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REGULATORY
ASSISTANCE PROJECT

September 12, 2024

Cost Allocation

Clean Energy Innovator Fellows Training

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Prepared for Berkeley Lab

Agenda

- Why Does Cost Allocation Matter?
- Background and Key Concepts
- Uses of Study Results
- Challenges with Allocating Demand and Energy
- Best Practices for Cost Allocation Approaches



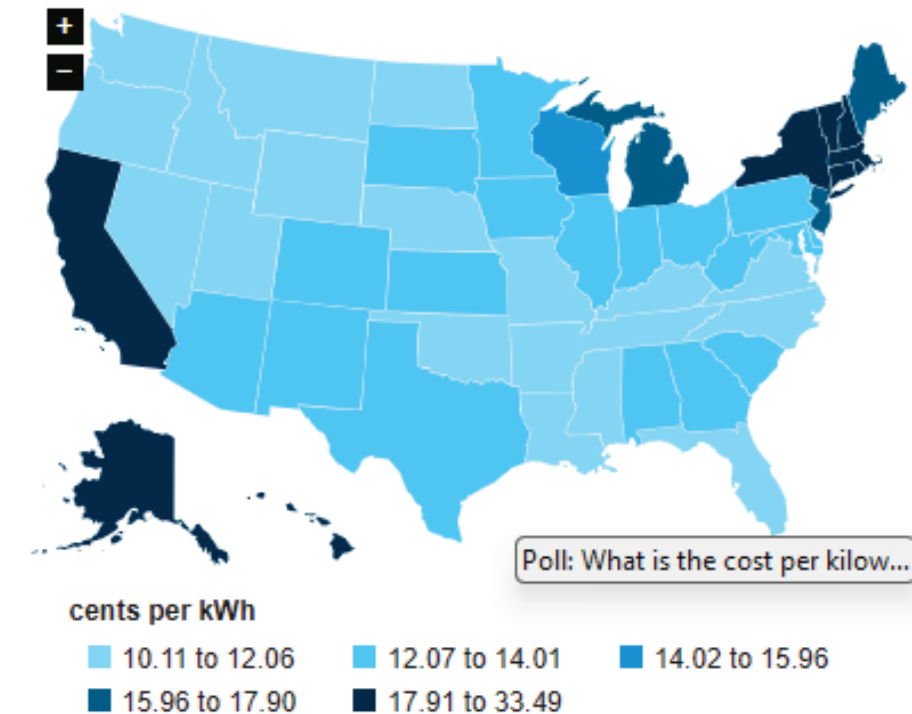
Poll: What is the cost per kilowatt-hour in the U.S. for the average residential customer?

1. 10 cents per kWh
2. 12 cents per kWh
3. 14 cents per kWh
4. 16 cents per kWh
5. 18 cents per kWh

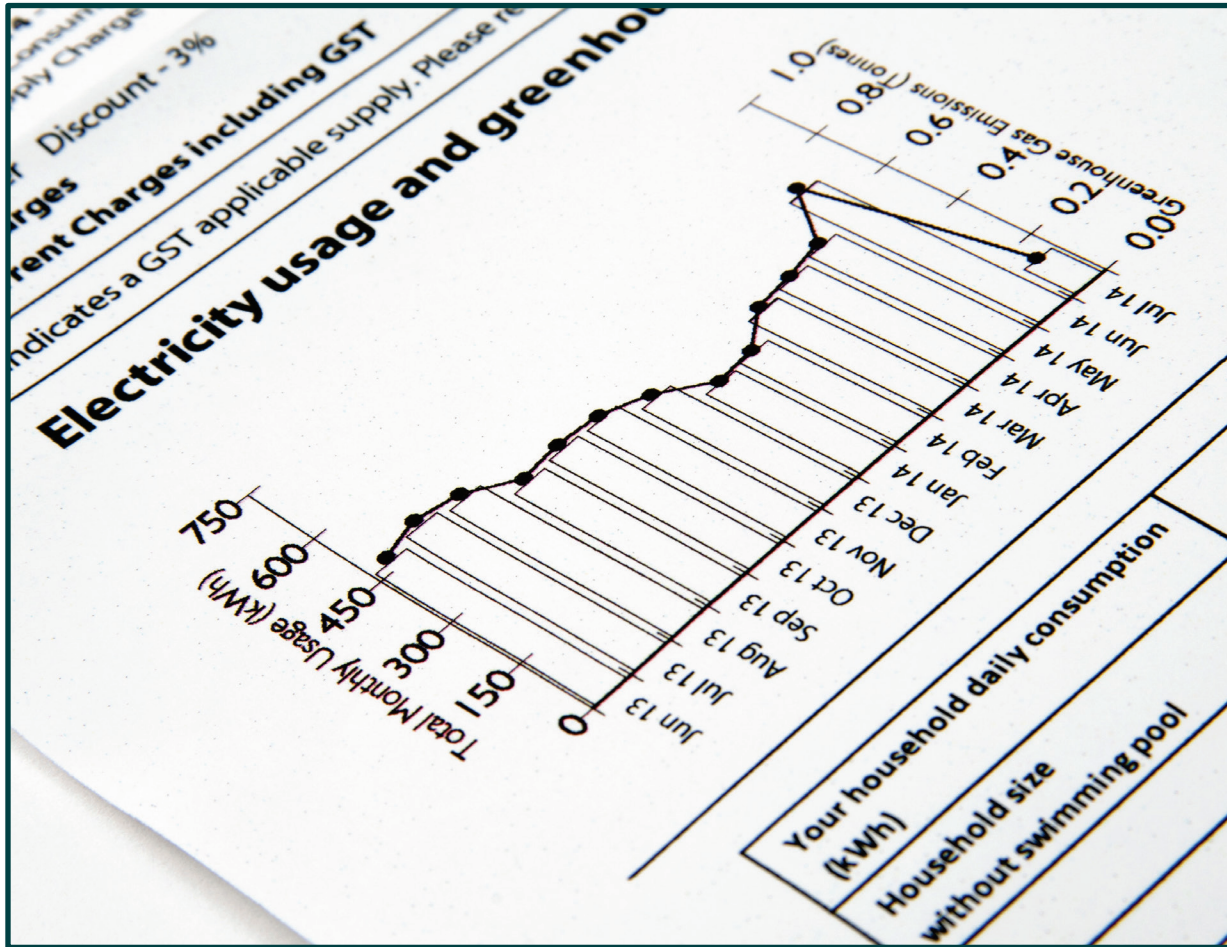
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4. 16 cents per kWh
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Residential average revenue per kilowatthour

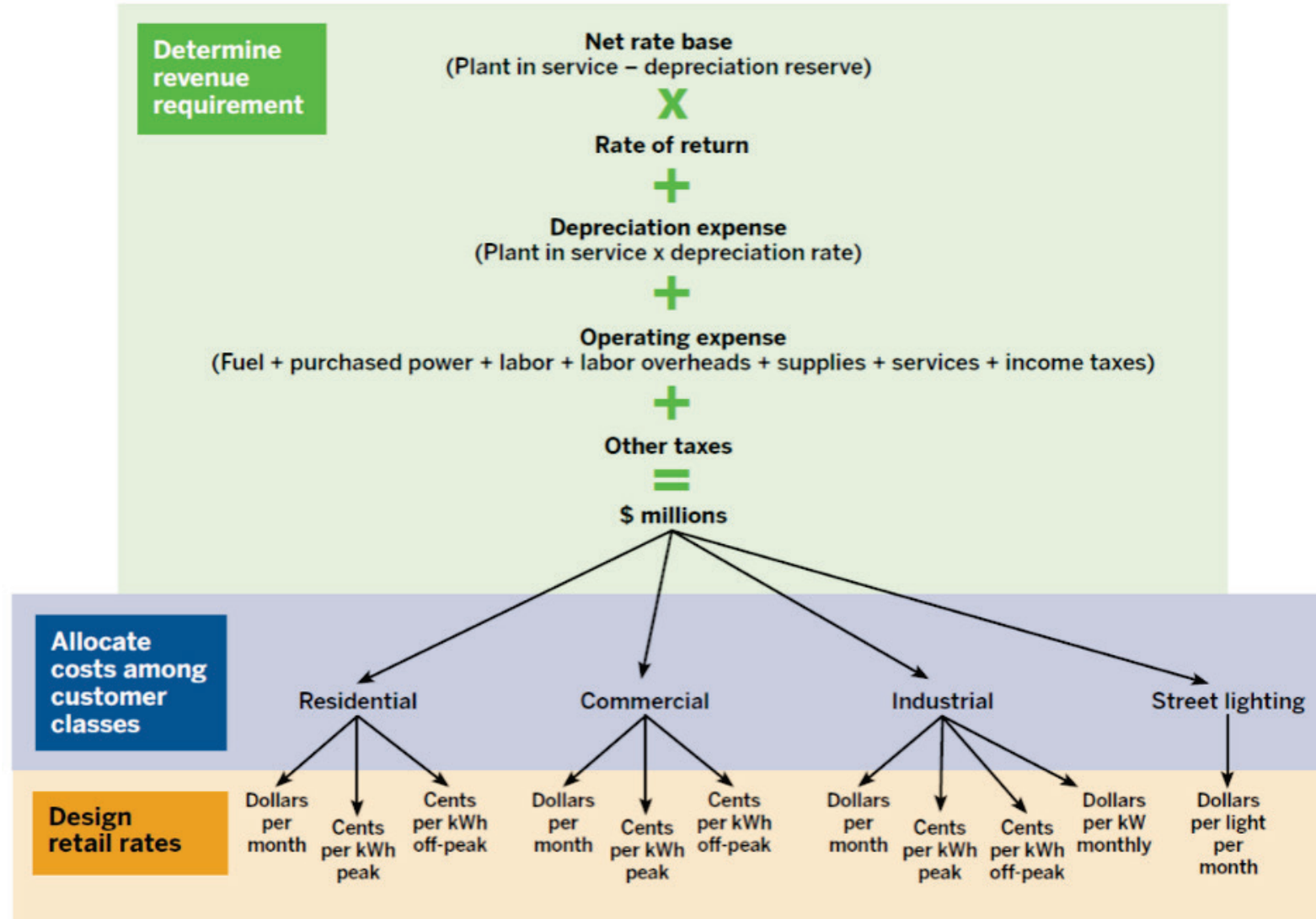


Why Does Cost Allocation Matter?

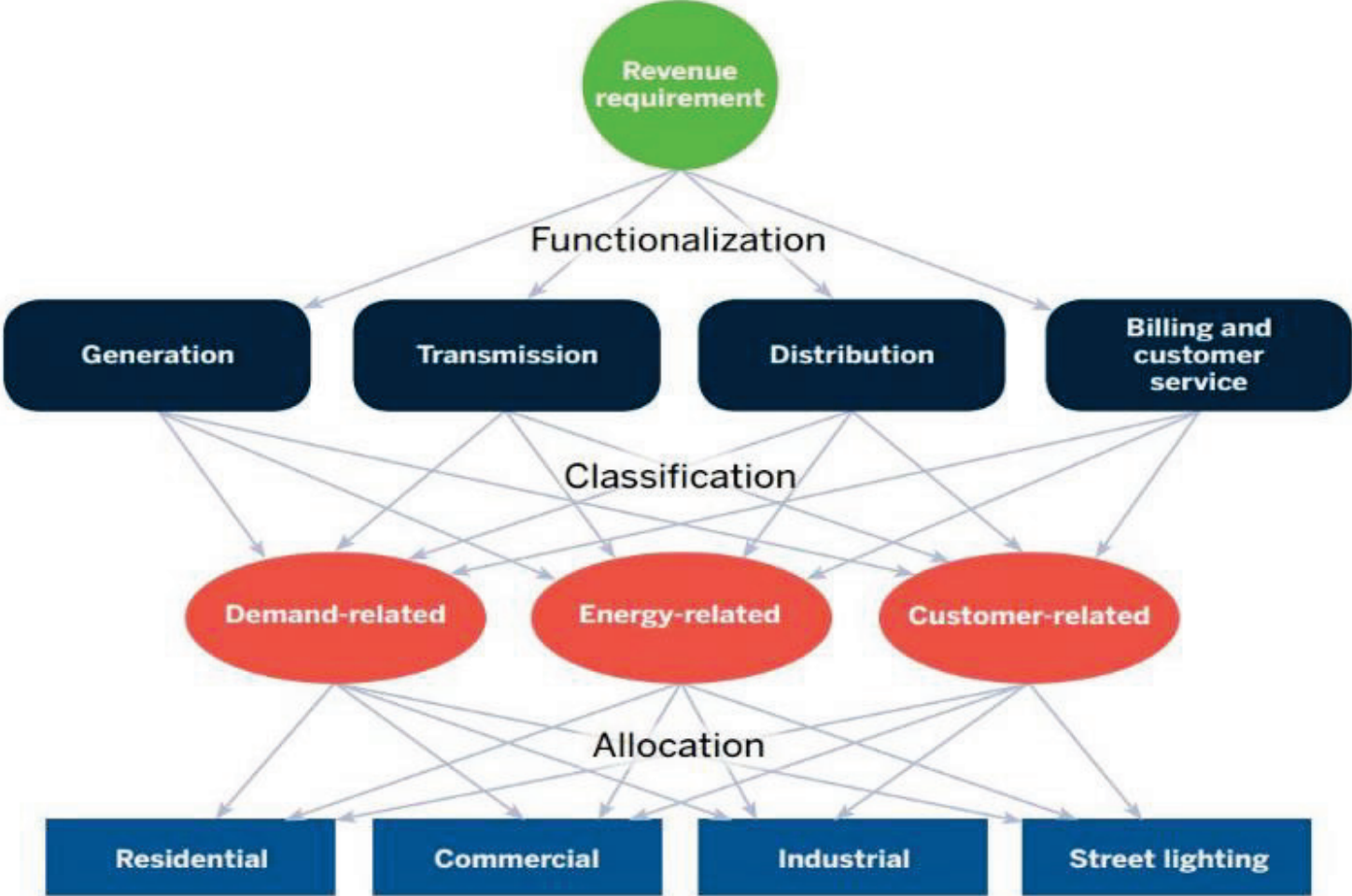


- Cost allocation matters to customers
 - Allocated costs are used to set rates for each customer class
- Two key analytical perspectives
 - Cost causation
 - Costs follow benefits
- Data and analysis from cost allocation process inform rate design

Simplified Rate-making Process



Traditional Embedded Cost of Service Study Process



Embedded Cost Method

Case No.: U-20162
Exhibit: A-30
Schedule: CC-1
Witness: T. W. Lacey
Page: 1 of 100

ELECTRIC UTILITY COST ALLOCATION MANUAL

January, 1992



NATIONAL ASSOCIATION OF
REGULATORY UTILITY COMMISSIONERS

1101 Vermont Avenue NW
Washington, D.C. 20005
USA

Tel: (202) 898-2200
Fax: (202) 898-2213
www.naruc.org

\$25.00

Typical Cost Function

Production

Transmission

Distribution

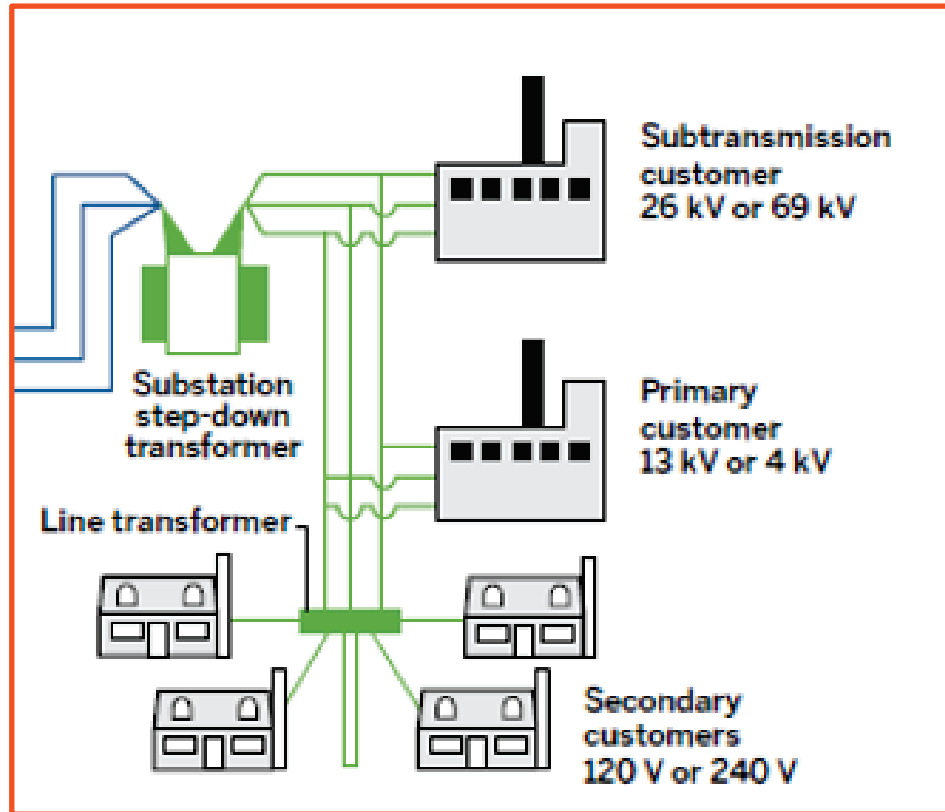
Typical Cost Classification

**Demand Related
Energy Related**

**Demand Related
Energy Related**

**Demand Related
Energy Related
Customer Related**

Determining Customer Classes



Customer Class Types

- Residential
 - Single-Family
 - Multi-Family
 - Solar?
 - Heating?
- Commercial
- Industrial
- Agriculture
- Street Lighting

Cost Causation for Electric System

- System serves joint needs of all customers across all hours of the year
- Each function has distinct cost drivers
 - Energy supply costs are time-differentiated
 - Transmission lines serve multiple purposes
 - Distribution is built only where there is load to support it
 - Basic meters are for billing, but the costs of advanced metering infrastructure are incurred for a broad array of purposes
- Administrative and general costs scale with size of the utility organization
- Public policy programs reflect a mix of motivations
 - Electric system benefits
 - Broader societal goals

Treatment of Fixed Costs

General Treatment of Fixed Costs

- **All enterprises incur costs that are fixed in the short run**
- **Most fixed costs are spread over the units that are sold**
- **As businesses grow, they incur additional fixed costs**

Fixed Costs for the Electric System

- **Equipment type and cost depend on expected use**
 - **Generation mix**
 - **Transmission lines added to connect remote resources**
 - **Line and transformer sizing**
- **Wear and tear drives continuing costs**
 - **Generator usage**
 - **T&D equipment ages from repeated high loads**

Examples of Fixed versus Variable Costs

- Multiple ways to serve an increase in peak demand
 - Peaker – mix of fixed and variable costs
 - Battery storage – almost entirely fixed costs
 - Demand response – variable costs

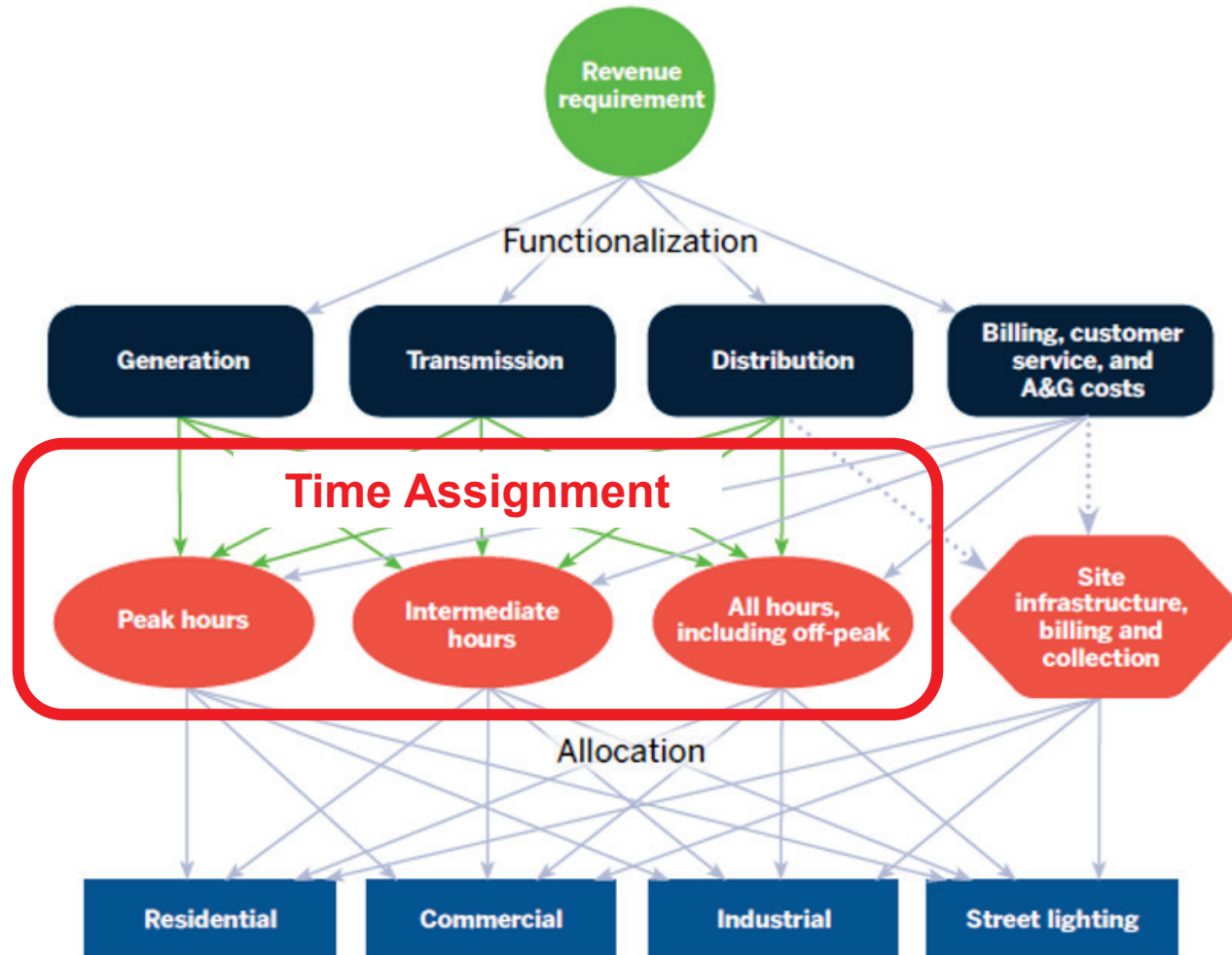


Using Results of Cost Allocation Studies

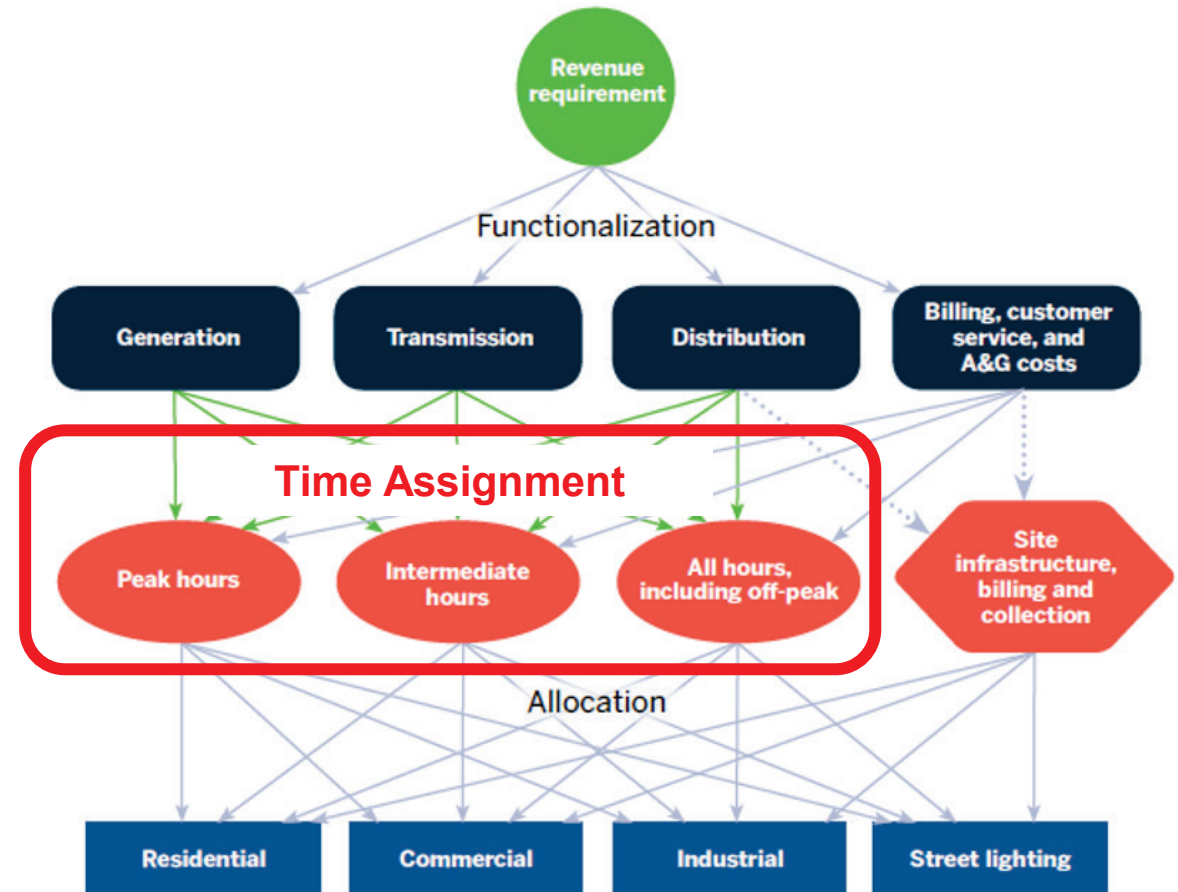
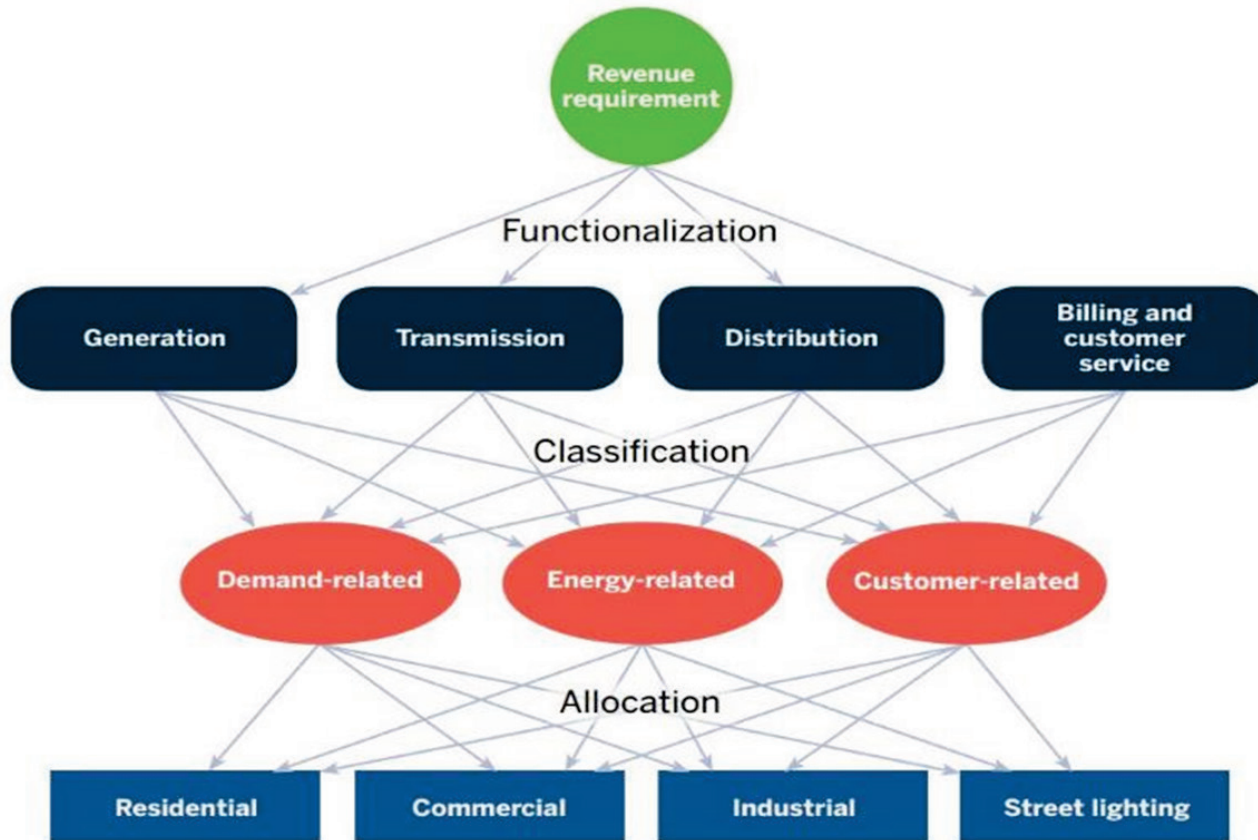
- Examine multiple reasonable approaches
- Define a range of reasonableness
- Apply judgment
- Change allocation of costs (and rates) gradually
- Cost allocation and rate design have different purposes:
 - Cost allocation - group equity
 - Rate design - customer understanding and efficient incentives



Modern Embedded Cost of Service Study Flowchart



Comparison of Traditional and Time-assigned Embedded Cost of Service Studies

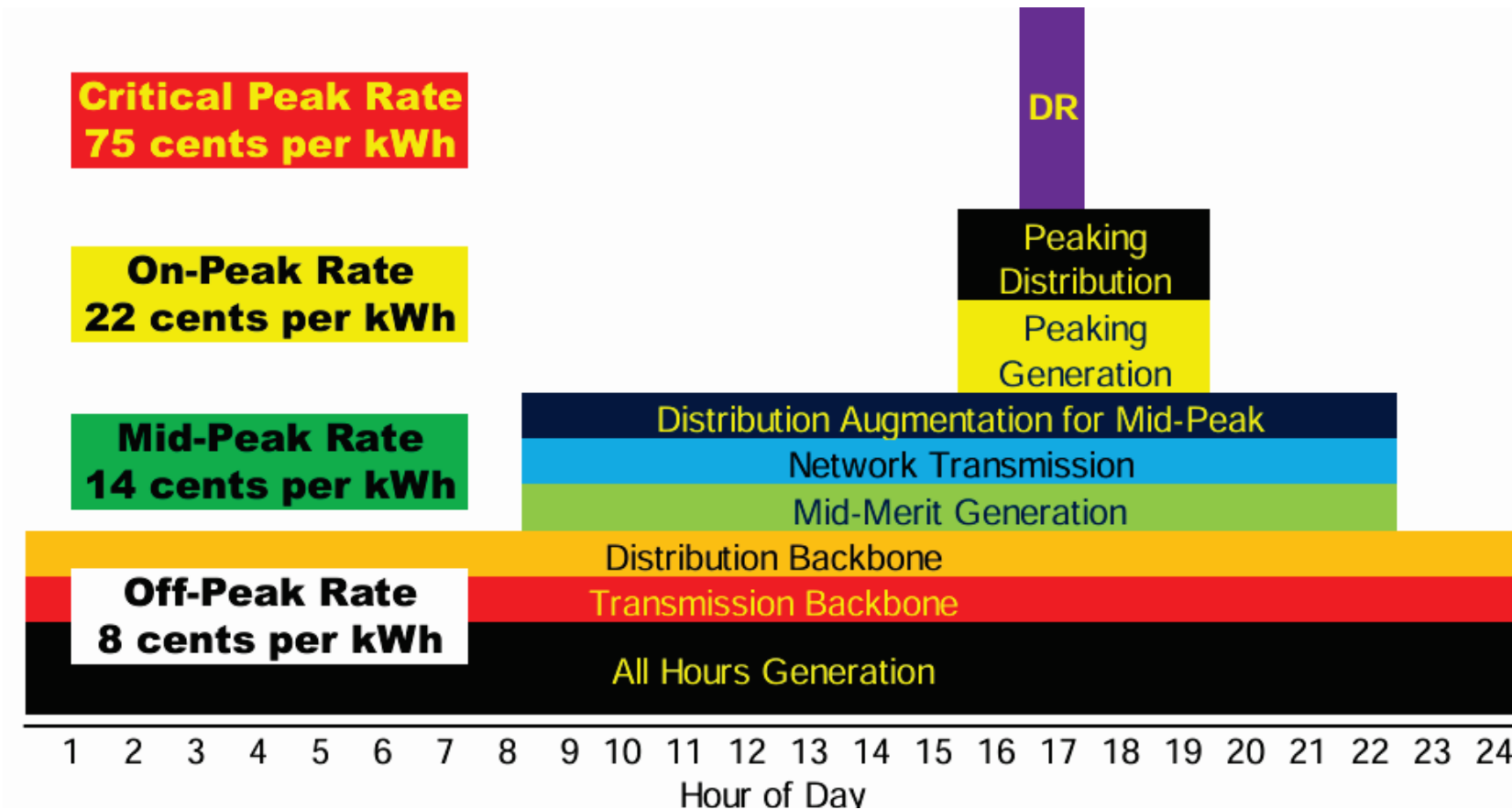


Start With Costs By Function



- Billing and Collection
- Site Infrastructure
- A&G Costs
- Distribution Peaking
- Distribution Mid-Peak
- Distribution Backbone
- Network Transmission
- Transmission Backbone
- Demand Response
- Peaking Generation
- Mid-Merit Generation
- All Hours Generation

How to Build a Cost-Based Time of Use Rate for Shared Elements of Electric System



Challenges with Traditional Demand & Energy Allocators

- Demand during specific hours
 - System peak, equipment peak, or class peak?
 - Demand allocators typically use only a subset of the relevant hours
- Energy-classified costs are usually allocated using annual kWh usage
 - Fails to reflect time-varying costs
- Time-based allocation addresses these issues



Best Practices for All Frameworks

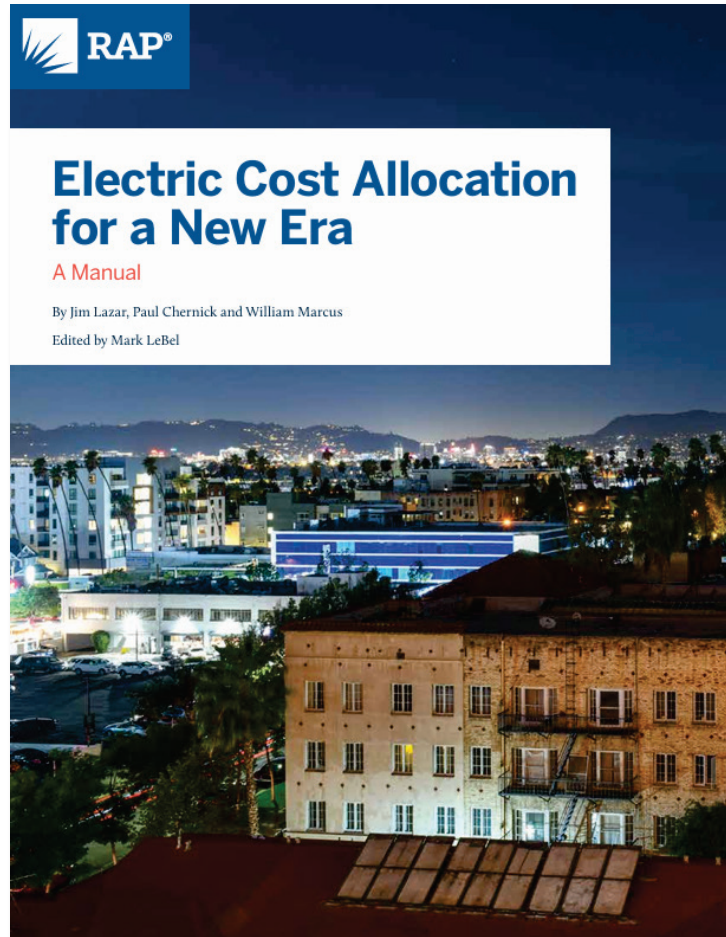
Common Opportunities for Improvements

- Apportion shared assets based on measures of usage
- Ensure broad sharing of administrative and general costs
- Eliminate the artificial distinction between fixed and variable costs
- Assign only customer-specific costs as customer related

Additional Refinements

- More granular functions
- Sophisticated understanding of demand and energy classifications
 - Classification and allocation can reflect time-varying costs
- Clear division between shared distribution plant and equipment that connects individual customers

Electric Cost Allocation for a New Era



- Electric Cost Allocation for a New Era is a guide to the allocation of electric utility costs between customer classes.
- The manual includes concepts that account for significant changes in recent decades and explores how cost allocation could be reimagined going forward.



About RAP

Regulatory Assistance Project (RAP)[®] is an independent, global NGO advancing policy innovation and thought leadership within the energy community.

Learn more about our work at raponline.org

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