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# Integrated Distribution Planning for Electric Utilities: Guidance for Public Utility Commissions

Mid-Atlantic Distributed Resource Initiative (MADRI)

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# PUCs' & Stakeholders' Views of Distribution System Planning



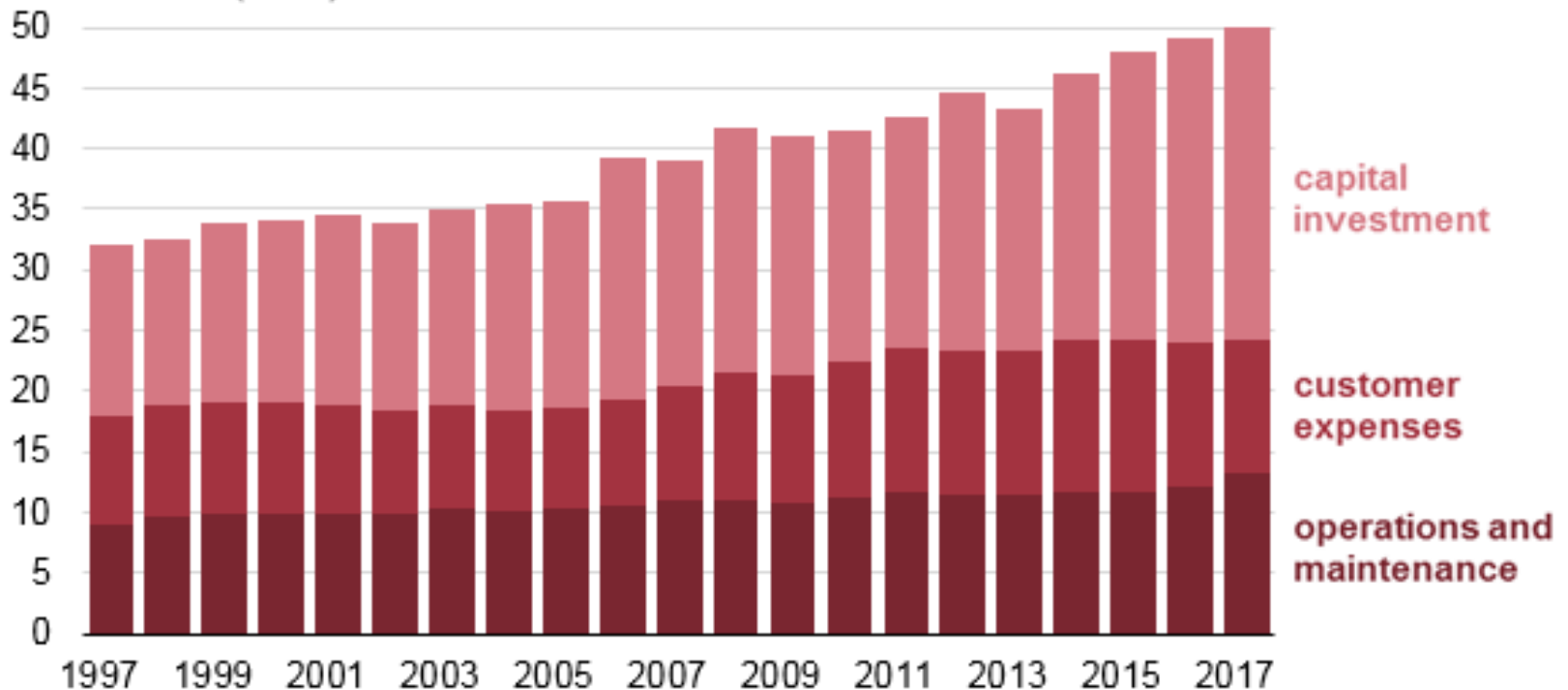
# 1 Why might PUCs consider taking a more active role in distribution system planning?





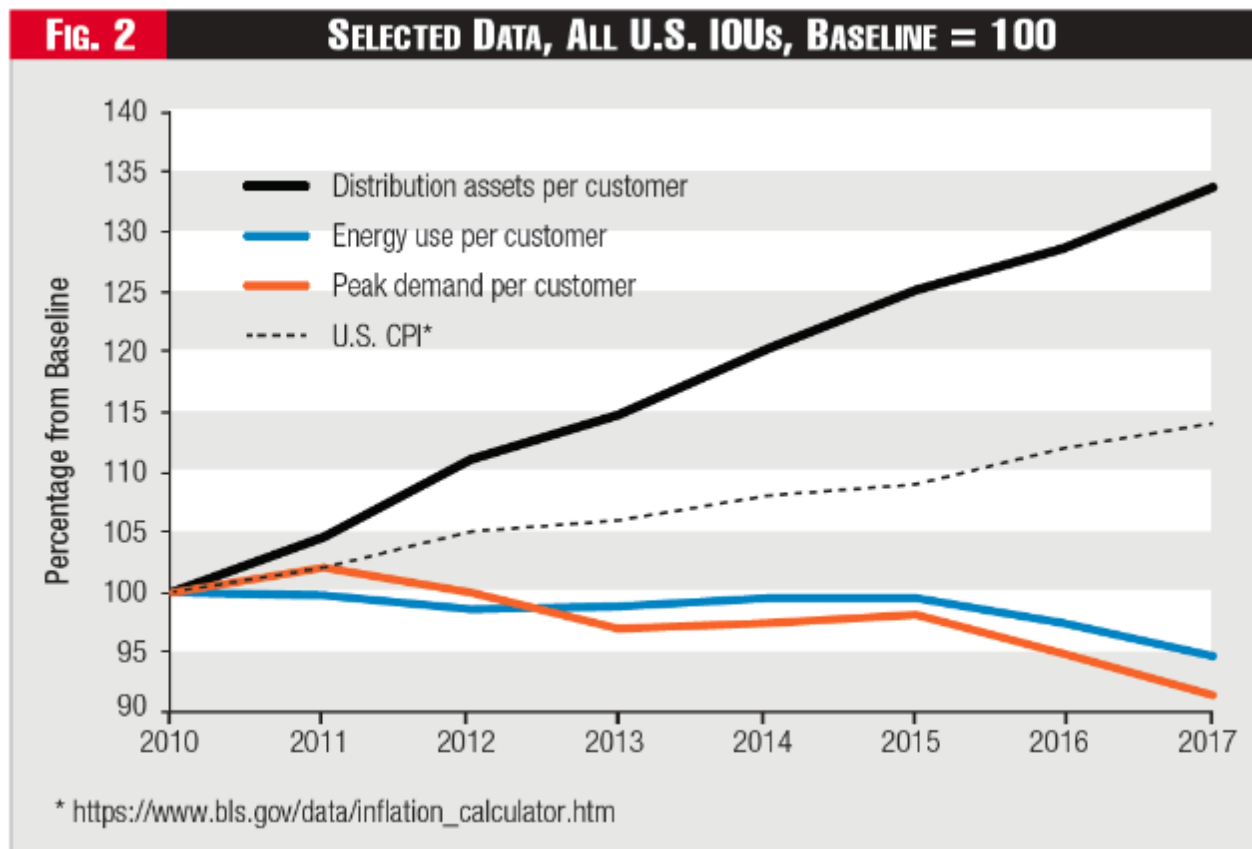
# Distribution System Costs are Rising Steadily...

Annual electric distribution system costs for major U.S. utilities  
billion dollars (2017)



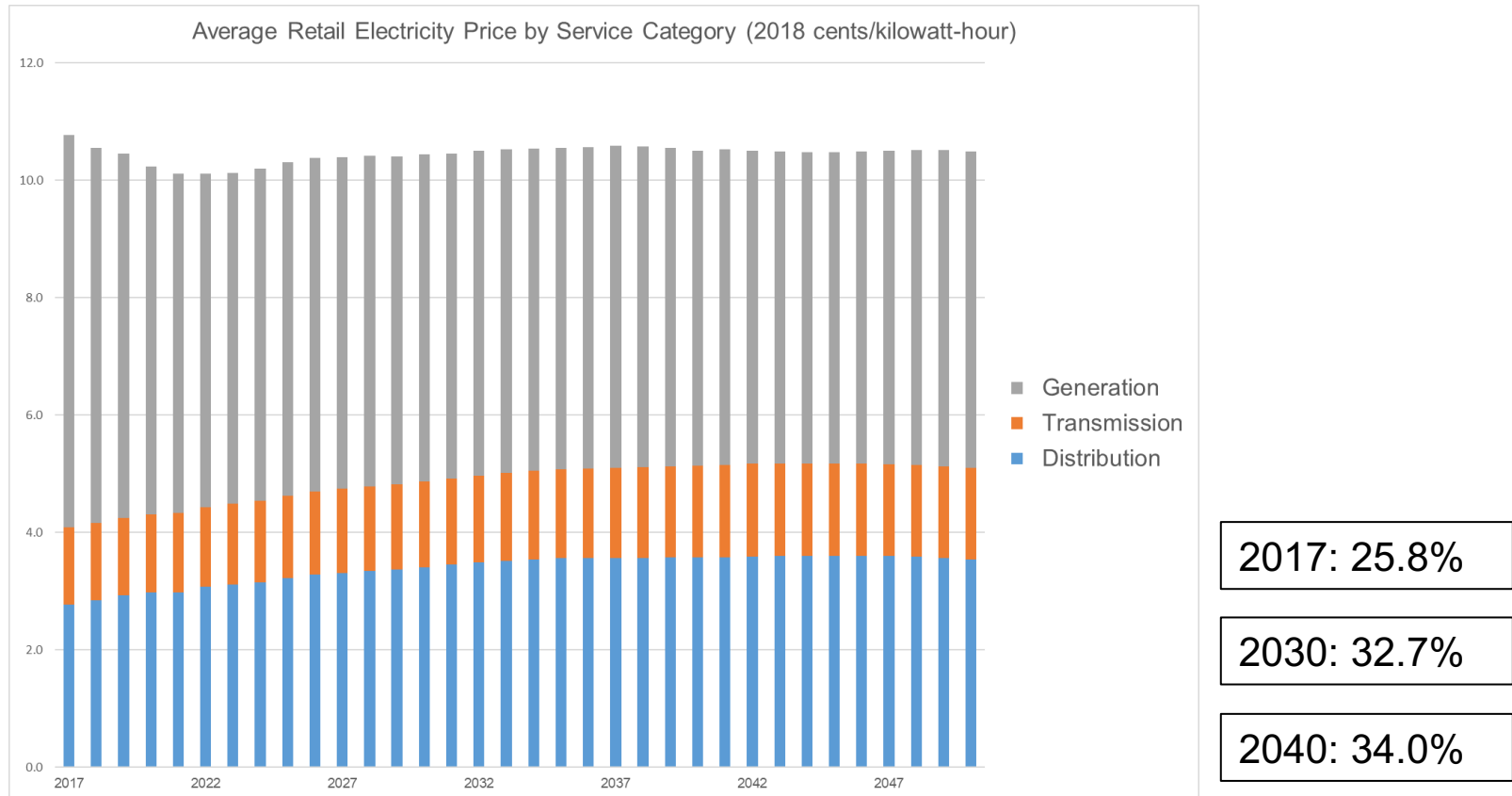
Source: U.S. Energy Information Administration (EIA), Federal Energy Regulatory Commission (FERC)  
Financial Reports, as accessed by Ventyx Velocity Suite

# ...Much Faster Than Inflation



Source: Alvarez, P., Ericson, S., and Stephens, D. (2019, July). The Rush to Modernize: Distribution Planning, Performance Measurement. *Public Utilities Fortnightly*. Retrieved from: <https://www.fortnightly.com/fortnightly/2019/07/rush-modernize>

# Distribution Share of Retail Bills is Large and Projected to Grow

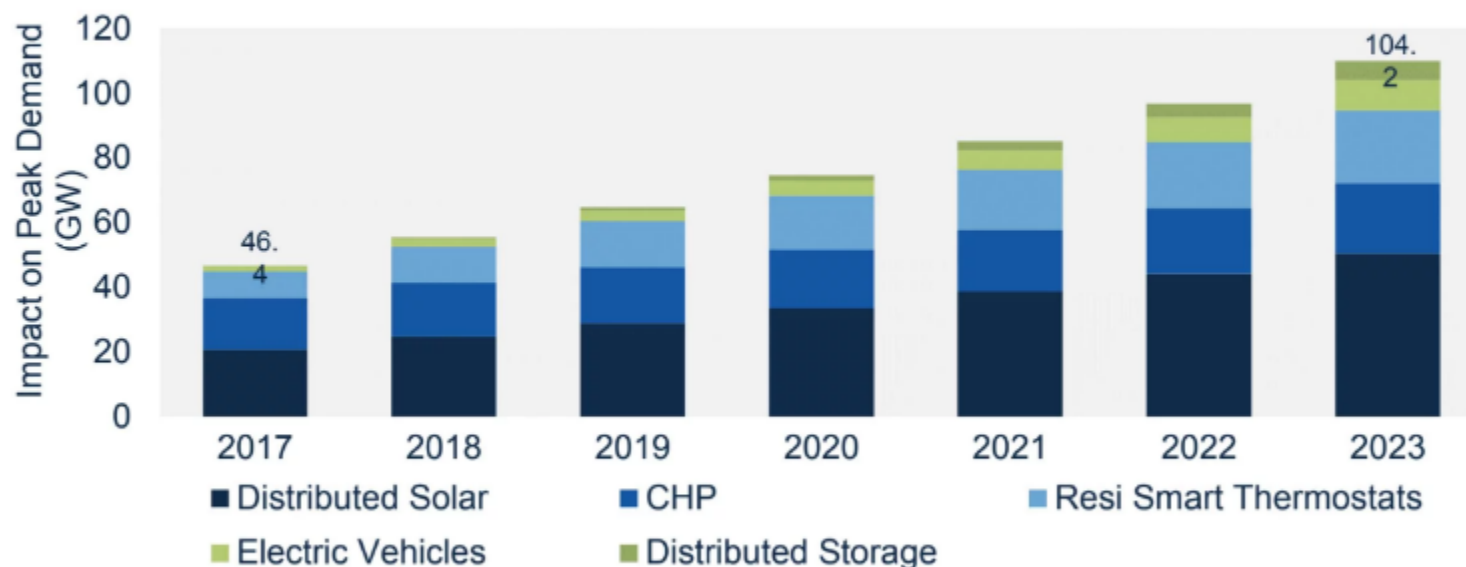


Data Source: EIA Annual Energy Outlook 2019

# Distributed Energy Resources are Growing Rapidly

US DER and Connected Devices Impact Expected to More Than Double from 46 GW to 104 GW

US DER and Connected Device Impact on Peak Potential, 2017-2023



Source: GTM Research and Department of Energy

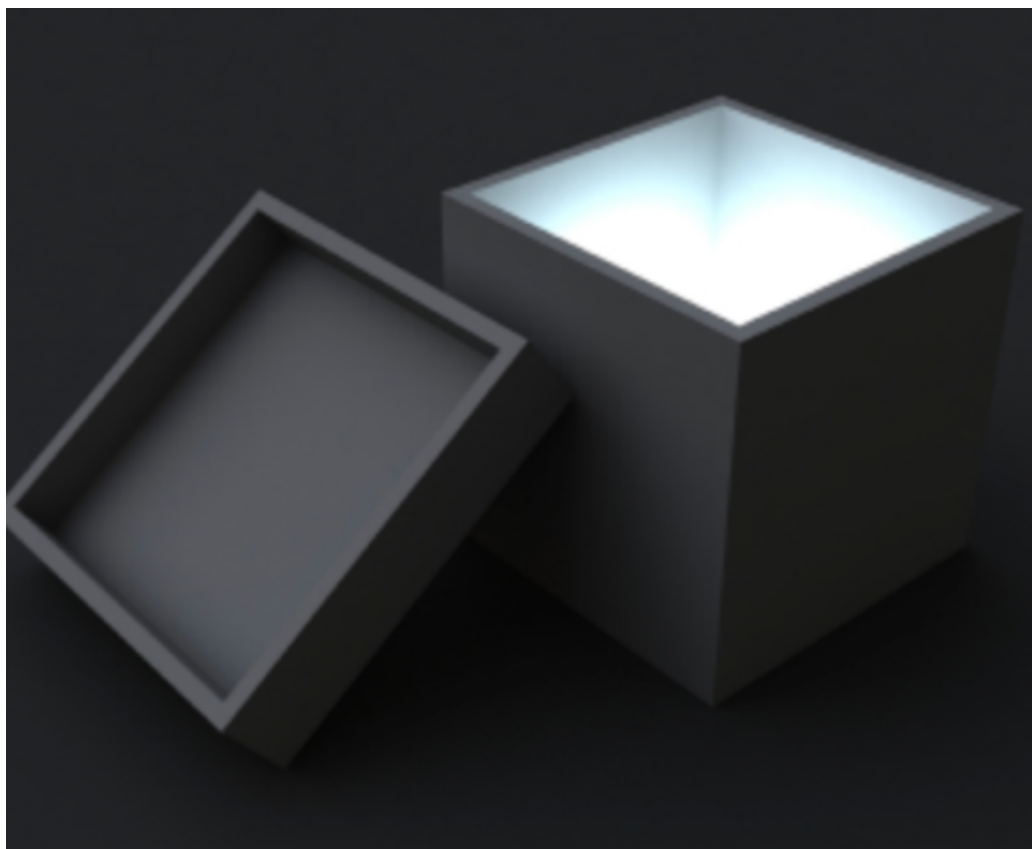
Grid Edge Innovation Summit 2018

gtmresearch

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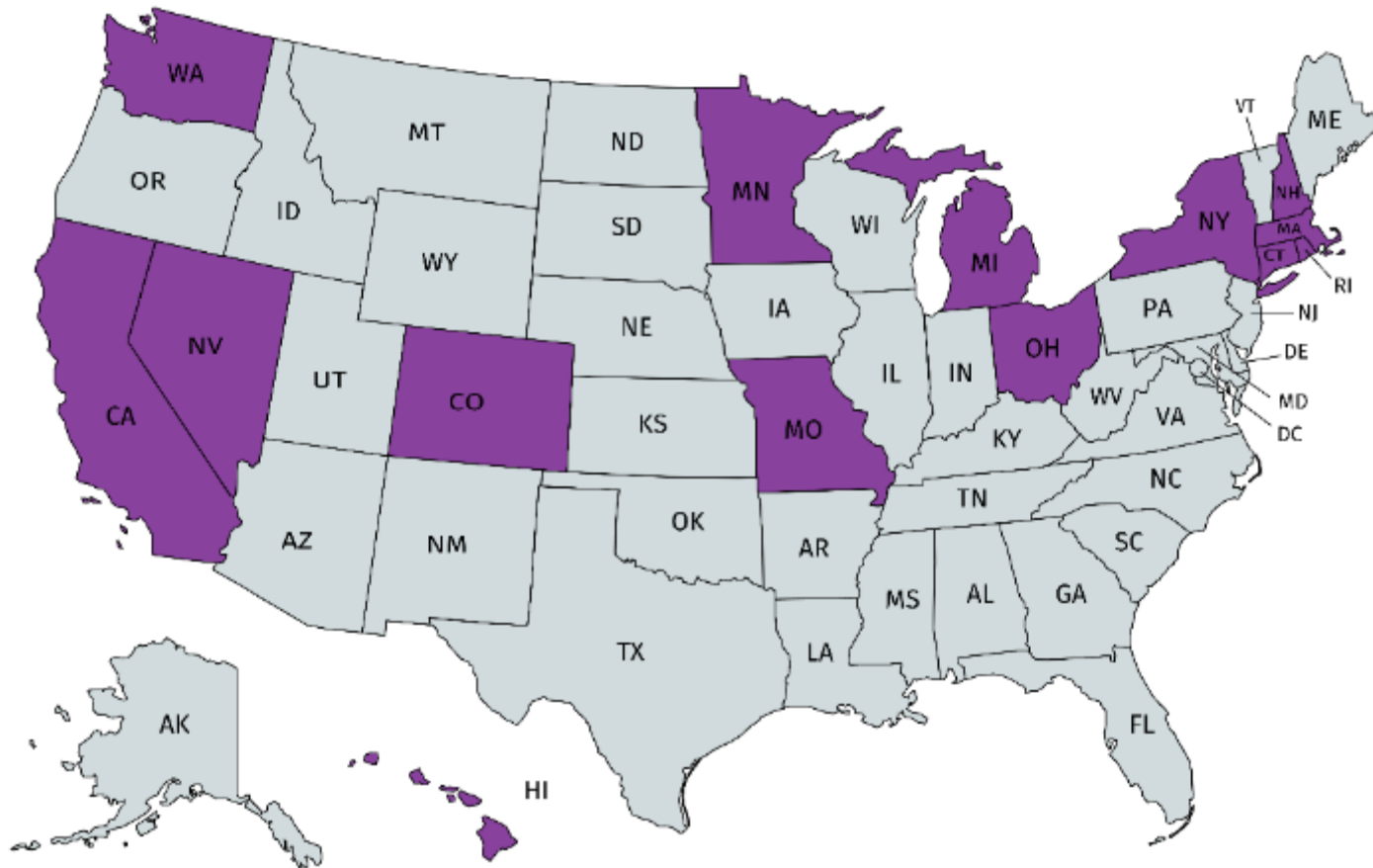
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# Regulators are Realizing They Need Visibility into the Black Box

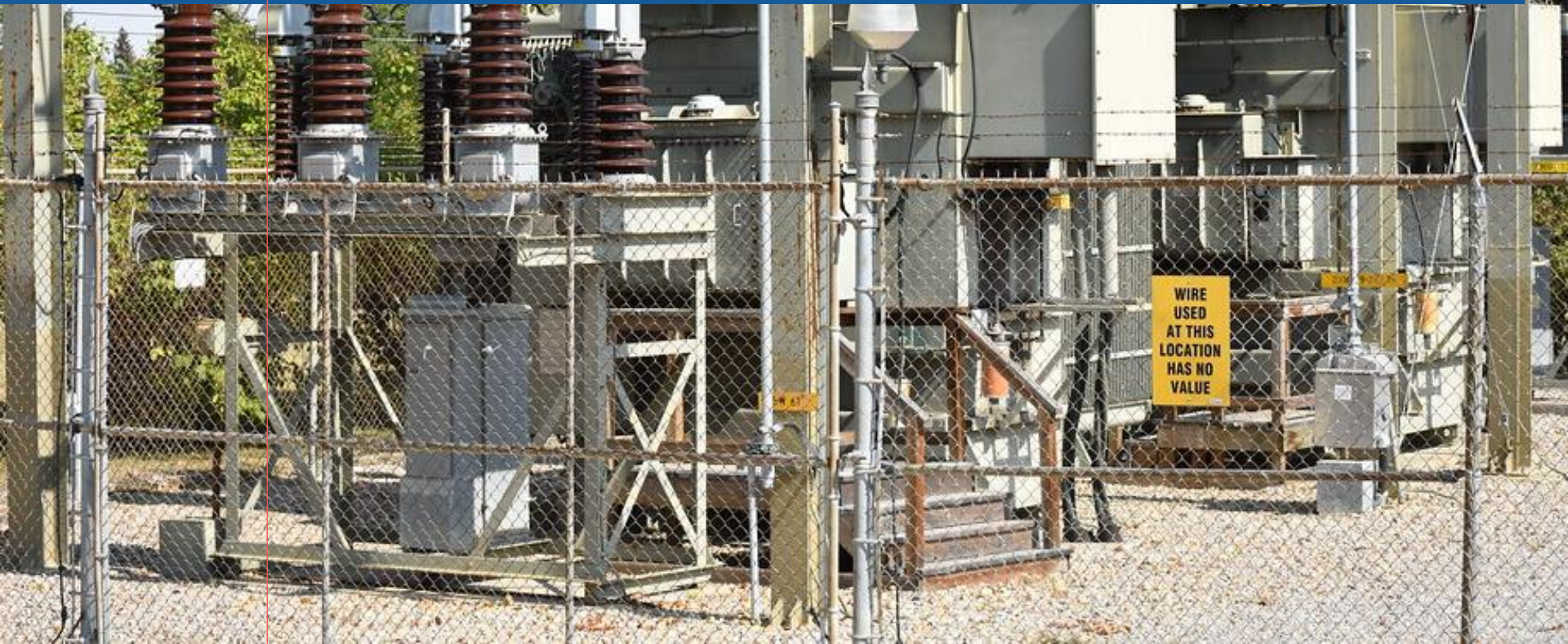




# PUCs Investigating Distribution Planning or Grid Modernization



# 2 Introducing the MADRI Guide to Integrated Distribution Planning (IDP)





**Integrated Distribution Planning  
for Electric Utilities:**  
Guidance for Public Utility Commissions

October 2019



Full report and  
executive summary  
available at:

[https://www.madrionline.org/  
resources/](https://www.madrionline.org/resources/)

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- I. Introduction: Purpose and Scope
- II. Establishing a Formal IDP Requirement through Regulatory Action
- III. Process for Developing an IDP
- IV. Content of an IDP
- V. Challenges for Developing and Implementing an IDP
- VI. Other Considerations for Planners and Regulators
- VII. Conclusions and Recommendations

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# An IDP Process...

- **Creates a plan for the maintenance and enhancement of the distribution system**
  - ✓ **Identifies future system needs and opportunities**
  - ✓ **Evaluates all potential options for meeting needs**
  - ✓ **Determines most valuable/least-cost/least-risk suite of solutions**
  - ✓ **Shines a light into the black box!**



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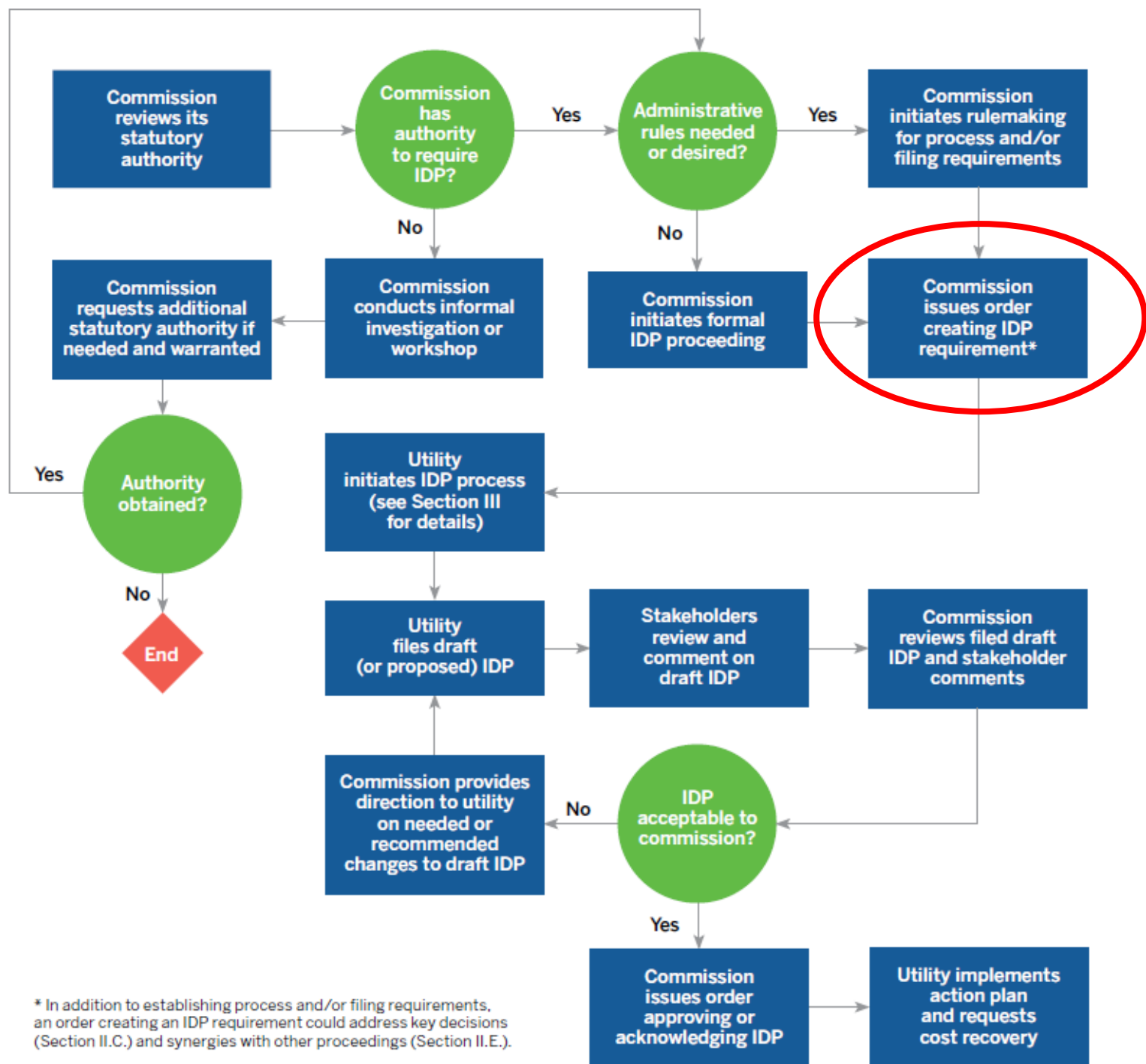
# Potential Benefits of IDP

- ✓ Minimize T&D costs to protect customers
- ✓ Address growing uncertainties about impacts of new technologies, variable loads, and variable generation
- ✓ Enable customer choices and adoption of clean resources
- ✓ Plan for the future and modernize the grid/better understand utility grid modernization proposals

# Commission Oversight of IDP



Photo by Public Utilities Commission of Ohio

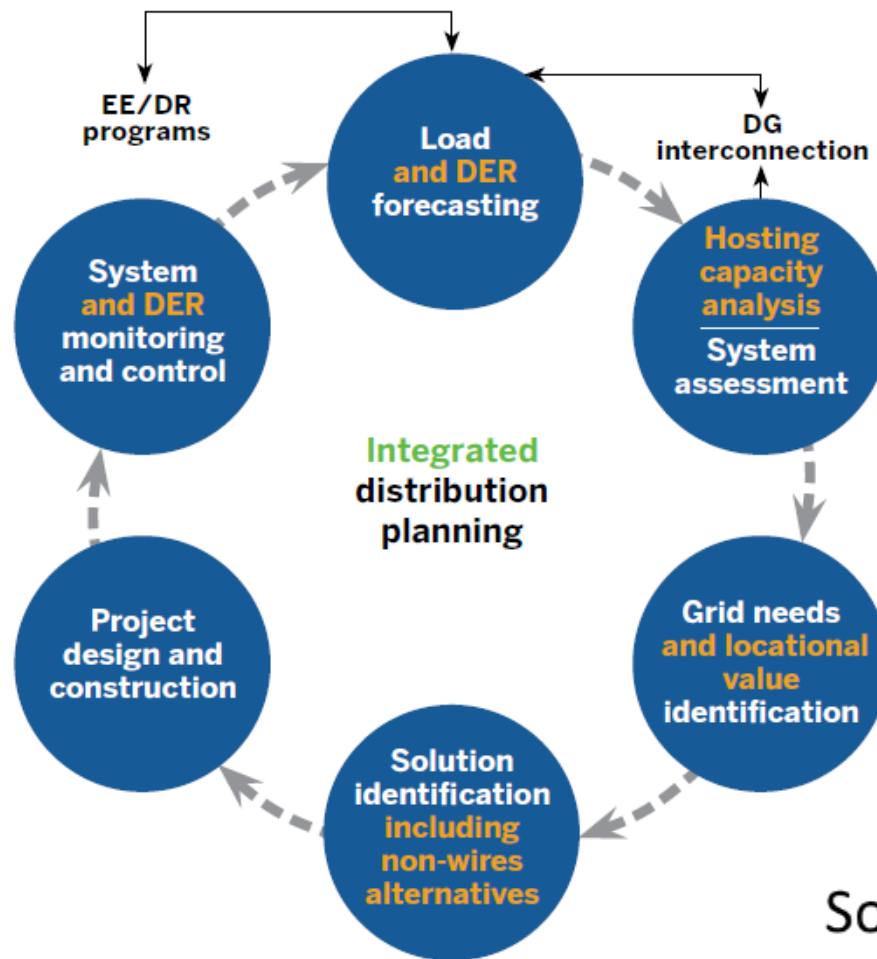


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# Possible Synergies with Other Regulatory Proceedings

- Grid modernization initiatives
- DER interconnection standards and procedures
- Transmission planning
- Changes to the electric utility business model and alternative ratemaking options
- Creation of a distribution system operator?

# Illustrative IDP Process



Source: GridLAB



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# Key Content Elements of an IDP

- Description of the current system
- Summary of planned retirements and committed future resource additions
- Load and DER forecast
- Hosting capacity analysis
- Needs assessment and risk analysis
- Evaluation of options for meeting forecasted needs
- Action plan
- Summary of stakeholder engagement

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# Challenges and Other Considerations Addressed in the Guidance (examples)

- Commission staffing/expertise
- Utility lost revenues and capital investment bias
- Data transparency/ownership/confidentiality
- Coordination of DER operations
- DER policy drivers
- Evolution of new technologies and systems

# About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at [raponline.org](https://raponline.org)



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