

New Mexico Energy Roadmap



FINAL REPORT: New Mexico Energy Roadmap

- Goals and strategies to achieve a more resilient energy economy
- Results of the deliberations of the New Mexico Energy Roadmap Steering Committee
- Metrics to guide implementation of the Roadmap

CONVENER

New Mexico Energy Minerals and Natural Resources Department (EMNRD)

RESEARCH AND FACILITATION

New Mexico First



NEW MEXICO FIRST

Disclaimer

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EXECUTIVE SUMMARY

Energy is a bedrock of the New Mexico economy and an area of untapped economic potential. New Mexicans desire plentiful, reliable and environmentally safe energy sources that uplift the well-being of our residents and allow our economy to thrive. In pursuit of these goals, the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) continued their planning efforts to develop this document – the New Mexico Energy Roadmap. The Roadmap, detailed in this report, contains goals and strategies that detail how we can strengthen and diversify New Mexico’s energy economy to build greater resiliency.¹

The Roadmap encapsulates the work of over 60 diverse energy stakeholders and six months of deliberations. To develop the Roadmap, stakeholders from many different sectors of New Mexico’s energy industry were invited to take part in the process that involved four meetings. Steering committee members first utilized scenario planning to envision futures for New Mexico’s energy economy – all scenarios containing qualities some may consider desirable or undesirable.² Based on the findings of the scenario planning, the steering committee generated and refined the ideas that are represented in the Roadmap.

The policy considerations represented in the Roadmap are many, but they are grouped into five categories – representing the topics of the Roadmap Steering Committee:

- Energy Economy Diversification
- Moving Energy
- Transportation
- Energy Efficiency
- Workforce and Education

Throughout all these goals and strategies, considerations for all of New Mexico’s energy sources are included. Strategy topics prioritized to begin implementation within the next 6 months include the following (see Appendix B for all strategies with implementation priority results):

- Develop a renewable portfolio task force to assess options and develop recommendations.
- Create a workable mechanism to bring state, federal, tribal and local authorities together to streamline implementation of energy investments within New Mexico.
- Support and implement the intermountain west MOU (memorandum of understanding) to electrify NM’s major thoroughfares
- Upgrade New Mexico building codes to at least national standards to improve energy efficiency.
- Develop ongoing public-private partnerships to further STEM learning and prepare New Mexico students for careers in energy.

¹ The New Mexico Energy Roadmap Steering Committee defines resiliency as the capacity of a system or entity to adapt to changes and overcome challenges.

² The results of this activity are contained in the New Mexico Energy Roadmap Scenario and Baseline Report (available at nmfirst.org).

INTRODUCTION

The purpose of this Energy Roadmap is to strengthen and diversify a New Mexico energy economy that is resilient to global changes.³ To achieve this purpose, the New Mexico Energy, Minerals and Natural Resources Department (EMNRD), in partnership with New Mexico First, tapped the expertise and dedication of over 70 energy stakeholders in the New Mexico Energy Roadmap Steering Committee (see Appendix C). These two organizations worked to build conversations amongst steering committee members that delved beyond personal allegiances and encouraged a more altruistic focus on the health and well-being of the state's energy economy.

Following the release of the 2015 New Mexico State Energy Policy and Implementation Plan, staff at the Energy Minerals and Natural Resources Department's (EMNRD) Energy Conservation and Management Division (ECMD) began to look for ways to enact specific objectives called out in the plan. However, the 2015 plan lacked clear strategies and direction for reaching the desired objectives. Therefore, in 2016, the ECMD applied for and received financial support from the U.S. Department of Energy to fund the development of an Energy Roadmap that defines a direction and sequence of strategies required to strengthen and diversify a New Mexico energy economy that is resilient to global changes.

Development of the Energy Roadmap is only the beginning of a decades long process of implementing changes to energy policies and practices at both the public and private level. The strategies and goals of the Energy Roadmap recognize and aim to address one common reality; the way the state produces, and uses energy must preemptively adapt to global energy developments. Thus, the Energy Roadmap strives to increase, renewable energy deployment, energy efficiency, alternative transportation and energy education and workforce, while also supporting new opportunities for the state's vast conventional energy sectors.

About the Process

The process to develop the Energy Roadmap was designed to be inclusive – recognizing that many sectors and resources comprise New Mexico's energy industry. As such, meetings and facilitation methods were tailored to produce an Energy Roadmap that supported all sectors within our state's energy economy. Additionally, participants were asked to build on the work of the 2015 Energy Policy and Implementation Plan, and to create an actionable plan for the next ten years with specific targets and lofty, but attainable goals.

The four-part series of Energy Roadmap meetings kicked off with scenario planning -- a process in which participants envision four different futures based on two common characteristics. In this scenario planning activity, participants populated characteristics of a New Mexico energy economy in which economic vitality and innovation were high or low. The outcomes of this first

³ This project defines resiliency as the capacity of a system or entity to adapt to changes and overcome challenges.

meeting are captured in the *New Mexico Energy Roadmap Scenarios and Baseline Report* (available at www.nmfirst.org).

Taking the input from the scenario planning session, the second meeting centered on building from scenarios to goals and strategies. Participants focused on the aspects of the scenarios they felt were most desired or worrisome to develop a vision for New Mexico's energy economy. The central ideas and themes became the basis of the goals and strategies first drafted in the second meeting.

The final two meetings were geared towards developing full drafts of the goals and strategies. In the third meeting, staff guided steering committee members to determine not only goal and strategy content, but the timeline and stakeholder metrics that will help in the implementation of the Roadmap. Following the third meeting, drafts were sent to all members of the committee for further review, and comments from steering committee members were submitted for consideration by the group.

Participants spent the fourth meeting reviewing comments and finalizing their goals and strategies, as well as the implementation timelines for each. The final meeting then concluded with a consensus vote on all items.⁴ Guidelines of the voting process asked participants to determine if they highly supported, moderately supported or did not support the goals and their accompanying strategies.

The Outcomes

The results of the steering committee's efforts are 15 goals and accompanying strategies that touch all energy industries in our state. These goals and strategies are grouped under the topics of the steering committee's five subcommittees:

- Energy Economy Diversification
- Moving Energy
- Transportation
- Energy Efficiency
- Workforce and Education

Topics addressed by the Energy Roadmap include improving government coordination, determining the best path forward for New Mexico's renewable portfolio standard, encouraging new opportunities for the fossil fuel industry, and continuing to reduce negative environmental impacts. Additionally, this Roadmap outlines actions to upgrading and implementing our energy efficiency technologies, as well as preparing our state's workforce to be successful in the energy industry.

⁴ The consensus definition utilized in the voting activity was the following: "I believe you understand my point of view, and I believe I understand yours. Whether or not I prefer this decision, I support it because it was arrived at openly and fairly and is the best alternative for us at this time." All strategies achieved full group consensus with the exception of Strategy 6.b. which did not achieve full consensus with one dissenter.

This document was intended to be highly actionable and the process to flow seamlessly into implementation. To that end, the Energy Roadmap does not contain only goals and strategies, but also timelines and groups whose help is necessary to make the plan a reality.

To best prepare for implementation, steering committee members were asked to take a post-exit survey in which they prioritized strategies most urgently needing implementation. Some strategy topics prioritized to begin implementation within the next six months include:

- Develop a renewable portfolio task force to assess options and develop recommendations.
- Create a workable mechanism to bring state, federal, tribal and local authorities together to streamline implementation of energy investments within New Mexico.
- Support and implement the intermountain west MOU (memorandum of understanding) to electrify NM's major thoroughfares
- Upgrade New Mexico building codes to at least national standards to improve energy efficiency.
- Develop ongoing public-private partnerships to further STEM learning and prepare New Mexico students for careers in energy.

Convener

The New Mexico Energy Minerals and Natural Resources Department's Energy Conservation and Management Division (ECMD) of EMNRD is the Principal Investigator for the project and has administrative responsibility for the cooperative agreement between the State of New Mexico and the manager for the Energy Roadmap. The project is funded by a grant from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. ECMD is responsible for all financial reporting, data collection, reporting of progress on the workplan and submittal of all deliverables.

ECMD develops and implements effective clean energy programs — renewable energy, energy efficiency, alternative fuels, and safe transportation of radioactive waste — to promote economic growth, environmental sustainability, and wise stewardship of our natural resources while protecting public health and safety for New Mexico and its citizens.

Policy Research and Facilitation

New Mexico First engages people in critical issues facing their state or community. The public policy organization offers unique events that bring people together to develop their best ideas for policymakers and the public. New Mexico First also produces nonpartisan public policy reports on critical issues facing the state. These reports – on topics including natural resources, education, the economy, healthcare and effective government– are available at www.nmfirst.org.

Our state's two U.S. Senators, Tom Udall, and Martin Heinrich serve as New Mexico First's honorary co-chairs. The organization was co-founded in 1986 by U.S. Senators Jeff Bingaman (retired) and the late Pete Domenici.

Authors and Reviewers

This New Mexico First report was prepared by Heather Balas and Kelsey Rader. Ms. Tatro, of Reineke Construction, is a valued research partner and subcontractor on this project. Report reviewers include the staff of the Energy Conservation and Management Division.

Acknowledgment

The State of New Mexico acknowledges the support, hard work and cooperation of our diverse group of energy stakeholders who participated in the development of the Energy Roadmap. They have shown that friendly and constructive dialogue, regarding tough issues, is still alive and well in New Mexico. A special acknowledgement goes out to the New Mexico Established Program to Stimulate Competitive Research (EPSCOR) who provided additional financial support for an additional steering committee meeting. The additional funding made the completion of a quality Energy Roadmap possible.

A final acknowledgment and thank you goes out to Michelle Henrie, for her voluntary, herculean effort to educate and gain unanimous support for this project from the 2017 New Mexico Legislature. Her public-spirited work will serve as inspiration to all who will participate in implementing this Energy Roadmap over the next decade and beyond.

NEW MEXICO ENERGY ROADMAP

Goals and Strategies

The table listed below contains the goals and strategies, which make up the content of the New Mexico Energy Roadmap. Goals are broad and represent a larger “endgame.” The accompanying strategies signify the steps by which the committee has proposed to achieve the larger goal.

Listed key stakeholders vary in their levels of specificity depending on group input. Additional details will come as the plan is implemented. Some strategy leaders and key stakeholders are represented by acronyms. For a full listing of acronyms used in this document, please see Appendix A.

Committee 1: Energy Economy Diversification

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 1:</u> Advance strategies to strengthen New Mexico’s overall energy economy by 2027.⁵				
	1.a. Create a workable mechanism to bring state, federal, tribal, and local authorities together to streamline implementation of energy investments within New Mexico.	APS	<ul style="list-style-type: none"> • EMNRD • RETA • NMFA • Tribal representatives 	Start by 3/2018
	1.b. Advance a productive and predictable regulatory structure for the energy sector that guides industry and protects the environment.	EMNRD or NMF	<ul style="list-style-type: none"> • NMOGA • REIA • NMED • NMPRC • Other energy associations 	Start by 3/2018
	1.c. Research tax reforms for NM that incentivize resiliency measures in the energy sector.	NMTRD	<ul style="list-style-type: none"> • NMOGA • EMNRD • Renewable energy associations • Utilities 	Start by 3/2018 Complete by 12/2020

⁵ Baseline: Track progress by measuring combined GDP contributions from the three major energy-related industry sectors: natural resources and mining, transportation and warehousing, and utilities. We recognize these categories are limited and may not capture all energy revenues.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	1.d. Monitor overall energy & energy-associated employment.	UNM and NM EPSCoR	<ul style="list-style-type: none"> • BBER • EDD 	Start by 1/31/2018
<u>GOAL 2:</u> Evaluate the future of RPS, renewable energy incentives, and complementary rulings and policies by 2020.				
	2.a. Develop a renewable portfolio task force to assess options and develop recommendations.	Consider a coalition of: <ul style="list-style-type: none"> • NM EPSCoR • NMF • Utton Center • EMNRD 	<ul style="list-style-type: none"> • Cryq Energy (Michelle Henrie) • EMNRD • PRC • NMOGA • NMTRD • NM AG • TNC • WRA • UCS • Utilities • Renewable energy associations (i.e., NMSEA) • Resiliency Institute -- Civil Engineering School at UNM • Conservation organizations (i.e., CCAE, NRDC) 	Start by 5/2018
	2.b. Identify strengths and weaknesses of current RPS law.	Consider a coalition of: <ul style="list-style-type: none"> • NM EPSCoR • NMF • Utton Center • EMNRD 	<ul style="list-style-type: none"> • Cryq Energy • EMNRD • PRC • NMOGA • NMTRD • NM AG • TNC • WRA • UCS • Utilities 	Start by 5/2018

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
			<ul style="list-style-type: none"> • Renewable energy associations (i.e., NMSEA) • Resiliency Institute -- Civil Engineering School at UNM • Relevant conservation organizations (i.e., CCAE, NRDC) 	
	2.c. Consider financial and market variables informing potential new laws or incentives.	Consider a coalition of: <ul style="list-style-type: none"> • NM EPSCoR • NMF • Utton Center • EMNRD 	<ul style="list-style-type: none"> • Michelle Henrie • EMNRD • PRC • NMOGA • NMTRD • NM AG • TNC • WRA • UCS • Utilities • Renewable energy associations (i.e., NMSEA) • Resiliency Institute -- Civil Engineering School at UNM • Conservation organizations (i.e., CCAE, NRDC) 	Start by 5/2018
	2.d. Consider fundamental energy policy variables.	EMNRD	<ul style="list-style-type: none"> • PRC • Renewable energy associations • Relevant industry and coalitions • Western Interstate States Energy Board • Utilities 	Start by 5/2018

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 3:</u> Develop a profitable produced water market by 2025.				
	3.a. Clarify ownership of and reporting requirements for produced water.	NMOGA and Strategic Action Forum	<ul style="list-style-type: none"> • OSE • NMED/OCD 	Start by 12/31/2018
	3.b. Revise rulings to allow uses outside of the oil field.	NMOGA and Strategic Action Forum	OCD	Start by 12/31/2019
	3.c. Provide support to NMED/ OCD with transparent produced water data.	NMOGA and Strategic Action Forum	<ul style="list-style-type: none"> • NMT • NMSU 	Start by 12/31/2018
	3.d. Develop a financial model that benefits the state.	NMOGA and Strategic Action Forum	<ul style="list-style-type: none"> • EMNRD • NMTRD • DFA • NMOGA • IPANM 	Complete by 12/31/2022
	3.e. Educate state leaders on best practices used by industry to safely move produced water.	NMOGA and Strategic Action Forum	<ul style="list-style-type: none"> • NMOGA • IPANM 	Complete by 7/15/2021
<u>GOAL 4:</u> Pursue emerging energy technologies through research, demonstration, development and deployment.				
	4.a. Expand energy storage capacity, with examples to include solar-plus storage (to support micro-grids), thermal storage and pumped hydro-electric.	Energy Storage Working Group	<ul style="list-style-type: none"> • SNL • NMSEA • Utilities 	Start by 2/20/18
	4.b. Expand the development and sale of energy-related value-added products.	Leader TBA post research and outreach	<ul style="list-style-type: none"> • IPANM • NMOGA • RPSEA • EDD 	Start by 1/1/2020
	4.c. Research opportunities and barriers for petrochemical plants (such as considered by Farmington and Gallup).	Leader TBA post- research and outreach	<ul style="list-style-type: none"> • IPANM • NMOGA • RPSEA 	Start by 1/1/2020

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
			<ul style="list-style-type: none"> • EDD • NWNMCOG 	
	4.d. Further evaluate opportunities and risks associated with nuclear energy, including small modular nuclear reactors, storage of hazardous material & civilian nuclear waste materials, and state economic benefits and risks derived from transportation & storage of waste.	Nuscale & RADHAZ Legislative Committee	<ul style="list-style-type: none"> • E. Trujillo, EMNRD • URENCO • Navajo Nation • Utilities 	Start by 3/2018
	4.e. Identify the top three barriers limiting the profitability of clean energy enterprises.	NM Solar Energy Association	<ul style="list-style-type: none"> • REIA • Utilities • Relevant renewable associations 	Start by 12/31/2018
	4.f. Consider options for smart siting of clean & renewable energy and storage installations.	TNC	<ul style="list-style-type: none"> • TNC • PRC • Utilities • NM Association of Counties • Audubon Society • AWEA 	Complete by 2027

Committee 2: Moving Energy

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 5:</u> Optimize NM's electricity transmission system.				
	5.a. Conduct analysis for future transmission assets under various resource development and policy scenarios. The key result is implications for transmission assets. Step one: find resources and capable analysts. Step two: create a steering board. Step three: conduct the study.	SNL	<ul style="list-style-type: none"> • PRC • EPSCOR • NMED • EMNRD • IPPs 	Complete by 12/31/2019

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
			<ul style="list-style-type: none"> Utilities 	
	5.b. Identify regulatory barriers to construction and cost recovery of new transmission assets.	Sun Zia, RETA or other merchant transmission developer representative	<ul style="list-style-type: none"> IOUs COOPs NMED EMNRD PRC RETA Federal agencies (i.e., BLM) 	Complete By 12/31/2020
	5.c. Streamline regulatory structure for transmission permitting and approval.	PRC and New Mexico State Land Office	<ul style="list-style-type: none"> PRC NMED IOUs COOPs EMNRD Transmission providers and developers Federal agencies 	Complete By 12/31/2022
GOAL 6: Increase the state's permitted natural gas processing capacity by 15% by 2027.⁶				
	6.a. Identify opportunities to build new or enhance processing facilities and associated pipelines.	NMOGA and IPANM	<ul style="list-style-type: none"> SLO BLM 	Complete by 12/31/2018
	6.b. Develop public awareness campaign about relative advantages and disadvantages of pipelines versus over the road trucking of hydrocarbons and ancillary products.	NMOGA	<ul style="list-style-type: none"> NMDOT PRC Pipeline Safety (agency that oversees pipeline safety statewide) Relevant industry groups Public NMED 	Complete by 12/31/2019

⁶ Energy Information Administration Report 757 (Processing Capacity) provides natural gas processing plant capacity. EIA also provides data on natural gas processed by state annually. Capacity to process natural gas may also be quantified based on NMED permits; however, these data are not currently available to the public.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	6.c. Explore the expansion of NG commodity exports from NM to other states and countries.	NM EDD	<ul style="list-style-type: none"> • Industry • SLO • BLM 	Complete by 12/31/2019
<u>GOAL 7:</u> Reduce vented and flared gas emissions by 50% by 2027 by incentivizing operators.⁷				
	7.a. Create a collaboration among involved agencies (SLO / OCD / NMED / BLM / NMTRD) to create a pilot program for incentivizing flare gas capture technology deployment and demonstration.	State Land Office, Land Steward Program or OCD	<ul style="list-style-type: none"> • Industry • NMTRD • EMNRD OCD • SLO • BLM • NMED • NMOGA • IPANM • Relevant environmental groups (i.e., EDF) 	MOU in place by 12/31/2019
	7.b. Identify the top five challenges to reducing flare gas and address them. For example: reduce lengthy (1 year) permitting time for construction of or getting access to collection pipelines.	NMOGA, OCD and/or BLM	<ul style="list-style-type: none"> • SLO • BLM • NMTRD • NMED • IPANM • Relevant environmental groups 	Identify by 12/31/2018 Develop plan to address by 12/31/2019

⁷ Goal is 50% reduction of vented and flared hydrocarbons in percentage of transported gas (versus reduction in billion cubic feet of transported gas). Baseline: NM EMNRD OCD C-115 Reports, with the caveat that reporting, especially from smaller producers, is incomplete. These reports show 1.96% (25.11 billion cubic feet) of total transported gas was vented or flared in 2016. Note that flared gas is the result of two different issues, the first being short term and the second, long term: 1) during drilling, waste gas and/or nitrogen laden gas is a waste product either because not pipeline exists yet, or because the gas is not suitable for delivery to the pipeline and, 2) after well completion, gas production could exceed capacity of pipeline at times, and hence, flared.

Committee 3: Transportation

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
GOAL 8: Increase the use of alternative fuel vehicles registered in NM to 15% by 2027.⁸				
	8.a. Increase alternative fuel infrastructure.	Clean Cities NM	<ul style="list-style-type: none"> • ECMD (with cooperation with NMDOT and NMED) • SWEEP • TNC • The Efficiency Project Clean Cities • Utilities • MPOs • NGVAmerica • RTPOs • Oil & Gas trade associations (i.e., NMOGA, IPANM) 	Completed by 2027
	8.b. Increase AFV availability and service.	Clean Cities NM	<ul style="list-style-type: none"> • Dealerships • OEMs • NGVAmerica • ECMD • EDD • NMED • SWEEP • GSD • DOT • PED 	Completed by 2027

⁸ Baseline metrics: 1) Alliance of Automobile Manufacturers data on sales of zero emissions vehicles by state - 254 ZEVs sold in NM in 2016. ZEVs include light-duty fuel-cell, all-battery, and plug-in hybrid electric vehicles; 2) Natural Gas Vehicles America estimate on number registered CNG vehicles in NM in 2015 was 800; 3) NM EMNRD data on alternative fueling stations in NM (compressed natural gas, liquefied natural gas, and electric charging) – 67 stations in 2016.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	8.c. Support and implement the intermountain west MOU to electrify NM's major thoroughfares.	EMNRD	<ul style="list-style-type: none"> • NMED • DOT • State parks • Intermountain west states • Utilities • Co-ops 	Completed by 2027
	8.d. Develop a road tax structure that includes AFVs based on vehicle impact including VMT and weight. Add a mechanism for documenting "primary fuel type" in the state's vehicle registration system.	NGVAmerica	<ul style="list-style-type: none"> • NMTRD • DOT • ECMD • Oil & Gas trade (e.g., NMOGA, IPANM) • NMTA 	Completed by 2027
	8.e. Develop marketing and outreach campaign for AFVs for the general public.	Clean Cities New Mexico	<ul style="list-style-type: none"> • EMNRD • NMED • Local Governments • Environmental groups • Auto companies • Trade associations 	Completed by 2027
	8.f. Develop incentive programs for AFV and infrastructure.	NGVAmerica	<ul style="list-style-type: none"> • EMNRD • NGOs • NMTRD • EDD • Utilities • Environmental groups • Oil & gas trade • Trade associations • Clean Cities 	Completed by 2027

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 9:</u> Reduce single occupancy vehicle miles traveled by 15% by 2027.⁹				
	9.a. Increase government investments into alternative modes of transportation.	DOT	<ul style="list-style-type: none"> • NGOs • MPOs • RTPOs • PED • ECMD • Car dealerships • State and local government • NM Municipal League Councils of Government • School bus associations 	Completed by 2027
	9.b. Encourage local communities to adopt plans, codes, and policies that support multi-modal transportation options and development.	Clean Cities New Mexico	<ul style="list-style-type: none"> • NGOs • MPOs • RTPOs • ECMD • NMDOH • NM APA • NM Real Estate Association • State and local government 	Completed by 2027
	9.c. Create incentive programs to increase the use of multi-modal transportation options.	ECMD	<ul style="list-style-type: none"> • NGOs • MPOs • RTPOs • NMDOH • DOT • State and local government 	Completed by 2027

⁹ Note: reducing single occupancy vehicle use is desired; yet a reliable indicator for this goal is not available. Baseline: 2015 NM vehicle miles travelled per DOT (data extracted from FHWA VM2 reports) was 27,435 million miles; population in 2015 was 2.1 million; hence, vehicle miles travelled per capita was 13,064 miles per capita.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	9.d. Require major developments to offer bike-, ride- and car-sharing.	Complete Streets Committee	<ul style="list-style-type: none"> • NGOs • MPOs • RTPOs • ECMD 	Completed by 2027
	9.e. Adopt a statewide complete streets policy (roads that accommodate all users).	Complete Streets Committee (Jessica Griffin will provide contact)	<ul style="list-style-type: none"> • DOT • EMNRD • NMED • NGOs • Relevant advocacy organizations 	Completed by 2027
<u>GOAL 10: Reduce emissions from mobile sources by 10% by 2027.</u>¹⁰				
	10.a. Promote alternative transportation fuels, including heavy-duty trucks of all types, buses, off-road machinery and large vehicles (mining trucks), rail.	NGVAmerica	<ul style="list-style-type: none"> • ECMD • NMED • NMTA • DOT • EDD • Utilities • Fleet operators (i.e., Penske, UPS) • Industry • Trade associations • Oil & gas trade 	Completed by 2027
	10.b. Evaluate regulatory or statutory efficiency and emission standards.	NMED	<ul style="list-style-type: none"> • Trade associations • ECMD • NGVAmerica • Oil & gas trade • Clean Cities 	Completed by 2027

¹⁰ Baseline: US EPA National Emissions Inventory data – for example, NM NOx emissions from mobile sources were 98,970 tons in 2014 (most recent data available), with 44% coming from on-road diesel heavy-duty vehicles, 25% from locomotives, and 21% from on-road non-diesel light-duty vehicles.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	10.c. Facilitate technology transfer from labs, universities, incubators, and others.	EPSCoR	<ul style="list-style-type: none"> • EDD • ECMD • NMED • PED • National Labs 	Completed by 2027

Committee 4: Energy Efficiency

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 11:</u> Rank in the top 20 states for energy efficiency by 2027.¹¹				
	11.a. Upgrade all New Mexico building codes to at least national standards, and develop a process for maintaining current codes.	SWEEP	<ul style="list-style-type: none"> • Construction Industries Commission¹² • Construction Industries Division¹³ • Construction companies and contractors • Home Builders Association • Green Builders NM, advocacy organizations Utilities • NAIOP • Local Governments 	Complete by 2020

¹¹ Baseline: State energy efficiency is measured by the American Council for an Energy Efficient Economy. NM's current score is 35.

¹² This group develops rules.

¹³ This group is responsible for implementing rules.

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	11.b. Require LEED certification of all new school, hospital, higher-education, and government buildings over 20,000 square feet.	ECMD	<ul style="list-style-type: none"> • CID • CIC • New Mexico Public School Facilities Authority • SWEEP • Higher education institutions • PED • School boards • AIA • UNM School of Architecture and Planning • US Green Buildings Council • Construction companies • Contractors • Hospitals • Advocacy organizations • NAIOP • ULI 	Complete by 2019
	11.c. Research opportunities and initiate policy action to allow public-private-partnerships for commercial buildings energy efficiency and low-income multi-family housing.	ECMD	<ul style="list-style-type: none"> • Relevant advocacy organizations • SWEEP • University research parks 	Complete by 2021

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	11.d. Extend the Efficient Use of Energy Act past 2020 -- incorporating policies to address energy efficiency disincentives.	SWEEP and TNC	<ul style="list-style-type: none"> • New Mexico Legislature (on the front end) • Utilities (post policy changes) • NRDC • UCS • Relevant advocacy organizations • CCAE • NM AG 	Complete by 2019 Legislative Session
<u>GOAL 12:</u> Measurably increase energy efficient behaviors by New Mexicans by 2027.¹⁴				
	12.a. Implement a public campaign to increase awareness and educate consumers about energy efficiency and conservation.	ECMD and TNC	<ul style="list-style-type: none"> • Relevant community advocates • PRC • Utilities • NM AG 	Complete by 2025
	12.b. Research and implement tools that allow customers to better understand and manage their energy use (such as smart meters and time of use rates).	CCAЕ	<ul style="list-style-type: none"> • Utilities • COOPs • Municipal water utilities • Large industrials • Energy efficiency advocacy groups 	Complete by 2027

Committee 5: Workforce and Education

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
<u>GOAL 13:</u> By 2020, better align education and training programs at New Mexico's two- and four-year colleges with current and future energy workforce needs.				

¹⁴ Baseline: per capita energy use ranking from EIA; most recent data (2015) – national ranking was 20th (greatest consumption rank would be 50th)

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	13.a. Develop an ongoing public-private partnership of energy companies, higher-education institutions, national laboratories, K-12 schools, and other public and public-private entities to further STEM learning and prepare New Mexico students for careers in energy.	EMNRD	<ul style="list-style-type: none"> • Energy industry • Relevant industry trade associations • Higher education institutions • EDD • PED • HED • DWS • National Labs • School Districts 	Start by the end of 2018
	13.b. Identify key knowledge, skills, and abilities needed for current and future energy-sector jobs in NM.	EMNRD	<ul style="list-style-type: none"> • Energy industry • Relevant industry trade associations • Higher education institutions 	Start by the end of 2018
	13.c. Catalog existing energy training programs and curriculum available in New Mexico.	EMNRD	Higher education institutions	Start by the end of 2018
	13.d. Identify gaps between education and training programs and employers' reported needs.	EMNRD	<ul style="list-style-type: none"> • Energy industry • Industry trade associations • Higher education institutions 	Start by 1st Quarter 2019
	13.e. Develop curriculum, internship/ apprenticeship programs, and job recruitment strategies through a public/private partnership that addresses gaps in training and strengthen existing programs.	EMNRD	<ul style="list-style-type: none"> • Energy industry • Industry trade associations • Higher education institutions 	Start through 2020

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	13.f. Prioritize recruitment and retention of well-qualified faculty and instructors with energy-related experience and expertise.	NM First	<ul style="list-style-type: none"> Industry trade associations Higher education institutions 	Start by April 2018
	13.g. Meet at least bi-annually to review progress and address evolving needs.	EMNRD	<ul style="list-style-type: none"> Higher education institutions NM EPSCOR 	Ongoing
GOAL 14: Through a public-private partnership, create energy career outreach program that reaches 15,000 students annually.				
	14.a. Meet at least bi-annually to review progress and address evolving needs.	NM EDD	<ul style="list-style-type: none"> Energy industry higher Education institutions 	Ongoing
	14.b. Continue and expand partnerships between higher education institutions, rural and tribal communities.	NM First at the 2018 Higher Ed Town Hall	<ul style="list-style-type: none"> Higher education institutions Pueblo Governors Associations Tribal Governments COGs NM Assoc. of Counties 	Start by April 2018
	14.c. Offer energy-career activities in high schools and enrich classes with energy career content.	PED, PRC	<ul style="list-style-type: none"> PED School districts 	Start by 2022
	14.d. Develop, distribute, and support the implementation of a one-semester high school energy course to improve energy literacy.	Santa Fe Community College	<ul style="list-style-type: none"> School districts PED EPSCoR 	Start by 2022
	14.e. Promote energy-related STEM clubs in schools statewide and STEM summer programs and increase student participation.	EPSCOR, PRC	<ul style="list-style-type: none"> Utilities (as funders and content contributors) School districts PED 	Start by 2018

GOAL	STRATEGY	STRATEGY LEADER	KEY STAKEHOLDERS	WHEN
	14.f. Sponsor a Senate memorial every legislative session to encourage energy career opportunities.	URENCO USA	<ul style="list-style-type: none"> Schools Industry Stakeholders from the New Mexico Energy Roadmap Steering Committee 	Start by 2019
<u>GOAL 15:</u> Remove barriers for New Mexican students to enter energy training programs.				
	15.a. Develop diverse financial support for energy-related programs and students, including through industry- and trade organization-financed student scholarships, professional internships and research experiences.	EMNRD to hand off to DFA and HED	<ul style="list-style-type: none"> Energy industry State Legislature Higher education institutions 	Start by 2018
	15.b. Recommend revisions to lottery scholarship to reflect needs of both traditional and nontraditional students pursuing energy-related fields of study.	NM First at the 2018 Higher Ed Town Hall	TBD by Town Hall participants	Start by April 2018

APPENDICES

Appendix A: Acronym Glossary

AFV – Alternative fuel vehicles, defined for this roadmap to be any vehicle other than gasoline or diesel-fueled
 AIA – American Institute of Architects
 APS -- Arizona Public Service
 AWEA -- American Wind Energy Association
 BBER -- University of New Mexico Bureau of Business and Economic Research
 BLM – United States Bureau of Land Management
 BLS – United States Bureau of Labor Statistics
 CCAE -- Coalition for Clean Affordable Energy
 CIC and CID – New Mexico Construction Industries Commission and Construction Industries Division
 CNG – compressed natural gas
 COG – New Mexico Council of Governments
 DFA – NM Department of Finance and Administration
 DOE – United States Department of Energy
 DWS – New Mexico Department of Workforce Solutions
 ECMD – Energy Conservation and Management Division within EMNRD
 EDD – New Mexico Economic Development Department
 EMNRD – New Mexico Energy, Minerals and Natural Resources Department
 EIA – United States Energy Information Agency
 EPA – United States Environmental Protection Agency
 EPSCoR – Established Program to Stimulate Competitive Research, in this document, NM EPSCoR
 EV – electric vehicle
 GDP – Gross Domestic Product, in this document, for the state of New Mexico
 GSD -- General Services Department
 HED – New Mexico Higher Education Department
 IAD – New Mexico Indian Affairs Department
 IPANM - Independent Petroleum Association of New Mexico
 IPP – Independent Power Producer
 ISO – Independent System Operator
 LEED – Leadership in Energy and Environmental Design
 LFC – Legislative Finance Committee
 MOU – Memorandum of Understanding
 MPO -- Metropolitan Planning Organization
 NAIOP -- National Association of Independent Office Properties
 NGO – non-governmental organization
 NM AG – New Mexico Attorney General
 NM APA -- New Mexico American Planning Association
 NM DOH – New Mexico Department of Health
 NM DOT – New Mexico Department of Transportation
 NM DMV– New Mexico Department of Motor Vehicles
 NMED – New Mexico Environment Department
 NMF – New Mexico First
 NMOGA – New Mexico Oil and Gas Association
 NM PTA – New Mexico Parent Teacher Association
 NMSU – New Mexico State University
 NMSEA – New Mexico Solar Energy Association
 NMTA – New Mexico Trucking Association
 NMT – New Mexico Tech or more accurately, NM Institute of Mining and Technology
 NMTRD – New Mexico Tax and Revenue Department
 NOx – nitrogen oxide

NRDC – National Resources Defense Council
 NWNMCOG – Northwest New Mexico Council of Governments
 OCD – New Mexico Oil Conservation Division within New Mexico’s Energy, Minerals and Natural Resources Department
 OEM – original equipment manufacturer
 OSE – New Mexico Office of the State Engineer
 PED – New Mexico Public Education Department
 PRC – NM Public Regulation Commission
 RADHAZ – Radioactive and Hazardous Materials Interim Committee (of the New Mexico Legislature)
 REIA – Renewable Energy Industries Association of New Mexico
 RETA – New Mexico Renewable Energy Transmission Authority
 ROI – Return on Investment
 RTO – Regional Transmission Organization
 RTPPO -- Regional Transportation Planning Organization
 RPS – Renewable Portfolio Standard
 RPSEA - Research Partnership to Secure Energy for America
 SFCC – Santa Fe Community College
 SLO – New Mexico State Land Office
 SNL – Sandia National Laboratories
 STEM – science, technology, engineering and math
 SWEEP – Southwest Energy Efficiency Project
 TNC – The Nature Conservancy
 UCS – Union of Concerned Scientists
 UNM – University of New Mexico
 Utilities – includes investor owned electric utilities, electric cooperatives, and municipal utilities
 ULI -- Urban Land Institute
 VMT – vehicle miles traveled
 WERS – Water Efficiency Rating Score
 WRA – Western Resource Advocates
 ZEV – zero emissions vehicle (fuel-cell, all battery or plug-in hybrid electric vehicle)

Appendix B: Prioritization Survey Report

Following the fourth and final meeting of the New Mexico Energy Roadmap Committee, steering committee members were issued a survey asking them to select the five strategies they believed should and can be implemented in the next six months (starting in January 2018). The table below shows the outcomes of the survey. Strategies receiving a high number of votes are indicated in bold text.

Strategy Number and Description	Support
1a. Create a workable mechanism to bring state, federal, tribal and local authorities together to streamline implementation of energy investments within NM.	23%
1b. Advance a productive and predictable regulatory structure for the energy sector that guides industry and protects the environment.	14%
1c. Research tax reforms for NM that incentivize resiliency measures in the energy sector.	29%
1d. Monitor overall energy & energy-associated employment.	14%
2a. Develop a renewable portfolio task force to assess options and develop recommendations.	49%
2b. Identify strengths and weaknesses of current RPS law.	11%
2c. Consider financial and market variables informing potential new laws or incentives.	6%
2d. Consider fundamental energy policy variables.	3%
3a. Clarify ownership of and reporting requirements for produced water.	14%
3b. Revise rulings to allow uses outside of the oil field.	14%
3c. Provide support to NMED/ OCD with transparent produced water data.	6%
3d. Develop a financial model that benefits the state.	9%
3e. Educate state leaders on best practices used by industry to safely move produced water.	3%
4a. Expand energy storage capacity, with examples to include solar-plus storage (to support micro-grids), thermal storage and pumped hydro-electric.	29%
4b. Expand the development and sale of energy-related value-added products.	6%
4c. Research opportunities and barriers for petrochemical plants (such as considered by Farmington and Gallup).	3%
4d. Further evaluate opportunities and risks associated with nuclear energy, including small modular nuclear reactors, storage of hazardous material & civilian nuclear waste materials, and state economic benefits & risks derived from transportation & storage of waste.	14%
4e. Identify the top three barriers limiting the profitability of clean energy enterprises.	3%
4f. Consider options for smart siting of clean & renewable energy and storage installations.	3%
5a. Conduct analysis for future transmission assets under various resource development and policy scenarios. The key result is implications for transmission assets. Step one: find resources and capable analysts. Step two: create a steering board. Step three: conduct the study.	31%
5b. Identify regulatory barriers to construction and cost recovery of new transmission assets.	9%
5c. Streamline regulatory structure for transmission permitting and approval.	3%
6a. Identify opportunities to build new or enhance processing facilities and associated pipelines.	3%
6b. Develop public awareness campaign about relative advantages and disadvantages of pipelines versus over the road trucking of hydrocarbons and ancillary products.	6%
6c. Explore the expansion of NG commodity exports from NM to other states and countries.	9%
7a. Create a collaboration among involved agencies (SLO / OCD / NMED / BLM / NMTRD) to create a pilot program for incentivizing flare gas capture technology deployment and demonstration.	14%
7b. Identify the top five challenges to reducing flare gas and address them. For example: reduce lengthy (1 year) permitting time for construction of or getting access to collection pipelines.	9%
8a. Increase alternative fuel infrastructure.	3%

Strategy Number and Description	Support
8b. Increase AFV availability and service.	0%
8c. Support and implement the intermountain west MOU (memorandum of understanding) to electrify NM's major thoroughfares.	17%
8d. Develop a road tax structure that includes AFVs based on vehicle impact including VMT and weight. Add a mechanism for documenting "primary fuel type" in the state's vehicle registration system.	9%
8e. Develop marketing and outreach campaign for AFVs for the general public.	3%
8f. Develop incentive programs for AFV and infrastructure.	11%
9a. Increase government investments into alternative modes of transportation.	6%
9b. Encourage local communities to adopt plans, codes, and policies that support multi-modal transportation options and development.	6%
9c. Create incentive programs to increase the use of multi-modal transportation options.	0%
9d. Require major developments to offer bike-, ride- and car-sharing.	3%
9e. Adopt a statewide complete streets policy (roads that accommodate all users).	3%
10a. Promote alternative transportation fuels, including heavy-duty trucks of all types, buses, off-road machinery and large vehicles (mining trucks), rail.	3%
10b. Evaluate regulatory or statutory efficiency and emission standards.	0%
10c. Facilitate technology transfer from labs, universities, incubators, and others.	3%
11a. Upgrade all New Mexico building codes to at least national standards, and develop a process for maintaining current codes.	26%
11b. Require LEED certification of all new school, hospital, higher-education, and government buildings over 20,000 square feet.	3%
11c. Research opportunities and initiate policy action to allow public-private-partnerships for commercial buildings energy efficiency and low-income multi-family housing.	3%
11d. Extend the Efficient Use of Energy Act past 2020 -- incorporating policies to address energy efficiency disincentives.	20%
12a. Implement a public campaign to increase awareness and educate consumers about energy efficiency and conservation.	0%
12b. Research and implement tools that allow customers to better understand and manage their energy use (such as smart meters and time of use rates).	0%
13a. Develop an ongoing public-private partnership of energy companies, higher-education institutions, national laboratories, K-12 schools, and other public and public-private entities to further STEM learning and prepare New Mexico students for careers in energy.	14%
13b. Identify key knowledge, skills, and abilities needed for current and future energy-sector jobs in New Mexico.	0%
13c. Catalog existing energy training programs and curriculum available in New Mexico.	6%
13d. Identify gaps between education and training programs and employers' reported needs.	3%
13e. Develop curricula, internship/apprenticeship programs, and job recruitment strategies through a public/private partnership that addresses gaps in training and strengthen existing programs.	3%
13f. Prioritize recruitment and retention of well-qualified faculty and instructors with energy-related experience and expertise.	0%
13g. Meet at least bi-annually to review progress and address evolving needs.	3%
14a. Market energy training programs to companies, industry, and students.	0%
14b. Continue and expand partnerships between higher education institutions, rural and tribal communities.	0%
14c. Offer energy-career activities in high schools and enrich classes with energy career content.	0%
14d. Develop, distribute, and support the implementation of a one-semester high school energy course to improve energy literacy.	6%

Strategy Number and Description	Support
14e. Promote energy-related STEM clubs in schools statewide and STEM summer programs and increase student participation.	3%
14f. Sponsor a Senate memorial every legislative session to encourage energy career opportunities.	0%
15a. Develop diverse financial support for energy-related programs and students, including through industry- and trade organization-financed student scholarships, professional internships and research experiences	3%
15b. Recommend revisions to lottery scholarship to reflect needs of both traditional and nontraditional students pursuing energy-related fields of study.	9%

Appendix C: New Mexico Roadmap Steering Committee Members

First Name	Last Name	Organization
Curt	Augustine	Alliance of Automobile Manufacturers
Carmen	Austin	Las Vegas District Forester
Jack	Bailey	NuScale Power
Robert	Balch	NM Tech
Blake	Barfield	Holly Frontier
Rita	Bates	NM Environment Department Air Quality Bureau
Mark	Bibeault	Los Alamos National Lab
Mike	Bowen	NM Mining Association
Theresa	Cardenas	Union of Concerned Scientists
Martha	Cather	NM Technical University
Janie	Chermak	University of New Mexico
Athena	Christodoulou	NM Solar Energy Association
Crystal	Coffman	Pattern Development
Jeff	Condrey	Northwest NM Council of Governments
Steve	Cummins	Los Alamos County Department of Public Utilities
John	Dailey	Nextera
Scott	Dawson	State of NM
Zach	Dillenback	NM Finance Authority
Tammy	Fiebelkorn	Southwest Energy Efficiency Project
Steve	Flammang	Westmoreland Coal Company
Mark	Gaiser	The Energy Conservation and Management Division
Sandra	Gaiser	MRCOG
John	Garcia	Home Builders of Central NM
Gabrielle	Gerholt	Concho Resources
Alaine	Ginocchio	Western Interstate Energy Board
Stephen	Gomez	Santa Fe Community College
Rico	Gonzales	El Paso Electric Company
Peter	Gould	NM Industrial Energy Consumers
Steve	Grey	Navajo Transitional Energy Company
David	Griego	State of NM
Jessica	Griffin	NM Department of Transportation
Keven	Groenewold	NM Rural Electric Cooperative
Charles	Hanley	Sandia National Laboratories
Michelle	Henrie	Cyrq Energy
Mary	Homan	NM Gas Company
Ken	Hughes	EMNRD
Anne	Jakle	NM EPSCoR
Rob	Joe	Navajo Nation
James	Kaminsky	NM Department of Taxation and Revenue
Patrick	Killen	BP America Production Company
Mitch	Krakauskas	Strata Production Company
Paul	Lorskulsint	URENCO USA
Charlie	Marquez	Alliance of Automobile Manufacturers
Ed	Martin	NM State Land Office

First Name	Last Name	Organization
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Colin	Messer	Clean Cities New Mexico
Amy	Miller	The Nature Conservancy
Michael	Miller	NM Permian Basin Petroleum Association
Rhonda	Mitchell	Tri-State Generation & Transmission Association
Raymond	Mondragon	Eastern Plains Council of Governments
Patrick	O'Connell	PNM Resources
Patrick	Padilla	New Mexico Oil and Gas Association
Geoff	Peterson	The Center for Sustainable Community/Raton
Heidi	Pitts	NM Public Regulation Commission
John	Reynolds	NM Public Regulation Commission
Ed	Rougemont	NM Electric Corp.
Ruth	Sakya	Southwestern Public Service Company
Matthias	Sayer	EMNRD
Glenn	Schiffbauer	Santa Fe Green Chamber of Commerce
Gerges	Scott	Agenda Global
Jack	Sidler	NM Public Regulation Commission
Raj	Solomon	NM Public Regulation Commission
Amy	Stein	University of Florida Levin College of Law
Colleen	Summers	New Mexico Gas Company
Bernarr	Treat	Xcel Energy/SPS
Eletha	Trujillo	ECMD
Harold	Trujillo	EMNRD
Arvin	Trujillo	Arizona Public Service Co.
Erica	Velarde	Energy Conservation and Management Division
Srinivasa	Venigalla	Navajo Tribal Utility Authority
Regina	Wheeler	Sunpower by Positive Energy Solar
Barbara	Wickman	San Juan College
Jim	Winchester	IPANM
Julia	Wise	NM Economic Development Department
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