New Hampshire Department of Energy

Grid Modernization Advisory Committee (GMAG)

Customer-Generator Interconnection Cost Allocation Sub-Committee Discussion/Report

Options for Consideration

New Hampshire Department of Energy
Concord, New Hampshire

DRAFT

June 2024

Todays Discussion

- Legislative Background
- Directive from GMAG Chair
- Findings from the Cost Allocation Sub-Committee
- GMAG Discussion of findings
- Recommended Next Steps
  - Breadth and details to include in report
  - Other issues

Legislative Background

12-P:16 Grid Modernization Advisory Group

- I. The department of energy shall establish and support a grid modernization advisory group (GMAG)…..

- II. (a) The grid modernization advisory group shall consider and provide recommendations to the department and the legislature on issues including, but not limited to:

- (b) The GMAG shall review different cost structures that *enable a reasonable portion of costs* of distributed generation and storage interconnections *to be shared by entities that interconnect future distributed generation* or storage to the distribution grid to the extent that such subsequent interconnection is enabled by the investment or costs incurred by the prior entity or entities that interconnect. The GMAG shall provide recommendations to address this issue by September 1, 2024.

GMAG Cost Allocation Sub-committee

Directive from the GMAG Chair, March 2024

- The sub-committee shall investigate cost allocation options including those utilized in other states and provide those options to the full GMAG committee for consideration and subsequent recommendations.

Findings from the cost-allocation sub-committee

- Initial findings were presented during the May GMAG meeting:
  - It was noted that cost allocation for customer-generator and storage interconnection is in its early stages in certain parts of the country. There continue to be numerous challenges.
  - Details regarding Massachusetts and New York cost allocation were discussed.
- Some of these findings were further investigated and discussed.
- The results are presented for further discussion on the following pages.

Type	aka	Description	State(s)	Cost Allocation	Cost Recovery	Pro's	Con's	Comments
Cost Causation		Entity causing need of system upgrades are responsible for payment of costs.	All	Interconnecting customer	Interconnecting customer	Ratepayers not burdened by cost.	Does not encourage DER, especially as DER penetration increases. DER's sometimes pay for more capacity than they require, effectively subsidizing others.	Current cost recovery
Limited Generation Profile (LGP)	Flexible IX (Interconnection)	Schedules limit DER energy and microgrids can send based on grid constraints.	CA	Avoids cost for interconnecting customer. Does not allocate to others.	Interconnecting customers	Potential to lower capital investment requirements for interconnections.	Requires robust monitoring and control infrastructure. Continuingly changing schedules.	Cost avoidance vs. cost allocation.
Basic Cost Sharing	Enhanced Line Extension	Expand upon existing Line Extension policies. Interconnecting Customer pays upgrades and is reimbursed by other future customers as they use the expanded capacity.		Interconnecting customer and subsequent customers. Limit to X years.	First customer(s) pay for upgrades. Reimbursed over time of others join.	Lowers capital investment requirements for interconnections. Relatively simple.	Requires utilities to manage and distribute funds to multiple organizations over multiple years	$/kW (or ratio of system capacity) . Over period of X years.
Basic Cost Sharing	Sub-Station Upgrades for 3VO or other conditions.	Ground Fault Over Voltage (GFOV) protection often requires system upgrades at the Substation. If a System Impact Study identifies significant substation investments are required other potential interconnecting customers can share those costs.		Interconnecting customer and subsequent customers. Limit to X years. VT has a one-time Transmission Ground-Fault Overvoltage (TFGOV) fee.	First customer(s) pay for upgrades. Reimbursed over time of others join. VT from all interconnecting customers.	Lowers capital investment requirements for interconnections. Relatively simple.	Requires utilities to manage and distribute funds to multiple organizations over multiple years	$/kW (or ratio of system capacity) . VT has a one-time fee. Can also be over period of X years.
Market Based Grid Access Fee	Grid Access Charge (GAC)	Utility and Stakeholder process, overseen by state regulators, develop fees and rate structures.	CA. Consider-ed in others	Access fees paid by interconnecting customers. Fees vary by need as determined by utility, stakeholders and regulators.	Access fees and portion from utility rate base	Creates market price signals to drive developers to appropriate locations on the utility system. Effective at recovering utility costs. Easy to understand.	Potentially regressive effects. Time and effort to evaluate fee structures.	
Multi-Beneficiary Cost Sharing	Provisional System Planning Program for Capital Improvement Projects (CIP) in MA. System Planning and Group Studies Integrated Distribution Planning (IDP)	Utilities forecast where DERs will be sited and plan upgrades for those locations. Locations shown on hosting capacity maps. Market driven studies can also identify projects.	MD, MA, NM, NY	Proportionally allocate costs (typically $/kW of nameplate) to new customers after first interconnection customer pays fair share of cost.	Portion of interconnection costs recovered from customers in rate base.	Utilities can apply portions of costs that benefit all customers to their rate base. Market driven studies and projects also considered.	Substantial cost tracking and crediting efforts needed. Individual dockets for each CIP in the case of MA. If planned DG is not built, ratepayers pay for unnecessary upgrades.	To-date it appears only these four states are having substantial discussion and effort on cost allocation.

Option 1: Cost Causation

Overview:

- Historical standard in utility industry.
- Entity causing need for system upgrades responsible for full cost.

Cost Responsibility and Recovery/Allocation:

- Interconnecting customer(s).

Pros:

- Ratepayers not burdened by cost.

Cons:

- Does not encourage DER, especially as DER penetration increases.
- DER's sometimes pay for more capacity than they require, effectively subsidizing others.

Key issues to address:

- N/A

Option 2: Limited Generation Profile (LGP)

Overview:

- DR agree to schedules or directives to limit output based on grid constraints.
- Also known as Flexible IX (Interconnection).

Cost Responsibility and Recovery/Allocation:

- Minimizes system upgrades needed by the utility and reduces interconnection cost to the developer.

Pros:

- Potential to lower cost of interconnection for developer and potentially ratepayers.
  - Potential for enhanced controls that will be needed to be shared by ratepayers.
- Simple.

Cons:

- Requires robust monitoring and control infrastructure.
- Continuingly changing schedules.

Key issues to address:

- Systems and resources needed by utilities and customer generators (c-g).
- Enforcement and control.

Option 3a: Basic Cost Sharing – Line Extensions

Overview:

- Expand upon existing Line Extension policies.
- Interconnecting Customer pays for upgrades and is reimbursed by other future customers as they use the expanded capacity.

Cost Responsibility and Recovery/Allocation:

- Interconnecting customer and subsequent customers. Limit to 5? years.
- First interconnection customer pays. Reimbursed if others join.

Pros:

- Potential to lower cost of interconnection for developer(s).
- Relatively simple.

Cons:

- Requires utilities to manage and distribute funds to multiple organizations over multiple years.

Key issues to address:

- Allocate cost by $/kW or other factor(s).
- Number of years for recovery.

Option 3b: Basic Cost Sharing – Substation Upgrades

Overview:

- If significant substation upgrades are identified during a System Impact Study (SIS).
  - i.e. requirements to meet 3VO or other conditions.
  - Utility to identify upgrade requirements and make known to developers so the potential exists to share system upgrade costs.

Cost Responsibility and Recovery/Allocation:

- Interconnecting customer(s) and subsequent customers. Limit to 5? years.
- First interconnection customer pays. Reimbursed if others join.

Pros:

- Allows other developers to know about potential project(s) for cost sharing.
- Potential to lower cost of interconnection for developer(s).
- Relatively simple.

Cons:

- Requires utilities to manage and distribute funds to multiple organizations over multiple years.

Key issues to address:

- Allocate cost by $/kW or other factor(s).
- Number of years for recovery.
- How to communicate identified upgrades. i.e. Hosting Capacity Map links, etc.

Option 4: Market Based Grid Access Fee

Overview:

- Utility and Stakeholder process, overseen by state regulators, develop fees and rate structures for customer-generator and storage grid access.
  - Note: VT has a one-time Transmission Ground-Fault Over Voltage (TGFOV) fee.

Cost Responsibility and Recovery/Allocation:

- Access fees paid by interconnecting customers. Portion *potentially* by ratepayers.
- Fees vary by need as determined by utility, stakeholders and regulators.

Pros:

- Creates market price signals to drive developers to appropriate locations on utility system.
- Effective at recovering utility costs.
- Easy to understand.

Cons:

- May reduce incentive to interconnect, especially for storage.
- Time and effort to evaluate fee structures

Key issues to address:

- Determine if this is desirable for NH.
  - If it has potential, find examples to use as basis.

Option 5: Multi-Beneficiary Cost Sharing

Overview:

- Developers can share in the cost of system studies and/or upgrades.
- Utilities forecast where DER's may be sited and plan upgrades for those locations.
  - Locations shown on hosting maps.
- Market driven studies can also identify potential system upgrade projects.

Cost Responsibility and Recovery/Allocation:

- Proportionally allocate costs (typically $/kW of nameplate) to new customer(s) after first interconnection customer(s) pays fair share of cost or minimum threshold.
- Portion of costs may be able to be recovered from ratepayers.
  - If benefits to all customers can be demonstrated.

Pros:

- Utilities can apply portions of costs that benefit all customers to their rate base.
- Market driven studies and projects also considered.

Cons:

- Substantial cost tracking and crediting efforts needed by utility and regulators.
- Individual dockets for each CIP in the case of MA.
- If planned DG is not built, ratepayers pay for unnecessary upgrades.
- Time consuming. Will take considerable effort to develop for NH.
  - May be too complicated or not appropriate for NH at this time.

Key issues to address: Numerous

Some perspective

- There is considerable interest in developing a reasonable cost allocation methodology for interconnection in NH.
- Some states that are further along have spent several years developing methodologies and processes, yet significant issues remain.
- Keeping it simple will increase the likelihood of success.
- The DOE is likely to start an investigative rulemaking proceeding as a follow-on to IP 2022-001 in the very near future.
  - IP 2022-001 recommended the creation of Working Groups to address the various interconnection issues.
  - The creation of a cost allocation working group could be a recommendation from GMAG.

Next Steps

- **Determine if additional investigation for other options is necessary.**
- **GMAG vote/discussion on preferred option(s).**
- **Breadth and details to include in report.**

Discussion

Please send comments regarding this draft to:

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