**MINUTES**
**of the**
**FOURTH MEETING**
**of the**
**SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE**

**September 30, 2009**
**Room 322, State Capitol**
**Santa Fe**

**October 1, 2009**
**Fuller Lodge**
**Los Alamos**

The fourth meeting of the Science, Technology and Telecommunications Committee was called to order at 10:16 a.m. on Wednesday, September 30, 2009, by Senator Stephen H. Fischmann, vice chair, in Room 322 of the State Capitol in Santa Fe.

| **Present** | **Absent** |
|---|---|
| Rep. Roberto "Bobby" J. Gonzales, Chair (Oct. 1) | Sen. Kent L. Cravens |
| Sen. Stephen H. Fischmann, Vice Chair | Sen. Phil A. Griego |
| Rep. Janice E. Arnold-Jones (Sept. 30) | Sen. Linda M. Lopez |
| Sen. Dede Feldman | |
| Sen. Vernon D. Asbill | |
| Rep. Jane E. Powdrell-Culbert (Sept. 30) | |
| Rep. Debbie A. Rodella | |
| Rep. Nick L. Salazar | |
| Rep. Luciano "Lucky" Varela | |
| Rep. Richard D. Vigil (Sept. 30) | |

| **Advisory Members** | |
|---|---|
| Sen. Carlos R. Cisneros | Sen. Mark Boitano |
| Rep. Karen E. Giannini | Rep. Kathy A. McCoy |
| Rep. Ben Lujan | Sen. William H. Payne |
| Sen. Richard C. Martinez (Sept. 30) | Sen. John M. Sapien |
| Rep. Danice Picraux | |
| Rep. Don L. Tripp | |
| Rep. Jeannette O. Wallace | |

(Attendance dates are noted for those members not present for the entire meeting.)

**Guests**

The guest list is in the original meeting file.

**Staff**

Gordon Meeks
Jeret Fleetwood

**Wednesday, September 30**

**Transmission Issues for Green Energy**

Wayne Shirley of the Regulatory Assistance Project provided the committee with an overview of electricity transmission issues. He began by providing the committee with a brief discussion about the Regulatory Assistance Project, then went on to provide the committee with a brief history of energy regulation by states. Mr. Shirley emphasized that the business model for utilities that has developed over the past few decades is less viable in today's rapidly evolving energy market. Among the obstacles confronting the ability of utilities to adapt to today's changing market is the lack of transmission lines to deliver power from newer generation sites, such as wind and solar farms, to customers hundreds of miles away. He provided the committee with maps indicating planned transmission line projects, but noted that none of them are under construction and they still face some regulatory obstacles. Mr. Shirley went on to discuss how state regulations work either to encourage or hinder transmission projects. He also pointed out that while New Mexico's location and abundant wind and solar resources help make the state be in a good position to be able to benefit from the emerging renewable energy market, regulatory issues could still hinder those efforts.

Questions and comments included:

- the impact of plug-in electric cars on electrical system loads;
- the demands placed by new and different devices on existing power demand patterns;
- the anticipated increase in demand for electricity and proposed strategies for meeting the increased demand;
- the idea that plug-in electric vehicles can be charged during evening hours, when load demands are relatively low, but power generated by wind energy seems to reach its peak;
- the Tres Amigas project, allowing the three power grids in the U.S., which currently operate on different voltage standards, potentially to trade power with one another;
- rate design issue differences between power generation and power transmission;
- the danger of overloading existing transmission lines in order to export power versus the initial costs of building too much transmission capacity and saddling consumers with the resulting costs;
- research that indicates that energy conservation and efficiency can save large amounts of energy and the reluctance of utility companies to embrace conservation efforts due to their dependence on older power generation business models;
- compatibility issues between AC and DC energy;

- the likelihood that the eastern half of the U.S. will begin to look toward western states for energy transmission;
- cost allocation issues associated with interstate power transmission;
- the difficulty of utilities to evolve into a new business model when consumers tend not to see long-term value in rate increases; and
- de-coupling of utility revenues.

**Solar Power Issues**

Jim Shadalov, vice president for business development at eSolar, provided the committee with an overview of eSolar's solar energy generation pilot project in Lancaster, California, and its generation project for El Paso Electric. He explained that eSolar employs solar technology that utilizes fields of precisely aimed solar panels to heat water contained in a centrally located tower to temperatures hot enough to generate steam, which in turn drives a turbine capable of generating significant amounts of electricity. Mr. Shadalov noted that recent advances in the software responsible for aiming the solar panels, coupled with some reduction to the size of the mirrors aimed at the steam tower, have made the technology much more cost-effective. He went on to indicate that the project involving El Paso Electric would be capable of producing 92 megawatts of electricity once it reaches full capacity in 2011.

Questions and comments included:

- the maintenance required to keep the mirrors in working order;
- the vulnerability of the solar panels to lightning and hail;
- locations of the manufacturing centers for the turbine, solar panels and steam tower;
- storage, reuse and eventual disposal of the water used in the steam towers;
- that wells drilled to provide water for the steam towers are existing Dona Ana county wells;
- steam tower temperature logistics;
- employment of New Mexicans to construct and operate the facility;
- threats to wildlife from the mirrors and the steam tower; and
- long-term plans for eSolar.

**Information Technology Transformation in Data Collection and Communications for Agriculture**

Lesa A. Medina, computer operations manager for the Information Technology and Communications Division of the New Mexico Department of Agriculture, provided the committee with an update regarding utilization of advanced technologies by the department to manage New Mexico's agricultural industry. She began by providing the committee with an overview of the New Mexico Department of Agriculture's mission and methods the department has employed to take advantage of information technology funds. For example, she highlighted the department's New Mexico Ag/Livestock Incident Response Team (NM-ALIRT), which has helped train and equip veterinarians to identify and respond to large or suspicious livestock losses occurring in New Mexico.

Ms. Medina went on to provide the committee with a demonstration of the NM-ALIRT program, emphasizing the various reporting requirements and subsequent availability of detailed livestock reports to subscribers to the program. She also pointed out how valuable constantly updated information is to New Mexico's livestock industry.

Questions and comments included:

- problems associated with low-octane gasoline being sold in Rio Arriba County;
- the relationship between the New Mexico Department of Agriculture and the New Mexico State University (NMSU) Board of Regents;
- the administrative structure of the New Mexico Department of Agriculture;
- budgetary authority for the department;
- apparent changes in focus of the department from agricultural issues to research and development; and
- potential problems associated with NMSU presenting the department's budget without fully supporting its mission.

**Cental Electronic Records Repository**

Sandra Jaramillo, state records administrator at the State Records Center and Archives (SRCA), and Angela C. Lucero, Records Management Division director at SRCA, provided the committee with testimony regarding challenges faced, and new initiatives proposed, by the SRCA. Ms. Jaramillo began by providing the committee with an overview of the SRCA's mission and developing challenges.

Questions and comments included:

- potential difficulties posed by constantly evolving document management programs and their growing compatibility issues with older programs;
- the use of microfilm technology and migration of paper documents to microfilm;
- the incompatibility of newer and older microfilm formats;
- document management software capabilities;
- plans to move most SRCA documents to an enterprise content management solution; and
- the investigation of document management strategies employed by large corporations.

**Thursday, October 1**

Mike Wheeler, chair of the Los Alamos County Commission, welcomed committee members to Los Alamos and thanked them for coming. He also discussed the importance of the committee's mission as it relates to Los Alamos and the Los Alamos National Laboratory (LANL).

Juan Griego of the National Nuclear Safety Administration also welcomed the committee to Los Alamos. He pointed out that New Mexico's national laboratories play a critical role in the

national security community's ongoing mission of ensuring the country's safety from all types of threats.

Members of the committee introduced themselves to the audience.

The superintendent of Los Alamos Public Schools introduced himself to the committee and also thanked members for coming to Los Alamos.

**Global Warming**

Duncan McBranch, principal deputy associate director for the Science, Technology and Engineering Division at LANL, provided the committee with testimony regarding global warming. He explained that the study of climate change involves several interrelated disciplines and that there are some policy implications to the research being conduced by LANL.

First, Mr. McBranch provided the committee with an update on the overall status of climate change, explaining that while the subject of global warming is politically volatile, research does seem to indicate that human emissions, while accounting for a small percentage of overall greenhouse gas production, appear to be tipping the balance of atmospheric gases toward a mixture that encourages increased temperatures. He went on to note that one of the difficulties facing researchers is pinpointing exactly who is responsible for emissions and how emissions in one area can affect others. For example, Mr. McBranch noted that while it is relatively easy to see South Africa's emissions against the backdrop of the rest of the African continent, which is much less urbanized, it is much tougher to track emissions in larger, more densely populated areas.

Mr. McBranch went on to discuss other issues associated with global warming, such as ocean Ph levels, which he explained seem to be linked to carbon dioxide levels in the atmosphere, and soil microbiology. He also noted that LANL has begun to use computer modeling to better understand driving factors in climate change, such as ocean temperatures and sea ice levels.

Finally, Mr. McBranch discussed electric grid modeling, explaining that coal-fired electric plants account for a considerable amount of carbon dioxide emissions. He noted that shifting to renewable resources, while serving to reduce carbon dioxide emissions, will eventually require a fundamental redesign of the electric grid. Mr. McBranch pointed out that such a thing is at least possible in the U.S., but that other nations that cannot adapt will continue to rely on coal as the cheapest means of generating power and thus drive climate change.

Questions and comments included:

- the availability of federal stimulus funds for cleanup of contaminated areas;
- surface water temperature models;
- short- and long-term increases in sea level and long-term projections for sea level increase; and

- the association between power generation plants in northwestern New Mexico and increased carbon dioxide levels in the area.

**LANL Economic and Work Force Development**

Steve Girrens, division director for the Technology Transfer Division at LANL, and Kurt Steinhaus, office leader for the Community Programs Office at LANL, provided the committee with an overview of the economic and work force development initiatives in which the laboratory is involved. Mr. Girrens explained that by encouraging economic and work force development in New Mexico, the laboratory continues to work toward helping New Mexico establish sustainable economic growth. He began by explaining that LANL has devoted considerable funding to building a science and technology pipeline to employment for New Mexico students. Mr. Girrens went on to list some of the educational partnerships LANL has entered into, such as Santa Fe Community College, New Mexico Highlands University and Northern New Mexico College. He also went into more detail about the pipeline to employment, explaining that the laboratory offers science and technology internships at high school, undergraduate and graduate student levels. Mr. Girrens pointed out that LANL employees also volunteer at area schools to help foster interest in science and technology. He also discussed the Math and Science Academy, citing it as a success story that can be duplicated across New Mexico.

Mr. Steinhaus provided the committee with an overview of Northern New Mexico Connect, which he called LANL's principal economic development investment. He explained that Northern New Mexico Connect helps New Mexico businesses grow by providing coaching, networking, research, technical assistance and investment activities. Mr. Steinhaus went on to note that Northern New Mexico Connect also makes use of existing LANL programs, such as the Venture Acceleration Fund, Springboard and the New Mexico Small Business Assistance program, to further support New Mexico businesses. He also provided the committee with a number of anecdotes to show that the program is already reaping positive results.

Questions and comments included:

- the use of distance learning programs to expand the reach of math and science programs;
- the time frame for licensing agreements of LANL technology;
- that LANL usually partners with small companies to license their technology;
- possible reasons for dramatic improvements in Native American students' math and science test scores;
- the application of technology transfer models to education;
- tracking of students involved in LANL education programs and the likelihood that they will work at LANL in the future; and
- how technology transfer companies find out about licensing partnerships with the laboratory.

**Los Alamos Energy Programs**

Terry Wallace, principal associate director of science, technology and engineering for LANL, said that ensuring that America has a reliable, affordable and clean energy supply is critical to national security. He continued to say that meeting this challenge in the face of growing global energy demand and climate change will require dramatic advances in science, technology and engineering. LANL is a central player in this scenario, according to Dr. Wallace, and Los Alamos will provide science, technology and engineering leadership for highly innovative solutions to meet the nation's energy needs.

Dr. Wallace discussed the energy security challenge, stressing the importance of energy to American society and its economy (the U.S. uses one-fifth of the world's energy). He said that the U.S. imports 70% of its oil products today and the country's energy supply is susceptible to price volatility and global politics. Renewable energy is pivotal to ensure the United States' secure access to energy in the years ahead. Dr. Wallace discussed nuclear, wind and solar energy sources, saying that Los Alamos has a role to play in developing these sources in New Mexico. He said that LANL is looking at advanced systems to provide energy for transportation and the energy grid as well. The resources at LANL are extensive, such as computer modeling systems, research facilities and general expertise. Dr. Wallace said there are three principal elements to the Los Alamos energy security programs, including: sustainable nuclear energy; materials and concepts for clean energy; and mitigating impacts of global energy demand growth.

The discussion addressed:

- coal as the main source of electric generation energy for the foreseeable future;
- the quadrupling of auto energy use in China since 1995;
- the reconciliation of needs to reduce carbon while maintaining the economy;
- the connection between LANL research and development with other countries that are driving pollution and the world economy;
- contamination of the United States with mercury by Chinese coal-fired power plants, which are added at one new one per week;
- India's role in adding to the world's greenhouse gases;
- progress in developing small, modular nuclear reactors;
- nuclear waste disposal and reprocessing;
- holistic solutions;
- research in electric storage for alternatives to lithium; and
- potential cleanup technology for mercury fallout.

**Energy Transmission Research**

Loren Toole, technical staff member for energy and infrastructure analysis at LANL, and Bill Tumas, program director for applied energy programs at LANL, provided the committee with testimony regarding energy transmission, particularly concerning integration of renewable energy sources into the electric grid. They explained that energy demands are expected to increase dramatically over the next 50 years and meeting those demands will require a portfolio of energy options. Mr. Toole and Mr. Tumas went on to note that LANL is conducting research

to address transmission issues and energy storage issues raised by emerging energy generation technologies.

Mr. Toole went on to discuss work that LANL has done on infrastructure modeling, noting that a scalable transmission grid model has been created. He explained that the scalable model enables researchers to study how changes on regional levels affect the national power grid. Mr. Toole also discussed renewable energy projects LANL is involved with at the Y-Bar Ranch north of El Paso, Texas.

Questions and comments included:

- the loss of energy that occurs from transmission of it from one place to another;
- short-term solutions for transmitting renewable energy generated in rural areas to urban customers;
- the tendency of utility companies to build extra turbines to meet peak demands, rather than explore energy storage options;
- who will bear the costs of building new transmission lines; and
- problems presented by building transmission lines either around or through the vast amounts of public land in the west.

There being no further business, the committee adjourned at 1:15 p.m.