

# GRID MODERNIZATION INITIATIVE PEER REVIEW GMLC 1.4.29 - Future Electric Utility Regulation

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# Future Electric Utility Regulation

## High Level Summary



### *Project Description*

Provide technical assistance and analysis for public utility commissions (PUCs) and a series of reports with multiple perspectives on evolving utility regulation and ratemaking, utility business models and electricity markets:

- Adapting to new technologies and services
- Assessing potential financial impacts on utility shareholders and customers
- Engaging consumers
- Addressing utility incentives to achieve grid modernization goals

### *Value Proposition*

- ✓ Modernizing grids requires utilities to make large investments in the face of rapid change and increasing risk and uncertainty.
- ✓ This project helps PUCs and utilities explore regulatory changes to deploy needed capital.

### *Project Objectives*

- ✓ States will have improved capability to consider alternative regulatory and ratemaking approaches to enable grid modernization investments.
- ✓ Approaches will better tie utility earnings to consumer value, economic efficiency, and other policy goals.
- ✓ Ultimately, states will provide utilities with regulatory guidance and incentives to efficiently deploy capital to achieve grid modernization goals.

# Future Electric Utility Regulation

## Project Team



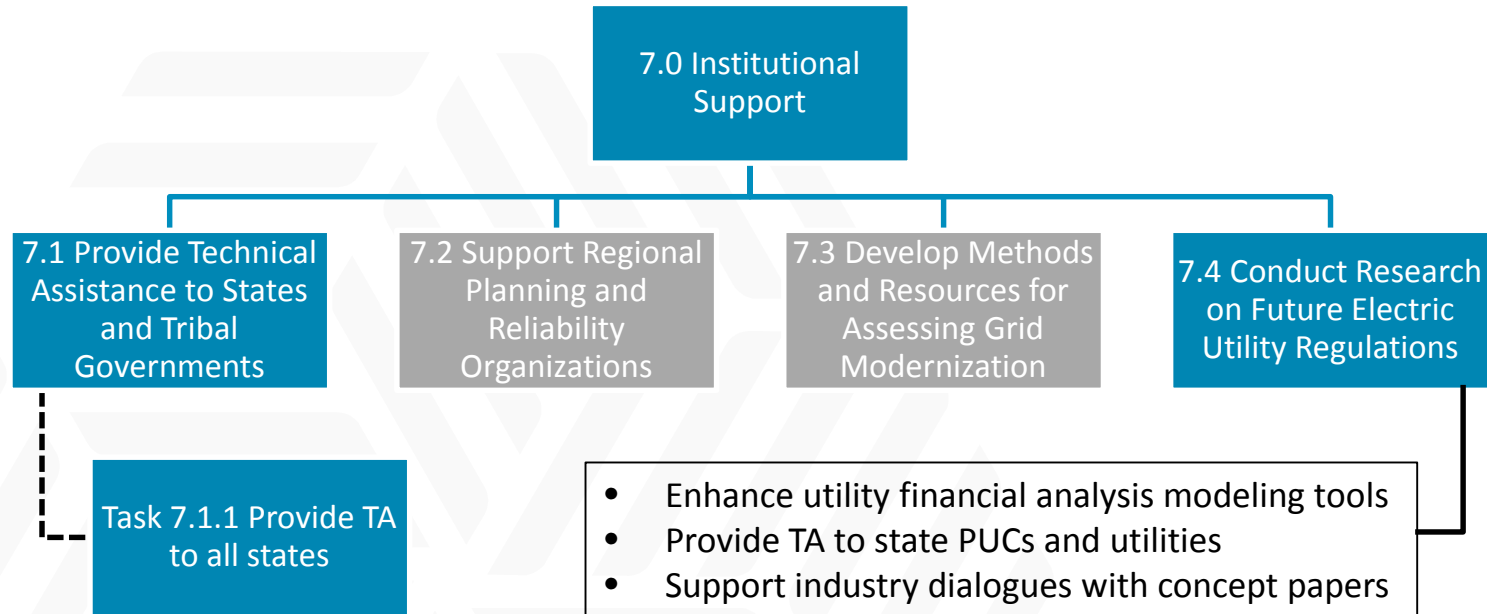
### *Project Participants and Roles*

- LBNL – Project manager; modeling and state technical assistance (TA); Future Electric Utility Regulation report series; performance-based regulation technical report
- NREL – Plus one; modeling and state TA
- NETL – Modeling and state TA
- SNL – State TA
- PNNL – State TA
- National Association of Regulatory Utility Commissioners – Outreach

PROJECT FUNDING			
Lab	FY16 \$	FY17 \$	FY18 \$
LBNL	\$810	\$795	\$725
NREL	\$71	\$117	\$47
NETL	\$75	\$25	\$25
SNL	\$34	\$33	\$33
PNNL	\$10	\$30	\$30
TBD (Task 1 modeling FY18)	—	—	\$140
<b>TOTAL</b>	<b>\$1M</b>	<b>\$1M</b>	<b>\$1M</b>

# Future Electric Utility Regulation

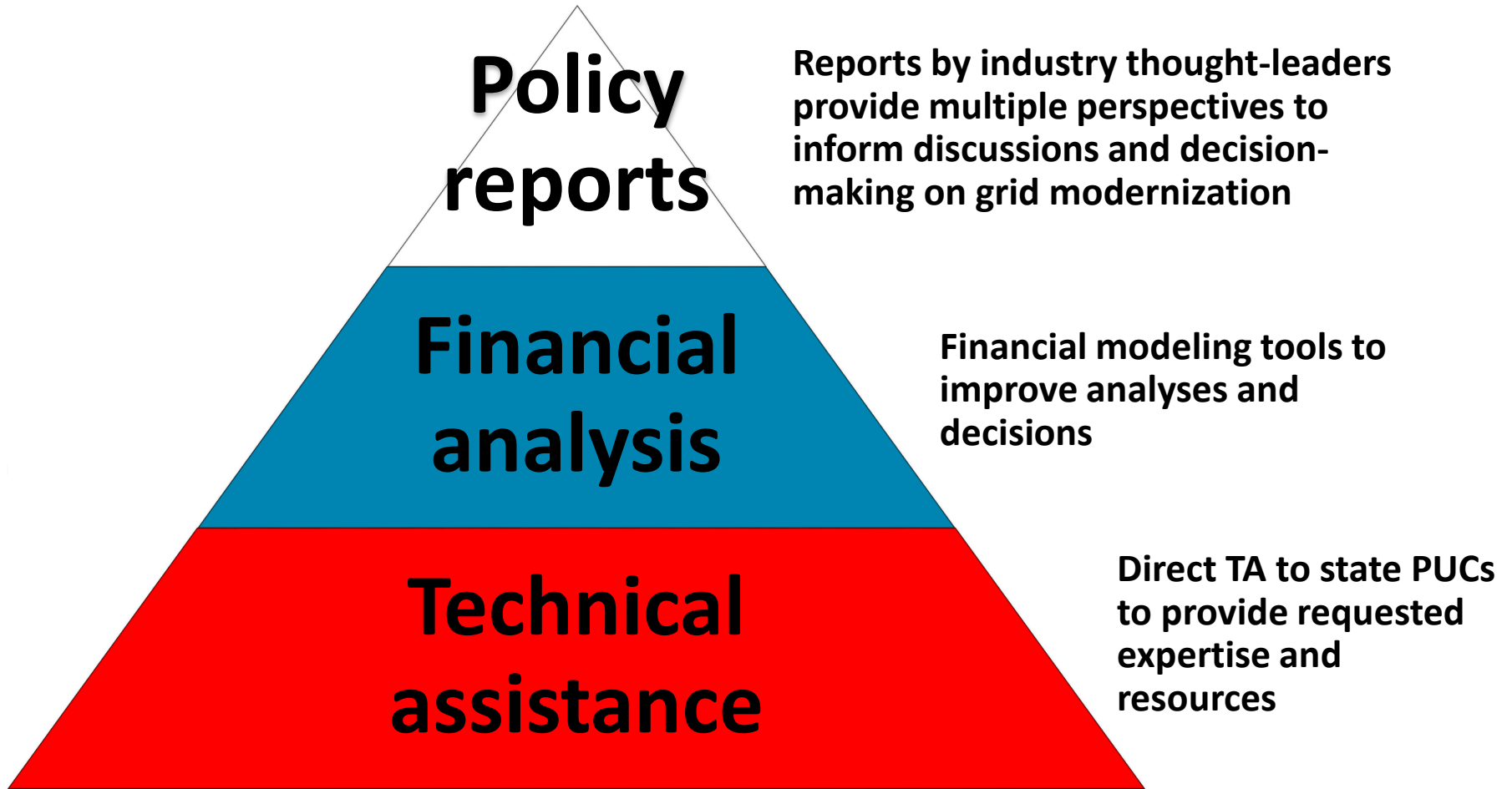
## Relationship to Grid Modernization MYPP



### MYPP vision for Institutional Support area

- ▶ Leverage technical expertise, analytical tools, models and data to support and manage institutional change in a period of rapid and potentially disruptive technological innovation
- ▶ Directly address high priority grid modernization challenges and needs
- ▶ Convene key grid stakeholders as an honest-broker for collaborative dialogues on grid modernization
- ▶ Create an over-arching suite of grid-related “institutional” analysis, workshops and dialogues

# Future Electric Utility Regulation Approach



# Future Electric Utility Regulation

## Key Project Milestones



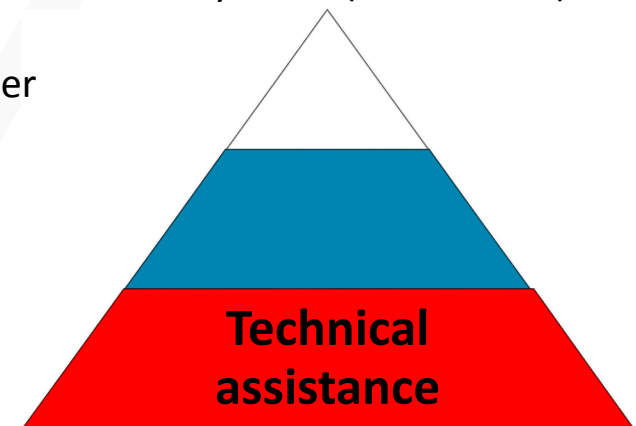
Milestone (FY16-FY18)	Status	Due Date
Upgrade financial modeling tools (FY16 & FY17); characterize utility in region targeted for state TA using FINDER model	Complete/on schedule	10/1/16, 10/1/17
Develop list of targeted states and topics for state TA	Complete	10/1/16
Provide status report on value of modeling for state TA	Complete	12/31/16
Complete 2 reports in Future Electric Utility Regulation series	1st complete; 2nd on schedule	4/1/17, 5/15/17
Publish technical report on performance-based regulation (PBR) with case studies and results of productivity and incentive power research	On schedule	5/15/17
Provide TA on financial impacts to 3-4 states each year	On schedule	10/1/17, 10/1/18
Provide TA on PBR, distribution markets, and energy services pricing to 2-4 states each year	On schedule	10/1/17, 10/1/18
Complete 4 additional reports in Future Electric Utility Regulation series	On schedule	4/1/18, 10/1/18

# Future Electric Utility Regulation

## Highlights of Accomplishments to Date

### 1. Technical assistance (TA) to state PUCs

- Two types of TA
  - Incremental changes to cost of service regulation
  - Broader visionary questions about alternative forms of regulation
- Focus on financial impacts to utility shareholders and utility customers
- State TA plan identifies approaches for targeting TA
- TA to date on the following topics:
  - Alternative cost recovery mechanisms for demand response (MN)
  - Cost recovery approaches for grid resiliency and security investments (PA)
  - Revenue decoupling (MT)
  - Impacts of tariff changes on financial performance of solar PV systems (Puerto Rico)
  - Performance-based regulation (VT)
  - Utility investor valuation framework and shareholder incentives (CA)

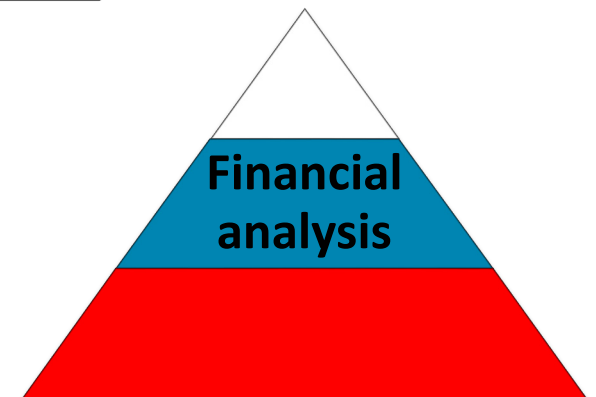
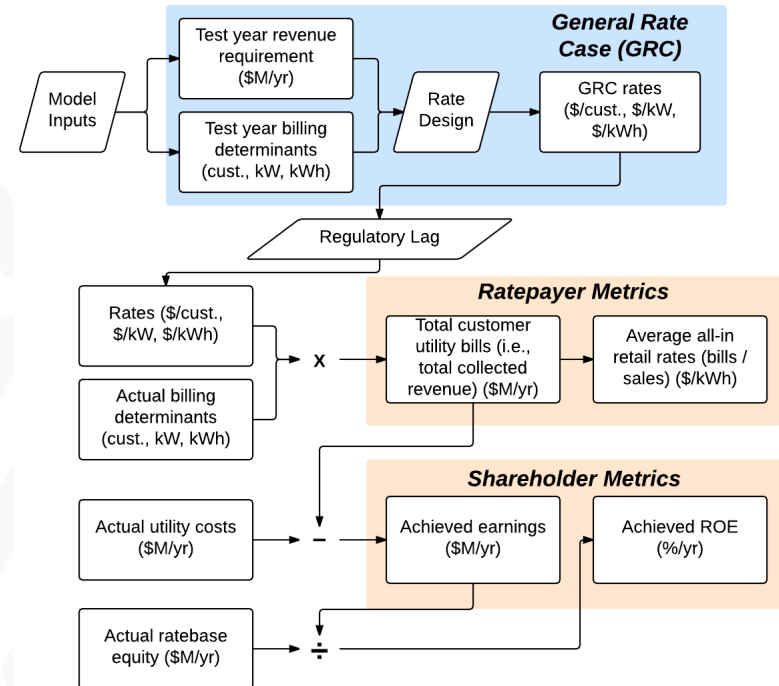


# Future Electric Utility Regulation

## Highlights of Accomplishments to Date

## 2. Financial analysis of impacts to utility shareholders and ratepayers

- LBNL's FINancial impacts of Distributed Energy Resources (FINDER) model quantifies financial impacts of DERs
- FY16 model enhancements & analysis quantified:
  - Combined effects of aggressive 10-yr ramp-up of energy efficiency and distributed solar PV
  - Financial impacts for utility and customers — by class, participants vs. non-participants
- Final report on findings for prototypical NE utility
  - Hourly impacts and shifts in timing of utility system peak
  - Impacts on utility costs, revenues, earnings, return on equity and customer rates
  - Impact of mitigation approaches — e.g., alternative revenue collection mechanisms such as demand charges and increased fixed customer charges





# Future Electric Utility Regulation

## Highlights of Accomplishments to Date

### 3. Future Electric Utility Regulation reports

- Innovative series of reports taps industry thought leaders to grapple with complex electricity issues
- Unique multiple-perspective approach highlights different views on the future of utility regulation and business models and achieving a reliable, affordable, and flexible power system to inform ongoing discussion and debate
- Advisory group\* provides guidance
  - Recognized experts — state regulators, utilities, stakeholders and academics
  - Helps identify and prioritizes topics
  - Reviews drafts, assists with outreach

\*See backup slides

[feur.lbl.gov](http://feur.lbl.gov)

Policy  
Reports

### New reports under GMI:

- *The Future of Centrally-Organized Wholesale Electricity Markets* (March 2017)
- *Regulatory Incentives for Utilities to Invest in Grid Modernization* (under peer review)
- *Value-Added Electricity Services: New Roles for Utilities and Third Parties* (underway)



# Future Electric Utility Regulation

## Response to December 2016 Program Review



### Recommendation:

Show how this effort is distinct from previous regulatory and analytical efforts.

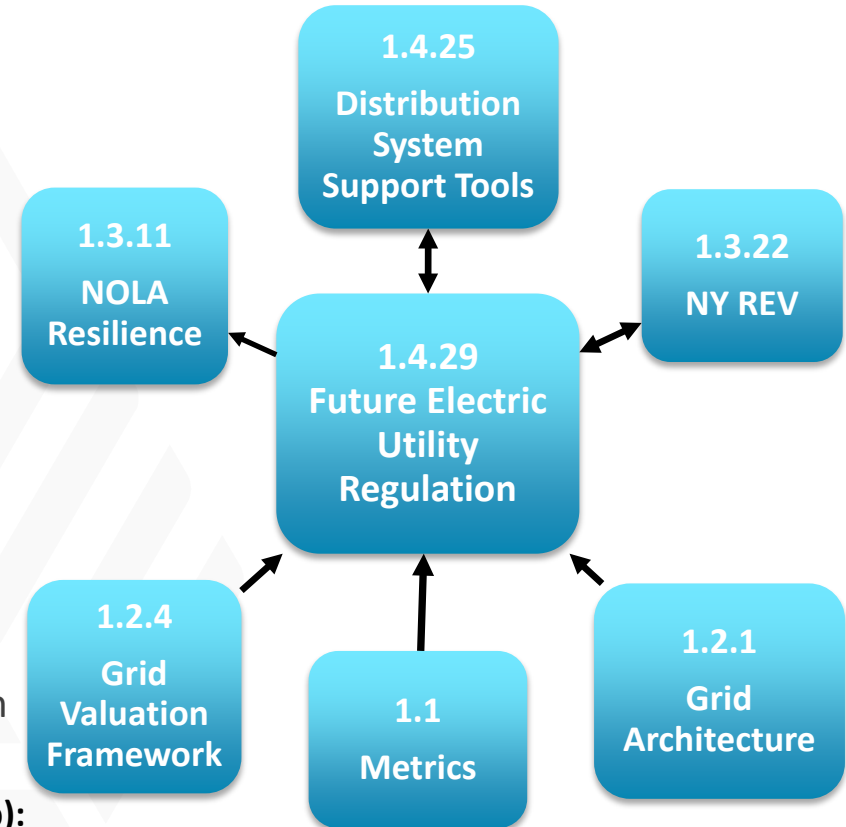
### Response:

- Activities are focused on DOE's *comprehensive* vision of a modern grid, rather than individual technologies or institutional components.
- We expanded modeling tools to improve financial analysis of the impacts of a suite of new technologies on utility shareholders and customers and implications for regulation and ratemaking.
- The project includes analysis and technical assistance for state PUCs on new topics, including performance-based regulation (multiyear rate plans with rewards and penalties related to target performance metrics), and markets and pricing for distribution system services.
- Under the GMI, the Future Electric Utility Regulation report series moved into new areas, such as:
  - Electricity markets
  - Incentives for utilities to make grid modernization investments under traditional and innovative forms of regulation
  - Ways states can foster competition for value-added electricity services while allowing utilities to play new roles

# Future Electric Utility Regulation

## Project Integration and Collaboration

- ▶ 1.1 Metrics – Metrics may inform state TA related to performance-based regulatory approaches.
- ▶ 1.2.1 Grid architecture – Used precursor work in [Future Electric Utility Regulation report #2](#); will reference as relevant in continuing report series
- ▶ 1.2.4 Grid valuation framework - Coordinated on TA for Vermont, a potential initial user of framework; can refer to framework in relevant reports in series
- ▶ 1.3.11 New Orleans resilience – Coordinating on city’s interest in performance-based regulation
- ▶ 1.3.22 NY REV – Insights from this project can be tapped for TA in other states.
- ▶ 1.4.25 Distribution system support tools - Significant penetration of DERs on the distribution system often raises utility regulatory and business model issues.



### Example stakeholder communications (beyond Advisory Group):

- ▶ Western Conference of Public Service Commissioners (5/25/16)
- ▶ Clean Energy States Alliance webinar (10/11/16)
- ▶ *Public Utilities Fortnightly* article (November 2016)
- ▶ Annual meeting of National Association of State Utility Consumer Advocates (11/14/16)
- ▶ National Governors Association’s Policy Academy on Power Sector Modernization (January 2017)

# Future Electric Utility Regulation

## Next Steps and Future Plans



- Continue **state TA** to support decision-making
- **Modeling** activities in FY17 linked to state TA
  - LBNL will assess financial impacts of distribution network investments to accommodate two-way power flows at high levels of distributed energy resources penetration and under various grid modernization scenarios.
  - NREL will address impacts of: 1) time of use rates with peak periods defined to encourage consumption mid-day and 2) two-way rates on consumer grid exports.
- **Technical report**, *Multiyear Rate Plans for U.S. Electric Utilities: Design Details and Case Studies of Performance-Based Regulation (PBR)*
- **Future Electric Utility Regulation series**
  - *Regulatory Incentives and Disincentives for Utilities to Invest in Grid Modernization*
  - *Value-Added Electricity Products and Services: New Roles for Utilities and Third Parties*
- **Upcoming presentations**
  - National Conference of Regulatory Attorneys – 5/10/17 panel on *Regulatory Incentives* report, combined impacts of high levels of energy efficiency and solar PV on utility shareholders and utility customers, and putting rate impacts of solar PV in context, *plus* presentation on PBR report
  - Western Conference of Public Service Commissioners – 5/23/17 innovation panel



# Future Electric Utility Regulation

## Advisory group for report series



### State Utility Regulators

Commissioner Lorraine Akiba, Hawaii

Commissioner Travis Kavulla, Montana

Chair Nancy Lange, Minnesota

Commissioner Carla Peterman, California

Chair Audrey Zibelman, New York\*

### Utilities

Doug Benevento, Xcel Energy

Tim Duff, Duke Energy

Val Jensen, Commonwealth Edison

Lori Lybolt, Consolidated Edison

Sergej Mahnovski, Edison International

Jay Morrison, NRECA

Delia Patterson, APPA

Peter Zschokke, National Grid

### Academics and Other Experts

Janice Beecher, MSU Institute of Public Utilities

Ashley Brown, Harvard Electricity Policy Group

Steve Corneli, consultant

Peter Fox-Penner, Boston University Questrom School of Business

Scott Hempling, attorney

Steve Kihm, Seventhwave

Kris Mayes, Arizona State University College of Law/Utility of the Future Center

Karl Rábago, Pace University School of Law

Rich Sedano, Regulatory Assistance Project

### Consumer or Environmental Advocates

Paula Carmody, MD Office of People's Counsel

Ralph Cavanagh, NRDC

Sonny Popowsky, former consumer advocate (PA)