail below, DESC's risk is narrowly targeted to limited durations during the mornings of winter peak days. This means that short- to medium- duration storage resources, paired with solar, would be strong candidates for mitigating import-risk during peak periods, while continuing to provide energy benefits throughout the year. In addition, demand-side management resources can often provide cost-effective reliability benefits by reducing peak demand.

Table 4. Expected maximum hourly imports by neighboring region (MW)

Neighbor	2028 Benchmark	Scenario #1 (2035 Ref. Load)	Scenario #2 (2035 High Load)
Dominion Energy Carolinas	1,456	1,663	1,968
Dominion Energy Progress	1,607	1,776	1,983
Santee Cooper	1,014	908	1,267
Southern Company	1,164	0	0

Q Describe DESC's hourly risk profile in the Preferred Portfolio, and the types of resources best suited to address any tail-end reliability events, in the event of higher-than-expected load growth.

A Figure 4 illustrates DESC's distribution of expected unserved energy ("EUE") by month and hour in 2035 under Scenario 2 (which uses the higher load forecast). Reliability risk is concentrated in the winter morning hours, especially between 4 a.m. and 9 a.m., as load ramps up but before solar energy has come online. Short- to medium-duration batteries (*e.g.*, four- to eight-hours) are well suited to address this type of short-duration risk, particularly when paired with solar resources that they could charge from during the day. Unlike peaker units, which might only operate a few days a year during critical conditions, batteries can also provide economic benefits through energy arbitrage capabilities throughout the year.

Figure 4. Distribution of DESC's probability-weighted EUE in Scenario 2

	Month											
Hour of Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
7	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
8	34%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
9	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
10	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

In the Company's Near-Term Load Growth portfolio, the model's maximum build limits on battery storage are binding, meaning the model builds the maximum allowable quantity of battery storage. In addition, the model selects to build new gas combustion turbines in this scenario. Absent the binding battery storage build limits, the model might have selected to build additional batteries instead of some or all of the new gas combustion turbine capacity. For example, one of the proposed new gas combustion turbines operates at a capacity factor at or below 4 percent through 2040. Given the gas turbine's low near-term utilization, battery storage—which can provide energy arbitrage services throughout the year—may have been a more economic option for the model to select.

DESC's decision to limit battery additions based on the ELCC Study results is particularly problematic under this higher load scenario. In a higher load scenario, each MW of incremental storage represents a lower percentage of peak demand, relative to a reference load scenario. Therefore, the system could likely incorporate a greater MW capacity of storage before the ELCCs start to decline.

Q What does your analysis suggest about the resource adequacy of DESC's system for the remainder of the planning horizon through 2050?

A While my analysis does not explicitly examine years beyond 2035, it indicates that DESC's application of the 2028 reserve margin and ELCC values may lead to portfolios that overbuild firm capacity relative to what DESC needs to meet its reliability standard. This can lead to unnecessary costs for ratepayers. As time progresses, DESC should keep an active view of its system's resource adequacy and should refresh its studies with up-to-date forecasts and data.

6. Concerns with the Company's modeling assumptions

Q Do you have concerns with the Company's reserve margin requirement assumption?

A Yes. I am concerned that the Company's decision to maintain the 2028 reserve margin result for more than two decades (through 2050) may lead to long-term portfolio builds that exceed the Company's reliability standard of 0.1 LOLE. This simplistic approach to meeting the resource adequacy standard may lead the Company to add or maintain firm capacity beyond what is needed, imposing unnecessary costs on ratepayers.

DESC's system, as well as its neighbors' systems, will evolve over time as peak loads, load shapes, and supply-side resource mixes change. In fact, the

PowerGEM Reserve Margin and ELCC Study itself states that the SERVM results are applicable only for "the next *two to five years*, assuming that resource mixes and market structures do not change drastically."[16] Despite this caveat in the Reserve Margin and ELCC Study, the Company did not conduct any resource adequacy modeling of future years beyond 2028 to validate whether it was reasonable to extend the 20 percent reserve margin assumption and ELCC values through 2050.

My independent analysis, described above, indicates that the Company's modeling framework may lead it to plan for resource adequacy beyond what the reliability standard requires, and maintain an unnecessarily high reserve margin. This risks imposing unnecessary costs on ratepayers through over-procuring firm capacity.

Q How does the Company's modeling framework lead to unnecessary firm capacity additions in its modeling results?

A The Company's simplistic modeling approach is especially likely to lead to unnecessary capacity additions in scenarios where the load changes substantially from the 2028 forecast. For example, the Company models a Near-Term Load Growth Build Plan based on a high load forecast, which adds an additional 875 MW of new gas capacity by 2035 to satisfy its 20 percent reserve margin requirement in this load scenario.[17] This capacity is incremental to the resources built in the Preferred Portfolio, which is modeled with the reference load forecast.[18] However, my independent resource adequacy analysis described above

[16] Reserve Margin and ELCC Study at 11 (emphasis added).

[17] DESC 2026 IRP at 53.

[18] *Id.* at 6, 11.

shows that the Preferred Portfolio, without this additional gas capacity, is able to reliably meet the higher load forecast. My examination of the timing and distribution of risk under the higher load level, also described above, indicates that short- to medium-duration battery storage would likely be a more economic resource option to address any tail-end reliability risks, as opposed to additional gas capacity.

I am also concerned that the Company's overestimation of its firm capacity needs may lead DESC to be overly cautious about retiring Wateree and Williams in the future, at ratepayers' expense. My independent analysis confirms that the Company can in fact retire Wateree and Williams by their planned retirement dates, even if load materializes above the reference forecast.

Q Is there any reason for the Company to build new resources beyond the quantity needed to satisfy its reliability standard?

A Yes. It may be economically optimal for the Company to add resources that can help drive down average energy production costs. Resources with low variable energy costs, such as solar, can avoid energy dispatch from more expensive fossil-based capacity resources and provide a hedge against fuel price volatility. Battery storage resources can also drive down average production costs by providing energy arbitrage services and avoiding the need to dispatch more expensive peaking capacity resources.

However, not all resources will drive down average production costs. Adding or maintaining expensive peaking capacity (such as coal plants) beyond the quantity needed to meet the Company's reliability standard will require capital expenditure that will go into the rate base and impose unnecessary costs on ratepayers. I am concerned that the Company's modeling results for the Near-Term Load Growth

Build Plan suggest that DESC would add unnecessary additional peaking capacity beyond what is needed if new load growth materializes that exceeds the reference forecast.

Q How should DESC more efficiently model reserve margin requirements in future analysis?

A DESC should take a more iterative approach to its capacity expansion and resource adequacy modeling. Instead of simply assuming that the 20 percent reserve margin will correspond to the 0.1 LOLE reliability standard going forward, DESC could model one or more future years to validate this assumption. If the results of this analysis show that the 20 percent reserve margin does not correspond closely to a 0.1 LOLE in the future, this suggests that further resource adequacy modeling is needed to identify appropriate reserve margin requirements under evolving system conditions.

This iterative approach to capacity expansion and resource adequacy modeling is a best practice in integrated resource planning.[19] While there are practical and computing limits to how many iterations the Company should model, the Company could choose at least one additional representative future year with a substantially different load and resource mix than 2028.

[19] *See* Synapse Energy Economics and Berkeley Lab, *Best Practices in Integrated Resource Planning: A guide for planners developing the electricity resource mix of the future* (Nov. 2024), available at: https://emp.lbl.gov/publications/best-practices-integrated-resource.

Q What are your concerns with the Company's decision to hold the ELCC input assumptions for solar and storage constant throughout the planning period?

A I am concerned that the Company is undervaluing the future reliability contributions of four-hour battery storage. As DESC's system expands and its peak load increases, I expect the DESC system to be able to incorporate a greater quantity of solar and storage before becoming saturated from a capacity accreditation perspective. DESC's reference load forecast projects that peak load will grow by 1.2 gigawatts ("GW") from 2028 through 2045 and its high load forecast projects that peak load will grow by 2.2 GW over the same period.[20] If this level of load growth were to materialize, I expect it to have a substantial impact on the quantity of battery storage that could be incorporated into DESC's system before firm reliability value starts to decline.

Q What are your concerns with the Company's decision to limit four-hour battery additions beyond a certain accreditation value?

A I am concerned that DESC is overly constraining battery additions in its capacity expansion modeling, based on its underestimation of forward-looking storage reliability contributions. DESC imposes a cumulative build limit of 1,200 MW on four-hour battery storage resource additions in its capacity expansion modeling,

[20] DESC Response to ORS Data Request No. 1-02, "ORS 2026-9-E 1-2f (Peaks)." The Company's response to ORS Data Request No. 1-02 and the associated attachment contains voluminous spreadsheet data and can be provided to the Commission and properly-authorized parties upon request.

split evenly between standalone battery storage and hybrid solar-plus-storage resources.[21] DESC explains its reasoning for this decision as follows:

> Once the marginal ELCC of 4-hour storage fell below 50%, this indicated that a resource with twice the discharge duration would provide greater reliability value per MW of installed capacity. Accordingly, the Company evaluated 8-hour storage (a resource that the IRP Stakeholder Advisory Group had requested for evaluation) and found it to have an incremental ELCC of approximately 65% for the first 400 MW tranche beyond 1,200 MW of 4-hour storage.[22]

Four-hour and eight-hour storage will have different cost trajectories on a per-kilowatt (kW) and per-kilowatt-hour (kWh) basis, as well as different accreditation values. They can provide different hourly energy arbitrage and reliability potential to the system. Deploying both types of storage, along with intermediate six-hour storage, would provide diversity benefits to DESC's system. Depending on the system's risk profile as well as the supply curve of the generating assets on the system, shorter- or longer- duration batteries may offer greater per unit benefits. DESC should allow the model to continue dynamically selecting resources up to the economically optimal quantity, as opposed to imposing the strict 1,200 MW constraint.

Q How could DESC more effectively model four-hour battery storage resources going forward?

A Instead of modeling a strict limit on the quantity of four-hour battery storage that can be added in the capacity expansion model, DESC could model tranches of four-hour battery storage resources, with declining firm capacity accreditation

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[21] DESC Response to ORS Data Request No. 3-07 (Exhibit LM-24 to Metz Direct).

[22] *Id*.

values. This is a resource planning modeling best practice. Furthermore, DESC could conduct ELCC analyses at intervals that are further out in the future (for example, every five years) to assess how ELCC results might change under different load conditions. Then, the MW quantities in each tranche of battery storage resources could change over time to reflect evolving ELCC results.

Q In conclusion, what are your recommendations regarding the Company's IRP?

A DESC should commit to retiring Wateree and Williams by their projected retirement dates in the Preferred Portfolio. My independent SERVM analysis validates the conclusion that this portfolio of resources will be able to reliably serve load throughout DESC's system, even under higher-than-expected load conditions. Keeping the coal plants online beyond their current retirement dates would impose unnecessary costs on ratepayers and is not needed for DESC to meet its reliability standard.

My review of the Company's modeling framework suggests that DESC is not accurately quantifying the firm capacity needed to satisfy its reliability standard. This may cause DESC to overestimate its firm capacity needs in the event of near-term load growth. To improve its modeling framework and minimize ratepayer costs, DESC should conduct forward-going analyses of how its reserve margin requirement and ELCC values for energy storage may evolve over time under different load and market conditions.

Q Does this conclude your testimony?

A Yes.

Exhibit SC-1:

Resume of Sabine Chavin

Synapse Energy Economics, Inc.

Sabine Chavin, Senior Associate

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schavin@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, Apr 2025–Present*, Associate*, Jul 2022–Apr 2025.

- Consults on energy sector issues, including integrated resource planning, power system modeling, federal energy legislation, tracking utility performance, electrification policies, and energy storage.
- Skilled power system modeler, with experience using resource adequacy, capacity expansion and production cost modeling to assess impacts of large loads, federal and state energy policies, forecast avoided energy costs, and evaluate energy equity considerations.
- Co-developer of interactive website dashboards, including one to assess energy and emissions in the Northeast and one to track the performance of electric utilities in Puerto Rico.
- Assists in developing testimony on power plant economics.

Kleinman Center for Energy Policy, University of Pennsylvania. *Student Fellow,* Jan–May 2022

- Attended energy and climate policy seminars on a range of topics including the geopolitics of rare earth materials, adaptive architectural design and geoengineering.
- Researched and authored a blog post on microgrid tariff regulations.

Neuroscience Lab, University of Pennsylvania. *MindCORE Fellow in Balasubramanian Lab*, Summer 2021

- Designed and coded in Python a model of spatial navigation to better understand biological neural navigation processes.
- Studied analytical techniques for interpreting our computational results.

Cryo-electron Tomography Lab, University of Pennsylvania. *Research Assistant in Chang Lab*, Summer 2020

- Generated and analyzed tomograms (3D representations) of parasites from 2D electron microscope data.
- Authored literature review on the lifecycle of *Plasmodium falciparum* (malaria parasite).
- Explored useful machine-learning approaches to classifying proteins.

EDUCATION

University of Pennsylvania, Philadelphia, PA
Bachelor of Arts in Physics: Concentration in Computer Techniques, 2022
Master of Science in Physics, 2022

University of California, San Diego, San Diego, CA
Certificate in Power Systems Engineering, 2026

PUBLICATIONS

Chavin, S., Fagan, B., Weiss, I. 2026. *Electric System On-Island Capacity Alternatives for Prince Edward Island: Examination of MECL Application for On-Island Capacity Supply.* Synapse Energy Economics for Prince Edward Island Regulatory and Appeals Commission.

Shenstone-Harris, S., W. Dejeanlouis, S. Chavin. 2026. *Understanding Rising Transmission Costs in the District of Columbia: An Overview of Transmission Planning and Its Impact on Electricity Customers in DC*. Synapse Energy Economics for the District of Columbia Department of Energy and Environment and Office of the Attorney General.

Chavin, S., P. Knight, S. Sharaf., A. Zeng. "How Increased Clean Energy Deployment in Indiana Can Pave the Way for Lower Bills." Presentation prepared for Advanced Energy United, February 2026.

Resor, C., S. Chavin, P. Knight, S. Sharaf. 2026. *The Next Decade in PJM: A Path to Reliability and Affordability*. Synapse Energy Economics for Advanced Energy United.

Borden, E., S. Chavin, W. Dejeanlouis, C. Mattioda, A. Zeng, A. Glaser Schoff. 2025. *Assessment of Storage Procurement Mechanisms and Cost-Effectiveness in Maine*. Synapse Energy Economics for the Maine Governor's Energy Office.

Chavin, S., Knight, P., Shenstone-Harris, S., Zeng, A., Fuzaylov, A., Hittinger, J. 2025. *Tackling the PJM Electricity Cost Crisis.* Synapse Energy Economics for Evergreen Collaborative.

Knight, P., S. Chavin, J. Hittinger, A. Zeng, C. Resor. 2025. *Modernizing Pennsylvania's Clean Energy Policies: An analysis of the proposed PRESS and PACER policies.* Synapse Energy Economics for Pennsylvania Department of Environmental Protection.

Chavin, S., Knight, P., Glick, D., Gyalmo, T., Weiss, I. *Risks of Rapid Data Center Growth in PJM.* Synapse Energy Economics for Sierra Club.

Shenstone-Harris, S., C. Mattioda, T. Gyalmo, S. Chavin. 2024*. Bill and Rate Impacts of PJM's 2025/2026 Capacity Market Results & Reliability Must-Run Units in Maryland.* Synapse Energy Economics for the Maryland Office of People's Counsel.

Synapse Energy Economics, Resource Insight, Les Deman Consulting, North Side Energy, and Sustainable Energy Advantage. 2024. Avoided Energy Supply Components in New England: 2024 Report. Synapse Energy Economics for AESC 2024 Study Group.

Takahashi, K., A. S. Hopkins, E. Carlson, S. Schadler, S. Chavin. 2024. *Memo: Assessment of Electric Grid Headroom for Accommodating Building Electrification (Revised July 2024)*. Synapse Energy Economics to New Yorkers for Clean Power.

Frost, J., S. Chavin, P. Silva. 2023. *Impacts of Electricity Generation Regulatory Structures on Connecticut Ratepayers.* Synapse Energy Economics for Connecticut Office of Consumer Counsel.

Kwok, S., P. Knight, J. Frost, S. Chavin, P. Rhodes. 2023. *Modeling the Benefits of Energy Storage in Maryland*. Synapse Energy Economics for American Clean Power Association.

Frost, J., J. Litynski, S. Chavin, P. Silva. 2023. *The Impact of Resource Inflexibility on Capacity Accreditation in New England*. Synapse Energy Economics for Sierra Club.

Knight, P., J. Frost, T. Fitch, E. Sinclair, J. Tabernero, O. Griot, B. Havumaki, J. Smith, L. Metz, S. Chavin. 2023. *TVA's Clean Energy Future: Charting a course to decarbonization in the Tennessee Valley.* Synapse Energy Economics for GridLab and Center for Biological Diversity.

Goldberg, D., S. Chavin, J. Tabernero, P.Knight. 2023. *Green Dash Northeast: state-level data on emissions and energy in the Northeast.* Synapse Energy Economics for Barr Foundation.

SKILLS

Python, OCaml, MATLAB, Java, Microsoft Office Suite

Resume updated June 2026