Monthly Public Meeting Notes

Accelerating the transition away from fossil fuels as we collaborate, cooperate and coordinate with climate crisis fighters in and around Santa Fe

Date: February 13, 2021
Place: via Zoom
Time: 10:00 am
Attendees: Robert Cordingley, facilitator; Paul Biderman, facilitator; Adam Wasserman, Arcelia Isais-Gastelum, Greg Sonnenfeld, Jack Kennison, Jean Darling, Jim Eagle, Joseph Maestas, Julia Ying, Nancy Singham, Reed Eckhardt, Dr. Steve Buelow, Barbara Sinha

Current Business

Team Progress Reports

Jim Eagle, **Climate Action Simulations Team** lead, has been thinking of a way to simulate what might happen at the United Nations Climate Change Conference (COP26) starting November 1, 2021, in Glasgow, Scotland.

Greg Sonnenfeld, **TRAC Team** lead, reported that he and Teresa are doing a deep analysis of the economic and greenhouse gas emissions aspects of community solar. They are finding it is more expensive to ratepayers to put in community solar than it is to have utility-scale solar facilities. They will be putting out a report soon.

Robert Cordingley is the lead for the **Communications Team**. He gave the following updates:

1) Weekly News Digest ~ Still being distributed
2) Quarterly Newsletter ~ Open rate for the issue that went out in February was in the neighborhood of 35% – 40%.
3) Anyone who would like to do social media for 350 Santa Fe is welcome and should contact Robert.

Robert gave an update on the **Legislative Action Team** because Christopher Mann, the team lead, is at a committee hearing this morning. There are many climate-related bills this session. The team has prioritized them by placing bills in:

- Tier 1, Legislation we are actively supporting
- Tier 2, Other climate legislation bills we support
- Tier 3, Other climate legislation bills we are evaluating

Included in Tier 1 are HB 9 (Climate Solutions Act), SB 8 (Local Government Air Quality Regulations), SJR 3 (Environmental Rights Constitutional Amendment) and others. Most bills in Tier 1 have been through one or two committee hearings. Examples of legislation in Tier 2 are SB 11 (Clean Fuel Standard Act), SB 112 (Sustainable Economy Task Force) and SB 149 (Prohibit New Fracking Licenses). Most of the bills in Tier 2 have passed at least one committee. Bills in Tier 3 are SB 84 (Community Solar Act), HB 4 (NM Civil Rights Act), and SB 63 (Solar for New Schools). Tier 3 bills have also passed one committee. The team is pleased at the way these bills are progressing through the legislative process. The bills can be followed using the information on the 350 Santa Fe website, 2021 Priority Bills tab.

What's Happening at the Public Regulation Commission

Joseph Maestas, Commissioner on the New Mexico Public Regulation Commission (PRC), holds a master's degree in Civil Engineering from the University of New Mexico. He has been a Santa Fe City Councilor and the Mayor of Espanola. He described the effect of Constitutional Amendment 1, which was approved by 56% of voters in November 2020. The amendment will transform the PRC from its 20-year status as a five-member elected body into a three-member commission appointed by the governor from a list of candidates proposed by a bipartisan nominating committee. Maestas said the PRC is chronically underfunded and right now in transition without a physical office. The commissioners will develop a two-year plan to leave the PRC in good shape for the next commissioners. He was impressed by the work of the Grid Modernization Advisory Group and sees grid modernization as one of the most important components of the transition to renewable energy. All three investor-owned utilities have submitted plans for electrification of vehicles.

Some of the problems and needs of the PRC are:

1) PRC is way behind in rule-making
2) A lack of technical expertise staff
3) They are not allowed to retain the fees they collect
4) Need a budget to hire consultants for the more complex cases, which are rare
5) Worried the PRC will be stripped of regulatory authority in 2023 when the amendment takes effect
6) PRC was directed to submit a flat budget, reduced by 5%, to the legislature for approval, when in reality they need $2.5 million more than the flat budget

Invited Talk

Biofuels from Algae: Working to Make Biofuels Cost Competitive

Speaker: **Dr. Steve Buelow, CEO of New Mexico Consortium**

Speaker note: Dr. Steve Buelow is currently the Research Director and CEO of the New Mexico Consortium. Before joining the New Mexico Consortium in 2012, Dr. Buelow held research and management positions for 26 years at Los Alamos National Laboratory (LANL). As Leader of LANL's Energy Security Center, he worked with line and program organizations to coordinate the development of LANL's Energy Security Mission. Dr. Buelow has degrees in Chemistry and Mathematics from the University of Wisconsin-La Crosse and in Physics and Chemical Physics from Harvard University. While at LANL he initiated and led research projects in a wide range of technical areas including hydrothermal chemistry, high-resolution spectroscopy, and the measurement of ultra-fast dynamical processes.

Presentation: In the past decade, fracking has decreased the cost of gasoline. During that period the technology for electric vehicles has improved performance. Cost is important to the acceptance of biofuels as a replacement for fossil fuels. One advantage of using algae as a biofuel feedstock to produce biocrude is that the product can use existing infrastructure such as pipelines, gas stations and refineries. Over the past decade, the U.S. Department of Energy (DOE) has invested over $100 million in research programs focused on reducing the cost of producing transportation fuels from algae biomass. A recent DOE program to investigate algae-based carbon dioxide utilization has a budget of $8 million.

Algae is grown in ponds. In that environment the algae is only one out of 10,000 or even one out of 100,000 parts of water. During processing the water is removed, but by the end of the cycle the water and nutrients are recovered.

The research at NM Consortium, in collaboration with LANL and New Mexico State University, has focused on developing new, more productive algae strains, improving cultivation, reducing the cost of harvesting and developing high-yield extraction-conversion technologies. These accomplishments have reduced costs by nearly a factor of 50.

New strains were developed using directed evolution and genetic engineering. Dr. Buelow discussed how it is possible for algae and plants to over-harvest light. This involves light (photon) capture by the algae antenna compared to the rate of electron capture. Part of the research was devoted to using chemistry to alter antenna size, to manipulate chlorophyll ratios in various strains, to alter the phototropin gene and alter pigment content.

Other things that were investigated led to improvements in:

- Ponds
- Technologies for low energy harvesting
- Co-product production and extraction, and
- Biofuel conversion

Q & A section [interspersed within presentation but separated here in notes]

- Jack: Have there been any large-scale facilities? Answer ~ In New Mexico, Saphire tried. They had the funding and the infrastructure but were unable to succeed. They are using the facilities for something else now.
- Jim: Has there been any attempt to concentrate carbon dioxide before it is fed to algae? Answer ~ Yes, concentrated carbon dioxide does make algae grow faster.
- Robert: What are demands on the water system? Answer ~ That will be shown on a slide later.
- Jim: Does LANL or the NM Consortium intersect with the algae program at Santa Fe Community College? Answer: ~ Yes, we did some collaboration with them. They had an amazing program.
- Robert: How far along are we in scaling up? Answer: ~ We measure output in terms of barrels a day. People have produced enough diesel to power Navy ships. Colorado State University had a demonstration scale project.
- Greg: What is the impact of using concentrated solar to process algae? Answer: ~ Methane is left at the end of the process. It can be used to fuel the process. Also we can recover heat during the cycle.
- Robert: I am taking the position of a newspaper reporter. I am worried strains are going to get in waterways and produce algae blooms. Answer ~ That is a concern. Our approach has been to develop engineered algae with a suicide gene as containment technology. This does need to be considered in a risk to benefit analysis.
- Robert: I assume these are fresh water algae. Answer ~ Fresh water algae are easier to work with but we also investigated sea water strains.
- Robert: Some percent of the algae biomass goes into products like tires. Is it more biodegradable than fossil-fuel derived products? Answer ~ It looks very similar to fossil fuel derived products. Biofuel can be used in almost any application fossil fuel is used.
- Robert: What is your opinion of uses for methane and hydrogen? Answer ~ It comes down to economics. Hydrogen will probably become the most common fuel replacing fossil fuels.

Next meeting

The next monthly public meeting will be Saturday, March 13th, 2021, starting at 10:00 am.

Meeting ended at 12:00 pm

Notes taken by Barbara Sinha