INDEPENDENT CASE STUDY

The Google-CFS Power Purchase Agreement

A Data Center Case Study

When the operator builds the plant: fusion offtake, hyperscale demand, and Virginia's energy market

Companion to What Virginia Is Spending, What Virginia Is Getting

Fusion

Prepared by Tommy Turner

Williamsburg and Christiansburg, Virginia

October 2026 · Version 2.2

DOI: 10.5281/zenodo.20679935 ORCID: 0009-0005-7422-9881

CASE STUDY: THE GOOGLE-CFS POWER PURCHASE AGREEMENT

When the Operator Builds the Plant: What the Fusion PPAs Mean for Virginia's Energy Market

Series: Companion to What Virginia Is Spending, What Virginia Is Getting (v5.3)
Evidence snapshot: June 12, 2026
Updated through: October 24, 2026, for the items dated in the text
Version: 2.2 (supersedes v2.1, August 2026)
Author: Tommy N. Turner
Location: Williamsburg and Christiansburg, Virginia
Contact: 757-784-0979 · tommy@gofast.pro · linkedin.com/in/tommyturner
ORCID: 0009-0005-7422-9881
DOI: 10.5281/zenodo.20679935
Published: June 2026 (v2.0) · Revised October 2026 (v2.2)

Companion case studies in this series:

- Henrico County: How Two Neighborhoods Forced Virginia's Second-Largest Data Center Jurisdiction to Change Course
- Prince William County: Governance Capture, the Revolving Door, and the Democratic Correction
- Hanover County: Mountain Road, Tract, and the Search for Leverage
- Chesterfield County: The $0.24 Rate, the Thirty-Year Lock, and the Two-Corridor County
- Orange County and the Town of Orange: Convergence at Two Scales: One Industry, Two Governments, and the Entitlement Neither Can Reach

Disclosure: The author serves on the advisory board of an Alfred P. Sloan Foundation-funded study at Emory University on data centers and the Southern energy buildout. The study had no role in this case study.

© 2026 Tommy N. Turner. All rights reserved. This report may be excerpted with attribution.

CONTENTS

PURPOSE AND SCOPE **4**
SECTION 1: THE DEALS **6**
The second offtaker 7
SECTION 2: THE PLANT **8**
Permit-by-permit status 8
Key reference numbers 10
SECTION 3: WHY THESE DEALS EXIST **12**
SECTION 4: THE REGULATORY PATHWAY **15**
The PJM application 16
SECTION 5: THE TECHNOLOGY COLLATERAL **18**
SECTION 6: RISK ALLOCATION **21**
SECTION 7: THE PRECEDENT QUESTION **25**
SECTION 8: WHAT IS NOT KNOWN **27**
SECTION 9: GAPS IN THE RECORD **29**
ENDNOTES **31**
SOURCES **39**

PURPOSE AND SCOPE

This case study documents the power purchase agreements between Google, Eni, and Commonwealth Fusion Systems and their implications for Virginia's energy market structure, ratepayer cost allocation, and data center infrastructure policy. It is not a technology profile. Readers looking for tokamak physics, magnet specifications, or plasma confinement details will not find them here. What they will find is an institutional and fiscal analysis of the commercial arrangements themselves, the regulatory pathways that make them possible, the allocation of risk among operator, developer, utility, and ratepayer, and the precedent the deals set for how data center demand is restructuring who generates power, who buys it, and who pays for the grid infrastructure that connects them. The report does not advocate for or against fusion, for or against the Google-CFS arrangement, or for or against operator-anchored generation as a model. It is designed to be analytically useful whether the ARC plant delivers in the early 2030s, later, or never.

Three developments shape this report. First, CFS, by its own account the first fusion company to apply to PJM Interconnection, entered PJM's reformed queue in April 2026 and gave the project's site a name: the Fall Line Fusion Power Station. The interconnection timeline now stands alongside the physics as a binding constraint on the delivery date, and this report treats it that way. Second, the offtake picture has resolved from one buyer to two. Eni's power purchase agreement, announced September 22, 2025 and valued by the companies at more than $1 billion, brings with it the comparison it invites between a technology-strategic buyer and an energy-major buyer pricing the same unbuilt plant. Third, the conventional-generation backdrop has hardened: the GS-5 rate class order, the CERC litigation, before the Supreme Court of Virginia as of June 12, 2026, a revised Dominion resource plan, capacity auctions clearing at their price cap, and a proposed acquisition of Dominion Energy itself by NextEra Energy.

The case study is written to serve three audiences. First, researchers studying the energy and social implications of data center expansion in the U.S. South; the material bears on five analytic categories: institutional analysis (Section 4), environmental and distributional justice and utility finance (Section 6), energy geography (Section 2), and energy labor (Section 8).[1] Second, Virginia policymakers, State Corporation Commission staff, and utility regulators evaluating how operator-anchored generation changes the grid planning and ratepayer cost allocation frameworks the Commonwealth has relied on for decades. Third, citizens and journalists seeking to understand the relationship between data center demand, new generation capacity, and residential electricity costs.

A note on lane discipline. The companion county study, *Chesterfield County: The $0.24 Rate, the Thirty-Year Lock, and the Two-Corridor County* (v3.0, June 2026; current version v3.1), owns the land-use record, the economic development mechanics, the local fiscal terms, and the county's two-corridor politics. This report owns the deal and the technology bet: the PPAs' structure and risk allocation, the fusion timeline they depend on, the offtaker strategy, the grid integration path, and what a speculative generation source means for a hyperscaler's energy book and for Virginia's data center energy story. Where the two reports touch, the fact is stated once here and the county record is cited rather than duplicated.

SECTION 1: THE DEALS

On June 30, 2025, Google signed a power purchase agreement with Commonwealth Fusion Systems for 200 megawatts of electricity from CFS's planned ARC fusion plant in Chesterfield County, Virginia.[2] The agreement represents half the ARC facility's projected 400 MW total output. Google described it as "the largest direct corporate offtake agreement for fusion energy."[3]

The structural significance of the deal is not the megawatts. It is the mechanism. The Google-CFS PPA is a bilateral private contract between a power consumer and an independent generator. Google is not buying power from Dominion Energy Virginia, its regulated utility. It is contracting directly with a developer that will build a plant on land leased from Dominion and connect to the Dominion grid through a switchyard on Dominion-managed property.[4] The traditional pathway for procuring new generation in Virginia runs through the utility, the State Corporation Commission, and the ratepayer cost recovery framework. This deal bypasses the utility's own procurement and the ratepayer cost recovery framework, but not the Commission: Va. Code § 56-580 D has the SCC permit the construction and operation of a generating facility it finds will have no material adverse effect on the reliability of regulated utility service and is not otherwise contrary to the public interest (Section 4). And the plant still runs through the utility, as landlord, development partner and interconnection host.

The PPA gives CFS a bankable revenue commitment from a creditworthy offtaker.[5] Project finance for a first-of-its-kind energy facility requires more than investor enthusiasm; it requires a contracted buyer whose credit quality and purchase commitment make the revenue stream financeable. Google's balance sheet and long-term offtake commitment provide exactly that. The agreement also includes options for Google to purchase power from future ARC plants, suggesting a fleet deployment model rather than a one-off transaction.[6]

Google's dual role deserves precision. Google has been an equity investor in CFS since the 2021 Series B round and increased its stake as part of the June 2025 strategic partnership.[7] The $863 million Series B2 round in which that increased stake formally landed was announced separately, on August 28, 2025, with Google, Nvidia's venture arm, Eni, Gates Frontier, and a consortium of Japanese investors led by Mitsui and Mitsubishi participating.[8] Google is both an owner of the developer and a contracted buyer of its output. This dual role is common in venture-backed energy but unusual in regulated utility markets, where the buyer and the generator are expected to maintain arm's-length commercial relationships.

The second offtaker

On September 22, 2025, Eni and CFS announced a power offtake agreement that the companies jointly valued at more than $1 billion, covering power from the same first ARC plant.[9] The megawatt quantity, contract term, and price were not disclosed; the only volume signal in the public record is CFS's own statement, the same day, that Google's 200 MW plus Eni's undisclosed share together commit "more than half" of the plant's 400 MW.[10] Eni is not a new arrival. It was among CFS's first institutional investors in 2018, signed a technological collaboration framework with CFS in 2023, and increased its equity stake in the Series B2 round. The PPA converts that technological and financial relationship into a commercial one.[9]

The disposition of the non-Google 200 MW, once among the most consequential unknowns in the public record, has narrowed rather than resolved. Something between zero and roughly 200 MW of ARC's output remains uncommitted, and the Eni tranche's size and terms are undisclosed.

The two-offtaker structure invites the comparison this report exists to make. Google is a technology-strategic buyer: an equity investor procuring firm carbon-free power for its own load in the same county, under a 24/7 clean energy commitment that no available technology currently satisfies at scale. Eni is an energy-major buyer: an investor since 2018 whose director of technology, R&D and digital said "The power will be sent to the grid at the end of the day," which TechCrunch summarized as "Eni will resell it."[11] One buyer is hedging its load growth and its carbon ledger; the other is buying a merchant position in a technology it part-owns. That two such different institutions committed to the same unbuilt plant within three months of each other is a market signal, though neither disclosed a price. What it is not is evidence the plant will run. CFS's release on the Google agreement says it "is anchored in CFS' SPARC achieving net fusion energy, known as Q>1"; the Eni release, as read for this report, states no such condition and says only that SPARC "will generate net energy."[2][9]

On June 11, 2026, CFS announced that Plynth Energy, an Abu Dhabi government-owned fusion-focused investment fund, had acquired a minority stake in the company for an undisclosed amount.[12] CFS's total capital raised then exceeded $3 billion, which the Fusion Industry Association's reporting puts at nearly one-third of all private investment in the global fusion sector.[13] On July 30, 2026, CFS announced $1 billion of additional equity financing and put its total capital raised at $4 billion; its September 10, 2026 release describes that total as "about 30% of the total capital raised by the fusion industry," the company's own figure, at a later date than the Association's.[13]

SECTION 2: THE PLANT

The site has a name now. On April 28, 2026, CFS announced that the ARC plant site in Chesterfield County would be called the Fall Line Fusion Power Station, after the geological boundary where the Piedmont drops to the Tidewater coastal plain and produces the rapids on the James River.[14] The name does some quiet geographic work: it ties a planned commercial fusion plant to the same river-industrial corridor that hosted the coal-fired Chesterfield Power Station for eight decades and that will host the CERC gas peaker. Generation bets, fossil and post-fossil alike, keep landing on the same few square miles of already-industrialized riverfront, because that is where the switchyards, the transmission, the water, and the zoning already are.

The facility is planned for a 94-acre site at 1201 Battery Brooke Parkway in the James River Industrial Center, on land owned by Dominion Energy Virginia, with CFS holding an option-to-lease.[15] Early announcement materials described the parcel as 100 acres; the county zoning record says 94, and this report uses the zoning figure.[16] Dominion provides technical and development support under a joint development agreement, but the plant is not a Dominion asset. CFS is the developer, owner, and operator. The distinction matters for everything that follows, because it determines who bears the costs and who captures the revenue. The full land-use record, including the conditional use permit's conditions and the surrounding corridor's by-right development history, is in the companion county study.[17]

CFS estimates the total project cost at $2.5 billion.[18] The plant is designed to produce 400 MW of net electricity as firm baseload power.[19] For the energy market analysis that matters here, "firm" means the plant can run continuously and dispatch power around the clock without dependence on weather, battery storage, or grid-balancing mechanisms. If it works as designed, the ARC plant would deliver what no existing renewable source can deliver at this scale without substantial supplementary infrastructure.

Permit-by-permit status

CFS has stated that construction begins only after state, local, and federal permits are in hand.[20] The table below is the report's accounting of that stack as of the evidence date. Checked negatives are entries where targeted searching found no public record; they are reported as absences, not as confirmed facts.

Approval	Authority	Status, June 12, 2026
Conditional use permit	Chesterfield County Board of Supervisors	Granted September 17, 2025, unanimous; described by CFS as the world's first CUP for a commercial

Approval	Authority	Status, June 12, 2026
		fusion power plant[17][21]
Site plan / land disturbance	Chesterfield County	No public record of filing
Radioactive materials license	Virginia Department of Health, Office of Radiological Health (NRC Agreement State)	Required; no application publicly announced[22]
Air permit (backup generation)	Virginia DEQ	Likely required for emergency generators; no filing found*
Stormwater / VPDES	Virginia DEQ	Potentially required by site design; no filing found*
Authority to construct/operate (Va. Code § 56-580 D)	Virginia State Corporation Commission	Required for a merchant generator; no docket found
Generation interconnection	PJM Interconnection	Application submitted April 2026; validation phase (Section 4)
Federal framework	U.S. Nuclear Regulatory Commission	Part 30 byproduct-materials framework; proposed rule published February 26, 2026, comment period closed May 27, 2026; rule not final[23]

No site work had been reported at Battery Brooke Parkway as of June 12, 2026. On July 30, 2026, Richmond BizSense reported, citing online county records, that CFS had not yet filed a site plan or a build permit for the plant, and quoted the CEO saying the company was “getting ready to move some dirt down there and start to prep that site.”[24] On groundbreaking timing the public record holds three formulations, none from a CFS document: a CFS spokesperson’s “late 2020s” in August 2025, trade reporting of 2027–2028 after the Series B2 raise, and American Nuclear Society reporting of 2028.[24]* The honest rendering is late this decade, probably 2028, unconfirmed by the company in writing.

The precedent that matters for the license line above: Massachusetts granted CFS a broad-scope radioactive materials license for SPARC in October 2024, which CFS described as the first of its kind for a commercial fusion machine.[25] Virginia’s version of that proceeding had not publicly begun as of June 12, 2026. A license application that has not been filed cannot be approved on any schedule, and the permit stack is one of the three clocks the risk analysis in Section 6 runs on.

The ARC site’s proximity to Google’s data center campus at Bermuda Hundred Road, where building permits for the first hall were filed June 4, 2026, is part of the strategic logic. Minimizing the distance between generation and load reduces transmission losses and simplifies grid interconnection. CFS told the Board of

Supervisors during the permit hearings that ARC will need approximately 400,000 gallons of water per day, which leaves open the county's longer-term industrial water question, documented in the companion study.[17]*

Key reference numbers

Metric	Value
Google PPA capacity	200 MW (June 30, 2025)
Eni PPA	>$1 billion stated value; MW and term undisclosed (September 22, 2025)
Committed offtake	"More than half" of 400 MW (CFS statement)
ARC plant design output	400 MW net
ARC estimated cost	$2.5 billion (CFS estimate)
Implied capital cost	~$6,250/kW before financing, operations, decommissioning
CFS total capital raised	$4 billion (CFS, July 30, 2026); >$3 billion at June 12, 2026
Site	94 acres, 1201 Battery Brooke Pkwy, Chesterfield County
PJM application	Submitted April 2026; ~400 MW; Cycle 1 of reformed queue
PJM study timeline	1–2 years (PJM); 4–6 years study-to-energization (CFS)
ARC target operation	Early 2030s (contingent; see slip table, Section 5)
SPARC status	Almost 80% complete (CFS program estimate, August 5, 2026); ~75% in April–May 2026
SPARC Q>1 target	2027 (company projection)
NRC framework	Byproduct material, 10 CFR Part 30; rule not final
CERC gas plant	944 MW, approved November 25, 2025; appeal pending at June 12, 2026, Supreme Court of Virginia
GS-5 rate class	≥25 MW demand and ≥75% load factor; effective January 1, 2027
Dominion data center load projection	13,353 MW by 2038 (2024 IRP)
PJM capacity price, DOM zone, 2025/26	$444.26/MW-day (1,436% over prior year)
PJM RTO clearing price, 2027/28	$333.44/MW-day (at FERC-approved cap)
Dominion acquisition	NextEra merger agreement announced May 18, 2026 (about $67 billion in press accounts); approvals pending (status, Section 6)

Sources: CFS and Eni press materials, PJM releases and auction reports, Virginia SCC orders, Dominion IRP filings, SEC filings. Developer and corporate figures are claims; grid and regulatory figures are from public filings. See endnotes.

SECTION 3: WHY THESE DEALS EXIST

The Google-CFS PPA did not emerge from a corporate sustainability brochure. It emerged from a supply crisis. Virginia's data center industry is consuming electricity at a pace that exceeds the grid's ability to generate and deliver it, and the institutions responsible for managing that grid are struggling to keep up.

The demand numbers. Dominion Energy's 2024 Integrated Resource Plan projects data center metered load in its Virginia service territory reaching 13,353 MW by 2038; overall demand in Dominion's PJM delivery zone is "forecasted to increase 5.5% annually over the next decade and double by 2039."[26] The 2025 IRP Update, filed October 15, 2025 using the PJM-derived load forecast the SCC directed Dominion to adopt, projects demand in the DOM Zone more than doubling by 2045, and its Company Preferred Plan builds about 33.4 gigawatts of new generation over twenty years: 52.4 percent solar, 25.4 percent natural gas, 10.3 percent wind, 6.0 percent battery storage, and 5.8 percent small modular reactors.[27] Dominion's own filing concludes that the portfolio retiring all gas by 2045, as the Virginia Clean Economy Act requires, is not viable on reliability and cost grounds.[27] The SCC accepted the update for filing on December 23, 2025, finding it "legally sufficient under the Guidelines" while stating that acceptance does not express approval of "the magnitude or specifics of Dominion's future spending plans."[27] Its July 15, 2025 final order on the underlying 2024 IRP had taken the same posture.[28] PJM's January 2026 long-term forecast trimmed near-term peaks after stricter vetting of data center requests but kept the long arc steep: summer peak rising from about 160 GW in 2025 to roughly 253 GW by 2046, driven primarily by data centers.[29]

The capacity market signal. The July 2024 PJM auction for the 2025–26 delivery year cleared the Dominion zone at $444.26 per megawatt-day, a 1,436 percent increase over the prior year, and PJM's independent market monitor attributed about $9.3 billion of that auction's capacity market revenues to existing and forecast data center load, about 63 percent of the $14.7 billion total cost to load that PJM reported for the auction.[30] The two auctions held after it and before June 12, 2026 both cleared at the FERC-approved price cap negotiated in the settlement of Pennsylvania Governor Josh Shapiro's complaint against PJM: $329.17/MW-day RTO-wide for 2026/27, and $333.44 for 2027/28, the latter clearing 134,478.1 MW, with cleared supply times clearing price summing to about $16.4 billion, which PJM notes is not a total cost to load.[31] Two consecutive auctions pinned at an administrative ceiling stopped functioning as price discovery some time ago: demand growth has outrun the supply response, and the cap is absorbing the difference. FERC extended the collar to the next two auctions in April 2026, and the first of them, the 2028/29 auction, cleared at its cap on July 14, 2026.[32] Those

costs flow through to ratepayers. Base rates are rising as well: the November 2025 biennial review order approved base rate increases that it put at about $11.24 a month for a typical residential customer in 2026 and another $2.36 in 2027.[33]

The generation shortfall and the fossil bridge. On November 25, 2025, the SCC approved the Chesterfield Energy Reliability Center, a 944 MW gas-fired peaker on the retired coal station site at the other end of the same James River industrial corridor as the fusion parcel, resting in part on a NERC analysis showing PJM reserve shortfalls under extreme weather conditions for the 2025-2029 forecast period.[34] As of June 12, 2026 the order was under appeal. After the SCC denied reconsideration on February 12, 2026, the Southern Environmental Law Center filed the community intervenors' notice of appeal on February 17 and, on May 27, 2026, a petition for appeal with the Supreme Court of Virginia on behalf of the Chesterfield NAACP, Appalachian Voices, and Mothers Out Front, arguing among other things that the approval failed the Virginia Environmental Justice Act; a parallel challenge to the DEQ air permit was pending in Richmond Circuit Court as of that date, with no ruling found.[35] The full docket history is in the companion county study.[17] What belongs in this report is the juxtaposition: on the same county ledger, the fossil bridge is being litigated while the fusion bet is being permitted. The CERC plant exists because the clean alternatives are not yet available; the fusion plant's commercial relevance exists for the same reason. June 1, 2029 is the CERC in-service target. The early 2030s is the fusion target. The gap between those dates is the period in which Chesterfield County hosts new fossil combustion justified, in part, by load from the same hyperscaler that is buying the fusion plant's output.

The rate structure. The same November 25, 2025 order created the GS-5 rate class, effective January 1, 2027, for customers with a measured or contracted demand of 25 MW or more on a contiguous site and a measured or expected load factor of at least 75 percent, with minimum demand charges of 85 percent of contracted distribution and transmission demand and 60 percent of contracted generation demand.[36] For customers taking initial service and signing an electric service agreement on or after January 1, 2027, the order sets a 14-year contract term, a load ramp of up to four years, and collateral requirements.[37] The 2026 General Assembly then layered legislation on top: the Lucas-LeVere Bolling cost-shift package, amended by Governor Spanberger in April and signed in May 2026, directs the SCC to assign data-center-driven costs to the customers driving them, after the Governor struck a provision that would have required data centers to bear PJM capacity purchase costs directly.[38] The statewide fiscal analysis is in the companion state report; the point here is that the regulatory environment the PPAs will operate in is being rebuilt in real time, around the same load growth that produced them.

The carbon constraint. Google has committed to operating on 24/7 carbon-free energy, and a senior Google executive reaffirmed in May 2026 that the 2030 goal stands.[39] The qualifier “24/7” is what separates this commitment from a standard renewable energy credit strategy. Solar generates during daylight. Wind depends on conditions. Both require massive storage to approximate firm delivery. The Joint Legislative Audit and Review Commission found that meeting unconstrained demand, with data centers the main driver, would require new solar, wind, natural gas and transmission together, with solar added at about twice its 2024 annual rate.[40] Small modular reactors at North Anna face regulatory timelines and cost uncertainties that may push deployment well into the 2030s.[41] Fusion, if it works, would join fission as a firm, carbon-free source, without fission’s long-lived spent fuel (Section 4). The PPAs are commercial bets on that conditional.

The budget backdrop. The General Assembly’s dispute over the data center sales tax exemption, unresolved as of June 12, 2026 with a July 1 shutdown threshold approaching, is documented in the companion state report and tracked in the county study.[17][42] The impasse ended before that threshold: the budget was approved by the Governor on June 29, 2026 (Chapter 1, 2026 Acts of Assembly, Special Session I, effective July 1, 2026).[42] It matters here only as weather: the political environment in which the SCC will eventually decide how to treat operator-anchored generation is one in which data center energy costs have become the most litigated question in Virginia politics.

SECTION 4: THE REGULATORY PATHWAY

Four regulatory frameworks now intersect at the Fall Line site: the federal Nuclear Regulatory Commission's licensing authority, the Virginia State Corporation Commission's jurisdiction over grid-connected generation, the local zoning process, and, since April 2026, PJM's interconnection queue. What is distinctive about all four is that each is processing a fusion plant for the first time, which means the approval pathways are being invented around the applicant.

The NRC framework. In April 2023, the NRC decided that commercial fusion devices would be regulated under the existing byproduct-materials framework, 10 CFR Part 30, rather than the utilization-facility framework that governs fission reactors.[23] The distinction rests on the physics. Fusion reactions are not self-sustaining; there is no chain reaction to run away, and no long-lived spent fuel requiring geological disposal. Congress codified the decision in the ADVANCE Act in July 2024.[43] The implementing rulemaking is now well advanced: the proposed rule, "Regulatory Framework for Fusion Machines," was published in the Federal Register on February 26, 2026, and its comment period closed May 27, 2026.[23] A licensing framework closer to that of particle accelerators and medical isotope facilities than to nuclear power plants is a substantial regulatory subsidy in time and cost, though the ARC plant will be the first full-scale commercial test of whether the streamlining holds at 400 MW. The rule is not final, and Section 6 treats that as live federal policy risk.

Virginia as an Agreement State. Virginia exercises primary authority over radioactive materials through its cooperative agreement with the NRC, via the Department of Health's radioactive materials program.[22] CFS confirms ARC will require a Virginia radioactive materials license. The Massachusetts precedent for SPARC, granted October 2024, took the form of a broad-scope license under that state's Agreement State program.[25] No Virginia application had been publicly announced as of June 12, 2026. This is the least-noticed clock in the project: the state license is a prerequisite to operation, the agency processing it had licensed no fusion power plant as of that date, and the proceeding had not started in public view by then.

The SCC and grid connection. The ARC plant is an independent generating facility connecting to the Dominion grid through a switchyard on Dominion-managed property, its output entering the PJM wholesale market through Dominion's transmission. A merchant generator in Virginia requires SCC authority under Va. Code § 56-580 D; no CFS docket appears in the public record as of the evidence date. The planning question is unanswered, and it now covers two offtakers: how does the SCC treat PPA-sourced generation for grid planning? Does the 200 MW

Google contracts for reduce the data center load Dominion must plan for in its IRP, or is it supplemental capacity that offsets nothing? If the PPA reduces planned load, it may reduce the infrastructure costs that flow to residential bills. If the SCC treats it as irrelevant to planning, ratepayers see no benefit from the private investment. As of June 12, 2026, the SCC had issued no ruling, and its generic proceeding on large-load interconnection had produced technical conferences, not orders.[44]

Local zoning. The Chesterfield Board of Supervisors granted the conditional use permit unanimously on September 17, 2025, following an equally unanimous Planning Commission endorsement in August; CFS calls it the world's first CUP for a commercial fusion power plant.[21] As of June 12, 2026, no significant local opposition to the fusion plant had been documented in the zoning record or the press coverage this report cites. The contrast with the county's data center politics, where the same board now faces vested-rights litigation over its new CUP ordinance, is documented in the companion study.[17] A 400 MW fusion plant on a former industrial parcel adjacent to a Dominion switchyard presents a different profile to residents than a 200-acre data center campus next to an elementary school, and the zoning record reflects that difference.

The PJM application

In the week before April 28, 2026, ahead of PJM's April 27 window close, CFS submitted a generation interconnection request to PJM for the Fall Line Fusion Power Station, announcing it on April 28 in a release titled as making CFS the first fusion company to apply to PJM Interconnection.[14] PJM's own release the next day confirmed the milestone from the other side of the counter, noting that its intake included, "for the first time, fusion energy."[45]

The mechanics matter more than the milestone. The application entered Cycle 1 of PJM's reformed interconnection process, the first major intake, in PJM's words, "under a redesigned approach," in a window that closed April 27, 2026 with 811 projects seeking 220 GW.[45] The queue reform replaced first-come-first-served with first-ready-first-served: applicants must demonstrate site control and post financial commitments up front. CFS's 400 MW sits in PJM's "other" resource category, alongside biomass and coal, because fusion does not yet have a category of its own.[46] A year ago, by CFS's own account, fusion was not in the drop-down menu on the application portal.[47] Project-specific details, including the queue position and the requested in-service date, are confidential until PJM accepts the application; as of the evidence date the project is in the validation phase.[45] On September 28, 2026, PJM began Phase I of the cycle with 617 projects totaling nearly 169 GW, from 811 initial applications of which 715 were accepted; PJM's announcement of September 30 does not say whether CFS's request is among the

617.[45] PJM expects cycle studies to take one to two years. CFS's own framing of the full runway is longer: four to six years from the start of the study process to electricity generation.[14]

Two institutional details deserve flagging. First, Dominion Energy advised CFS on the PJM process under their joint development agreement, which places the incumbent utility in the position of coaching an independent generator through the queue that the utility's own load growth has congested.[14] Second, PJM is using an AI-enabled review tool called HyperQ, developed by Google's Tapestry, to speed Cycle 1 application review.[45] A Google-developed tool is helping PJM process the applications that include the plant whose output Google has contracted to buy. No party in the sources this report cites has suggested impropriety, and PJM describes the tool as identifying and helping to assess sections of documents for further review. The observation belongs in the institutional record anyway: at every layer of this project, the entities inventing the process and the entities subject to it overlap.

The arithmetic of the runway is central to the report's analysis, and Section 6 builds on it. Four to six years from a study start in 2026 lands commercial operation between roughly 2030 and 2032 if nothing slips, which means the interconnection clock alone now occupies the entire margin between today and the "early 2030s" target. The physics no longer has the schedule to itself.

SECTION 5: THE TECHNOLOGY COLLATERAL

The ARC plant's financing, construction, and offtake commitments all wait on a machine in Devens, Massachusetts. SPARC is the demonstration tokamak that must produce more energy from fusion than the process consumes, the threshold called Q>1, before those commitments convert from bets into a schedule. CFS's release says the Google agreement "is anchored in" that threshold; the Eni release, as read for this report, states no such condition.[2][9] SPARC is, in the precise sense of the word, the collateral: the asset whose performance secures everyone else's position. The report tracks its status not out of technological interest but because every milestone and every slip reprices the Google and Eni positions.

Status. CFS reported on April 9, 2026 that SPARC is "about three quarters" complete, and in May that it is "nearly 75%." The figure is a program tracking estimate blending engineering, procurement, manufacturing, and assembly; it is not a physical construction percentage, and the two statements five weeks apart suggest the number is moving slowly.[48] On August 5, 2026, CFS described SPARC as "almost 80% complete," a program figure of the same kind.[48] The verifiable hardware record: the 75-ton cryostat base was installed in March 2025; the first production toroidal field magnet, a 24-ton D-shaped unit, passed a month of performance tests validated by the Department of Energy's independent panel in September 2025, earning CFS an $8 million milestone payment under DOE's Milestone-Based Fusion Development Program; that magnet was moved to its assembly stand in December 2025; and as of mid-May 2026, two of the eighteen toroidal field magnets were in place.[49] The first 48-ton half of the vacuum vessel arrived in October 2025, and CFS's April 9, 2026 post reported both halves inside Tokamak Hall; outfitting had begun by May 2026.[50] CEO Bob Mumgaard said at CES in January 2026 that all eighteen magnets should be installed by the end of summer 2026, a statement carried by press but absent from CFS's written materials.[51]* Sixteen magnets in roughly three and a half months was the implied pace. CFS's August 28, 2026 blog post says "We've tested 15 TF magnets now" and gives no installed count.[51]

CFS announced at the same CES appearance a collaboration with NVIDIA and Siemens to build a digital twin of SPARC, feeding Siemens design and lifecycle data into NVIDIA's Omniverse simulation libraries, with the stated aim of compressing "years of manual experimentation into weeks of virtual optimization."[52] Google DeepMind had announced its own AI partnership with CFS in October 2025, applying its TORAX plasma simulator to SPARC operations planning.[53] The pattern is consistent with everything else in this report: the technology bet is being

de-risked with the tools, and the balance sheets, of the companies that are also its customers and investors.

The target. CFS's own published position, on its technology page and in a May 2026 blog post, is that SPARC operations begin in 2027 and that Q>1 comes the same year.[54] That is the company's projection, and this report characterizes it as such. As of June 12, 2026, no month or quarter had been published, and no separate interval between first plasma and Q>1 had been stated. Two later statements bear on it. On July 30, 2026, TechCrunch reported that CFS "is now targeting a launch later this year" and that "The company hopes that by next year, Sparc will achieve scientific breakeven": on the article's date, turn-on in 2026 and Q>1 in 2027, in a reporter's account rather than a CFS document. On August 28, 2026, a CFS blog post wrote of starting to operate SPARC "in coming months," without a date or a year for Q>1.[54]

The record of the dates. The discipline this report applies to every CFS date follows from the table below, which assembles the company's public schedule statements over time. The reader should know that the current target is not the original one, and should also know that the slippage has been absorbed quietly, in changed language across documents rather than in any announcement of delay.

Statement date	SPARC commitment	ARC commitment	Source type
September–December 2021	Net energy from fusion "by 2025"	First plant "completed" early 2030s	CFS press releases
February 2023	"Operational in 2025," net energy "soon thereafter"	Grid power early 2030s	CFS press release
July 2023	First plasma late 2025; Q>1 "by early 2026 at the latest"	—	IEEE Spectrum paraphrase*
December 2024	First plasma 2026, net energy "shortly after"; website begins stating Q>1 "in 2027"	Power to grid early 2030s	CFS press release; cfs.energy
June 30, 2025 (Google PPA)	PPA "anchored in" Q>1; no date in release	Early 2030s	CFS press release
September 22, 2025 (Eni PPA)	CEO: "on track" to turn SPARC on "later in 2026"	Early 2030s	Press-carried CEO statement*
January 2026 (CES)	Turn-on "next year" (2027), in the reporter's words; all 18 magnets installed by end of summer 2026, attributed to the CEO	Early 2030s	Press report (TechCrunch)*

Statement date	SPARC commitment	ARC commitment	Source type
April–May 2026	~75% complete; “operations begin in 2027”	“early 2030s schedule for ARC power plant commercial operation”	CFS blog
July–August 2026	“Almost 80% complete” (August 5); operating SPARC “in coming months” (August 28), no year	Power on the grid “in the early 2030s” (July 30)	CFS blog; CFS press release

Three observations. The Q>1 date has moved roughly two years since 2021, from “by 2025” to 2027, without a single announcement of delay. The turn-on date moved from “later in 2026” to 2027 somewhere between September 2025, when the CEO affirmed the earlier date the same day the Eni deal was announced, and the following January; a July 30, 2026 press report again put turn-on later in 2026 (above). And “early 2030s” has been the ARC formula continuously since December 2021 while its meaning shifted from “completed” to “delivering power” to “commercial operation.” A phrase that holds unchanged for five years while the dates upstream of it slip is doing a different job than a date. None of this is evidence the machine will fail; tokamaks are hard, and a two-year slip on a first-of-kind device is unremarkable by the standards of large-scale physics projects. It is evidence about how the company communicates schedule, and it instructs the reader on how much weight “2027” and “early 2030s” should bear now. In June 2026 CFS published five peer-reviewed papers on ARC physics, with the CEO saying they “increase our confidence” in the early-2030s path.[55] Confidence statements are not schedule statements, and the report treats them accordingly.

SECTION 6: RISK ALLOCATION

The PPAs create a risk allocation structure fundamentally different from the traditional utility model. Understanding who bears what risk, and under what conditions, is essential to evaluating whether operator-anchored generation protects or exposes the public. The central point is this: the delivery date now runs on three independent clocks, and slip risk is no longer a single-variable problem.

The three clocks. The physics clock runs through Devens: Q>1 in 2027 by the company's projection on its technology page and in its May 14, 2026 blog post, with the slip history and the later statements documented above. The permit clock runs through Richmond and Rockville: as of June 12, 2026, a state radioactive materials license not yet applied for in public view, an SCC authorization with no docket in the public record, and DEQ permits with no filings found; and a federal rule that, as of October 24, 2026, appeared in the Federal Register's NRC index on the phrase "fusion machines" only as the February 26, 2026 proposed rule. The queue clock runs through Valley Forge: a one-to-two-year PJM study process for a cycle whose application window closed April 27, 2026 and whose Phase I began September 28, 2026 (PJM's announcement does not say whether CFS's request is in it), inside a four-to-six-year study-to-energization runway by CFS's own description. Any one of the three can move the delivery date by itself; none can advance it. The early-2030s target turns on whichever clock runs longest. The queue clock now sets the floor. Even perfect physics in 2027 cannot put ARC electrons on the grid before the interconnection process completes, which on CFS's own numbers lands between 2030 and 2032. The physics determines whether the date holds. The queue determines what the earliest possible date is. The permits are the clock nobody is watching, which is usually the one that bites.

Technology risk. Everything still depends on SPARC. If the demonstration underperforms, slips, or fails to validate the physics at projected scale, ARC's construction schedule shifts, and Google's 200 MW and Eni's undisclosed tranche remain undelivered for the duration. The technology risk is concentrated on CFS and its investors. The grid-level consequences of failure are shared with every ratepayer in the Dominion service territory, because during any delay Google's Chesterfield campuses draw from the grid that the CERC plant and the capacity auctions are pricing.

Project finance risk. CFS had raised more than $3 billion by June 2026, and $4 billion by July 30, 2026, against an estimated $2.5 billion project cost, and the offtake book now carries two creditworthy counterparties instead of one. That is a materially stronger financing position than a single-offtaker book, and it is the Eni deal's main function in the capital structure: a second investment-grade revenue commitment

makes the project's debt story less dependent on a single buyer's terms. First-of-a-kind cost overrun risk is unchanged and remains where it was: on CFS equity. Not on Google or Eni, whose PPAs are understood to be fixed-price commitments (inferred from standard structures; terms undisclosed).[56] Not on ratepayers, because the plant is not rate-based. Not on Chesterfield County, where the disclosed public money for siting is two matching $1 million grants from the Virginia Clean Energy Innovation Bank and the county.[57]

Offtaker pricing risk, and what the two contracts reveal. Neither PPA's price is public, so the comparison the two-offtaker structure invites must be made structurally rather than numerically. Google is buying a hedge against its own load in its own backyard, denominated in its 24/7 carbon-free commitment; the option value of fleet offtake rights and the strategic value of standing up a new firm-power industry plausibly justify a price premium no pure power buyer would pay. Eni is buying a resale position in a market it knows, through a company it has part-owned for eight years; its willingness to put a ten-figure number on the contract is the closest thing the public record holds to an arm's-length valuation of unbuilt fusion capacity, though without a disclosed volume or term it is not a price. The asymmetry of disclosure is itself informative: the deal whose value was announced is the one held by the party that resells power for a living. What neither contract reveals is who absorbs slip. Whether either offtaker holds delay penalties, price adjustments, or walk-away rights tied to SPARC milestones or delivery dates is undisclosed, and the Helion-Microsoft PPA, which reportedly carries financial penalties for missed delivery, demonstrates that fusion offtakers can and do negotiate such terms.[58]* Section 9 lists the PPA terms among its open documentary items.

Ratepayer risk. No Dominion cost recovery proceeding this report reviewed through June 12, 2026 includes the ARC plant, which keeps the construction-cost firewall between the project and residential bills intact. The temporal mismatch is the core of the exposure: the PPAs were signed in 2025; the plant delivers in the early 2030s at the earliest; and in between, Google's Chesterfield campuses ramp on grid power priced by capacity auctions that have cleared at their administrative cap three times in a row, the third on July 14, 2026, when the 2028/29 auction cleared at $325.00/MW-day (UCAP) under the extended FERC collar.[32] Ratepayers fund the bridge years through base rates, including the $11.24 monthly increase already ordered, and through capacity costs: the 2028/29 result and whatever the 2029/30 auction, scheduled for December 2026 under the same collar, adds to the stack. The PPA is a claim on future capacity, not present capacity. Nothing about the second offtaker changes that.

Grid reliability risk. Even at full 400 MW delivery, the plant covers a fraction of the load it is associated with. The companion county study estimates Google's three

Chesterfield campuses at roughly 520 to 780 MW at full buildout (100 to 150 MW at Bermuda Hundred and 420 to 630 MW at the western sites), and the combined Google and Chirisa footprint at more than 1,000 MW.[17][59] The remainder comes from the grid; whether GS-5's contract provisions reach those campuses depends on when each signed its electric service agreement, because the order applies them to agreements signed on or after January 1, 2027.[37] The PPA reduces Google's grid dependence for a portion of its load; the grid must still be built and maintained for the rest.

Counterparty and corporate risk. This risk arrived from an unexpected direction. On May 18, 2026, NextEra Energy and Dominion Energy announced a merger agreement, a stock-and-cash transaction (0.8138 NextEra shares per Dominion share plus $360 million in aggregate cash) that press accounts value at about $67 billion, which the companies' joint release said was expected to close in 12 to 18 months, pending approvals from shareholders, FERC, the NRC, and the Virginia State Corporation Commission, among others.[60] The approvals were still pending on October 20, 2026, when WHRO reported that the SCC's staff had recommended against the merger as proposed unless the companies commit to 57 conditions, 25 of them already in the companies' own proposals, with an evidentiary hearing scheduled to begin November 17, 2026 and a Commission decision due by January 11, 2027.[60] Dominion is not a party to either PPA, but it is the ARC project's landlord, its joint development partner, its interconnection host, and its adviser in the PJM queue. Every one of those relationships will be inherited by a new owner whose integration priorities are unknown, and the SCC review of the merger will run concurrently with the years in which CFS needs its lease executed, its switchyard built, and its state approvals granted. No public statement from either company read for this report, including their two Form 8-K filings and joint release of May 18, 2026, addresses the fusion project's place in the transaction; their filings with the SCC in the merger case were not reviewed. Nothing in the documents read suggests the merger is hostile to the project. The exposure is quieter: the project's most important non-contractual relationships now run through an institution in the middle of changing hands.

Environmental justice dimensions. The CFS plant produces zero operational carbon emissions if it works as designed. The 944 MW CERC gas plant was approved partly because clean alternatives, fusion included, are not yet available. Dominion's own environmental justice screening for the CERC air permit found the host census block group is 84 percent people of color and 73 percent low-income, with 22 of 24 surrounding block groups containing potential environmental justice communities under the Virginia Environmental Justice Act.[61] That record, and the litigation it feeds, belongs to the companion county study;[17] what belongs here is the

structural question of who bears the costs and who captures the benefits. The communities adjacent to the CERC site bear the health and environmental cost of the bridge years. The communities that capture the benefits of the data center campuses, and eventually of the fusion plant's tax base, are different communities. The costs and benefits land in different places, on different populations, on different timelines, and the fusion plant's eventual cleanliness does not retroactively compensate the people who breathed the interim.

Reputational and political risk. Fusion has been thirty years away for seventy years, as the joke goes, and the joke carries weight in policy circles. The political environment has sharpened: the cost-shift legislation was signed in May 2026, the budget that carried the fight over the data center exemption was approved by the Governor on June 29, 2026 (Chapter 1, 2026 Acts of Assembly, Special Session I), and the gubernatorial administration ran on making data centers pay their fair share.[38][42] If SPARC slips visibly past the company's 2027 projection while residential bills absorb consecutive capacity auctions at the cap, the fusion plant risks becoming the symbol of a procurement model that privatized the upside of clean firm power while the public funded the bridge. CFS and Google have made commitments that elected officials will hold them to, on a timeline that extends across at least two more electoral cycles.

Decommissioning risk. A gap: no public document located by this report as of June 12, 2026 discloses a decommissioning plan, cost estimate, or financial assurance mechanism for the ARC plant (the CUP file, Section 9, has not been read), and the byproduct-materials framework does not impose the decommissioning fund requirements that apply to fission reactors. The proposed NRC rule was open for comment through May 2026; whether the final rule addresses financial assurance for fusion facilities is one of the specific things to read it for.[23]

Federal policy risk. The regulatory pathway in Section 4 rests on a rule that is not final. A change of direction in the rulemaking, congressional intervention, or post-construction imposition of additional requirements would move both schedule and cost. The ADVANCE Act codification narrows this risk but does not close it; statutes fix frameworks, not license conditions.[43]

SECTION 7: THE PRECEDENT QUESTION

If the Google-CFS model works, it becomes the template. The structure, a hyperscale operator contracting directly with an independent generator for firm carbon-free power, was already propagating across the industry before the ARC plant produced a single electron, and the file has only thickened since. Microsoft's Constellation deal restarts Three Mile Island Unit 1. Amazon and Talen restructured their Susquehanna arrangement in June 2025 from a behind-the-meter co-location model to a grid-connected, front-of-the-meter supply of up to 1,920 MW, with the reconfiguration set for a spring 2026 refueling outage. Google's own book now runs from the CFS PPA through a 25-year contract on the restarted Duane Arnold nuclear plant, the Kairos Power SMR master agreement, the acquisition of developer Intersect Power, and a 20-year Michigan contract obliging it to fund new clean generation for a gigawatt-scale campus.[62] The fleet logic is explicit: the CFS agreement's options on future ARC plants signal a procurement strategy, not an experiment.[6]

Each deal shares a common structural logic. The operator contracts for power outside the regulated utility framework, absorbs some development risk through its purchase commitment, and shifts the generation decision from the utility and its regulator to the operator and its chosen developer. The traditional model in Virginia works differently: Dominion builds or contracts, the SCC approves, the investment is rate-based, costs are recovered from all ratepayers. If operators self-supply at scale, the traditional model is not eliminated but hollowed out, with the utility becoming a transmission and distribution company for the self-supplied load while residential and small-commercial customers remain fully dependent on the regulated system. The fiscal mechanics: a campus that self-supplies 200 MW of a 1,000 MW load still requires grid infrastructure sized for the full load; GS-5's minimum charges cover 85 percent of contracted distribution and transmission demand and continue after the contract term for a customer that keeps taking service; and the Piedmont Environmental Council's advocacy analysis estimates roughly 61 percent of remaining infrastructure costs shift back to residential ratepayers after the term expires.[63] Self-supply changes where some megawatts come from. It does not change who underwrites the wires.

The fusion field, priced. The competitive landscape since March 2026 matters to this report only insofar as it prices the CFS bet, and one paragraph covers it. Helion, which holds a 2023 Microsoft offtake (~50 MW, with reported delivery penalties), raised $465 million at a $15.5 billion valuation in June 2026 to finish its Orion plant, which broke ground in Washington State in July 2025 against a 2028 delivery promise.[58]* TAE Technologies agreed in December 2025 to a merger with Trump

Media that would make it one of the first publicly traded fusion companies.[64]* In January 2026 Type One Energy and TVA announced, with Tennessee regulators, the initial submission of a state byproduct-material license application for Project Infinity at TVA's Bull Run site, which includes the 350 MWe Infinity Two plant; on August 31, 2026 the license issued by the Tennessee Department of Environment and Conservation was announced, described in press coverage as the first license to operate a commercial fusion machine in the state.[65] Pacific Fusion cleared its second technical milestone tranche in June 2026.[66] The Department of Energy stood up a dedicated Office of Fusion in its November 2025 reorganization, and its milestone program paid CFS what CFS described as the program's largest award to date for the validated magnet test.[67] The field's direction is uniform: capital and offtake keep arriving, regulatory firsts keep accumulating, and no commercial machine had produced net energy as of October 24, 2026 in the sources this report cites. CFS's PJM application is best read in this context, as a first-mover claim on the one queue position that matters in the data center capital of the world.

Georgia and Tennessee face the same demand pressures through different institutional structures: Georgia through a regulated utility whose commission approved roughly 10,000 MW of new capacity in December 2025 with most of it driven by data center demand, Tennessee through a federal power agency now hosting a fusion pilot of its own.[65][68] Virginia's distinctive contribution remains the operator-anchored generation model. If the Fall Line plant delivers, it provides the template operators elsewhere will replicate. If it is delayed or fails, the grid will have been built anyway, the bridge generation will have run anyway, and the question of who pays will have been answered in the interim by default: ratepayers first, with the accounting argument to follow. This report is designed to be useful either way.

SECTION 8: WHAT IS NOT KNOWN

This section exists because the sourcing discipline in these reports requires flagging the boundaries of the public record, not papering over them. Several material questions about the Google-CFS and Eni-CFS arrangements cannot be answered from publicly available documents, and researchers relying on this case study should understand where the evidentiary foundation ends.

The prices. Neither PPA's price terms have been disclosed: no per-megawatt-hour price, no escalation formula, no floor or ceiling, for either contract. Without prices, Google's effective cost of fusion power cannot be benchmarked against Dominion generation, PJM wholesale, or alternative clean procurement, and the Eni contract's ten-figure headline cannot be decomposed into volume and tenor. The prices will matter enormously if the fleet model materializes, because subsequent PPAs will benchmark against the first two.

The slip terms. Whether either offtaker holds delay penalties, milestone-linked price adjustments, or termination rights tied to SPARC performance or delivery dates is undisclosed. This is now the single most analytically important gap in the record, because the three-clock structure of Section 6 makes some slippage scenario the base case, and the contracts' treatment of it determines who actually bears that risk.

The Eni volume. The megawatt quantity and term behind the ">$1 billion" figure are undisclosed. The only public constraint is that Google's 200 MW plus Eni's share exceed half of 400 MW. Whether a residual tranche remains unsold, and who is negotiating for it, is unknown.

The queue position. The PJM application's queue identifier, requested in-service date, and study assumptions are confidential until PJM accepts the application. The report can therefore bound the interconnection timeline only by PJM's generic one-to-two-year study estimate and CFS's four-to-six-year runway statement.

The GS-5 interaction. Unanswered as of June 12, 2026: whether the 200 MW Google procures through the PPA reduces Google's contracted demand under GS-5, whether Google pays Dominion for full contracted distribution and transmission demand regardless of self-supplied generation, and whether GS-5's contract provisions, which the order applies to agreements signed on or after January 1, 2027, reach Google's Chesterfield campuses at all.[37] The answer determines how much grid infrastructure cost Google absorbs versus how much flows to other ratepayers.

The SCC treatment. As of June 12, 2026, the SCC had issued no ruling on how PPA-sourced generation from an independent fusion facility is treated for IRP,

capacity planning, or rate purposes, and no CFS docket appeared in the public record in which it could rule. Until that framework exists, the regulatory treatment of the arrangement is uncertain.

The merger's effect on the project agreements. Whether the CFS lease option, the joint development agreement, and the interconnection arrangements carry change-of-control provisions, and how NextEra intends to treat the fusion collaboration, is not addressed in any merger document or statement located by this report.[60]

The all-in cost of ARC power. CFS's $2.5 billion estimate implies roughly $6,250 per kilowatt before financing, operations, fuel, and decommissioning.[69] Whether ARC's levelized cost will be competitive with anything cannot be determined until a plant exists. Researchers should be cautious about cost projections from any source, including CFS, until a first commercial facility has an operating record.

The state's role in project economics. The disclosed public money remains small: $1 million from the Virginia Clean Energy Innovation Bank matched by $1 million from Chesterfield County for siting, and a $500,000 VCEIB grant to VCU for fusion supply chain research.[57][70] Whether additional state or local incentives have been offered, and on what terms, is not in the public record this report has identified.

The workforce picture. CFS has indicated approximately 150 full-time operational jobs at the plant.[71] Construction employment, local hiring shares, and the durability of the supply chain commitments are undisclosed. For scale, JLARC found a typical 250,000-square-foot data center employs about 50 full-time workers.[72]

SECTION 9: GAPS IN THE RECORD

Each item below is an open documentary question with an address. The list is ordered by analytical value to the questions this case study frames.

1. **The PJM application materials.** The generation interconnection request becomes progressively less confidential as it advances; once accepted, queue data (position, requested in-service date, capacity, fuel class) appear in PJM's public queue. Track PJM's New Services Queue for the Fall Line entry; request the feasibility and system impact studies when they exist. The requested in-service date is the single most informative undisclosed number in the project, because it is the date CFS told the grid operator, under financial commitment, rather than the date it told the press.

2. **The conditional use permit file.** Chesterfield County: the full CUP application, staff report, proffered conditions, and any correspondence between CFS, Dominion, and county staff. The county study carries the land-use analysis;[17] this report's interest is the conditions that touch operations: water sourcing commitments, decommissioning or restoration obligations, noise and traffic conditions binding the plant's operating envelope.

3. **State permit applications, as filed.** Virginia Department of Health radioactive materials program: any CFS application, pre-application correspondence, or licensing guidance for the Fall Line plant (the agency had licensed no fusion power station as of June 12, 2026, and its internal preparation materials belong to the same record). Virginia DEQ: air and stormwater filings when they appear. SCC: any § 56-580 D application. Each filing date is a data point for the permit clock.

4. **The NRC rulemaking record.** The public comment file on the proposed fusion rule (closed May 27, 2026) will show what CFS, the Fusion Industry Association, and the utilities asked for, including on decommissioning financial assurance, the report's flagged gap. Public record.

5. **Disclosed PPA terms.** Alphabet's SEC filings (10-K commitments notes), Eni's annual report and Italian-market disclosures, and any CFS bond or private placement documents that surface. Eni, as a listed company that announced a value figure, is the likelier disclosure vector; its filings should be checked each cycle for any quantification of the offtake commitment.

6. **The Dominion agreements.** The land lease or lease option and the joint development agreement. Private contracts, but the merger creates a new disclosure vector: material contracts and change-of-control terms may surface in NextEra-Dominion merger proxy materials and SCC merger-review filings. The

SCC’s merger docket should be monitored for any reference to the CFS arrangements.

7. **The SPARC schedule record.** Each dated schedule statement CFS publishes (cfs.energy news releases; the CFS blog) is an entry for the slip table in Section 5. The table’s value compounds: it is the only compilation of the project’s public schedule statements this report has located, and by 2027 it will either validate the company’s current projection or price the next one.
8. **VDH Fusion Program engagement materials.** The stakeholder engagement records for the Chesterfield site would show what the Commonwealth is telling residents about fusion safety and what residents are asking, a primary source that the press releases this report draws on do not supply.

ENDNOTES

Endnotes are numbered by first appearance. An asterisk marks claims resting on secondary sources only, where no primary document was located or reviewed.

[1] The research framework categories used in this report are the author's analytic categories, applied by type of work.

[2] Commonwealth Fusion Systems, "Google and Commonwealth Fusion Systems Sign Strategic Partnership Agreement to Commercialize Fusion Energy," press release, June 30, 2025; Google, The Keyword (blog), June 30, 2025. Some trade coverage dates the deal "July 2025" from later coverage cycles; the announcement date is June 30, 2025.

[3] Google, The Keyword (blog), June 30, 2025. The characterization is the buyer's; CFS's release of the same day, as read for this report, does not make it.

[4] CFS site materials and Chesterfield County zoning record: ARC at 1201 Battery Brooke Parkway on land owned by Dominion Energy Virginia; grid connection through an overhead line and switchyard interconnecting to Dominion facilities.

[5] The bankability characterization is an author assessment based on standard project finance structures; specific financing terms are undisclosed.

[6] Google, The Keyword (blog), June 30, 2025. The agreement includes options for offtake from future ARC plants.

[7] CFS press release, June 30, 2025: "An investor in CFS since 2021, Google also is deepening its relationship with CFS by increasing its stake in the company. Financial terms weren't disclosed."

[8] CFS, "Commonwealth Fusion Systems Raises $863 Million Series B2 Round," press release, August 28, 2025. Participants included Google, NVentures (Nvidia), Eni, Gates Frontier, Counterpoint Global, and a consortium of Japanese investors led by Mitsui & Co. and Mitsubishi Corp.* (full investor list partly from press aggregation).

[9] Eni and CFS, "Eni and Commonwealth Fusion Systems Sign $1 Billion+ Power Purchase Agreement, Expanding Strategic Partnership to Commercialize Fusion Energy," joint press release, September 22, 2025. The ">$1 billion" figure is company-stated, in the release headline and first sentence; the same release states financial terms were not disclosed. Eni's investment in CFS dates to 2018; the technological Collaboration Framework Agreement to 2023.

[10] Rick Needham (CFS Chief Commercial Officer), "Fusion forward: CFS signs second power plant customer in 3 months," The Tokamak Times (CFS blog), September 22, 2025: the two deals cover "more than half" of the first plant's 400 MW.

[11] TechCrunch, September 22, 2025: Lorenzo Fiorillo, Eni's director of technology, R&D, and digital, "The power will be sent to the grid at the end of the day"; the article's summary, "In short, Eni will resell it."*

[12] CFS, "Commonwealth Fusion Systems Announces Equity Investment by Abu Dhabi-Based Plynth Energy," press release, June 11, 2026. Amount undisclosed.

[13] CFS corporate boilerplate (“more than $3 billion,” June 2026); Fusion Industry Association, Global Fusion Industry Report, on CFS’s share of global private fusion investment. CFS news releases, July 30, 2026 (“CFS has now raised a total of $4 billion”) and September 10, 2026 (“To date, CFS has raised $4 billion, representing about 30% of the total capital raised by the fusion industry”).

[14] CFS, “Commonwealth Fusion Systems Becomes First Fusion Company to Apply to PJM Interconnection,” press release, April 28, 2026; Ben Byboth, “Going to the grid: CFS applies to plug our first ARC fusion power plant into PJM,” The Tokamak Times (CFS blog), April 28, 2026. The blog states the request was submitted “last week,” i.e., in the week before April 28 and by the April 27 window close. The release announces the Fall Line Fusion Power Station name and states the four-to-six-year study-to-energization range. Dominion’s advisory role under the joint development agreement is stated in the release, with a quote from the president of Dominion Energy Virginia.

[15] CFS Chesterfield CUP application and county zoning record; CFS holds an option-to-lease on the Dominion-owned parcel.

[16] Some December 2024 announcement coverage describes a 100-acre site; neither the Governor’s December 17, 2024 release nor Virginia Energy’s December 19, 2024 release, as read for this report, states an acreage. The 2025 county zoning record and Board of Supervisors action describe 94 acres. This report uses the zoning figure.

[17] Tommy N. Turner, *Chesterfield County: The $0.24 Rate, the Thirty-Year Lock, and the Two-Corridor County*, v3.0, June 2026 (companion report, the version current at the evidence date; current version v3.1, 10.5281/zenodo.20672436). The county study owns the land-use record, CUP conditions, EDA mechanics, local fiscal terms, corridor politics, and the CERC docket history.

[18] CFS public statements. Developer estimate; actual costs unknowable until construction is complete.

[19] CFS technical specifications. Developer claim; output unconfirmed until operation.

[20] CFS, Chesterfield Site Information page (cfs.energy/chesterfield/info), accessed June 12, 2026: “CFS expects to begin construction after obtaining state, local, and federal permits.”

[21] Chesterfield County Board of Supervisors, September 17, 2025, unanimous CUP approval; Chesterfield County BOS meeting roundup; GreeneHurlocker (CFS land-use counsel), September 23, 2025. Planning Commission unanimous endorsement the week of August 18, 2025. “World’s first Conditional Use Permit for a commercial fusion power plant” is CFS’s characterization (April 28, 2026 release).

[22] Virginia Department of Health, Office of Radiological Health, Radioactive Materials Program (NRC Agreement State); CFS Chesterfield Site Information page: “ARC will require a radioactive materials license from Virginia.” No application publicly announced as of June 12, 2026; checked negative.

[23] U.S. Nuclear Regulatory Commission: Commission vote of April 14, 2023 adopting the byproduct-materials framework (10 CFR Part 30) for fusion energy systems; “Regulatory Framework for Fusion Machines,” proposed rule, 91 Fed. Reg. (February 26, 2026); comment period closed May 27, 2026.* (comment-period dates per American Nuclear Society

reporting of the Federal Register notice). NUREG-1556 Vol. 22 draft guidance accompanies the rulemaking.

[24] Groundbreaking formulations: CFS spokesperson, “late 2020s” (Richmond BizSense, August 21, 2025); 2027–2028 (Engineering News-Record, on the Series B2 raise)*; 2028 (American Nuclear Society Nuclear Newswire, May 1, 2026)*. No CFS primary document states a groundbreaking year. Site plan and permit status after the evidence date: Richmond BizSense, July 30, 2026 (online county records; CEO remark on site preparation).

[25] CFS, “Commonwealth Fusion Systems Granted Radioactive Materials License for SPARC Fusion Machine,” press release, October 24, 2024 (Massachusetts broad-scope license). The release also states the ADVANCE Act codified the NRC’s fusion framework decision in July 2024.

[26] Dominion Energy Virginia, 2024 Integrated Resource Plan, filed October 15, 2024 (Case No. PUR-2024-00184): data center metered load 13,353 MW by 2038; “Demand is forecasted to increase 5.5% annually over the next decade and double by 2039 in the Company’s delivery zone within PJM.”

[27] Dominion Energy Virginia, 2025 Integrated Resource Plan Update, filed October 15, 2025 (Case No. PUR-2025-00184), using the 2025 PJM Derived Load Forecast at the SCC’s directive: demand “forecasted to increase 6.3% annually over the next decade and more than double by 2045 in the DOM Zone”; Company Preferred Plan Summary (Figure 5.1.1.3), 2026-2045: 33,448 MW of new resources (17,534 MW solar, 8,510 MW gas, 3,460 MW wind, 2,000 MW storage, 1,944 MW SMR); mandatory full-VCEA-retirement portfolio characterized as not viable. Virginia SCC, Final Order, Case No. PUR-2025-00184, December 23, 2025: the update is “legally sufficient under the Guidelines and should be accepted for filing”; acceptance does not “express approval in this Final Order of the magnitude or specifics of Dominion’s future spending plans”; the case is dismissed.

[28] Virginia SCC, Final Order, Case No. PUR-2024-00184, July 15, 2025: the 2024 IRP is “legally sufficient”; acceptance does not “express approval in this Final Order of the magnitude or specifics of Dominion’s future spending plans.” The order’s directions for the next IRP are characterized from Virginia Mercury and Clean Virginia reporting.*

[29] PJM Interconnection, 2026 Long-Term Load Forecast Report, January 14, 2026: summer peak rising from ~160 GW (2025) to ~253 GW (2046), data centers the primary driver; near-term reductions reflect stricter vetting of data center adjustment requests.

[30] PJM, 2025/2026 Base Residual Auction Report, July 30, 2024: DOM zone $444.26/MW-day. Prior-year DOM clearing $28.92/MW-day (Monitoring Analytics, 2025 State of the Market Report for PJM, Table 5-21); the increase is 1,436 percent. The 833 percent figure is the Rest-of-RTO increase, not the Dominion zone’s. Monitoring Analytics, 2025 State of the Market Report for PJM, vol. 1: inclusion of existing and forecast data center load increased capacity market revenues by a combined $23,100,955,341 across the 2025/2026, 2026/2027 and 2027/2028 BRAs, of which it puts $7,271,197,971 in 2026/2027 and $6,497,653,512 in 2027/2028, leaving $9,332,103,858 for 2025/2026. PJM’s 2025/2026 report gives a total cost to load of $14.7 billion; the 63 percent is this report’s division of the one by the other, a share of the auction’s total cost to load, not of an increase.

[31] PJM, 2026/2027 Base Residual Auction Report, July 22, 2025: “For the 2026/2027 BRA, all prices cleared at the cap ($329.17)”; 134,310.8 MW (UCAP) cleared in the RTO, a figure

that includes 105.5 MW of Price Responsive Demand (the report's RTO table, which excludes it, gives 134,205.3 MW). PJM, 2027/2028 Base Residual Auction Report, December 17, 2025: all prices at the cap of $333.44/MW-day (UCAP); 134,478.1 MW (UCAP) cleared from annual and matched seasonal resources, a figure that excludes the 106.5 MW of Price Responsive Demand the report records (PJM's July 14, 2026 release gives 134,585 MW, the two summed and rounded); the sum of cleared supply times clearing price was $16.4 billion, which PJM notes "does not equate to a total cost to load". The cap was $256.75/MW-day in ICAP terms in both auctions; the UCAP caps differ because, in PJM's words, "Actual Reference Resource AUCAP Factor resulted in stated $/MW-UCAP values" (the approximately $325/$175 UCAP pair filed in ER25-1357 rested on a preliminary factor).

[32] FERC accepted PJM's price collar extension April 28, 2026, applying it to the 2028/29 BRA (bidding closes July 7, 2026) and 2029/30 BRA (December 2026, per PJM's September 3, 2026 parameters report and July 14, 2026 release, which give no day). PJM states the 2028/29 collar as a cap of $256.75/MW-day and a floor of $138.25/MW-day in ICAP terms, $325.00 and $175.00 in UCAP terms (2028/2029 BRA Planning Period Parameters, May 12, 2026, "As approved by FERC in Docket ER26-1556"; 2028/2029 BRA Results Report, July 14, 2026), and the 2029/30 collar as $337.83 and $181.91 in UCAP terms (2029/2030 BRA Planning Period Parameters, September 3, 2026); PJM attributes the UCAP differences to changes in the Reference Resource UCAP factor. The 2028/29 auction had not run as of the evidence date. It cleared on July 14, 2026 with all prices at the $325.00/MW-day (UCAP) cap, the Dominion zone included with a $0.00 locational price adder; 138,317.8 MW (UCAP) cleared in RPM, and total procured capacity fell 6,831.3 MW (UCAP) below the RTO Reliability Requirement (PJM, 2028/2029 BRA Results Report, July 14, 2026). Original collar: FERC-approved settlement of Pennsylvania Governor Shapiro's complaint, April 21, 2025.

[33] Virginia SCC, news release and Final Order, Case No. PUR-2025-00058 (Dominion biennial review), November 25, 2025: approved revenue increases of $565.7M (2026) and $209.9M (2027) against $822M/$345M requested; typical residential bill +$11.24/month in 2026, +$2.36/month in 2027; ROE 9.8 percent.

[34] Virginia SCC, Final Order, Case No. PUR-2025-00037, November 25, 2025: CPCN granted for the Chesterfield Energy Reliability Center, approximately 944 MW nominal, with Rider CERC. The order recites the Company's projected total cost of $1.47 billion, excluding financing costs, and projected commercial operation by June 1, 2029; it cites a NERC analysis showing PJM reserve shortfalls under extreme weather conditions for the 2025-2029 forecast period. Earlier coverage describing the plant as "~1,000 MW" overstates the order's nominal figure.

[35] SCC, Order on Reconsideration, Case No. PUR-2025-00037, February 12, 2026 (petition denied, suspension lifted; reconsideration had been granted December 16, 2025 on SELC's December 15 petition for Appalachian Voices, Chesterfield County NAACP, and Mothers Out Front). Southern Environmental Law Center, press release, May 27, 2026: petition for appeal filed with the Supreme Court of Virginia (VEJA, VCEA energy-efficiency, and fuel-cost grounds); petition stage as of June 12, 2026, no briefing schedule. Community Intervenors' Notice of Appeal, filed with the SCC February 17, 2026 (Southern Environmental Law Center). Air permit: DEQ approval December 19, 2025*; SELC appeal in Richmond Circuit Court, February 2026, no ruling found.* Full docket history: companion county study.[17]

[36] Virginia SCC, Final Order, Case No. PUR-2025-00058, November 25, 2025: the GS-5 class "shall include customers with: (1) a measured or contracted demand of 25 megawatts ("MW") or greater on a contiguous site; and (2) a measured or expected load factor of at least 75%"; effective January 1, 2027; minimum distribution and transmission charges of 85 percent, and minimum generation charge of 60 percent, of contracted demand.

[37] Virginia SCC, Final Order, Case No. PUR-2025-00058, November 25, 2025: "The contract provisions shall apply to customers taking initial service and signing an ESA on or after January 1, 2027. The contract term shall be 14 years."; a load ramp "not to exceed four years (with a minimum annual ramp of 20%)"; collateral of $1.5 million/MW, also for ESAs signed on or after January 1, 2027; minimum charges continue if the customer keeps taking service after the contract term.

[38] Virginia Mercury, April 16 and May 18, 2026; Inside Climate News, May 15, 2026.* The Lucas/LeVere Bolling package directs SCC cost-assignment to high-load users, extends bill assistance, and authorizes distribution undergrounding; the Governor's April 16 amendments struck the provision requiring data centers to bear PJM capacity purchase costs directly, substituting broader SCC cost-allocation authority. Signed mid-May 2026.

[39] Google 24/7 carbon-free energy commitment, corporate sustainability materials; Bloomberg, May 19, 2026: senior Google executive reaffirming the 2030 goal.*

[40] Joint Legislative Audit and Review Commission, Report 598, "Data Centers in Virginia," December 9, 2024: unconstrained demand "would double within the next 10 years, with the data center industry being the main driver"; "New solar facilities, wind generation, natural gas plants, and increased transmission capacity would all be required to meet unconstrained demand"; solar would have to be added "at twice the annual rate they were added in 2024." A 183 percent rise in energy use by 2040 under unconstrained demand is read off JLARC's Figure 3-3 (average monthly energy use from a 2023 base); JLARC does not state the percentage in text.

[41] Dominion Energy Virginia, 2024 IRP: SMR deployment in portfolios from the mid-2030s; North Anna SMR feasibility RFP (July 2024); Dominion investment in GE Hitachi BWRX-300 development; Dominion-Amazon SMR exploration MOU (October 16, 2024). No SMR license application filing confirmed as of the evidence date.

[42] Tommy N. Turner, *What Virginia Is Spending, What Virginia Is Getting*, v4.0, March 2026 (companion report, the version current at the evidence date; current version v5.3, 10.5281/zenodo.20679292); budget status as of June 12, 2026 per the companion county study.[17] Enactment: Legislative Information System, HB30, 2026 Special Session I, bill history, June 29, 2026: "Approved by Governor-Chapter 1 (effective 7/1/2026)."

[43] ADVANCE Act, July 2024, codifying the NRC's byproduct-materials decision for fusion (per CFS release of October 24, 2024 and Fusion Industry Association materials).

[44] Virginia SCC, generic proceeding PUR-2024-00144: technical conferences on large-load interconnection (December 2024) and data center load flexibility (December 12, 2025). No order establishing PPA treatment.

[45] PJM Interconnection, "Over 800 New Generation Projects Seek to Connect Under PJM's Reformed Process," news release, April 29, 2026: 811 projects, 220 GW, window closed April 27, 2026; validation phase; one-to-two-year study expectation; project details confidential

until acceptance; resource mix including “for the first time, fusion energy”; HyperQ (Google Tapestry) AI-assisted application review. PJM Inside Lines, “Over 600 Projects Enter Phase 1 of PJM’s New Interconnection Process,” September 30, 2026: Phase I began September 28, 2026; 811 initial applications, 715 accepted into the cycle, 617 projects and nearly 169 GW in Phase I; the post does not mention fusion.

[46] American Nuclear Society, Nuclear Newswire, May 1, 2026: CFS’s ~400 MW classed in PJM’s “other” category (biomass, coal, methane, fusion), first commercial fusion interconnection request to a major grid.

[47] CFS blog, April 28, 2026: “A year ago, fusion energy wasn’t in the drop-down menu on the application website. But now it is.”

[48] CFS blog, April 9, 2026 (“about three quarters” complete; tracking estimate combining engineering, procurement, manufacturing, assembly) and May 14, 2026 (“nearly 75%”); CFS blog, August 5, 2026 (“now almost 80% complete”). The figure is a program estimate, not physical construction percentage.

[49] Cryostat base installed March 2025 (CFS blog, March 25, 2025). First production toroidal field magnet: performance tests validated by DOE’s independent expert panel, $8 million milestone payment, the program’s largest to date (CFS press release, September 30, 2025); magnet moved to assembly stand December 2025 (CFS blog, January 6, 2026). Two of 18 TF magnets in place as of May 14, 2026 (CFS blog).

[50] Vacuum vessel: two 48-metric-ton halves, 96 tons total; first half arrived October 28, 2025; both halves inside Tokamak Hall per the CFS blog of April 9, 2026; the May 14, 2026 post describes the second half and outfitting under way (CFS blogs). The “106,000-pound” figure circulating in aggregator coverage is a pound conversion of the 48-ton half and is not CFS language; this report uses CFS’s figures.

[51] Bob Mumgaard at CES 2026, per TechCrunch, January 6, 2026: all 18 TF magnets expected installed by end of summer 2026.* The date appears in no CFS written material located by this report. CFS blog, August 28, 2026: “We’ve tested 15 TF magnets now”; no installed count.

[52] CFS, “Commonwealth Fusion Systems Accelerates Commercial Fusion with Siemens and NVIDIA,” press release, January 6, 2026: SPARC digital twin via Siemens Xcelerator data feeding NVIDIA Omniverse/OpenUSD, unveiled at CES 2026.

[53] Google DeepMind and CFS AI partnership (TORAX plasma simulator; simulation, optimization, and control work for SPARC), announced October 16, 2025 (DeepMind blog; CFS blog; Axios).

[54] CFS technology page (cfs.energy/technology/sparc, accessed June 2026): “In 2027, it’ll become the world’s first commercially relevant fusion energy machine to produce more energy from fusion than it needs to power the process.” CFS blog, May 14, 2026: “When SPARC operations begin in 2027…” Company projection; no month or quarter published. Archived captures show the “in 2027” language first appeared on the site between November 3 and December 19, 2024. CFS blog, August 28, 2026 (“after we start operating SPARC in coming months”); TechCrunch, July 30, 2026 (“targeting a launch later this year”; breakeven “by next year”).*

[55] CFS, press release, June 4, 2026: five peer-reviewed papers on ARC physics; CEO statement that the papers “increase our confidence” in the early-2030s grid path.

[56] Inferred from standard PPA structures; the risk allocation terms of both PPAs are undisclosed.

[57] Office of the Governor of Virginia, press release, December 17, 2024: “a $1 million grant by the Virginia Clean Energy Innovation Bank” “matched with a $1 million grant by Chesterfield County.” Virginia Energy, press release, December 19, 2024: “VCEIB provided an initial $1 million investment,” matched by Chesterfield County, “to support the initial siting costs of this project.”

[58] Helion Energy: $465 million Series G at $15.5 billion valuation, June 2026 (TechCrunch, June 4, 2026)*; Orion groundbreaking July 30, 2025, Chelan County, Washington, 2028 delivery target (S&P Global, July 30, 2025); the 2023 Microsoft PPA (~50 MW) reportedly carries financial penalties for missed delivery, with Constellation as managing party.* Penalty terms have not been published.

[59] Author estimate, derived from site plans, acreage analysis, and industry benchmarks; Google has not disclosed a total projected load figure. Methodology in the companion county study.[17]

[60] NextEra Energy and Dominion Energy, merger agreement dated May 15, 2026, announced May 18, 2026 (Dominion Energy SEC Form 8-K, merger agreement, and joint release): each Dominion share converts into 0.8138 NextEra shares plus a per-share cash amount equal to $360,000,000 divided by the closing share count; the joint release says the transaction “is expected to close in 12 to 18 months”; the 8-Ks give an outside date of November 15, 2027, extendable to August 15, 2028; approvals include shareholders, FERC, the NRC, and the Virginia SCC, among others. Neither the 8-Ks nor the joint release, as read for this report, states a transaction value; WHRO (October 20, 2026) gives “$67 billion.” No merger document located by this report addresses the CFS arrangements. Status: WHRO, “SCC staff recommend axing Dominion-NextEra Energy merger as proposed,” October 20, 2026 (staff recommendation; 57 conditions, 25 in the companies’ proposals; evidentiary hearing beginning November 17; decision deadline January 11, 2027).

[61] Dominion Energy Virginia, “Environmental Justice Desktop Review for the Chesterfield Energy Reliability Center Project,” revised September 23, 2024, Appendix H of the CERC air permit application (Virginia DEQ): Census Tract 1004.03, Block Group 3; 84 percent population of color, 73 percent low-income, 41 percent Hispanic/Latino, 26 percent limited-English households; 22 of 24 block groups within three miles contain potential EJ communities under Va. Code § 2.2-234.

[62] Microsoft-Constellation, Three Mile Island Unit 1 restart PPA, 2024. Amazon-Talen, Susquehanna: restructured June 2025 from a behind-the-meter co-location model to a grid-connected, front-of-the-meter retail structure, up to 1,920 MW, reconfiguration during a spring 2026 refueling outage (POWER, June 12, 2025).* NextEra-Google, Duane Arnold restart with 25-year PPA, announced October 27, 2025. Google-Kairos Power 500 MW master agreement, October 2024, first deployment via TVA. Google acquisition of Intersect Power, ~$5 billion, reported January 2026.* Google Michigan ~1 GW campus tied to a 20-year contract funding new clean generation, Bloomberg, March 18, 2026.*

[63] Piedmont Environmental Council, analysis of SCC Case No. PUR-2024-00121, January 7, 2026. Advocacy analysis, not a regulatory finding: ~61 percent of remaining grid infrastructure costs estimated to shift to residential ratepayers after the 14-year contract term.

[64] TAE Technologies-Trump Media merger, announced December 18, 2025, ~$6 billion all-stock, expected to close mid-2026 (CNBC; TAE release; World Nuclear News).*

[65] Type One Energy and TVA: agreement for the 350 MWe Infinity Two stellarator pilot at Bull Run (September 2025); Type One Energy, January 29, 2026: state regulators, Type One and TVA announced "the initial submission of a 'byproduct material license' application" for Project Infinity at TVA's Bull Run Energy Complex. American Nuclear Society, Nuclear Newswire, September 2, 2026: the Tennessee Department of Environment and Conservation license to Type One was announced August 31, 2026, "the first license to operate a commercial fusion machine in the state."*

[66] Pacific Fusion: second technical milestone set completed (440 GW pulser prototype), unlocking a further tranche of its >$1 billion milestone-based Series A; demonstration-system construction expected to begin summer 2026 (TechCrunch, June 2, 2026; ANS, March 4, 2026).*

[67] DOE Office of Fusion created in the November 20, 2025 departmental reorganization (AIP FYI; Fusion Industry Association). DOE Milestone-Based Fusion Development Program: CFS magnet validation payment, September 30, 2025 (endnote 49).

[68] Georgia Public Service Commission, Order Adopting Stipulation and Granting Certification of Capacity, Docket Nos. 56298 and 56310, issued December 30, 2025 (final determination scheduled for December 19, 2025): the applications sought certification of 7,999 MW (All-Source) and 1,886 MW (supplemental). The PSC's Data Center Fact Sheet states 9,985 MW, "approximately 80 percent of which is expected to power data centers"; the two totals are not reconciled here. See the companion Georgia report (v2.1, March 2026) for the fiscal analysis.

[69] $2,500,000,000 / 400,000 kW = $6,250/kW. Derived from CFS's estimated cost and design capacity; developer figures.

[70] VCU College of Engineering News, February 4, 2026: $500,000 VCEIB grant for advanced magnetic materials fusion research (AM2P laboratory).

[71] CFS, December 17, 2024 announcement materials; subsequent clarification by a CFS vice president: approximately 150 full-time operational employees. Developer claim.

[72] JLARC, Report 598, December 9, 2024, p. i: a typical 250,000-square-foot data center may employ approximately 50 full-time workers.

SOURCES

Sources are organized by document type. Where a source supports material across multiple sections, it is listed where its contribution is most significant.

Regulatory and Government Sources

Virginia State Corporation Commission, Final Order and news release, Case No. PUR-2025-00058 (biennial review; GS-5 rate class), November 25, 2025. Virginia State Corporation Commission, Final Order (November 25, 2025) and Order on Reconsideration (February 12, 2026), Case No. PUR-2025-00037 (Chesterfield Energy Reliability Center). Virginia State Corporation Commission, Final Order, Case No. PUR-2024-00184 (2024 IRP), July 15, 2025. Virginia State Corporation Commission, Final Order, Case No. PUR-2025-00184 (2025 IRP Update), December 23, 2025. Community Intervenors' Notice of Appeal, Case No. PUR-2025-00037, February 17, 2026. Code of Virginia § 56-580 D. Virginia State Corporation Commission, generic proceeding PUR-2024-00144 (large-load interconnection; load flexibility technical conferences). Dominion Energy Virginia, 2024 Integrated Resource Plan (October 15, 2024) and 2025 Integrated Resource Plan Update (October 15, 2025). Dominion Energy Virginia, Environmental Justice Desktop Review, CERC air permit application Appendix H, revised September 23, 2024. U.S. Nuclear Regulatory Commission, fusion regulatory framework decision (April 14, 2023); "Regulatory Framework for Fusion Machines," proposed rule, Federal Register, February 26, 2026; NUREG-1556 Vol. 22 (draft). ADVANCE Act (2024), fusion provisions. Virginia Department of Health, Office of Radiological Health, Radioactive Materials Program materials. PJM Interconnection: 2025/2026 BRA Report (July 30, 2024); 2026/2027 BRA Report (July 22, 2025); 2027/2028 BRA Report (December 17, 2025); 2026 Long-Term Load Forecast Report (January 14, 2026); "Over 800 New Generation Projects Seek to Connect Under PJM's Reformed Process," April 29, 2026; 2028/2029 BRA Planning Period Parameters (May 12, 2026); 2028/2029 BRA Results Report (July 14, 2026); 2029/2030 BRA Planning Period Parameters (September 3, 2026); PJM Inside Lines, "Over 600 Projects Enter Phase 1 of PJM's New Interconnection Process," September 30, 2026. Legislative Information System, HB30, 2026 Special Session I, bill history (Approved by Governor, Chapter 1, June 29, 2026). Monitoring Analytics, PJM State of the Market reporting, 2024–2025. Federal Energy Regulatory Commission, capacity price collar settlement approval (April 21, 2025) and extension acceptance (April 28, 2026). Joint Legislative Audit and Review Commission, Report 598, "Data Centers in Virginia," December 9, 2024. Chesterfield County Board of Supervisors, CUP approval, September 17, 2025. Office of the Governor of Virginia, press release, December 17, 2024. Virginia Energy, press release, December 19, 2024. Georgia Public Service Commission, Docket Nos. 56298 and 56310, Order of December 30, 2025. Dominion Energy, Inc., SEC Form 8-K and merger agreement exhibits, May 2026; joint NextEra-Dominion announcement, May 18, 2026. Supreme Court of Virginia: petition for appeal, CERC docket (SELC for Chesterfield NAACP, Appalachian Voices, Mothers Out Front), filed May 27, 2026.

Corporate and Developer Materials

Commonwealth Fusion Systems press releases: Google strategic partnership (June 30, 2025); Eni PPA (September 22, 2025, joint); Series B2 (August 28, 2025); SPARC Massachusetts radioactive materials license (October 24, 2024); DOE magnet milestone validation (September 30, 2025); Siemens/NVIDIA digital twin (January 6, 2026); PJM interconnection application and Fall Line naming (April 28, 2026); five ARC physics papers (June 4, 2026); Plynth Energy investment (June 11, 2026); ARC Virginia announcement (December 17, 2024); $1 billion raise and $4 billion total (July 30, 2026);

Hyundai Motor Group investment (September 10, 2026). The Tokamak Times (CFS blog): tokamak assembly (March 25, 2025); first magnet delivery (January 6, 2026); 75 percent progress (April 9, 2026); PJM application (April 28, 2026); vacuum vessel second half (May 14, 2026); second customer (September 22, 2025); SPARC progress and DOE milestone approvals (August 5, 2026); net fusion energy (Q>1) (August 28, 2026). CFS Chesterfield Site Information page and SPARC technology page, accessed June 2026. Eni S.p.A., press release, September 22, 2025. Google, The Keyword (blog), June 30, 2025; Google DeepMind blog, October 16, 2025. Fusion Industry Association, Global Fusion Industry Report and regulatory materials. Type One Energy, TVA project and Tennessee license application releases (September 2025; January 29, 2026). NextEra Energy, Duane Arnold announcement (October 27, 2025); merger announcement (May 18, 2026).

News and Trade Coverage

American Nuclear Society, Nuclear Newswire, May 1, May 18 and September 2, 2026. Power Magazine, June 12, 2025 and April 28, 2026. American Public Power Association, April 28, 2026. World Nuclear News, April 30, 2026. Utility Dive, April 29, 2026. Virginia Mercury: biennial review and CERC coverage (November 25, 2025); legislation coverage (April 16 and May 18, 2026); IRP coverage (July 17, 2025; October 22, 2025). Inside Climate News, January 7, February 24, and May 15, 2026. Richmond BizSense, August 21, 2025 and July 30, 2026. WHRO, October 20, 2026. Virginia Business, 2025–2026 coverage. TechCrunch: September 22, 2025; January 6, 2026; February 13, June 2, June 4, and July 30, 2026. Fortune, January 7, 2026. Bloomberg: August 28, 2025; March 18 and May 19, 2026. S&P Global, July 30, 2025. CNBC, December 18, 2025. Axios, May 18, 2026.

Advocacy and Policy Analysis

Piedmont Environmental Council, analysis of SCC Case No. PUR-2024-00121, January 7, 2026 (advocacy analysis). Southern Environmental Law Center, press releases, February and May 27, 2026. Carl Vinson Institute of Government, “Tax Incentive Evaluation: Georgia Data Center Sales & Use Tax Exemption,” December 2025.

Companion Reports

Tommy N. Turner, *What Virginia Is Spending, What Virginia Is Getting: The Commonwealth Data Center Reference*, v5.3, August 2026, 10.5281/zenodo.20679292. Companion case studies, cited by concept DOI: Henrico County, 10.5281/zenodo.20671031; Prince William County, 10.5281/zenodo.20673498; Hanover County, 10.5281/zenodo.20672048; Chesterfield County, 10.5281/zenodo.20672436; Orange County and the Town of Orange, 10.5281/zenodo.20672496. Tommy N. Turner, *What Georgia Is Spending, What Georgia Is Getting*, v2.1, March 2026.