

# Energy Technology Overview, Glossary of Terms & Project/Policy/New Mexico Key Actors

We understand that the terminology and concepts relating to energy can be complex and overwhelming. Sovereign Energy created this Glossary of Terms as an effort to build energy literacy, allowing Tribal Nations and Indigenous communities to feel comfortable and confident in energy development dialogues. Through a deeper understanding of these terms, Tribes will be better able to conduct informed decision-making and lead the way toward a just, interdependent, and sustainable energy future.

## Energy Technology

**Biofuels:** Biofuels are fuels that are derived from Biomass. Examples include: ethanol, biodiesel, biogas, etc.

**Biomass:** Biomass is organic material that can be processed into biofuel to produce steam or electricity. Some types of Biomass can be used directly for this purpose as well.

**Community Solar:** A community solar project is a shared solar energy setup that can power multiple buildings in a local area.

**Concentrating Solar Power:** Concentrating Solar Power (CSP) is a solar power technology that uses mirrors to reflect and concentrate sunlight onto receivers as heat. The concentrated solar energy can be used to generate electricity.

**Fuel Cells:** A fuel cell is a system that converts the chemical energy of a fuel into direct electricity in a more efficient manner than regular batteries or gasoline generators. Hydrogen is the most common fuel used in these cells.

**Hydrogen Energy:** Hydrogen Energy is a type of energy system that uses hydrogen as fuel. Hydrogen is a cleaner fuel than gasoline and biofuels because it does not create any harmful byproducts.

**Hydropower:** Hydropower is the use of natural running water in electricity generation. The flow of water is used to run turbines and generators, creating electricity in the process.

**Geothermal Energy:** By digging deep underground, the natural heat of the Earth's core can be used to power steam turbines in Geothermal stations to produce electricity. This process is known as Geothermal Energy.

**Microgrids:** Microgrids are self-sustaining solar generation stations that can power multiple buildings, regardless of their main grid connection status. A microgrid is typically made up of a solar panel array, a battery storage system, and a power controller.

## Energy Technology

**Nuclear:** Nuclear Energy is the usage of Nuclear Fission to generate electricity. Radioactive compounds generate a lot of energy when they break down into non-radioactive elements, and this energy is harnessed in the form of steam to produce electricity.

**Solar PV:** Solar Photovoltaic (PV) is a technology for converting sunlight directly into electricity through the photovoltaic process, which is different from the CSP technology of generating electricity from Concentrated Solar Heat.

**Wind Power:** Wind power is the process of generating electricity by harnessing the power of strong winds to turn propeller blades. These blades are connected to a turbine, which converts this rotational energy into usable electricity.

## Glossary of Terms

**Distributed Energy Resource (DER):** Small-scale energy resources usually situated near sites of electricity use. Examples of DERs that can be installed include: rooftop solar photovoltaic units, wind generating units, and battery storage.

**Elective Power Distribution:** The final stage in the delivery of electricity.

**Elective Pay (often called "direct pay"):** The IRA allows for certain entities, including Federally recognized Tribal governments, their subdivisions, their agencies and Alaska Native Corporations, to be able to receive a payment equal to the full value of tax credits for building qualifying clean energy projects. Unlike competitive grant and loan programs, in which applicants may not receive an award, direct pay allows entities to get their payment if they meet the requirements for both direct pay and the underlying tax credit. Example: A federally recognized Tribe is planning to build a solar array to power their community center. Through direct pay, the tribe can get up to 30% of the capital cost back under the Investment Tax Credit. On top of that 30%, the Tribe may qualify for an additional 20% off the capital cost under the Low-Income Communities Bonus Credit program, if they apply for and receive an allocation under that program.

**Grid Modernization:** The process of updating and enhancing the electrical grid infrastructure to incorporate advanced technologies and practices, ensuring efficiency, reliability, and sustainability.

**Grid Redundancy:** The capacity of the electrical grid to maintain functionality and meet demand even when certain components or pathways fail, crucial for ensuring uninterrupted power supply.

**Grid Reliability:** The ability of the electrical grid to deliver consistent and high-quality power to consumers.

**Grid Resilience:** The ability of the electrical grid to withstand and recover from disruptions, including natural disasters, cyber-attacks, or physical damage.

**Generation & Transmission (G&T) Provider:** An entity responsible for both generating electricity and transmitting it through the grid to distribution points or end-users, with particular relevance to tribal energy projects seeking to integrate renewable generation and enhance energy self-sufficiency.

**Feeder:** A power line or circuit that carries electricity from a substation to distribution transformers or directly to consumers.

**Independent System Operator (ISO):** Control area operator responsible for the reliability of the electric grid. Their main objectives revolve around ensuring grid stability, overseeing energy transactions, and aiding market functionalities, usually within a singular state or localized area.

## Glossary of Terms

**Interconnection:** Interconnection refers to the process of physically and technically connecting energy generation sources to the electrical grid to facilitate the distribution and delivery of electricity.

**Investment Tax Credits:** Investment Tax Credits (ITCs) are tax incentives provided to investors to encourage investment in projects that contribute to specific policy goals, such as promoting clean energy production. These credits allow investors to offset a portion of their tax liability based on the amount invested in qualifying projects, thereby reducing the overall cost of investment and stimulating growth in renewable energy development.

**Inverter:** A device that converts direct current (DC) electricity generated by solar panels or other renewable sources into alternating current (AC) electricity suitable for use in the electrical grid.

**Kilowatt (kW):** A unit of energy measured in a thousand watts.

**Kilowatt Hour (kWh):** The delivery of a thousand watts of electricity in one hour.

**Megawatt (MW):** A unit of energy measured in one million watts.

**Megawatt Hour (MWh):** The delivery of one million watts of electricity in one hour.

**Nameplate Capacity:** Maximum output a generator can produce under specific conditions.

**Net-Metering:** Net metering policies allow utility customers with distributed on-site generation, such as rooftop solar panels, to offset the electricity they draw from the grid by selling excess power from their generation system back to the grid.

**Peak Load:** Maximum power demand within a specified period, typically a day or a year.

**Power Purchase Agreement (PPA):** Contract between an electricity generator and a purchaser, detailing terms of sale, price, and duration.

**Production Tax Credits:** Tax incentives are provided to renewable energy producers based on the amount of energy generated.

**Renewable Energy Credits (RECs):** Tradable or sellable certificates representing the environmental benefits of renewable energy generation.

**Substation:** Facility where electricity voltage is transformed, controlled, and distributed within an electrical grid.

**Transmission:** Process of transporting electricity over long distances from power plants to substations or distribution points.

**Regional Transmission Organization (RTO):** Manage electricity grids across multiple states, supervise regional wholesale electricity markets, and ensure reliability planning for their respective areas. Functionally, RTOs enable electric utilities to share resources, optimizing the utilization of the cheapest, cleanest, and most efficient energy sources available.

**Renewable Energy Generation:** Production of electricity from sustainable, replenishable energy sources such as wind, solar, hydro, or biomass.

## Project Key Actors

**Project Company:** Legal entity that owns the project, also called a special purpose entity.

**Resource/Landowner:** Legal and/or beneficial owner of land and natural resources.

**Sponsor/Developer:** Organizes all of the other parties and typically controls project development. Makes an equity investment in the company or other entity that owns the project.

**EPC Contractor:** The Construction contractor provides the design, engineering, and construction of the project.

**Operator:** Provides the day-to-day O&M of the project.

**Feedstock Supplier:** Provides the supply of feedstock (i.e., energy, raw materials) to the project (e.g., for a power plant, the feedstock supplier will supply fuel).

**Product Off-taker:** Generally enters into a long-term agreement with the project company for the purchase of all the energy.

**Lender:** A single financial institution or a group of financial institutions that provides a loan to the project company to develop and construct the project and that takes a security interest in all of the project assets.

**Tribal Host:** Primary sovereign of the project site.

## Policy Key Actors

### Utilities

**Investor-Owned Utilities (IOUs):** IOUs are utilities owned by private investors or shareholders. They operate for-profit and are regulated by state utility commissions. IOUs provide electricity, natural gas, water, or other services to customers within a specific geographic area, aiming to maximize shareholder value while meeting regulatory requirements and customer needs.

**Rural Electric Distribution Cooperatives:** Rural electric distribution cooperatives are non-profit utilities owned and operated by the consumers they serve, typically located in rural areas. These cooperatives provide electricity to rural communities and are governed by a board of directors elected by their members. They focus on serving the needs of their members and promoting economic development in rural regions.

**Tribal Utilities:** Tribal utilities are entities owned and operated by federally recognized tribes or tribal organizations to provide essential utility services, such as electricity, water, or wastewater treatment, to tribal lands and communities. These utilities play a crucial role in promoting tribal self-sufficiency, economic development, and sovereignty.

**Municipal Utilities:** Municipal utilities are publicly-owned entities operated by local governments, such as cities or towns, to provide essential utility services to residents within their jurisdiction. Municipal utilities may offer electricity, water, wastewater treatment, or other services and are accountable to elected officials or appointed boards responsible for governing the municipality.

**Public Power Districts:** Public power districts are non-profit, government-owned utilities responsible for generating, transmitting, and distributing electricity within a specific geographic area, often serving rural or suburban communities. These districts are governed by publicly elected boards or appointed officials and prioritize providing reliable and affordable electricity to their customers.



## Regulatory Bodies

**Environmental Protection Agency (EPA):** Regulates environmental aspects of renewable energy projects, including air and water quality standards, emissions regulations, and environmental impact assessments.

**Federal Energy Regulatory Commission (FERC):** An independent body tasked with overseeing the cross-state transportation of electricity, natural gas, and oil. Additionally, FERC evaluates plans for constructing liquefied natural gas (LNG) terminals and interstate natural gas pipelines, along with issuing licenses for hydropower projects.

**North American Electric Reliability Corporation (NERC):** Sets and enforces reliability standards for the North American bulk power system, including requirements for renewable energy integration and grid stability.

**Bureau of Ocean Energy Management (BOEM):** Manages offshore renewable energy development in federal waters, including leasing and permitting for offshore wind, wave, and tidal energy projects.

**State Public Utility Commissions (PUCs):** State PUCs regulate utilities within their respective jurisdictions, including electricity, natural gas, water, and sometimes telecommunications. They oversee various aspects of renewable energy, such as interconnection standards, renewable portfolio standards (RPS), net metering programs, and utility rate structures related to renewable energy integration. PUCs also handle complaints, approve utility investments, and set policies to promote renewable energy development and grid modernization at the state level.

## Government Agencies

**Department of Energy (DOE):** Oversees energy policy, research, and development initiatives, including programs focused on advancing renewable energy technologies, improving energy efficiency, and promoting clean energy adoption.

**Department of Energy (DOE) Office of Indian Energy:** The DOE Office of Indian Energy supports tribal energy development by providing technical assistance, funding, and resources to tribes, aiming to enhance economic development, improve energy access, and build energy self-sufficiency in tribal lands.

**Department of Agriculture (USDA):** Supports renewable energy development in rural areas through programs like the Rural Energy for America Program (REAP) and provides grants, loans, and technical assistance for bioenergy, biomass, and other renewable projects.

**Department of the Interior (DOI):** Manages federal lands and resources, including permitting and leasing for renewable energy projects on public lands and offshore areas through agencies such as the Bureau of Land Management (BLM) and Bureau of Ocean Energy Management (BOEM).

## Federally Funded Research and Development Centers (FFRDCs)

**Sandia National Laboratories (SNL):** Conducts research and development in various areas, including nuclear energy, renewable energy, cybersecurity, and national security.

**Lawrence Livermore National Laboratory (LLNL):** Focuses on research in nuclear fusion, renewable energy, climate change, and national security.

**Los Alamos National Laboratory (LANL):** Conducts research in renewable energy, including solar, wind, and bioenergy, as well as nuclear energy and national security.

**Oak Ridge National Laboratory (ORNL):** Conducts research in renewable energy, including bioenergy, advanced materials for energy applications, and energy efficiency technologies.

**Pacific Northwest National Laboratory (PNNL):** Focuses on research in renewable energy, energy storage, grid modernization, and environmental sustainability.

**National Renewable Energy Laboratory (NREL):** Advances renewable energy and energy efficiency technologies through research, analysis, testing, and deployment support, aiming to accelerate the transition to a sustainable energy future.

## New Mexico Key Actors

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