|  |  |  |  |
| --- | --- | --- | --- |
| PGRR Number | [134](https://www.ercot.com/mktrules/issues/PGRR134) | PGRR Title | Interconnection Studies Reform for Dispatchable Loads |

|  |  |
| --- | --- |
| Date | November 5, 2025 |

|  |  |
| --- | --- |
| Submitter’s Information | |
| Name | Peter Hans Hirschboeck, P.E. |
| E-mail Address | [peter@impactECI.com](mailto:peter@impactECI.com) |
| Company | impactECI LLC |
| Phone Number | 202-709-7787 |
| Cell Number |  |
| Market Segment | Not applicable |

|  |
| --- |
| Comments |

# Glossary

|  |  |  |  |
| --- | --- | --- | --- |
| *BESS* | Battery Energy Storage System | ***M&V*** | Measurement and Verification |
| *CAISO* | California Independent System Operator | ***MISO*** | Midcontinent Independent System Operator |
| *CLR* | Controllable Load Resource | ***MPC*** | Maximum Power Consumption |
| *EirGrid DS3* | Delivering a Secure Sustainable Electricity Supply | ***MW*** | Megawatt |
| *EMS* | Energy Management System | ***NPRR1188*** | Nodal Protocol Revision Request 1188 |
| *ERCOT* | Electric Reliability Council of Texas | ***NPV*** | Net present value |
| *ESO* | Electricity System Operator | ***OpenADR*** | Open Automated Demand Response |
| *ICCP* | Inter-Control Center Communications Protocol | ***PJM*** | PA-NJ-MD Interconnection |
| *ILLE* | Interconnecting Large Load Entity | ***PUC*** | Public Utility Commission |
| *IROL* | Interconnection Reliability Operating Limit | ***RTO*** | Regional Transmission Organization |
| *ISO* | Independent System Operator | ***SPP*** | Southwest Power Pool |
| *LPC* | Low Power Consumption | ***TAC*** | Technical Advisory Committee |
| *LLIS* | Large Load Interconnection Studies | ***TSP*** | Transmission Service Provider |
| *LMP* | Locational Marginal Price | ***UPS*** | Uninterruptible Power Supply |

# Comments

impactECI submits these comments in strong support of PGRR134: *Interconnection Studies Reform for Dispatchable Loads*, sponsored by Luminary Strategies and led by Arushi Sharma Frank, who is coordinating a broader coalition in support of this critical market reform.

# Introduction

impactECIis an expert consultancy specializing in energy, climate, and infrastructure strategy, with expertise in data center energy integration and grid modernization. Founded by Peter Hans Hirschboeck, P.E., in October 2022, impactECI provides strategic advisory services to utilities, technology companies, private equity firms, and grid operators navigating the complexities of the energy transition.

Peter Hans Hirschboeck has nearly 20 years of experience in energy markets and infrastructure development. His background includes:

* Leading energy and utilities projects for hyperscale data center developers, including initiating and contracting 4 GW of energy infrastructure at Amazon Web Services and an additional 2 GW for impactECI clients
* Professional engineering licensure (California) with electrical engineering expertise
* M.S. in Financial Mathematics from the University of Chicago and B.S. in Electrical Engineering from the University of Illinois at Urbana-Champaign
* Current roles as Senior Advisor to Emerald AI and Bellawatt, and Advisor to Paces and Common Forge

impactECI recently researched, developed, and wrote a comprehensive paper covering Data Center Flexibility Framework, to be published in November 2025. This work informs our support for PGRR134 and provides evidence for the economic and operational benefits of the proposed interconnection reform.

# Broader Strategic Context

* 1. **Positioning ERCOT as National Leader**

The proposal lets ERCOT lead rather than followon flexible load integration. While other ISOs are developing similar frameworks, Texas can establish best practices by:

* **Moving first**: Implementing operational CLR-based interconnection before PJM, MISO, or CAISO
* **Demonstrating value**: Quantifying transmission savings and timeline improvements to inform national policy
* **Attracting investment**: Positioning Texas as the most attractive jurisdiction for data center development and the emerging flexibility ecosystem through regulatory innovation

## Supporting Texas Economic Competitiveness

Data centers represent billions in potential capital investment and tens of thousands of good-paying jobs. PGRR134 directly supports Texas economic development as it:

* **Accelerates project timelines**: Interconnection timelines can be shortened to 2 years or fewer
* **Reduces project costs**: Lower transmission upgrade cost allocation improves project economics
* **Demonstrates regulatory innovation**: Attracting sophisticated developers who value forward- thinking policy environments

Texas's competitive advantages, abundant land, renewable energy resources, deregulated market structure, and business-friendly environment are undermined by interconnection bottlenecks; PGRR134 removes a critical obstacle.

## Alignment with PUC Market Design Goals

The Texas PUC's market design blueprint emphasizes "increasing the utilization of load resources for grid reliability." PGRR134 advances this objective by:

* **Expanding load resource participation**: Creating pathways for large loads to provide dispatchable capacity
* **Improving resource adequacy**: Adding flexible capacity that complements traditional generation
* **Enhancing market efficiency**: Valuing flexibility through market mechanisms rather than regulatory mandates

# Technical Alignment with NPRR1188 and the Four-Pillar Flexibility Framework

NPRR1188, approved by the Texas PUC in November 2024, established the operational framework for nodal dispatch and settlement of Controllable Load Resources. This market design change allows for loads to be dispatched using their locational nodal shift factors. As a result, congestion can be managed more efficiently.

PGRR134 extends the NPRR1188 framework backward into the interconnection study process, allowing loads to commit to CLR operation before energization. This creates a virtuous cycle:

* Planning studies can model load as NPRR1188-compliant CLRs with defined Low Power Consumption (LPC) and Maximum Power Consumption (MPC) parameters
* Transmission Service Providers (TSPs) can authorize earlier energization when constraints can be managed by dispatch down to the CLR's LPC
* Load Commissioning Plans (LCPs) still ensure full firm service delivery on appropriate timelines
* System operators gain dispatchable capacity that enhances rather than threatens reliability

## The Four-Pillar Flexibility Taxonomy Applied to CLR Elections

impactECI's research has identified four distinct pillars of data center flexibility that enable controllable load operation. PGRR134's CLR election framework allows loads to leverage any combination of these capabilities:

## Pillar 1: Compute Flexibility

Modern data centers can shift computational workloads across time and geography. AI training workloads, for example, can be scheduled during off-peak hours or delayed/paused during grid stress events with minimal business impact. Key mechanisms include:

* Workload deferral: Delaying or slowing non-time-sensitive batch processing during peak demand period
* Geographic load balancing: Shifting computation to data centers in different ERCOT load zones with available transmission capacity
* Computation type prioritization: Maintaining inference (user-facing) workloads while curtailing training operations

## Pillar 2: Energy Resource Flexibility

Data centers typically deploy substantial behind-the-meter generation and storage for reliability purposes. These assets can be coordinated with grid operations:

* **Backup generators**: Diesel or natural generators designed for high reliability can serve partial or full load during grid stress. Implementation must consider environmental emissions affecting local air quality, climate goals of the owners/operators, permitted run-times, and risks of depleting fuel intended for true grid outages in the case of diesel.
* **Battery and uninterruptible power supply** **systems**: Multi-hour battery energy storage systems (BESS) which are purpose built for longer-duration backup, cost management, and other applications and uninterruptible power supplies sized for shorter-duration backup and power quality applications, as well as hybrid BESS-UPS being developed may provide flexible capacity

## Pillar 3: Contractual Flexibility

PGRR134's CLR election mechanism represents a substantial innovation in contractual flexibility. By allowing loads to contractually commit to dispatchability during interconnection studies, the proposal creates:

* **Maximum curtailment frameworks**: Loads can specify curtailment capabilities with corresponding interconnection timeline benefits
* **Performance-based interconnection rights**: Interconnection approval tied to verified curtailment performance rather than purely passive capacity delivery
* **Economic compensation pathways**: Future integration with ERCOT ancillary services markets to monetize flexibility

## Pillar 4: Infrastructure Flexibility

Data center physical infrastructure increasingly incorporates grid-interactive design:

* **Advanced cooling systems**: Thermal energy storage, liquid cooling, and other emerging technology that can modulate power consumption while maintaining IT equipment within operating temperature ranges
* **Power distribution architecture**: Electrical systems designed for dynamic load management and seamless coordination with grid signals

These pillars are categorizations of currently applicable technologies with strong potential; other technologies or pillars might make sense based on each locations unique considerations, programs, and cost profiles, among others.

## The critical "350 vs. 15 Days" Insight

A DOE report last year reinforces PGRR134's approach: grids experience peak stress for only ~15 days while operating with substantial headroom for ~350 days annually[[2]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftn2). The impact is compelling: 0.5% of data center uptime can enable 100GW headroom[[3]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftn3) in the power grid without major investment. Analysis of multiple U.S. utility territories shows:

* **Top 15 peak load days** typically occur during summer afternoon peaks and winter cold snap
* **Shoulder seasons** (spring, fall) and most off-peak hours have significant unused transmission and generation capacity
* **Strategic curtailment** of large loads during the 15 peak stress days means there would likely be no need for systems upgrades that otherwise would have limited benefit for the remaining 350 days without system strain.

For data center operators, accepting 1-4% annual curtailment (up to ~350 hours) can accelerate interconnection timelines significantly,maintaining computational availability.

## 3.3 Operational Experience from Other Markets

Elements that form the basis for PGRR134 are not untested concepts, as there are similar frameworks operating successfully in other US transmission systems jurisdictions:

* **SPP** implemented an expedited interconnection pathway for generators with transmission upgrade responsibilities. Participants could energize within 90 days by accepting real-time dispatch constraints.
* **Within PJM**, a coalition of players, Amazon, Calpine, Constellation, Google, Microsoft, and Talen (ACCGMT) have jointly proposed new structures to allow new campuses to connect faster while still meeting grid-support obligations.

|  |  |  |
| --- | --- | --- |
| Aspect | Old PJM Non-Capacity-Based Load (NCBL) | ACCGMT Approach |
| Voluntary | Began with some voluntary options, shifted to mandatory allocation | Voluntary program where data centers opt-in to provide flexibility, demonstrating ability for demand reduction or self-supply; no forced curtailment for non-participants |
| Who curtails/pays | Large loads (≥50 MW) designated NCBL would be the first curtailed in grid emergencies; cost and curtailment risk assigned to participating loads | Data centers aggregate their own flexible assets and manage compliance within self-defined portfolio without forced assignment |
| Resource mix | Could credit Bring-Your-Own-Generation/ Demand response (BYOG/DR), but through utility assignment and clear rules | User-assembled portfolio: on-site, off-site, aggregation, contracts |
| Stakeholder view | Faced criticism over fairness, practicality, and risk of undermining tariff integrity and market design | Widely supported by data centers and tech firms; viewed as innovative, flexible, and able to reduce risk and promote market confidence in large load integration |
| Market rules | Formal new class with detailed obligations; planned for FERC filing | Emerging through regulatory negotiation, demonstration, and evolving ISO/RTO rules |

**Related frameworks have also been deployed abroad:**

* **UK National Grid ESO** operates sophisticated demand-side response programs including "Demand Turn Up" (consuming excess renewable generation) and "Dynamic Containment" (fast frequency response).
* **Irish grid operator EirGrid** deploys data centers as "fast post-fault active power recovery" resources under the DS3 program. Multiple hyperscale facilities provide MWs of curtailment capability with <1 second response times.

These international precedents demonstrate that dispatchable load programs enhance rather than threaten reliability when designed with appropriate safeguards.

# Quantified Economic Benefits

* 1. **Transmission Deferral Value**

impactECI’s research across comparable markets shows that flexible load interconnection can defer or avoid transmission investments valued from millions to billions per GW of flexible capacity, depending on regional congestion. NV Energy and Gridlab’s model[[4]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftn4) highlights $300M in net present value of system cost reduction from 2 GW of flexible curtailment.

## Accelerated Interconnection Value

PGRR134's CLR election pathway could reduce existing large load interconnection queue duration significantly to periods of 2 years or fewer for loads willing to accept curtailment. This may have the effect of increasing revenue by both making unfeasible projects based on the long timelines feasible with flexibility and through the time value of accelerating projects.

## System-Wide Reliability and Economic Benefits

PGRR134 may create system-wide benefits that extend beyond participating loads:

* **Reduced operating reserve requirements**: Dispatchable loads provide downward flexibility that complements traditional generation reserves
* **Improved generator economics**: By managing transmission constraints through dispatch, PGRR134 reduces generator curtailment and improves capacity factors for existing generation
* **Rate pressure relief**: Avoided transmission costs prevent upward pressure on transmission tariffs for all customer classes
* **Enhanced renewable integration**: CLRs can absorb excess wind/solar during high production periods and curtail during low renewable output, improving system economics

# Implementation Recommendations

While impactECI strongly supports PGRR134 as drafted, we offer the following implementation recommendations to maximize program effectiveness

## Explicit Performance Standards

**Recommendation**: ERCOT should develop standardized CLR performance requirements as part of NPRR1188 implementation that clarify expectations for loads electing CLR treatment during interconnection studies.

Suggested Standards:

* **Response time**: ≤5 minutes from dispatch signal to 90% of requested curtailment
* **Availability**: ≥95% successful response to dispatch instructions
* **Curtailment depth verification**: Actual load reduction within ±5% of committed LPC

## Curtailment Limits and Rules

**Recommendation**: Establish curtailment limits and rules that balance flexibility value with customer operational needs. These might include:

* Cap on hours or events per year
* Required recovery periods
* Curtailment durations
* Notice periods for curtailment events

## Standardized Study Assumptions

Recommendation: ERCOT should publish standardized modeling assumptions for CLR elections in Large Load Interconnection Studies (LLIS). Key Assumptions to Specify:

* Statistical availability assumptions (accounting for forced outages, communication failures, etc.)
* Constraints eligible for CLR-based mitigation vs. those requiring physical transmission upgrades
* Timelines for transitioning from CLR-based interim service to full firm service under LCP
* Standardization reduces study complexity, improves comparability across projects, and accelerates the study process itself.

## Coordination with NPRR1188 Implementation

**Recommendation**: Align PGRR134 implementation timeline with NPRR1188 deployment (12–24-month implementation window from November 2024 approval).

**Critical Dependencies:**

* ERCOT EMS systems must be capable of CLR dispatch before loads can energize under PGRR134
* Market settlement systems must accommodate CLR energy and uplift charges
* Telemetry and communication infrastructure must be tested and validated

**Potential Phasing:**

* **Phase 1** (Months 1-6): Develop CLR election forms, study procedures, and performance standards
* **Phase 2** (Months 7-12): Pilot program with 2-3 volunteer large loads in different ERCOT zones
* **Phase 3** (Months 13-24): Full program deployment as NPRR1188 operational capabilities come online

# Performance Guarantees and Risk Mitigation

While PGRR134 establishes the interconnection study framework, implementation success requires rigorous performance verification mechanisms. impactECI recommends ERCOT develop:

## 6.1 Real-Time Telemetry Requirements:

* Sub-second telemetry of load consumption at CLR sites
* Automated reporting to ERCOT EMS systems
* Cybersecurity protections consistent with NERC CIP and related standards

## 6.2 Automated Curtailment Systems:

* Direct ERCOT dispatch capability via ICCP, OpenADR 2.0b, IEEE 2030.5, or other relevant protocols
* <5 minute response time from dispatch signal to load reduction
* Redundant communication pathways to prevent dispatch failures

## 6.3 Third-Party Verification:

* Independent measurement and verification for curtailment events
* Annual performance audits by ERCOT or qualified third parties
* Financial penalties for repeated non-performance (similar to generation resource non- performance charges)

## 6.4 Graduated Response Capabilities:

* CLRs should specify multiple curtailment levels (e.g., 10%, 20%, 30%, etc.) with corresponding response times
* ERCOT dispatch can call partial curtailments for moderate constraints and full curtailments only during severe events
* This granularity improves dispatch efficiency and reduces customer impact

# Recommendation

impactECI strongly recommends approval of PGRR134 as a critical innovation in ERCOT's large load interconnection process. The proposal:

* Maintains reliability through robust safeguards including IROL authority, queue priority preservation, and TSP study discretion
* Unlocks economic value through transmission deferral accelerated interconnection timelines, and system-wide efficiency gains
* Positions Texas competitively by establishing best-in-class frameworks for data center development and flexible load integration
* Builds on proven foundations by extending NPRR1188's operational framework into interconnection planning
* Aligns with national trends while allowing ERCOT to lead rather than follow in flexible load integration

The unprecedented large load growth facing ERCOT requires innovative solutions that preserve reliability while avoiding unnecessary infrastructure costs. PGRR134 provides such a solution by recognizing and capturing the potential for flexibility of modern data centers and large industrial facilities.

We urge the Reliability and Operations Subcommittee to recommend approval of PGRR134 at the earliest feasible ROS meeting and subsequently urge TAC and the ERCOT Board to expedite review and approval.

[[1]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftnref1) Based on ERCOT System Planning and Weatherization Update (September 22-23, 2025)

[[2]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftnref2) <https://www.canarymedia.com/articles/utilities/one-way-data-centers-can-help-the-grid-by-being-flexible/> <https://www.energy.gov/sites/default/files/2024-08/Powering%20AI%20and%20Data%20Center%20Infrastructure%20Recommendations%20July%202024.pdf>

[[3]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftnref3) <https://nicholasinstitute.duke.edu/sites/default/files/publications/rethinking-load-growth.pdf>

[[4]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en-US&rs=en-US&wopisrc=https%3A%2F%2Fnetorgft12035027.sharepoint.com%2Fsites%2Fimpacteci.com%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F53d650de578e40ae92c81b0e389cc8d2&wdorigin=BrowserReload.Sharing.ServerTransfer&wdexp=TEAMS-TREATMENT&wdhostclicktime=1762381306849&wdenableroaming=1&mscc=1&hid=7929573E-4E33-4C0D-8B24-09636180E4C5.0&uih=sharepointcom&wdlcid=en-US&jsapi=1&jsapiver=v2&corrid=1f673141-d263-a1ca-0495-6ea6a2e53da4&usid=1f673141-d263-a1ca-0495-6ea6a2e53da4&newsession=1&sftc=1&uihit=docaspx&muv=1&ats=PairwiseBroker&cac=1&sams=1&mtf=1&sfp=1&sdp=1&hch=1&hwfh=1&dchat=1&sc=%7B%22pmo%22%3A%22https%3A%2F%2Fnetorgft12035027.sharepoint.com%22%2C%22pmshare%22%3Atrue%7D&ctp=LeastProtected&rct=Normal&afdflight=90&csiro=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush#_ftnref4) <https://gridlab.org/portfolio-item/data-center-flexibility-nv-energy-case-study-report/>

|  |
| --- |
| Revised Cover Page Language |

None

|  |
| --- |
| Revised Proposed Guide Language |

None