

Grid Modernization Advisory Group Public Information Webinar

Grid Modernization Roadmap for New Mexico

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

DECEMBER 17, 2020



Agenda

- Introduction of Presenters
- Overview of Roadmap Timeline and Grid Modernization Advisory Group (GMAG) Process
- GMAG Whitepaper Highlights
- Moving Toward Implementation
- Next Steps

Presenters



ENERGY, MINERALS AND NATURAL RESOURCES PROJECT LEADS

AnnaLinden Weller, Policy Lead, Office of the Secretary

Jacqueline Waite, Program Lead, Energy Conservation and Management Division

Daren Zigich, Technical Lead, Energy Conservation and Management Division

GRID MODERNIZATION ADVISORY GROUP MEMBERS

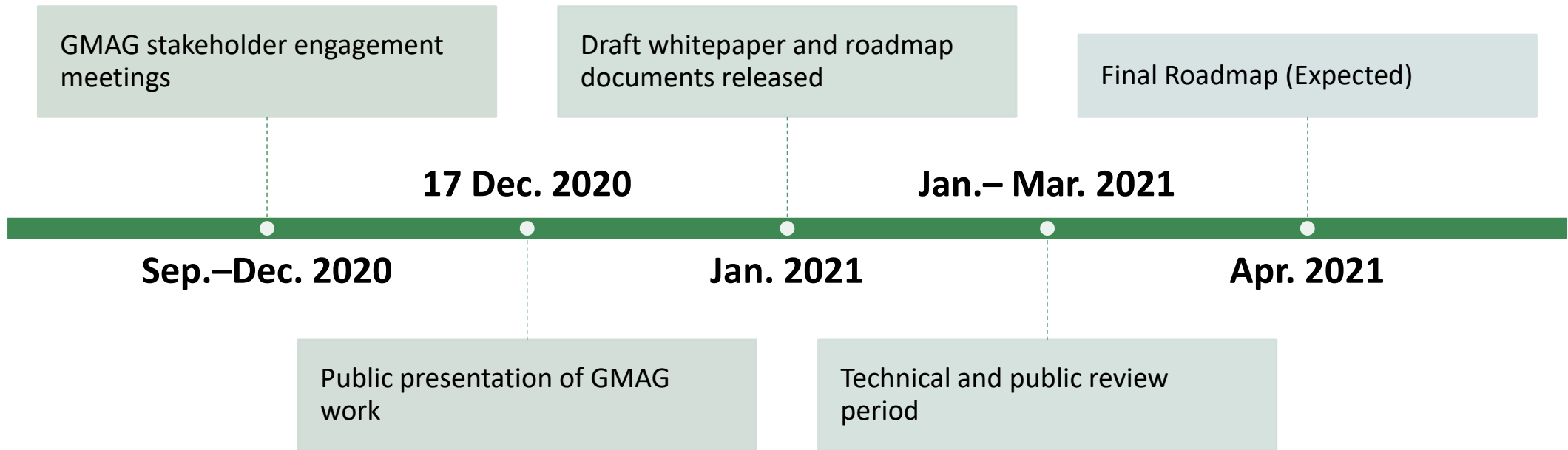
Brian Johnson, Renewable Energy Transmission Authority

Rikki Seguin, Interwest Energy Alliance

Taiyoko Sadewic, Positive Energy Solar

Arthur O'Donnell, participant in the US DOE Solar Innovators program, supporting NM PRC

Roadmap Development Timeline



Legislative Charge

HB 233 (2020)

AN ACT

RELATING TO ENERGY; DIRECTING THE ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT TO DEVELOP A ROADMAP FOR GRID MODERNIZATION; ESTABLISHING A GRID MODERNIZATION GRANT PROGRAM; ENABLING A PUBLIC UTILITY TO SUBMIT AN APPLICATION TO THE PUBLIC REGULATION COMMISSION TO MODERNIZE GRID TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE; ALLOWING UTILITIES TO RECOVER CERTAIN COSTS FOR GRID MODERNIZATION PROJECTS; CREATING A FUND.

The Grid Modernization Advisory Group

MEMBERS INCLUDE:

- Electricity sector: investor-owned utilities (IOUs), cooperatives, municipal utilities, and NTUA
- Academia: UNM, NMSU, including UNM EPSCoR- affiliated researchers
- Sandia National Laboratory
- Utility and distributed renewable industry representatives
- Public Interest: consumer, landowner, and environmental advocates

The GMAG is made up of members with a direct stake in grid operations and functions, including subject-matter experts in grid technologies, energy economics, and electricity policy.

Over the past four months, the GMAG has produced a series of technical, economic, and policy-oriented whitepapers which will become the knowledge base for a wide-ranging, flexible, and technology-neutral roadmap for grid modernization in New Mexico.

We present the recommendations in these whitepapers today and will ask you to consider how to prioritize them.

Overview of Process

Step 1

DRIVERS: Why do grid modernization now?

Step 2

DESTINATION: Where do we want to end up in 10+ years?

Step 3

BEGINNING: Where are we now? (Baseline Report)

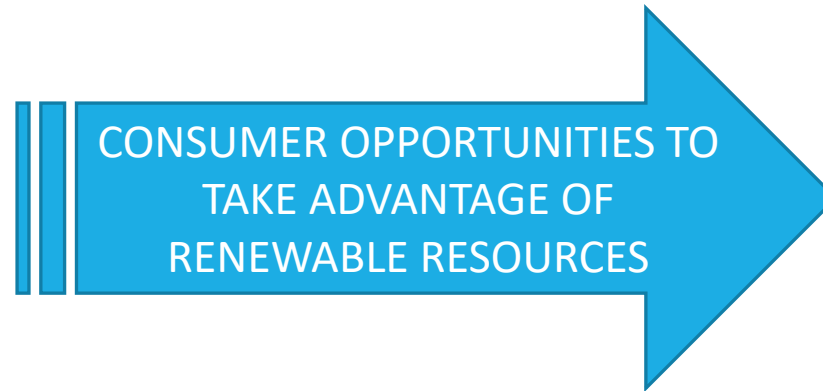
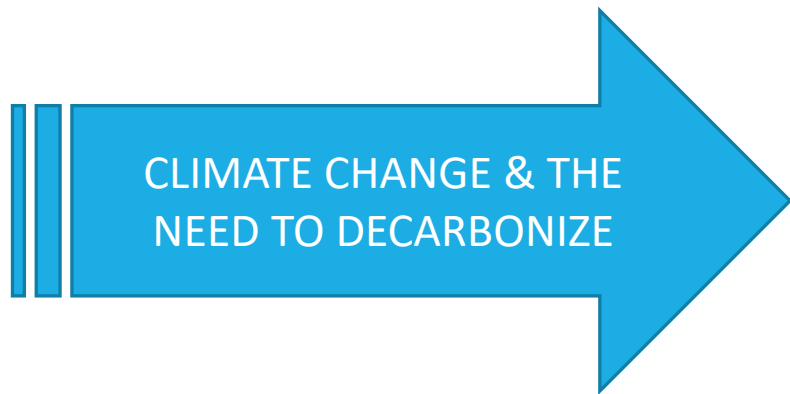


Step 4

ACTIONS: What might get us to the destination and what are the potential milestones, roadblocks, enabling capabilities?

Main Drivers for Grid Modernization

Why should we modernize New Mexico's grid *now*? What drives this process? The GMAG defined four **drivers**:



Major Functional & Operational Goals of a Modern Grid

Objective Hierarchy		
Non-Negotiable	Primary	Secondary
Affordability	DER Integration	Reduce Carbon Emissions (in other sectors)
Reliability, Resiliency and Security	Adapt to Changing Load	System Efficiency
Adopt Clean Energy Technologies	Asset Optimization	
	Customer Enablement	
	Operational Market Animation	

What is grid modernization?

*US DOE (2017) *Modern Distribution Grid*, vols I-III.

Building the Roadmap

	Short-term	Mid-Term	Long-term	Physical or Operational Goal(s) Targeted	<p>Overarching Vision NM's electric grid of the future will deliver resilient, reliable, secure, and affordable electricity to consumers where they want it, when they want it, and how they want it. We note that safe operation by both providers and consumers is an assumed inherent characteristic of any electricity system.</p>
Why?	Driver A				
What?		Recommended Action*		Reliability, Resiliency & Security Adapt to Increased/ Changing Load	
How?		Enabling Technologies and Capabilities			

The diagram illustrates the relationship between different components of the roadmap. A box labeled 'Driver A' in the 'Why?' row has a blue arrow pointing to a red-bordered box labeled 'Recommended Action*' in the 'What?' row. A yellow arrow points from 'Recommended Action*' to the 'Physical or Operational Goal(s) Targeted' column. A green arrow points from a box labeled 'Enabling Technologies and Capabilities' in the 'How?' row up to 'Recommended Action*'. The 'Physical or Operational Goal(s) Targeted' column lists 'Reliability, Resiliency & Security' and 'Adapt to Increased/ Changing Load'.

*Includes prerequisite actions, major milestones, potential challenges and possible positive and negative impacts.

List of Current Actions

- Invest in AMI/Advanced Grid Infrastructure
- Review and make recommendations for Advanced Inverters
- Strategically Employ Energy Storage
- Update the Interconnection Manual
- Coordinated Transmission Planning
- Bulk Power Markets Research and Recommendations
- IRP standardization and coordination
- Require utilities to submit a Distribution System Plan (DSP)
- Customer Engagement Programs
- LMI Programs
- Rate Design/ DER Incentives

GMAG Whitepaper Highlights

RECOMMENDED ACTIONS IN BRIEF

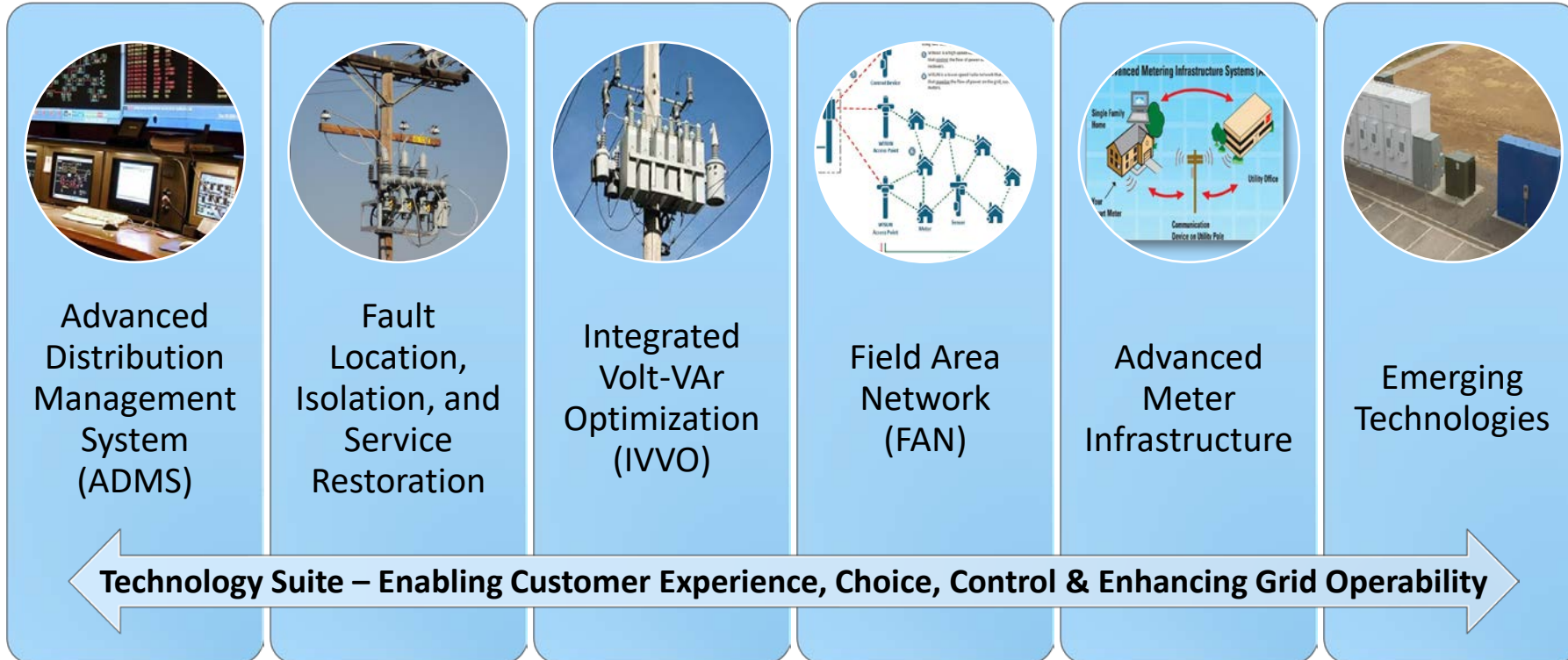
Technical Actions

AMI & SMART GRIDS

ADVANCED INVERTERS

STORAGE

AMI & Smart Grid Deployment



Advanced Inverters

To encourage a process for adoption of interconnection rules and standards for DC/AC inverters -- based on IEEE-1547-2018 and UL 1741 SA. These allow for mandatory minimum autonomous and communications capabilities at the point of deployment of distributed energy resources.

Require that newly installed inverters are enabled with these advanced functions to provide essential reliability (ex. frequency and voltage ride-through) as well as communications capabilities that may be activated as the future marketplace matures for flexibility services and interactive utility controls. Installation of new devices is phased with replacement; there is no need to wholesale replace existing inverters until the end of useful life.

Recommendation: The New Mexico PRC should establish a technical advisory group comprised of utility/industry/academic experts to review the current state of development and deployment of advanced inverters. The group may make recommendations on the requirements for new inverter installations and provide insight to the necessary communications protocols that will optimize DER in the state. These new settings should be aligned with the availability of IEEE 1547 and UL 1741 certified equipment by 2022, and be incorporated into revised Interconnection Manual/tariffs.

The National Association of Utility Regulatory Commissioners (NARUC) has adopted a resolution recommending that state commissions adopt and implement IEEE 1547-2018 – and by association, the advanced inverter functionalities that the new standard enables.

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Strategically deploy battery and other energy storage on the New Mexico grid

Energy storage systems support integration of renewables, as well as frequency regulation and other grid support.

Background

Storage Benefits

- Supports decarbonization and renewables
- Supports all objectives of grid modernization
- Costs may increase
- Strategic and flexible deployment - on the grid, behind-the-meter

Storage Technologies

- Battery storage is frontrunner, but all technologies important
- Also relevant: pumped hydro, compressed air, thermal, electric vehicles
- Batteries fairly mature, controls still in development
- Long-term storage not mature
- Hydrogen potential as future storage option

Recommendations

Legislative/Regulatory Policy Incentives for:

- Solar + storage
- Dedicated storage systems, charged from any source
- Behind-the-Meter
- New Mexico deployment: two 1-MW battery storage systems, 10-to-50 MW planned
- Nationally: 250 MW largest system, 1500 MW planned, many others emerging

Storage Economic Development

- Need NM-based consortia for manufacturing and deployment
- Create public-private partnerships for aggressive implementation
- Document value streams that are most relevant to NM and the region

Question:

How do we best utilize storage tech now, capable of 1-to-8 hours charging?

Policy and Planning Actions

INTERCONNECTION MANUAL REVISIONS

COORDINATED TRANSMISSION PLANNING | NEW MEXICO RTO TASK FORCE

INTEGRATED RESOURCE PLANNING REVISIONS | DISTRIBUTED RESOURCE PLANNING

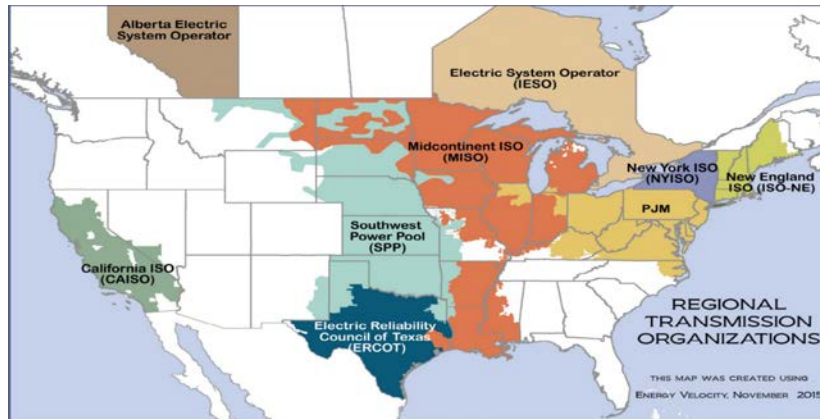
CUSTOMER ENGAGEMENT: BEYOND AMI

Grid Modernization – Update Interconnect Rules & Manual

- Goal** The energy transition using Distributed Energy Resources (DER) will decarbonize our electricity supply, build resiliency and reliability at the source of use, defer T&D resources, offer grid services and build a sustainable economy of local jobs.
- Issues** The 2008 outdated rules and manual that govern DER (customer-owned) is shutting down portions of the grid to DER because of DER saturation applying old rules to screening, restricting the use of storage, and delaying approvals.
- Resource** The Federal Energy Commission (FERC) and neighboring states have developed rules to open up the grid to more DER with major changes starting in 2013 up through this year’s FERC order 2222 in order to advance and expand the value of DER on the grid.
- Targets**
- ***Revised screening to increase the capacity for DER on the grid***
 - ***Allows storage + solar to expand the value of solar for limited or no back feed***
 - ***Game changing features of DER equipment (inverter) that offer grid services***
 - ***Fast track screening providing certainty and consistency across utilities***
- Next Steps** This is a one-two year project convening a workshop to engage stakeholders. There is a steep learning curve to manage risk and uncertainty of technology. This expands the role of the NM Public Regulatory Commission to serve the “public interest” which includes: environmental protection, social equity, and an evolving structure with grid reliability and lower cost.

Create and Support NM RTO Task Force

- The **western grid is a roadblock to efficiently decarbonizing the electric sector and meeting individual state renewable energy requirements.** Those same issues also create **unnecessary costs for energy customers.**
- Regional discussions about the benefits of RTO/ISOs are underway
 - Western Interstate Regional Electricity Dialogue
 - Western Wholesale Electricity Market Configurations Study
- Task Force will participate in these discussions on behalf of the state of New Mexico, looking for opportunities to explore the benefits to New Mexico and make recommendations to the state.



- Likely participants:
 - EMNRD Staff (co-convener)
 - EDD Staff (co-convener)
 - SLO Staff
 - NM Renewable Energy Transmission Authority (“RETA”)
 - Local Economic Development Offices
 - PRC Commissioners or Staff
 - Electric Utilities
 - Academic Institutions
 - Energy Industry
 - Environmental Advocates
- Possible recommendations:
 - Legislative Changes
 - Studies –ex. Economic development benefits; market design

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Integrated Resource Planning, Standardization and Coordination—a ten-year plan

IRP: cost-effective portfolio of assets, balancing expanding renewables with traditional resources to decarbonize.

Concerns/Obstacles

Up to Now

- Only IOUs currently file IRPs
- IRPs not consistently accessible
- Contentious process = disincentive for utilities to engage, perform
- IRPs do not cover 20 years
- Lack of transmission planning
- Recent IRP rule change

Negative Impacts / Mitigation

- Can be quite burdensome
- PRC staff cannot handle more / more staff, funding
- Expanded program with same requirements = exacerbates problems
- Utilities' coordination not clear
- "all electric utilities" = opposition / create the NMCPG, participate

IRP Vision

Short-Term: 2021 (start plan)

- Create NM Coordinated Planning Group (NMCPG) - voluntary, tackle IRP first
- Online clearinghouse of IRPs
- Engage now in public participation, PRC process - all 3 IRP cycles in process

Mid- to Long-Term: 2030 (end plan)

- Organize NMCPG - formal structure, objectives
- New elements in IRP rule, for modern grid - grid security, resiliency
- Extend IRP to G&Ts, municipalities (operating transmission)
- Recommend IRP rule changes to Commission
- Attempt IRP rule change - statute change if needed
- More support to PRC - retain utilities' fees, do not revert

Question:

How to offset costs of more reporting with benefits for utilities?

REQUIRE UTILITIES TO SUBMIT A DISTRIBUTION SYSTEM PLAN (DSP)

STEP	KEY ENABLERS	LEAD
Introduce Legislation that directs the PRC to create Rules that define the DSP process.	Require utilities to file DSPs that will be reviewed and approved by the Commission with participation by interested parties	Legislature and/or Governor
Formal presentation to the PRC staff and Commissioners.	Clearly document the value and steps in creating a DSP process.	TBD
Creation of formal DSP Rules by the Commission.	Petition the PRC to charter workshops on distribution planning and the creation of a formal process, discuss issues and potential PRC Rules.	PRC staff, other interested parties
Filing of initial DSPs by utilities.	Publication of distributed generation hosting maps and data, load carrying capacity and current and forecasted load on feeders and substation transformers and other information as required by the Rules.	IOUs, non-IOUs as applicable

- In a typical year, approximately **one quarter to one third of utility investments** are directed to the distribution grid, for a variety of purposes. Typically, expansion of distribution facilities is treated as within the “ordinary course of business”
- At least a subset of proposed DSP content is being currently assembled for internal planning by New Mexico’s utilities
- A comprehensive DSP process is especially critical for utilities’ pursuit of **Energy Transition Act (ETA) targets, 2020-2040**, going forward
- The Advisory Group recommends that DSPs initially be presented as separate non-IRP filings

Customer Engagement: Beyond AMI Data

This team proposes a new commitment to educating customers / members about the benefits for themselves, the utility and the state of New Mexico as everyone collectively moves towards a renewable energy future and meets the goals of the Energy Transition Act.

Within this white paper are tools to increase engagement and a specific pilot program to engage customers / members in peak shaving and voluntary demand response. This recommendation is an intermediary or parallel set of actions as the strategies of grid modernization move forward.

Key explorations of the Pilot Program

1. Discover if customers / members only participate if incentivized with a financial benefit
2. To see if customers / members will take action to assist with peak shaving
3. Can a utility aggregate from enough customer classes to show peak shaving can happen on either a voluntary or incentivized basis?
4. See if a reduction in energy and infrastructure costs are possible in partnership and the results can be used with Integrated Resource Planning (IRP)
5. Would working with customers / members beyond AMI enable the utility to be more adaptive, flexible and resilient?

Steps and Tools

Education for Customers / Members –
*What is a grid modernization? &
Understand the work the utility is doing
to move towards renewables and
decarbonization*

A partnership to tell customers /
members when to turn off appliances,
charge EV, or do the laundry and dishes

Tools are: texts, messaging, emails,
flyers, etc.

Savings seen in utility bills

Evaluation

Economic Actions

PROGRAMS FOR LOW AND MODERATE INCOME NEW MEXICANS
RATE DESIGN & DER INCENTIVES

Low to Moderate Income Programs

- Actions

- Build upon and increase state/private partnership grants for
 - Affordable rooftop solar panels for LMI homeowners
 - Necessary infrastructure for rooftop solar for LMI homeowners
 - Energy efficiency retrofit/upgrade to LMI homeowners
- Incentivize a public owned community solar programs for LMI non-homeowners
- Increase investment on the energy efficiency of public housing and public infrastructure
- Create a legal and financial incentive for rural LMI communities to create community micro-grids
- Reduce energy burden through discount programs

- Requirements

- Community Solar Act (with a pathway for community ownership of assets)
- Increase funding
- Address Mountain States Legal Foundation v. NM Corp. Comm'n, 101 N.M. 657 (1984)

Rate Design and DER Incentives

Actions

- Encourage or at least remove barriers to residential and other DER systems without disadvantaging other ratepayers
- Incentivize innovative DER including ratepayer scale storage and AC and DC microgrids
- Explore tension between decentralization and decarbonization to strike the balance
- Develop an initial set of policies and principles based on other grid mod roadmap goals and actions and other state laws and policies (for example, affordability, reliability, customer enablement and engagement, top down vs. bottom-up distribution, job creation, etc.) and then establish rate design tools to meet those goals

Recommendations

- PRC “generic” rate design proceeding(s) that encourage broad stakeholder participation to identify issues, challenges and options in order to provide regulators and utilities with the information they need to drive clean energy and energy efficient outcomes and policies (for example, decoupling, time varying pricing, demand response, performance-based ratemaking, on-bill financing, etc.)
- Develop a list of “informed and debated” criteria or principles that the PRC will use in reviewing new rate petitions
- Workshops on cost/benefit of DER in various New Mexico service territories and other customer education and outreach

Moving Toward Implementation



Finalizing Whitepapers (January-March 2021): external expert review, public comment, prioritization



Roadmap Document: EMNRD will draft the roadmap with recommendations from whitepapers



Implementation Group: Convened by EMNRD, performs further research on action items as needed, shares progress, a space for coordination across stakeholders



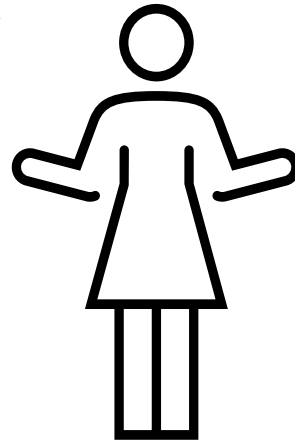
Implementation Support: EMNRD will seek funding for and establish the grid modernization grant program outlined in HB 233



Measuring Progress: EMNRD, with Implementation Group, will track changes relative to baselined metrics, allowing the roadmap be a living document

Public Input: Determining First Priorities

In January 2021, final whitepaper drafts will be published on EMNRD's Grid Modernization webpage:
<http://www.emnrd.state.nm.us/ECMD/GridModernization/GMAG.html>



We want to know which actions you – the members of the public – think is most important to focus on first for your communities and your state.

Submit your thoughts and comments directly to nmenergy.roadmap@state.nm.us by February 28th, 2021.

THANK YOU

