

**MINUTES
of the
THIRD MEETING
of the
RADIOACTIVE AND HAZARDOUS MATERIALS COMMITTEE**

**August 15, 2011
Red River Conference Center
Red River, New Mexico**

The third meeting of the Radioactive and Hazardous Materials Committee was called to order at 10:10 a.m. by Senator Richard C. Martinez, vice chair, on Monday, August 15, 2011, at the Red River Conference Center.

Present

Sen. Richard C. Martinez, Vice Chair
Rep. Thomas A. Anderson
Sen. Vernon D. Asbill
Sen. Carroll H. Leavell
Sen. John Pinto
Rep. Jim R. Trujillo

Absent

Rep. Antonio Lujan, Chair
Rep. Cathrynn N. Brown
Rep. Brian F. Egolf, Jr.
Sen. Stephen H. Fischmann
Rep. Shirley A. Tyler
Sen. David Ulibarri

Advisory Members

Rep. Eliseo Lee Alcon
Rep. Jim Hall
Sen. William H. Payne
Sen. Nancy Rodriguez
Rep. Nick L. Salazar

Sen. Rod Adair
Rep. Donald E. Bratton
Sen. William F. Burt
Sen. Eric G. Griego
Sen. Gay G. Kernan
Sen. Lynda M. Lovejoy
Sen. Bernadette M. Sanchez

Guest Legislator

Rep. William "Bill" J. Gray

Staff

Gordon Meeks
Renée Gregorio

Guests

The guest list is in the meeting file.

Handouts

Handouts and other written testimony are in the meeting file.

Monday, August 15

Renewable Portfolio Standards Status Report

Roy E. Stephenson, director of the Utility Division at the Public Regulation Commission (PRC), spoke to the committee about the implementation of the Renewable Energy Act, amendments to that act and the political environment for regulation of electric utilities.

He said that, in general, the history of regulation of the electric utility industry has emphasized the need for reliability of electric power and affordability. In recent years, diversity of generation sources has come into the mix due to public support for alternative, cleaner fuel and the perception of "peak oil". Therefore, states have enacted laws requiring utilities to obtain electric power from a mixture of alternative generation sources. The legislature enacted the Renewable Energy Act to include a renewable portfolio standard, like many other states have done, and which Congress is considering.

Many states also require integrated resource plans (IRPs) from their utilities, which in New Mexico means that all utilities must have five-year IRPs and offer choices to the public to participate in these plans. The IRPs lay out the utilities' source of power and expectations for rates to the consumer.

Mr. Stephenson said that the priorities for utilities are regulation, reliability, affordability and diversity. However, these priorities do not all come in the same package, he said. To achieve one priority might mean spending more money on other priorities. This is a challenge for all utilities and their regulators. Mr. Stephenson said he would be meeting with other state and federal representatives later this year to hear about strategies and issues related to achieving this goal.

Renewable energy sources are touted by their proponents because many would like the United States to be less dependent on foreign sources of energy. There is a desire to use native resources. Secondly, every form of fossil fuel combustion has consequences, such as tailings, the effects of coal mining, smoke in the atmosphere and other environmental consequences.

A diversified portfolio is necessary to achieve those goals. The PRC is struggling with diversity, Mr. Stephenson said. Coal is cheap and abundant, but burning it produces smoke. Natural gas is available, but it costs more. Furthermore, all these sources must be integrated into the grid. The natural gas outage in February this year demonstrated that electric and natural gas utilities are mutually dependent. Natural gas requires electricity to operate. Interdependence drives management of the entire electric utility system.

The Renewable Energy Act sets out broad policy objectives, and the PRC enacts rules to ensure that this and other laws are carried out. The statute says the renewable energy portfolio shall be diversified, and the PRC rules go more deeply into how the portfolio needs to be diversified. Each power source has its own advantages and costs, depending on the area of the state. Wind resources are readily available in some places, and solar is abundant in most places.

Geothermal energy has not yet been fully explored, but it may be promising. In addition, there is some ability to use biomass generation, including woody biomass, dairy waste and agricultural waste. Some advocates think landfill and sewer gas from human waste might also be added to the mix.

Many other states with renewable energy portfolio standards do not have the resources that New Mexico does. How to connect generation and consumption is an issue nationwide, Mr. Stephenson said.

New Mexico is number one in terms of distributed generation, and the state has standards that are among the highest in the country. These standards include filing requirements and the submittal of annual reports by the utilities. Mr. Stephenson and Leslie Padilla clarified program filings, what they look like, the time frame for the filings and the status of one pending filing from last year by Public Service Company of New Mexico (PNM), filed on July 1.

Mr. Stephenson said that the PRC obtained federal funding to pay for a new unit at the PRC dedicated to efficiency and renewable energy. He said that PNM's filing indicates that it satisfied the current renewable energy portfolio standard requirement for 10% renewables. Diversity requirements in the law, however, are a real challenge for the utilities. Biomass, for example, is hard to derive energy from because there are no sources out there selling this sort of energy.

Ms. Padilla said that El Paso Electric has proposed projects that by 2012 will be 60% solar. In order to achieve these targets, she said, utilities need to be more creative and less conventional.

All utilities are required by statute to offer voluntary renewable energy purchase programs to their customers. All new industries take a while to grow due to economies of scale. New Mexico has been viewed as a good place for renewable energy companies to relocate. For example, Spain, a world leader in solar energy, has shown interest in partnering with New Mexico companies.

PNM's filing is a good example of regulatory difficulties, the presenters said. Renewable energy certificates are regulatory devices to meet generation requirements of a certain amount of electricity from renewable sources. Some utilities have more certificates than they need. Southwest Public Service (SPS), for example, cannot just sell service to PNM because SPS is in a different grid and energy transport is not possible. SPS proposed to sell certificates to PNM. Some argue that the statute allows it, even across state lines, as long as there is a market. The statute does say that if energy is generated and someone uses it, the energy can be counted. There is an agency that tracks such things, said Mr. Stephenson.

He also explained the reasonable cost threshold, which says that a utility is not required to generate energy or purchase it if it exceeds a "reasonable" threshold. But the question then becomes, what is reasonable? The PRC defines "fair, just and reasonable" to make sure there is

no duplication or waste. Energy generation is encouraged, but it also must be marketable.

He mentioned several examples, such as the solar projects on the outskirts of Taos at the University of New Mexico campus and the Kit Carson Electric Cooperative photovoltaic system. Tax credits are available to individuals but not to governmental entities such as a university. Another entity gets the tax credit, such as the manufacturer.

PNM's 2009 plan has projects sited next to power stations where there is backup capacity when the sun goes behind a cloud or the wind dies down. PNM has looked at where the need is and has plans for the renewable facility to go where it is needed. If a utility built it, it can benefit. Mr. Stephenson explained that the PRC has to balance the interests of the investors and the ratepayers.

Mike D'Antonio, representing PNM, asked to speak and explained that utilities may not be creative or inventive because there is risk associated with getting approved by the PRC. Everyone pays a premium for that risk, he said.

The presenters described several aspects of renewable generation constraints involving intermittency and costs that have to be factored into decisions of utilities and the PRC.

Questions and discussion by the committee included:

- calculation of megawatts from wind;
- the disadvantages of wind turbines, including noise, damage to birds and bats, and load versus wind slide;
- energy demand as cyclical;
- integration of variability and lack of storage;
- need for systems that are quick to ramp up and down;
- calculation of a reasonable cost threshold for each technology;
- hidden costs;
- net metering;
- energy efficiency;
- load management;
- demand management;
- decoupling rates from the direct costs of providing power;
- energy savings mandates;
- PRC rules versus statutes;
- the Public Utility Act provision that grants fining authority to the PRC;
- source of the renewable energy portfolio standard;
- consideration of nuclear energy as a renewable energy source;
- exemption of local government-owned electric utilities from the law (Renewable Energy Act);
- how the renewable energy portfolio standard numbers were decided upon;
- carve-outs for specific kinds of renewables;

- the presence of geothermal and biomass energy on federal land in this state and help in developing those resources;
- tax subsidies from the federal government compared to the state;
- the provision in statute that says if a utility cannot meet the target because of cost, it is forgiven;
- billing everyone a fair price instead of rolling it into a fixed cost;
- location of the independent grids;
- overabundance of cheap natural gas in the state and natural gas generation of electricity; and
- reconsideration of renewable energy portfolio standard percentages.

Chevron Solar Power Plant

Margaret Lejuste, policy government and policy affairs for Chevron, and John Espinoza, special projects manager for the Questa mine, spoke about the Questa solar project, a collaboration between Chevron Mining Incorporated and Chevron Technology Ventures. During this five-year testing period, the project is using concentrating photovoltaic power (CPV) to provide an in-depth understanding of the technology and its benefits, Ms. Lejuste explained. She added that northern New Mexico is a unique solar resource with over 300 days of concentrated sunshine. She said that the site being used for the project is on brown fields, or previously impacted lands, rather than on pristine lands.

Mr. Espinoza reiterated that one of the benefits of the project is the reclaiming of the tailings facility. He said that the project participants are evaluating how deep a cover needs to be on top of the tailings for vegetation to grow, and they will assess the effectiveness of various levels for post-mining remediation. He said the way the towers work is much like a sunflower in that the towers track the sun and angle up and down to find the sun to collect energy. He mentioned the presence of safeguards, including fencing, video cameras and sensors on the monitoring system. The Questa project is one of the largest CPV facilities in the world, covering about 20 acres and including 173 solar trackers that generate one megawatt of electricity, which is sold to Kit Carson Electric Cooperative and distributed throughout Questa and other areas of the state.

Ms. Lejuste stressed the importance of community involvement, saying that many town hall meetings were held to get public input and to meet with officials and key stakeholders to address concerns regarding visibility and security of the equipment. She added that although the trackers are 18 feet by 20 feet in size, they cannot be seen from Highway 522 except in one spot. She also stated that the project has provided up to 100 local jobs during construction, mostly to former mineworkers. The project was completed without incident or injury, she stated.

Questions and discussion by committee members addressed:

- the return on investment received by selling to Kit Carson Electric Cooperative and Kit Carson being able to meet its requirements for solar energy;
- space needed for the movement of the panels as they track the sun;

- how to generate economic development in the area, especially as related to what one megawatt might be worth;
- total output being one megawatt, enough to power an area the size of Questa;
- that the Questa mine still employs 170 people and is in operation in a very limited way; and
- whether there is a tax incentive for Chevron.

Cimarron Utility Scale Solar Array

Rhonda Mitchell, senior governmental relations adviser for the Tri-State Generation and Transmission Association, Incorporated (Tri-State), said that the company is a nonprofit, wholesale power supplier owned by 44 electric cooperatives and public power districts serving approximately 1.5 million people in Wyoming, Nebraska, Colorado and New Mexico. She said that Tri-State does not own the Cimarron solar facility, but purchases power agreements and transmission from it. Tri-State owns and maintains over 5,000 miles of transmission lines, she stated.

Ms. Mitchell reviewed the typical daily consumption patterns, which show the morning and evening load pick-up times, as well as the daily generation patterns, which show that coal is the most heavily loaded source. She said that generation varies, of course, on cloudy days. It is the variation, she added, that is difficult to track and plan for. (See the handout for specific graphs.)

Ms. Mitchell reviewed the renewable energy portfolio standard mandates that apply to Colorado and New Mexico, including that there be 5% renewable energy sources in place by 2015 and 10% by 2020. She explained that the cooperative model is different in that there are no shareholders; with Tri-State, costs are passed on to its member-owners. She added that Tri-State ranked number six nationally in the Solar Electric Power Association's utility solar rankings for its 30-megawatt generation and was the highest ranked cooperative utility. She also said that Kit Carson Electric Cooperative in Taos ranked number two nationally in solar production.

In conclusion, Ms. Mitchell summarized that photovoltaic power is a credible resource, but not inexpensive, although prices should continue to drop. She said that two full-time employees operate the Cimarron facility and that there were between 140 and 160 people employed during the construction phase of the project.

Questions and discussion by committee members addressed:

- how to integrate renewable energy into the existing energy system, whose baseload is coal;
- locations of gas and oil generating plants in Lordsburg and in Colorado;
- clarification of the megawatts generated in total from a variety of sources (4,000) versus what is generated from solar itself (30);
- whether the small local cooperatives are equal owners with Tri-State;
- how decisions get made at Tri-State, which is through its 44-member board, with each owner having a member on the board;

- the need for new technology for storage as it is currently limited;
- how power is regulated within all the spikes and dips of consumption, which is that the load is constantly monitored and coal plants meet the majority of the demand; when loads spike, natural gas plants are fired up or other power is purchased; and
- power regulation depends on the time of year, and utilities look at forecasts and weather and have automatic generation control that works to meet the need.

The committee approved the minutes from the July 18 meeting.

The Red River Story

Lee Bergstedt, aquatic ecologist at GEI Consultants, Incorporated, gave a history of the biological monitoring of Red River, which began in 1997 and is still in place. Mr. Bergstedt said that, due to concerns over mining operations and rock pile effects on the aquatic community, data have been collected over three time periods: baseline conditions, pre-1966; mining operation conditions, 1966-1996; and present conditions, 1997-present. He indicated that most problems were from excess sediment from many sources but were mostly related to hydrothermal scarring along the river, which caused poor water quality. In addition, baseline data collected showed that these impacts were present prior to open pit mining in the area and also occurred in areas upstream of the mine. He said that there were no measurable impacts of mining on the ability of the Red River to support aquatic organisms. (See handout for the specific data collected over time.)

Mr. Bergstedt added that toxicity tests were conducted after rain events. There has been a decline in fish populations above town and around Capulin Canyon, but there has been an increase in population downstream. He said that, historically, fish populations are good upstream of town, then hydrothermal scarring causes a decrease in population, then the population increases again. As with the area around Hottentot drainage (as shown in the photograph in the handout), the amount of mud and resultant poor water quality caused by the sediment dumped into the river affected the fish population two months after the rain event. This was in 2007, but Mr. Bergstedt reported comebacks of fish populations in 2008 and 2009, then a stabilizing pattern, even though the habitat is not as strong as before.

To bring the story to the present, Mr. Bergstedt stated that since 1997, Red River has a population of brown trout that is sustaining; rainbow trout are still stocked; and benthic invertebrate species are present. He added that what limits the river from being able to clear itself is the continuance of mudslides from scars. He concluded that naturally occurring events are the driver in the river's habitat and that all data collected since 1997 are available through Chevron's annual mining reports.

Questions and discussion by committee members addressed:

- the definition of benthic invertebrates;
- the water's murkiness possibly being caused by the Bitter Creek drain scars;
- the definition of hydrothermal scars and clarification that the scars are not due to mining;

- the depth of the river; and
- determining the number of fish per mile through three pass removal methods.

Renewable Energy Technologies

Henry Herman, chief executive officer for Jetstream Wind, Incorporated (JWI), a Santa Fe-based company dedicated to providing innovative and effective power production solutions for global clean energy, spoke to the committee about JWI's various projects and use of technologies. He said that JWI has developed zero-emission electric, fuel and desalination systems using solar and hydrogen technology, which generates and stores electricity at prices that are competitive with coal-based systems.

He described JWI's concentrating solar power (CSP) dish as the smallest, most powerful dish in the world, differing from other dishes in that it is not only cheaper, but it can be assembled in 30 minutes or less. He added that JWI is creating a version of the CSP dish that involves a solar pyrolysis process, which generates pure hydrogen using no electricity and provides clean renewable fuel completely from the sun's heat.

Mr. Herman described the process by which water can be broken down by the processes of electrolysis and pyrolysis to create hydrogen. (See handout for details of this process.) As Mr. Herman further explained, plasma that is renewably generated to break apart water can be achieved almost anywhere, and JWI has figured out a means to create renewable hydrogen from any type of water. The plasma arc reactor separates water into hydrogen and oxygen, with minimal power requirements as compared to hydrogen output, he said. He added that this process does not require high electricity rates, storage or transportation and can be accomplished in any gas station in America. Through this process, salt water can be desalinated 10 times faster off renewable energy for free. He pointed out that New Mexico has one of the largest saline bases in the country and that the state could generate as much fresh water as it wants from renewable energy for free. He stressed that even dirt or garbage could be thrown into the tank and plasma would break it down, causing hydrogen and oxygen to rise to the top, thus creating water from dirt and garbage.

Mr. Herman also spoke about JWI's visit to Lawrence Livermore National Laboratory (LLNL), where a process is being developed that uses high-energy lasers to vaporize nuclear materials at fusion temperatures. In theory, what this process could be used for is to create a nearly endless supply of energy while at the same time reducing the stockpile of nuclear waste, he said.

Mr. Herman said that a public-private partnership exists between JWI and the laser inertial fusion energy program (LIFE) at LLNL and that JWI could help to accelerate the time line. Since New Mexico has the Waste Isolation Pilot Plant facility and is already storing nuclear waste, why not start destroying it? He pointed out that the state could have an alternate revenue stream at a very high profit margin.

Questions and discussion by committee members addressed:

- storing hydrogen to provide continual power in a 100% emission-free plant;
- JWI's involvement in the LIFE program is that hydrogen is generated by JWI's dish to power the lasers;
- scalability and the cost of desalinization; and
- that even produced water from oil and gas can be treated when using plasma technology.

Adjournment

Before wrapping up, Senator Martinez alerted the committee members to a letter in their packets from Los Alamos National Laboratory that answers many of their questions from the July meeting. There being no further business, the committee adjourned at 3:10 p.m.