

The NMSEA SunPaper

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Ramping Up for Solar Fiesta 2010

By Mary McArthur, Solar Fiesta Director

Large-scale PV Progress

By Ron Herman, Editor

NMSEA's major annual event, the Solar Fiesta, celebrates its 10th anniversary in 2010. As in the past, this year's event - with the theme "What a Bright Idea!" - will offer classes for adults, activities for children, and exhibits of products and services to save money on energy, generate renewable energy, and conserve natural resources.

This year's dates are **September 11-12**, a week earlier than previous years. Please mark your calendar now! We'll be in a different location, too - at **Menaul School**, located at 301 Menaul Blvd NE, on the NE corner of Menaul and Broadway.

Athena Christodoulou, Solar Fiesta Workshop Coordinator, has issued a **Call for Speakers** for our annual array of presentations. See page 9 for more information, and go to our website to fill out an application, due by **Monday, July 19**.

We appreciate **PNM's sponsorship** of the Solar Fiesta. Janet Bridgers is this year's Sponsorship and Exhibitor Manager. Solar and sustainable organizations will be hearing from her in the near future. See our website for **booth and Solar Fiesta Guide ad pricing**. Look for a solar yellow postcard reminder, if you're on our mailing list.

This year, **ticketing** has changed. Entry tickets will be sold to attendees as they arrive in their cars, and pricing has changed to encourage more workshop attendance. We appreciate your assistance with the new routine.

Our fun-loving **Solar Fiesta Committee** consists of Jim Barrera, RP Bohannon, Allan Davies, Ron Herman, Robert Nelson, Dave Patterson, TJ Scarberry, Mandy Scarberry, and Claire Simons, along with Janet, Athena, and me. While the major positions have been filled for some time, we are still seeking the following coordinators: Kids Area, Workshop AV, Silent Auction, and Solar Chefs. The success of the Solar Fiesta depends

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Two large PV (photovoltaic, solar electric) projects have made impressive debuts recently in Albuquerque. The Bell Group has installed panels over their 5-acre employee parking lot at their plant and offices on the west mesa just north of Central Avenue. When completed in July, their system will deliver 1,100 kilowatts (KW, or 1.1 megawatts) to the PNM grid to offset their power consumption. Last February National Electric completed a 250 KW PV installation on the roof of their store and warehouse near I-25 between Comanche and Montano. Furthermore, \$4.5 million in federal stimulus funds are now available to several school districts for PV systems.

The Bell Group system is being installed by VE Group of Moriarty with help from National Roofing and US Prefab. The PV cells were manufactured by Schott Solar. Alan Bell, CEO of the Bell Group, says that his company "made the investment because over the fifteen years we have owned the property, we have done pretty much everything we could to improve energy

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The NMSEA SunPaper

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If you wish to submit an article, you may do so by traditional mail or send it by e-mail to info@nmsea.org.

Advertising Rates

All advertising is in black and white, and photos and graphics must have a resolution of at least 250 dpi in JPEG, TIF, or PDF format. Text-only ads may be provided in MS Word (.doc) format (not .docx). Ad copy must be e-mailed by Aug. 2 for the Sept/Oct Solar Fiesta Guide. Circulation is typically 3,000 for the Guide. The size requirements and prices for individual ads are as follows:

		<u>Fiesta Guide</u>	<u>Nov/Dec</u>
Full Page:	9½" H X 7" W	\$305	\$122.00
Half Page:	4½" H X 7" W	\$165	\$66.00
Quarter Page:	4¼" H X 3½" W	\$90	\$36.00
Biz Card:	2" H X 3½" W	\$50	\$20.00

Reduced rates are available for multiple issues in Solar Fiesta packages. Contact the office for more information.

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Wow, it's Summer Solstice 2010 already. I'm writing this from Montana where the green grass is tall, the clover's deep, the cows and bees are happy, and climate change is good.

At the May conference of the American Solar Energy Society (ASES) in Phoenix, NMSEA had a large contingent of members. On the arrival evening there was a large gathering of members at a restaurant, where we had some good conversation. I introduced myself and then confessed that we had smuggled in some aliens across Arizona's eastern boarder, but it had been such a long hot trip we drank them when we got to our motel room.

On the first day Gary Vaughn, Jim Barrera, and I attended the Chapter Caucus. After Chapter Rep nominations, a session on chapter success stories was held that included the following: 1) Creating and funding an Executive Director (ED): Levi Belnap, ED Utah; 2) How to Put on a Successful Home Tour: Natalie Marquis, ED Texas; 3) Increasing Chapter Membership: Laura Cina, ED Minn; 4) Creating a Large Event, The Solar Fiesta by Gary, Jim, and myself. After the presentations four parallel mentoring sessions took place. We answered questions about the Fiesta and then dialoged with the other presenters, I found the approach that the young ED from Utah is using to be quite interesting. At lunch there was more networking with the technical divisions. In the afternoon some of the sessions I found helpful were Developing Quality Solar Training Programs in a Shrinking Market by Jeff Spies, and Collaboration and Partnerships Among Chapters by Terri Parker.

After attending the opening plenary (see Chalom article, p. 4), we set up our vendor's booth. A special thanks to Jim Barrera for his astute design and decorator's touch with Mexican blankets and ristras. The booth was an eye catcher. Jim, Gary, Ragan Matteson, R.P. Bohanan, and myself were busy there throughout the three days. Yet, between the five of us we were able to rotate out to workshops, presentations, and meet other vendors. Some of the other core NMSEA members at the convention were Karlis Viceps, Marlene Brown and Mark Chalom. On the way home Gary and I stopped and met with a couple of the members of the Gallup Solar group.

The Solar Social that Jenny Beyss organized for NMSEA in June was a success. About 30 people

attended with a nice balance of new people, members, and some board members. After a round of introductions Paul Lusk, a retired UNM Professor of Architecture, gave a slide presentation on his "live-in" research facility in the South Valley. His lifetime of work demonstrates how people can live comfortably within nature's cycles. Jenny then led a group discussion on individual interests and goals, helping to narrow them down to some categories and collaborations we could further develop. Jenny also got most of the people to fill out a questionnaire, so we should have some input for future events. Jason Marks, a Public Regulation Commission representative, spoke to us on the need to support renewable energy - not only the small residential size, but on the large-scale commercial thermal, PV, and wind. Then he fielded comments and questions from the group. Congressman Martin Heinrich's representative, Antonio Sandoval, made it clear that Mr. Heinrich's office is open to hearing our suggestions on how to promote renewable energy.

Sincerely,

Monte Ogdahl

NMSEA President



Albuquerque Chapter Meetings

The Albuquerque Chapter of NMSEA will meet on July 27th at REI. Professor Olga Lavrova from the Electrical and Computer Engineering Department at UNM will speak. Olga is the Albuquerque chapter leader for NMSEA. She will describe the Renewable Energy and Solar Car design programs at UNM and will share the results of UNM's competition in the all-solar car challenge held in June. For more details, go to www.ece.unm.edu/solarcar.

The speaker for the August 24th meeting has not yet been determined. Monthly Chapter meetings are normally held at REI on the fourth Tuesday, and they are open to the public and free of charge. REI is located at 1550 Mercantile NE, 87107, near I-25 and Montañito. For more information, contact NMSEA at 505-246-0400 or visit www.nmsea.org.



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NMSEA Solar Fiesta! Sept. 11-12, 2010

The ASES Conference Experience

By Mark Chalom, Architect

From May 17 through the 22nd I was fortunate to attend the 39th national conference of the American Solar Energy Society (ASES) held this year in Phoenix, AZ. It was at the downtown conference center where Greenbuild was held last November. At 3,000 attendees vs. 30,000 for Greenbuild, the feeling was much different. It was not a big marketing show; it was more technical and specialized in solar energy's place in the new emerging sustainable society. This, sounding narrow, was much the opposite. The session topics and papers showed that. There were up to 7 tracks going on at the same time. There was something for everyone. As a passive architect, I found many sessions dealing with vernacular architecture, passive cool tower design, carbon-neutral design, day-lighting design, efficient building systems, and kinetic building skins. Others found different tracts, such as high temperature solar energy for air conditioning buildings. Everyone was pleased and found the information and education we all sought.

The Opening Plenary panel set the pace for the rest of the conference. Ray Suarez from the PBS News Hour moderated the panel, which included Amory Lovins of the Rocky Mountain Institute, Denis Hayes, former director of the National Renewable Energy Laboratory (NREL) and founder of Earth Day, Cathy Zol, assistant secretary of DOE, and Brad Albert, general manager and strategic planner for Arizona Public Service. The discussion was engaging and thought-provoking. The mood was positive, but guarded. The opportunities ahead for solar are plentiful and diverse. The best quote was from Amory Lovins, who said of the future, "Everything will work out in the end. If things are not working out now, we are not at the end." We have no choice but to think positively and keep moving on.

Two sessions stood out as the best for me - Cool Tower Design and Solar Energy for the Other 80%. Cool Towers: Integrated Passive Cooling for Buildings and Spaces was the best technical session I attended. I have designed and utilized cool towers before, but there I received a full education on their science and mathematical design based on actual tested towers. I now know everything needed to design a successful tower, and I am looking forward to the opportunity. The concept is simple: build a tower to catch the warm wind or open air, use a spray or wet surface to add moisture, which evaporates and makes the air cooler and heavier; let this cool air fall down into your building or living space. These systems work so well that they are even used to air-condition outdoor spaces, as is being done at the Zion National Park visitor's center.

Solar Energy for the Other 80% was the most

meaningful presentation for me. It did not deal with BTU's, or efficiencies, or watts/\$. It was about improving the quality of life and saving the lives of people in poverty around the world. This is where solar is bringing up the bottom, not adding to the wealth of the top. Laurie Stone of Solar Energy International in Colorado led the session and dedicated it to Walt Ratterman, a solar hero whose life work was to bring appropriate technologies to under-privileged communities around the world. Walt died in the Haitian earthquake. He was also honored at the evening awards ceremony. This was the only session where the majority of presenters were women. Louise Meyer, co-founder of Solar Household Energy, talked of developing simple solar ovens and promoting solar cooking around the world. This saves some women hours every day collecting firewood. It allows them to pursue child development, self education, and income-producing crafts. Laura Stachel, founder of We Care Solar, explained how as a gynecologist she took a simple solar panel and rechargeable batteries in her suitcase to a hospital in Uganda. There, very sick people arriving at night were turned away, because there were no surgical lights to do any emergency procedures, and some woman died during childbirth as a result. Laura's batteries lit LED headlamps, so doctors could work at night and save lives. Debbie Tewa, a former engineer with Sandia Labs, now the Arizona Tribal Energy Coordinator, spoke of the many opportunities and projects on native lands.

New Mexico was very well represented at the conference. NMSEA had an educational booth staffed by Monte Ogdahl, President, Gary Vaughn Vice President, Jim Barrera Secretary, R.P Bohannon, board member, and Ragan Matteson, office manager. They shared many of the outreach educational programs they have been developing. They showed off the long history of New Mexico's involvement in Solar Energy from the Anasazi centuries ago to the upsurge in the early 70's, to high tech development now being done at Sandia Labs. Greeting attendees in their colorful Hawaiian shirts, rather than polyester suits, NMSEA stood out from a distance. Instead of cheap, useless, plastic junk, NMSEA handed

(Continued on page 6)

(Solar Fiesta! 2010, Continued from page 1)

upon a large number of individuals. **Lend a hand** for a few hours or several weeks to help create NMSEA's largest annual event!

Our website, www.nmsea.org, is updated as preparations for the Fiesta progress. For additional information or to volunteer, contact our office at info@nmsea.org or 505-246-0400/888-886-6765.

We look forward to seeing you in September! ☀

(Large-scale PV, Continued from page 1)

conservation within the building. We had reached a point where the next step was to begin producing our own energy. In New Mexico the logical choice is solar.” My top photo below shows ten of the thirteen 40-foot wide rows of PV panels that extend westward 200 feet across the parking lot. My second photo shows a detail of the I-beam and galvanized steel mounting structure and electrical junction boxes. Bell added that the installation process has been very efficient and that “staying in close communication with everyone involved in the project - the contractors, the city, and PNM - has been key to a smooth-running project.”

The National Electric installation was done by Nations Roof Renewable Energy Solutions and Mosher Enterprises, an electrical contractor. The panels were made by Hareon Solar. Their system is shown in their photo at right. In a press release for National Electric, Christie Humphrey, Marketing Coordinator, said “this project will not only provide energy and cost savings, but it will give others in the community a place to observe a system of this magnitude in operation.”



National plans to use the installation as part of their education and training programs to show customers and electricians how a PV system is installed and how it integrates with a building. Humphrey said the company purchased this system with “a strong desire to be environmentally conscious and lower their carbon footprint as a corporation.” Furthermore, “Investing in a solar PV system is a good economic decision for our company,” said Lyle McDaniels, Executive Vice President. “With the current rebates and incentives available, investing in solar energy is a wise choice offering a good return on invested capital for all companies.” National Electric is an independent lighting and electrical hardware distributor supplying residential, commercial, industrial and utility markets.

New Mexicans can also expect to see PV on some schools. The following fifteen school districts were selected for PV systems through a competitive application process: Belen, Carrizozo, Corona, Dulce, Elida, Gallup, Hatch, Los Alamos, Los Lunas, Moriarty, Peñasco, Portales, Rio Rancho, Ruidoso, and Taos. The money will be used for a 50 KW photovoltaic system at one school in each of the 15 districts.

Governor Richardson announced the availability of these funds in a press release from his office, saying “These new solar systems will not only create jobs and help these schools reduce their utility bills, but the entire process - from installation to monitoring the energy and cost savings - will serve as an invaluable educational tool for both students and teachers. We want these projects to inspire students to pursue education and jobs in New Mexico’s emerging green economy.” The NM Public Education Department will manage the projects and the Energy, Minerals and Natural Resources Department will provide technical assistance. Jon Goldstein, Secretary of the EMNRD, said “we are happy to see so many additional projects around the state that help us to further reduce our dependence on non-renewable resources.” ☀



(ASES Conference, Continued from page 4)

out small adobe bricks made the way they have been for 6,000 years - earth, water and sun. They explained how these blocks were part of New Mexico's solar history and future. Many have never seen an adobe, and those who had were pleased they were a part of the conference. NMSEA was one of four chapters chosen from thirty-three nation-wide to speak on how the Solar Fiesta grew. Helen Beauchamp of Zomeworks Corp. in Albuquerque presented an important paper on Double Play Buildings. Zomeworks was also represented on the trade show floor, standing proudly with the big solar corporate world.

Karlis Viceps, solar designer/builder and former president of NMSEA, received the Rebecca Vories Award. He was recognized for all his efforts, including helping to organize ASES conferences, co-founding the Taos chapter and Solar Festival, and helping to develop NMSEA's popular SunChaser education program. He was also recognized for his "calm good humor, attention to detail, and enthusiasm for getting the message out about solar energy."

Charles Andraka from Sandia Labs was given the Hoyt Clarke Hottel Award for his lifelong work in the concentrating solar power industry. Alfred von Bachmayr was one of three presenters at the Emerging Architecture evening session, which is always a highlight of the conference. Alfred's presentation covered the past work he has done as founder and director of the World Hands Project. They design and build low-cost housing in the Third World, remote Native American sites, and recently a school in Haiti. His body of work is extensive and was well received.

Professor Steven Dent from the UNM School of Architecture presented a case study of the successful projects he has designed. Many employees from Sandia Labs presented papers, chaired sessions, and talked about the research happening at the high-tech level. Marlene Brown, former president of NMSEA and an honored ASES Fellow, was busy teaching workshops, presenting



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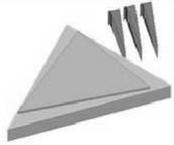
papers, chairing a session, and being a major organizer and leader of the Women in Solar group.

Doug Balcomb, also a past NMSEA president, led a session on the state-of-the-art of passive solar design. Dr. Balcomb is one of the most highly honored persons in the solar world for his work in passive solar analysis. (See also the photo on page 9.) He is an ASES Fellow and former director of the Los Alamos Solar Division. He was the first director of The National Solar Energy Research Institute, now NREL. Passive solar has dropped out of style lately and is not promoted as well as it should be. Doug had asked me to speak about my work and the patterns I see evolving. I presented some of the observations that I wrote about in the December 2009 issue of Green Fire Times. I presented my new homes and those of others built in the Santa Fe area as a result of the new codes, and I mentioned the disconnect regarding the Home Energy Rating System (HERS) standards. The paper was very well received, and I found many others around the country who feel the same as I do about HERS. I also had the chance to talk to Craig Cristensen, the principal engineer for residential buildings at NREL. He agreed that HERS is limited and more testing of existing buildings needs to be done.

The first solar conference was held in Phoenix in 1955, a few miles from where we were. An evening presentation was given about that historic time and the

presentations then by names I've read about in my solar history books. We were shown a back-up Vanguard satellite, covered with Solar Cells, and the first solar powered Transistor radio. I've attended many ASES conferences since 1975. This was one of the best. Most of the others I spoke with also felt that ASES has done an exceptional job of keeping a very diverse set of people and applications held together by the common fascination of the potential of the sun's energy. We were all quite satisfied that we had gathered again to share and learn from each other, and we have come a long way since PV panels were \$1500 a watt. (They are now close to \$10/w.)

The conference ended with a special reception and dinner at Taliesin West, the Frank Lloyd Wright School of Architecture. We were given a special tour of the school and facility with guides and students to answer questions or engage in conversation. Don Aitken and his wife Barbara Harwood hosted the event. Don was director of ASES for many years. He and Barbara are professors and have run the FLW School for over 30 years. The Sonora desert was green and in bloom, and the sun was setting, as we had drinks and appetizers on the deck overlooking Phoenix. Dinner was shared with comrades from around the country on the patio as the stars appeared and the air cooled. This was surely the moment Frank wanted us to have. A perfect way to end another successful ASES Conference. ☀



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*** PNM Asks for Rate Hike ***

According to recent news in the Albuquerque Journal, the New Mexico Independent, and other sources, PNM has requested another major rate increase to meet their increasing costs. This would impact not only low-income customers, but PV system owners who would pay PNM for all of their use, even what they themselves generate, if they are under the proposed Solar Performance Program. Attend a local advisory meeting (see events on page 16) and watch for further details and the status of PNM requests.

Editor

Solar Energy Investments

Closing share prices compared to the DOW index (approximate, rounded):

<u>6/28/10</u>	<u>4/28/10</u>	<u>6/28/09</u>
First Solar (FSLR):		
\$119	\$128	\$162
Market Vectors, Solar Energy ETF (KWT):		
\$10.17	\$12.53	\$14.97
Dow Jones Industrial Average (\$INDU)		
10,139	11,045	8,447

Selected prices provided for relative information, only; NMSEA does not recommend specific investments. All investments involve risk, so invest cautiously. ☀

NMSEA Board Meeting July 17

The next meeting of the NMSEA Board of Directors will be on Saturday, July 17, at the NMSEA office, 1009 Bradbury Dr. SE, Albuquerque, 87106, from 12:00 noon to 3:00PM with a potluck before at 11:30AM. Members welcome. Call 505-246-0400 by July 13, if you have an item for the agenda.



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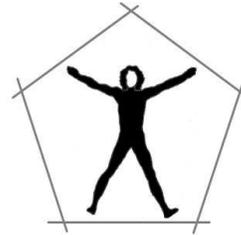
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Call for Speakers for Solar Fiesta

By Athena Christodoulou,
 Workshop Coordinator

This year's Workshop Series reflects the 2010 Fiesta's "What a Bright Idea!" theme encouraging and educating Solar Fiesta attendees to "go green." The success of the workshops depends on our speakers. As a solar professional or enthusiast, you may have a unique perspective on renewable energy, energy efficiency, or sustainability. Would you consider sharing your expertise by participating on September 11 or 12? Last year the response was phenomenal, demonstrating the dedication of our community to education. If you are interested in speaking this year, here's what you need to know:

1. There are these two types of presentations:
 - Workshops - 1-hour to the general public; beginning and intermediate solar and general-interest topics.
 - Technical Sessions - 20 minutes to industry peers and technically-minded folk, Sunday only.
2. For more information and to register your talk, go to the www.nmsea.org home page or the Fiesta page.
3. The deadline for application is **Monday, July 19, 2010**.

Thank you for your participation!



Dr. Douglas Balcomb (center) receiving his "Solar Default Swap Certificate" from Monte Ogdahl, NMSEA President, at the 2010 ASES conference in Phoenix. The certificate is an exotic financial instrument that effectively insures the bearer against the catastrophic failure of the sun. Also known as "II" for Insolance Insurance (not to be confused with insolence insurance), the NMSEA certificate guarantees full payment within 30 days for loss of income, as well as for pain and suffering, in the event that the sun is extinguished for more than 24 hours. Also shown are Dr. Balcomb's wife, Cecilia, Gary Vaughn (left), and RP Bohannon (right).

Shedding light on our solar future.



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Governor Richardson's Legacy: A Clean Energy Economy

By Howard Stephens, Virginia Stephens,
and Jim Cochran of Vision Trust, Inc.

What does it take to create a clean energy economy—that is, the labor, capital, businesses and consumers that produce, distribute and use clean energy goods and services throughout the state? We interviewed Governor Richardson for one of our New Mexico Clean Energy Update public radio reports to get his perspective. This Q & A article, based on our interview with Governor Richardson, presents his views.

Vision Trust, Inc. (VTI): Most of us would agree that it takes vision, leadership and experience to grow something as complex as a clean energy economy. When you took office in 2003, what was your vision for a clean energy economy in the state?

Governor Richardson: “Well, I felt that we could be a national leader on clean energy because of our sunshine days, because of our national labs, because we had the workforce, and because I wanted to develop clean energy as another industry for New Mexico. I felt we were too dependent on fossil fuels, on tourism, on mining - all very good, but we didn't have alternative economies.”

VTI: Was there a sense of urgency about pushing clean energy forward?

Governor Richardson: “Well, I had a sense of urgency, and I knew that there were a lot of potential coalition blocks that would be supportive, that everyone talked clean energy, but we didn't have the state government, which I believe at the time needed to take the lead, to be aggressive. So early on we pushed and worked with the legislature and a lot of renewable energy companies and individuals, and also our state government, to make this happen.”

VTI: How did your experience as Secretary of Energy with the Clinton Administration influence your leadership for developing clean energy in New Mexico?

Governor Richardson: “I'd whetted my appetite as Secretary of Energy and so two years later I saw an opportunity in running for Governor, and making renewable energy a centerpiece of my campaign as Governor. So, we started the first year, and my first two years as Governor we passed a lot of legislation that helps us in this clean energy area, in fact across the board. The legislature was very cooperative, but most of the ideas came from the executive branch. So, this legislature deserves credit for getting them passed.”

VTI: What was the strategy for developing a clean energy economy? What were some of the results?

(Continued on page 12)



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(Richardson's Legacy, Continued from page 11)

Governor Richardson: "There was a strategy of how we deal with the legislature, with tax incentives, how we deal with solar energy manufacturers, with the labs, the public thrust of saying that we're going to be number one in clean energy, and just this last year we've attracted six major solar companies. We did get 600 megawatts of wind power going in New Mexico. We upgraded the energy standards; we set aggressive requirements of investor-owned utilities to achieve 20% renewable energy generation. This was the Renewable Portfolio Standard. We did the lead-by-example state government program, efficient green buildings, establishing energy efficiency programs."

VTI: How does the future look for clean energy in New Mexico?

Governor Richardson: "We have a phenomenal future, if we continue our policies. We have the national labs, we have the workforce, we're internationalizing our investments in bio fuels and alternative energy across the board, we have the best asset, which is our sunshine, but we also have enormous stretches of land where you can have wind power and solar. The future's very bright for New Mexico, but it's going to take sustained leadership."

Authors' notes:

Howard and Virginia Stephens are members of the NMSEA Advisory Board. They are also officers, along with Jim Cochran, of Vision Trust Inc., a New Mexico non-profit founded to develop educational and public interest programs. Together they produce the New Mexico Clean Energy Update (NMCEU), a series of 13 five-minute weekly public radio reports. The reports are broadcast on KUNM FM-89.9 on Tuesday mornings at 6:33 a.m. through August 31, 2010. The New Mexico Clean Energy Update report upon which this article was based, was scheduled for broadcast on June 29, 2010 at 6:33 a.m. You can listen to this and the other reports at your leisure, as KUNM archives broadcast audio for two weeks on their website: www.KUNM.org/listen/archive/. More information about the programs and the producers, along with downloadable MP3 files and streaming audio for the 2007 and 2008 reports, is available on the New Mexico Clean Energy Update website www.NewMexicoCleanEnergyUpdate.com. The 2010 report series will be placed on the NMCEU website after they are broadcast. Funding for the New Mexico Clean Energy Update is provided by the American Recovery and Reinvestment Act through the U.S. Department of Energy and the New Mexico Energy Conservation and Management Division. Learn about New Mexico clean energy programs at www.CleanEnergyNM.org. ☀

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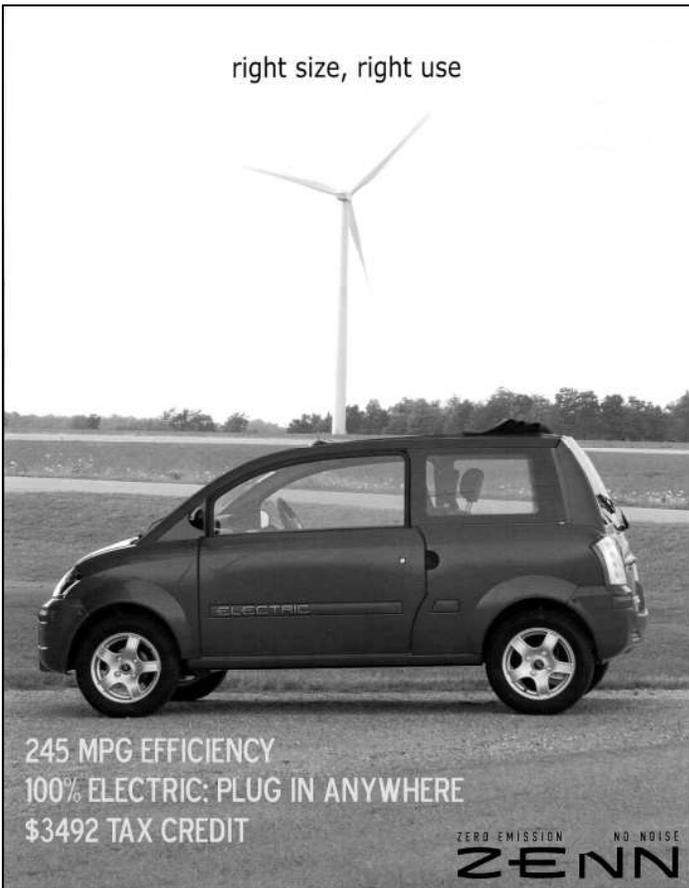
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Time for Electric Vehicles?

By Monte Ogdahl, NMSEA President

So, it's the right time for electric vehicles (EV). Why did it take so long? And are we there yet?

A sleek, sexy, Tesla sports car accelerates from 0 to 60 in 3.9 seconds and then continues to 125 mph without shifting a gear! How is this done? The Tesla is propelled by a 248 hp pure-electric motor, which receives all its electricity from a rechargeable lithium-ion battery pack. The sophisticated electronics system can take the car 244 miles of EPA city/highway driving, before it has to take a 3.5-hour siesta charge from a 240 volt 30 amp receptacle. If your electricity costs about 10 cents per kilowatt-hour (kWh) it will cost you about \$2.52 to "fill up." (240 Volts x 30 Amps = 7,200 or 7.2 kilowatts x 3.5 hours = 25.2kw x \$0.10 = \$2.52) The Tesla is a custom car base-priced at about \$109,000. Not a bad price when you compare it with a couple of the fastest gas-guzzling cars on the market, like the Porsche Carrera or the Ferrari Modena.

There is a lot of history that explains why it has taken so long for the electric car to begin a serious comeback. It involves more than just the GM story of "Who Killed the Electric Car." GM was not the only manipulator, but they have certainly caused delays in the progress with some sporadic bright additions to electric transportation. I will cover more of this early history in a future article.

By the early 1990's electronics had introduced the lithium dream battery and solved several of its problems and improved efficiencies with better speed controls. However, there were serious problems keeping the cells balanced during charging and use. Also, they were subject to catching on fire! The lithium battery was also very expensive, especially considering its limited lifetime.

However, at the 1990 Los Angeles Auto Show, GM, Ford, Chrysler, and Nissan all planned production and distribution of innovative EVs. Why were all of these companies getting on the EV bandwagon? Because starting in 1968, due to the horrific smog problems in Los Angeles, the California Air Resources Board (CARB) began incrementally tightening emissions to improve air quality. By the 1990's implementation percentages were set for transitional and Low Emission Vehicles (LEV), and they were expecting 800,000 Zero Emission Vehicles (ZEV) in California by 2003. Numerous other states were adopting Corporate Average Fuel Economy (CAFE) standards. To help bring the batteries up to speed, a battery consortium was set up between GM, Ford, Chrysler, and the Department of Energy, and GM's famous EV-1 was making headlines.

But as the deadlines for serious change approached, the public had become complacent with lower gas prices
(Continued on page 14)



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(Electric Vehicles, Continued from page 13)

and were buying more of the big gas-guzzling sport-utility vehicles as a status symbol. With pressure from auto manufactures the Clinton administration was convinced that the hybrid was the way to go and moved forward with a lawsuit against CARB that removed the ZEV portion from the law. On cue GM started canceling the lease agreements on their EV-1's and refused to sell any. GM confiscated all the EV-1's and crushed all of them but one, which they stripped of the technology and placed in a museum next to a 1915 Detroit Electric car. The other big manufactures of EVs attempted to do the same, but about 1,000 of those EVs escaped that fate, and some later sold for more than their value new.

American auto makers didn't do much towards developing hybrid vehicles, but Honda and Toyota went to work on that technology. The Toyota Prius is a great little car, and it became another American status symbol for certain groups of people. The President of GM now says he's sorry that they were involved in killing the EV program. But what do we expect him to say? Millions of tax-payer dollars have been put into GM's bailout, and they are promising the Volt electric will be available soon, but as an electric hybrid, not a pure-electric vehicle.

By 2005 the problems of unbalanced operation, short

lifetime, and fires that had plagued the lithium batteries of the 90's were solved, and larger batteries were for sale. But, they were still very costly. The second part the of the solution was micro-sensors with a micro-processor battery management system. Now, consider four years of EV road testing, recent price breakthroughs for lithium batteries that have half the weight per energy and a 3,500 cycle life (compared to 700 for lead-acid). With these changes we have a performance that puts the EV "in the passing lane" at an affordable price.

For more details on this subject, get the book *Build Your Own Electric Vehicle*, second edition. That book will be the required text for the course I am planning. An advanced class will include actual conversion of a bicycle, car, or utility vehicle, depending on interest.

With fossil fuel pollution in the air, water, and land, and the monopoly control of oil companies, I would say "It's time to be there now and take our lives back." Part of the reason old habits die so slowly and new innovations take so long is the lack of innovative education. That is what NMSEA is about. For this kind of class we provide information and include practical hands-on training with parts and equipment. If you are interested in an EV class, e-mail solpwr@plateautel.net or info@NMSEA.org. ☀



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NMSEA Chapter Options

All NMSEA members are invited to participate in our local chapters around the state. When you register, you will be placed in the chapter nearest to you geographically, or you may contact the office to change your chapter, if you desire. (Note: members are not limited to the chapter in their area and are welcome to visit other chapter events.)

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ASES Membership

NMSEA is a chapter of the American Solar Energy Society, and we encourage our members to join ASES as well. ASES members receive SOLAR TODAY magazine, Solar Action Network (SAN) alerts, the Sunbeam e-newsletter, discounts on publications, and more! Five percent of your ASES dues are dedicated to special outreach programs including ASES Legacy Schools, library gift subscriptions and the purchase of Green Tags.

For more information and for ASES business membership categories, please visit www.ases.org.

If you join or renew ASES at the Professional level *and* join or renew NMSEA, deduct \$10 from your ASES dues (as indicated below). If you join or renew ASES at the Basic level and join or renew NMSEA, deduct \$5 from your ASES dues.

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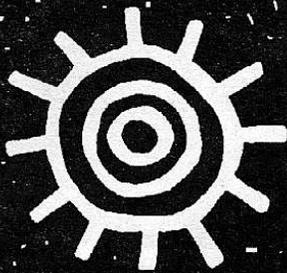
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Vision Statement

We envision a thriving, bio-diverse earth, with civilization powered by clean, renewable and sustainable energy from the sun.

Coming Events

- July 17 Board of Directors Meeting, Saturday, NMSEA office, 1009 Bradbury Dr. SE, Albuquerque, 87106. Members welcome. Meeting is 12:00 noon to 3:00PM; potluck before at 11:30AM.
 - July 27 Albuquerque Chapter Meeting, 6:30 pm, at REI Recreational Equipment store at 1550 Mercantile NE, 87107. Speaker: Professor Olga Lavrova on Renewable Energy and Solar Car design programs at UNM.
 - August 24 Albuquerque Chapter Meeting, 6:30 pm, at REI Recreational Equipment store at 1550 Mercantile NE, 87107. Speaker to be announced; watch our e-mail Blasts.
 - Sept. 11-12 Solar Fiesta 2010 at Menaul School. Exhibits, demonstrations, information, workshops, fun activities.
- PNM Public Advisory Process meetings on their Integrated Resource Plan for 2011-2030: July 6, Santa Fe; July 7 Los Lunas; July 8, Albuquerque; July 12, Clayton; July 14, Ruidoso; July 15, Alamogordo; July 20, Silver City; July 21, Deming. See PNM.com/irp or call 888-413-0064 for more information.