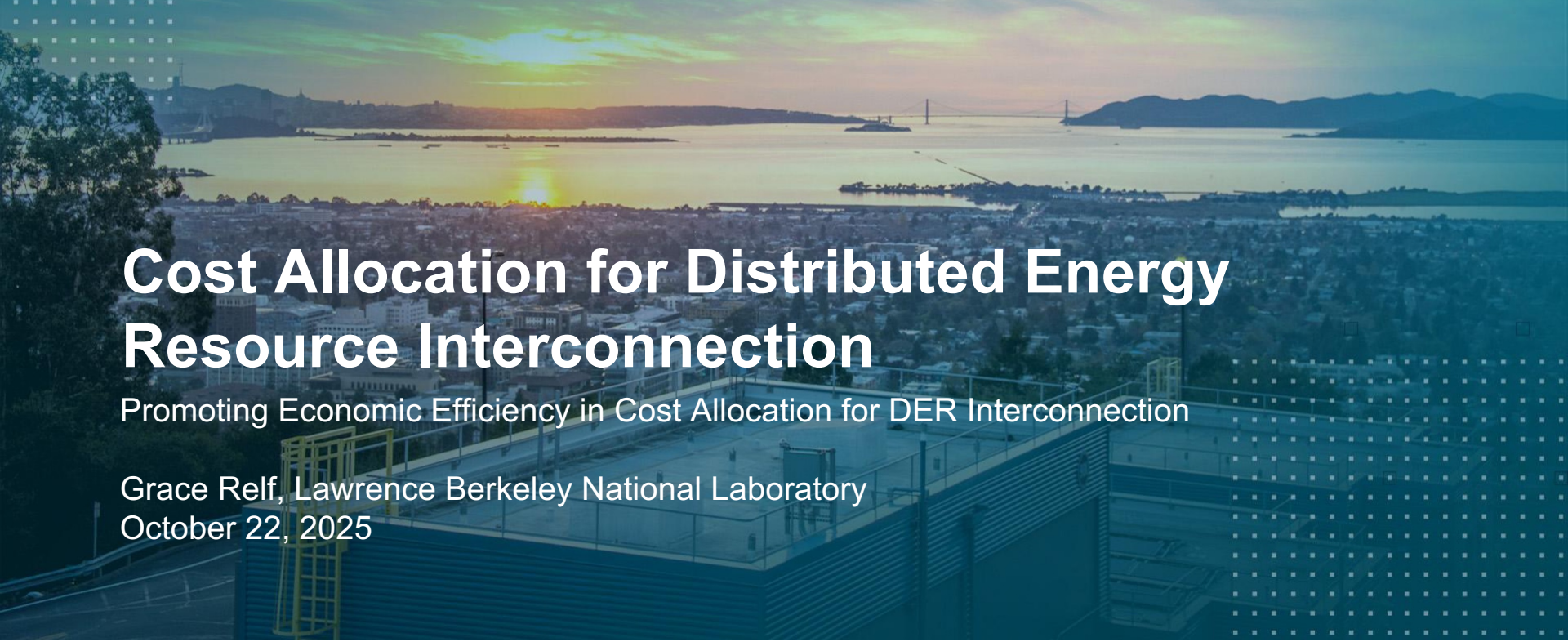

Cost Allocation for Distributed Energy Resource Interconnection

Promoting Economic Efficiency in Cost Allocation for DER Interconnection

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Energy Technologies Area
BERKELEY LAB

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Agenda

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  - Industry manuals
  - Cost allocation process
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  - Challenges with cost-causer pays
  - Approaches to DER interconnection cost allocation
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Background on Electric Utility Cost Allocation

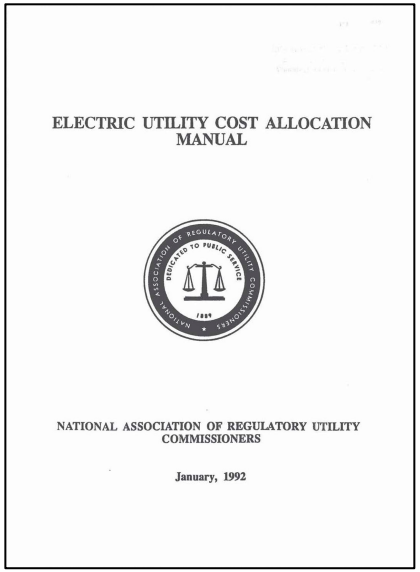
Utility Cost Allocation – Industry Manuals

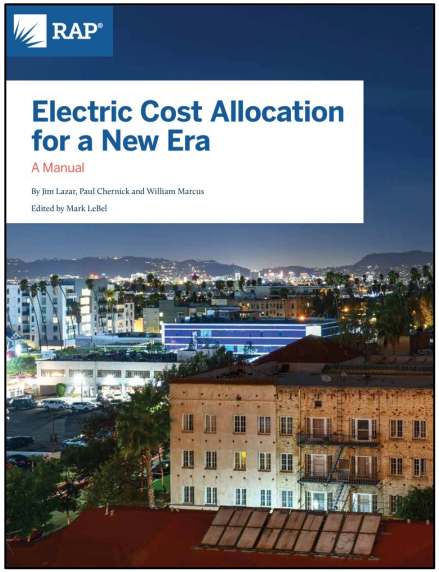
The NARUC Electricity Utility Cost Allocation Manual is a foundational document that outlines cost allocation history, theory, and approaches.

RAP's Electric Cost Allocation for a New Era manual builds on these concepts for modern grids. It identifies two primary conceptual principles.

- Cost causation: Why were the costs incurred?
- Costs follow benefits: Who benefits?

"In the end, cost allocation may be more of an art than a science." – Lazar, Chernick, and Marcus





Sources: NARUC, 1992; RAP, 2020

Modernizing Cost Allocation

- Cost allocation hasn't always kept up with changes to electric system design and operation.
- A number of system changes impact cost allocation.
  - Greater availability of data allows more detailed analysis of cost drivers and usage patterns.
  - New types of generating resources and price changes impact how to dispatch generating units and operate the system.
  - Customer adoption of generating resources impacts how to design and operate the distribution system.
  - Newer technologies can serve multiple purposes.
- In some cases, new approaches to cost allocation can better support the objective of fairly assigning costs across classes.

Allocation of "Smart Grid" Costs

Smart Grid Element	Pre-Smart Grid Element	"Traditional" FERC Account	Traditional Classification	Smart Grid Classification
Smart Meters	Meters	370	Customer	Demand/Energy/ Customer
Distribution Control Devices	Station Equipment	362	Demand	Demand/Energy
Data Collection System	Meter Readers	902	Customer	Demand/Energy/ Customer
Meter Data Management System	General Plant	391-397	Subtotal of Customer and Demand	Demand/Energy/ Customer
Smart Grid Managers	Customer Accounts Supervision	901	Customer	Demand/Energy
Energy Storage Devices (Batteries; Ice Storage)	Installations on Customer Premises	371	Customer	Demand/Energy

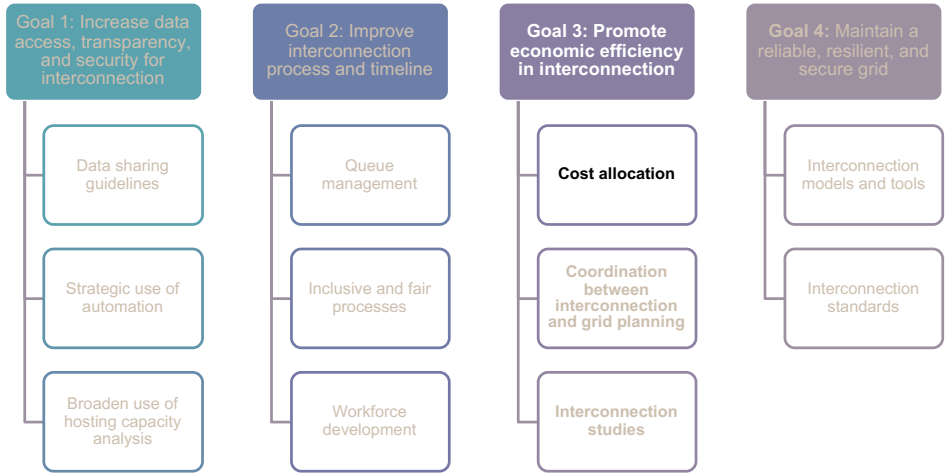
Source: RAP, 2016

Cost Allocation for DER Interconnection

Why Address Cost Allocation for DER Interconnection

Cost allocation is an integral part of promoting economic efficiency in interconnection.

- High interconnection costs can inhibit DER growth.
- Typically, allocation of interconnection costs uses a “cost-causer pays” model, where the DER project that triggers the need for grid upgrades pays the full cost, despite other customers who also will use the upgraded infrastructure.
- States, utilities, and stakeholders are exploring new approaches to interconnection cost allocation to reduce the time and cost to interconnect and allocate costs fairly to beneficiaries. This is largely happening in areas where grid constraints and costs are limiting DER adoption.



DOE i2X DER Interconnection Roadmap

Challenges with Cost-Causer Pays

Issue	Description
Free riders	DERs that trigger upgrades pay 100% of the costs, allowing other interconnecting DERs to benefit from that equipment without paying.
Cost uncertainty	Cost-causer pays methodologies exacerbate uncertainty about whether DER projects will be charged for all or no upgrade costs and may lead to speculative applications or cause applicants to abandon planned DER projects.
Interconnection delays	Cost-causer pays methodologies contribute to lengthy interconnection queues given uncertainty of interconnection costs and increased incentives to submit speculative applications to understand cost responsibility.
High costs for certain customers	Cost-causer pays methodologies may result in exorbitant charges to a single interconnection customer and may cause applicants to abandon planned DER projects.
Lack of alignment with load cost allocation	Allocating costs differently for load and DER energy exports misaligns utility incentives to interconnect exporting facilities timely because they can erode utility revenue.
Misassigned cost allocation	In the absence of holistic grid planning, which considers exporting facilities and load growth together, benefits of DER-related grid upgrades for accommodating customer loads are not considered, resulting in assignment of the full cost to interconnecting DERs.

Sources: DOE DER Interconnection Roadmap, McDonnell, M., R. Nelson, and N. Mims Frick, 2025

Approaches to DER Interconnection Cost Allocation

- Cost allocation approaches:
  - Direct assignment – customers pay in full for certain, specific assigned costs
  - Fixed fees – all customers in a certain group pay a flat fee (e.g. $/system) to cover certain costs
  - Pro-rata allocation – each interconnecting customer pays for a proportional share of upgraded equipment
  - Use of established rate case allocators – costs are rate-based following traditional revenue requirement and cost allocator processes
- Important considerations for implementing these approaches include:
  - How the *upgrade need is triggered* (e.g., due to a single interconnection request, a group of interconnection requests, or proactively/not triggered by any specific request)
  - Whether any costs may be *rate-based* either upfront or after a certain time period
  - What *cost mitigation* tactics may be appropriate to reduce upgrade costs, such as through low or no cost system modifications, phased interconnections, and flexible interconnections that impose limits on system use to avoid the need for upgrades
  - How *costs will be recovered* to ensure the approach is feasible and meets the jurisdiction's cost allocation principles

Examples of Cost Allocation Approaches in Practice
Cost-causer pays
Reimburse initial paying customer over time
Create a reserve fund
Conduct group interconnection studies
Proactively upgrade grid infrastructure
Establish cost caps
Incorporate grid usage costs into tariffs
Follow practices for line extension cost allocation

Berkeley Lab Research Underway

Berkeley Lab is researching approaches to DER interconnection cost allocation to catalog state and utility efforts, identify lessons learned, highlight emerging best practices, and provide useful tools to practitioners.

- Cost allocation for DER interconnection costs is increasingly important to mitigate bottlenecks on local grids to resource deployment, but new approaches are nascent, challenging to design, and information is limited on impacts to date.
  - Approaches differ based on resource size/type, types of upgrades needed, and jurisdictional objectives.
  - Effective working groups can improve the process by increasing understanding and trust among parties and streamlining proceedings.
- Balancing risk-sharing for proactive investments between interconnection customers, utilities, and ratepayers is challenging.
- Complementary approaches, such as improved load and DER forecasting, distribution system planning, and interconnection cost transparency, help reduce costs overall, mitigate risk, and improve customer experience.

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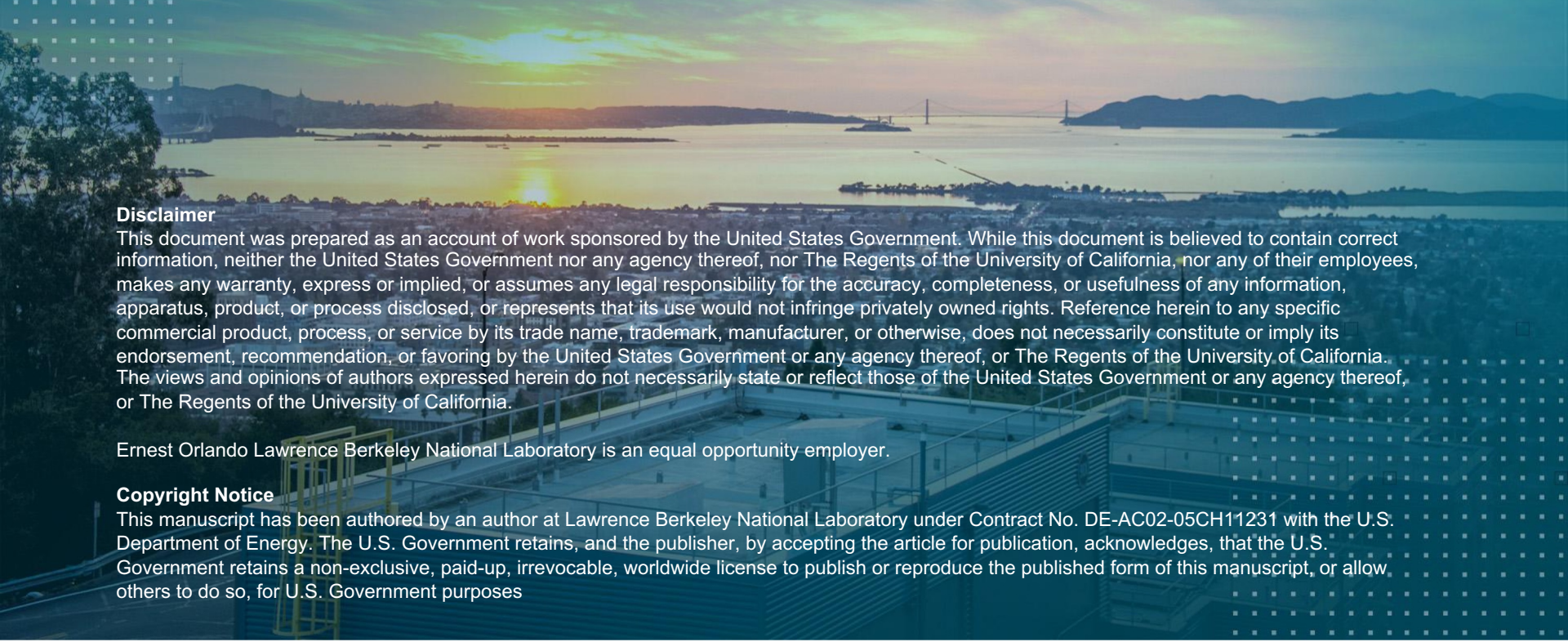

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