Extension Clean Energy Outreach

By Leigh Fortson, Extension Regional Communications Coordinator and REA (Renewable Energy Advocate)

Issue 26 February 2, 2011

Why Colorado is a Cleantech Leader

Source: Shawn Lesser, Greenchipstocks.com

The state of Colorado has become a national leader in the cleantech field, with renewable energy development at the top of its agenda. By quickly implementing key improvements in wind and solar technologies and utilizing efficiency programs such as the implementation of smart-grid technologies in their utilities, Colorado is making the state a much greener place. Further, natural gas use has a high focus, because Colorado is a major natural gas producer in the nation; and there is a big movement in Colorado, especially Denver, to revamp public transportation systems to try to reduce the amount of cars on the road and reduce pollution.

"Few states can match Colorado's record of improvement and support in every cleantech industry effort by citizens, businesses, universities and government" says Christine Shapard, Executive Director of the Colorado Cleantech Industry Association (CCIA).

Ten highlights of Colorado's Cleantech efforts are listed below:

1. **Governmental Involvement**. State government in Colorado is leading the way in cleantech technology. Governor Bill Ritter was recently named as the "greenest" Governor of any state in the United States. Within the past three years, the Colorado legislature has passed at least fifty-seven pieces of cleantech legislation. The state's Renewable Portfolio Standard mandates that a minimum of thirty percent of electricity produced will come from renewable sources by the year 2020. Just announced, the State is funding a state-wide supply chain study for the wind, solar and smart grid sectors lead by the Colorado Clean Energy Cluster and Colorado Association for Advanced Manufacturing. Further, the Colorado Department of Labor launched its Green Jobs Colorado initiative last year.
2. **Business Startup Help**. Colorado is only one of a handful of states that have created organizations to help in the startup process for cleantech businesses. They created the Colorado Cleantech Initiative (CCI) in 2005 plus the Colorado Cleantech Industry Association CCIA and Clean Launch in 2009.
3. **Cleantech Companies Thriving**. There are between 300 and 1,500 cleantech companies operating in the state of Colorado. An important achievement beyond the sheer numbers of cleantech companies operating within the state is the fact that two companies, Vestas and SunRun, are listed within the top-10 cleantech companies in the world.
4. **Venture Capital Investment**. Cleantech companies have an almost impossible task of gaining a foothold without the influx of substantial venture capital. Colorado ranks within the top three states in the United States in providing venture capital investment for cleantech companies.

5. **Business Cluster Development**. The impact of cleantech business development that is strongly supported by government and investment is the clustering of cleantech companies in specific areas. In Colorado, you will find clusters of companies working in wind technology, solar, smart grid and efficiency fields as well.
6. **Job Creation**. The cleantech industry is a bright spot when it comes to the subject of putting people to work. It is estimated that the cleantech industry in Colorado employs over 18,000 people within the state. As more and more companies enter the field of cleantech technologies, these numbers are sure to continue to grow.
7. **Municipality Participation**. Denver is the seventh "greenest" city in the United States. Greenprint Denver has become a national model highlighting how clean energy technology and energy conservation can benefit a large city.
8. **Research and Development**. Colorado has a national footprint on the leading edge of cleantech technology. The state has the largest laboratory that strictly encompasses all facets of cleantech research and development in the entire United States—the National Renewable Energy Laboratory

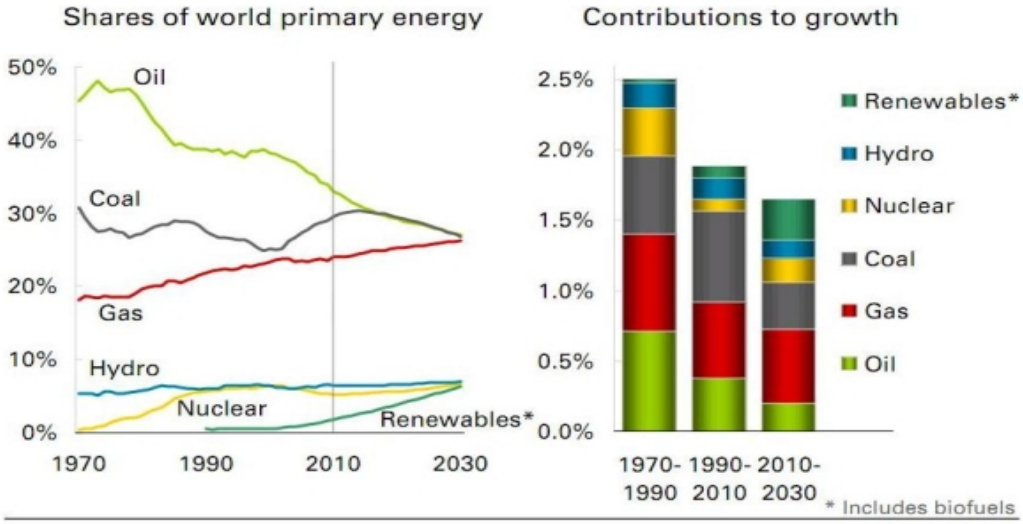
(NREL). Their new Research Support Facility is considered one of the "greenest" buildings ever built.

9. **University Leadership**. Colorado State University just unveiled the Center for the Clean Energy Economy to be run by former Governor Bill Ritter. The University of Colorado at Boulder is ranked 6th among universities in the United States in cleantech technologies research and development. CSU and the Colorado School of Mines are also designated leaders in the fields of renewable energy and research and development.
10. **Cleantech Projects in Action**. A project is being developed by Constellation Energy and Oak Leaf Energy Partners to develop a solar installation that will produce 4.4 megawatts of solar power for Denver International Airport (DIA). The installation will be the largest installation built on the site of a customer that the state has seen to date.

BP: Renewables to Outpace Growth of Oil

Source: Martin LaMoinica, news.cnet.com

The BP Energy Outlook 2030, a closely watched indicator for the state of the energy industry, claims energy sources will diversify more in the future, with a bigger role for renewable, nuclear, and hydropower. Demand will continue to grow around the world, with developing countries consuming a larger share of energy.



(Credit: BP)

Energy growth was mostly met with increased use of fossil fuels over the last 20 years. In the next 20 years, BP expects that solar, wind, geothermal, and biofuels will contribute a higher percentage--an 18 percent contribution to energy growth from 2010 to 2030, compared to 5 percent of energy growth from 1990 to 2010.

BP also forecast what portion renewables will play in primary energy--that is, energy sources before they are converted to a usable form such as electricity or liquid fuels. It predicts that renewable energy will go from less than 2 percent of primary energy use now to more than 6 percent in 2030.

One of the assumptions in BP's projections is that energy efficiency will improve significantly, particularly in OECD (Organization for Economic Co-operation and Development) countries, and that governments around the world will adopt regulations to limit greenhouse gas emissions. But BP Group Chief Executive Bob Dudley said that BP, which advocates a way to put a price on carbon, is not optimistic about policy movement.

"Our base case assumes that countries continue to make some progress on addressing climate change, based on the current and expected level of political commitment. But overall, for me personally, it is a wake-up call," he said.

The BP projection assumes continued economic growing, leading to primary energy growing by 1.7 percent per year, or nearly 40 percent over the next 20 years, with much of that growth coming from non-OECD countries.

Among fossil fuels, BP expects that natural gas use will grow faster than coal and oil, which it says reached peak demand in 2005 in OECD countries. Higher efficiency in transportation will contribute to slow growth of oil use, while BP expects that biofuels will represent 6 percent of liquid fuels in 2030.

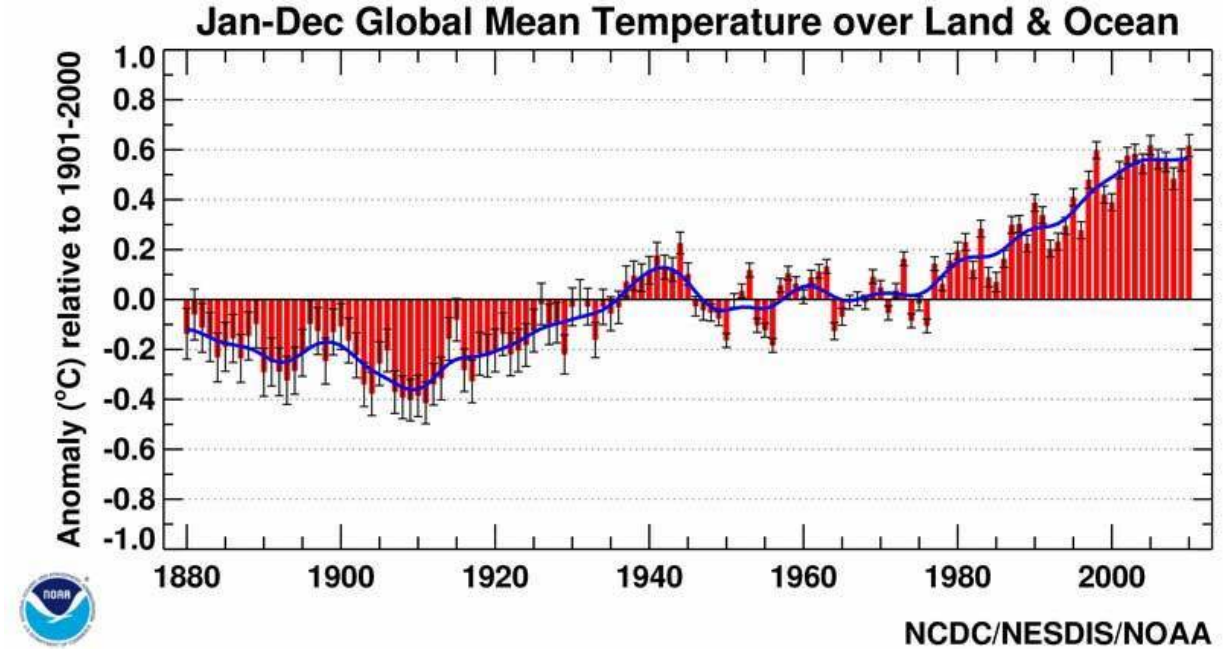
Global Forecast: Warmer and Wetter, Again

Source: NPR.org

Every January for the past decade, you've heard the same basic news story: It announces that last year was one of the warmest years on the planet since 1880, when record-keeping began in earnest.

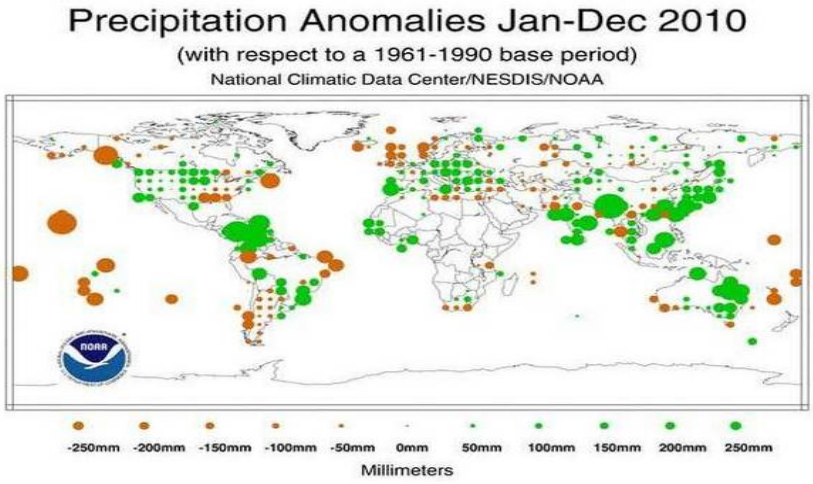
Well, yes, last year was one of the warmest years on record since 1880. In fact, 2010 ties the record with 2005 as the hottest year in the historical record.

Tying with 2005, 2010 was the warmest year on record since record-keeping began in 1880. The chart shows how much the global temperature varied from the average temperature in the 20th century. Last year was the 34th consecutive year the temperature was above the 20th century average.



NOAA

2010 was also the wettest year on record. This chart below shows how much the precipitation in each region varied from the average. Though precipitation varies widely by region, many areas, including China, North Korea and Pakistan, saw heavy rainfall.



NOAA

"Precipitation is highly variable from place to place, so there were lots of dry areas, lots of wet areas. But when we average those out, it was also the wettest year on record," Deke Arndt of NOAA said.

Warm air can hold more water, but Arndt can't say whether there's a direct link between the record-tying heat and the record-breaking precipitation, like the devastating floods in Pakistan.

These are global averages, but Arndt said the story was different for those of us in the United States.

"Both the temperature and precipitation were above normal," he said. "It was the 23rd warmest year on record in the United States. It was the 36th wettest year on record — these both fall into the upper third of the United States climate history, which dates back to 1895."

Of course, there's a lot of variation across the globe, so it's not at all surprising to see records in some places but not in others. Last year's global record was due in part to an unusually hot Pacific Ocean, caused by the El Nino weather pattern.

John Christy, a professor of atmospheric science at the University of Alabama in Huntsville, sees the same general warming trend in his measurements of global temperature. Those are based on satellite measurements of the planet's air from the surface up to 35,000 feet.

"The take-home lesson is that if you have an El Nino, you're going to have a hot year," he says. "But I just finished shoveling eight inches of global warming off my driveway this Monday here in Alabama. So whatever the globe is doing, your local weather can have a completely different picture, that's for sure."

And as for the long-term global trend? David Easterling of the National Climatic Data Center in Asheville, N.C., says that's our doing. Global warming is driven by our growing emissions of carbon dioxide and other greenhouse gases.

"Although we can't attribute any individual event, such as the Russia heat wave, it's always important to keep in mind that the probability of these kinds of events do increase as the climate warms," he says.

And, yes, that's the same conclusion you heard from the world's most respected climate scientists in 2010, 2009 and 2008. The story on global warming isn't changing.

U.S. Solar Panel Maker Energizes Job Market

Source: FoxNews.com

A Colorado solar energy company's expansion is expected to create 1,200 new jobs within the next couple of years, but people won't necessarily need experience in the renewable energy sector to be hired.

Abound Solar, based in Longmont, Colorado, and founded in 2007, makes cadmium telluride thin-film photovoltaic solar modules.

"They're primarily used in industrial, commercial applications, usually ground mounted to larger scale solar installations," Bob Grier, senior vice president of operations for Abound, explained.

About 90 percent of the panels that are manufactured in their plant head to Germany, the world's largest market for solar energy, Grier said.

Thanks to an influx of cash from a $400 million loan guaranteed through the U.S. Department of Energy and an additional $110 million in equity financing, the company is expanding its production and will be in need of new employees in both Colorado and Indiana.

"How many hires is always a moving target for us," Dennis Stoltenberg, vice president of human resources, told Fox News.

"We anticipate probably as we get rolling into this year and the year after, all things aligned right, we'll probably be at a head count of 1,200 in the U.S.," he said.

The expansion will create a demand for people in manufacturing positions to work on the additional production lines, Stoltenberg said, but only some of the new hires for these jobs will be required to have solar energy backgrounds.

"There's a lot of skills that are transferable from any manufacturing environment: the ability to understand, you know listening to the rhythm of a machine, so you can understand if something is wrong," Stoltenberg said. "That's not unique to just the solar manufacturing world. That's a manufacturing experience and a lot of those skills are transferable."

Pay range for technicians and operators is $15 to $20 per hour, depending on experience.

The company will also be looking for engineers with positions that they expect will pay somewhere between $75,000 and $150,000 per year. These candidates will likely have education levels that begin with bachelor's degrees up to PhD's and Master's, Stoltenberg said.

Even in a job market flush with unemployed, finding the specific expertise required by the company may be a challenge, he admitted.

"One of the things that I think we're experiencing in the solar manufacturing world," Stoltenberg said, "is it is an emerging manufacturing business. So people with past experiences aren't exactly certain how what they have done, represents them well for job titles in our industry. And what we're also discovering is that lots of solar manufacturing companies call jobs differently."

Residents in Tipton, Indiana, stand to gain the most in terms of new job openings; Abound has purchased a million-square-foot building in the state that is being built to their specifications.

"The reason we're going to Indiana, we looked all over the U.S. for manufacturing facilities capable of supporting what we want to do long term," Grier said. "We we're going to build a plant for a lack of a better term, kind of a bomber plant, large scale manufacturing facility."

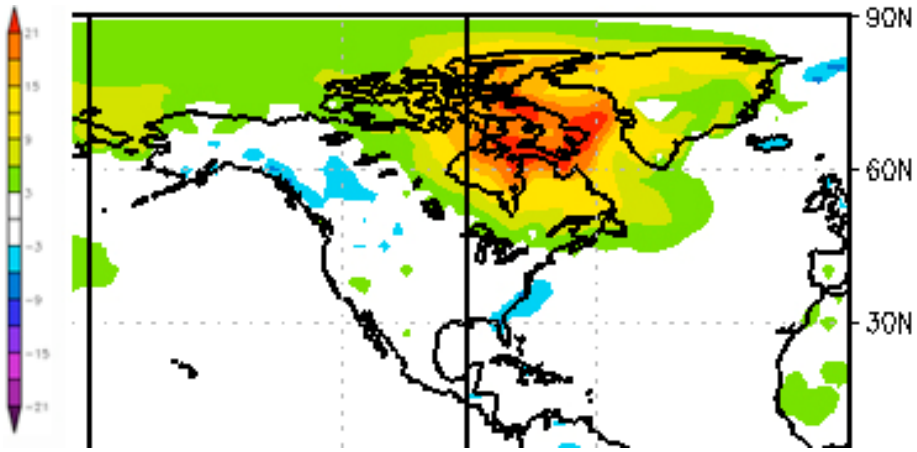
Abound said it will use multiple recruiting tools, including social networking sites like Twitter, LinkedIn and Facebook to spread the word.

Read more: http://www.foxnews.com/us/2011/01/07/solar-panel-maker-energizes-job-market/#ixzz1Ak59bbvN

North of the Border: The New Tropics?

Source: Bob Henson, University Corporation for Atmospheric Research, http://www2.ucar.edu/

Some fascinating weather has unfolded across the Northern Hemisphere over the last month, but you may have only heard about part of it. The media dutifully reported on the heavy snow that battered the mid-Atlantic and New England states in late December. It was also the United Kingdom's coldest December in at least the last century. Meanwhile, the sparsely populated Canadian Arctic basked in near-unprecedented mildness.



NOAA

Surface temperature anomalies for the period 17 December 2010 to 15 January 2011 show impressive warmth across the Canadian Arctic

It's the second chapter of a tale that began a year ago, when Canada as a whole saw the warmest and driest winter in its history. Much of the blame went to El Niño, which typically produces warmer-than-average weather across Canada. So far, so good—but similar things are happening this winter, even with a La Niña now at the helm. Just how mild has it been? The map shows departures from average surface temperatures for the period from 17 December 2010 to 15 January 2011, as calculated by NOAA's Earth Systems Research Laboratory. The blue blip along the southeast U.S. coast indicates readings between 3°C and 6°C (5.4–10.8°F) below average for the 30-day period as a whole. That's noteworthy—and in fact, it was the coldest December in more than a century of record-keeping across south Florida. Blue also shows up across the UK, where December averaged 5.2°C (9.4°F) below normal.

What really jumps out, though, is a blob of green, yellow, orange, and red covering a major swath of northern and eastern Canada. The largest anomalies here exceed 21°C (37.8°F) above average, which are very large values to be sustained for an entire month.

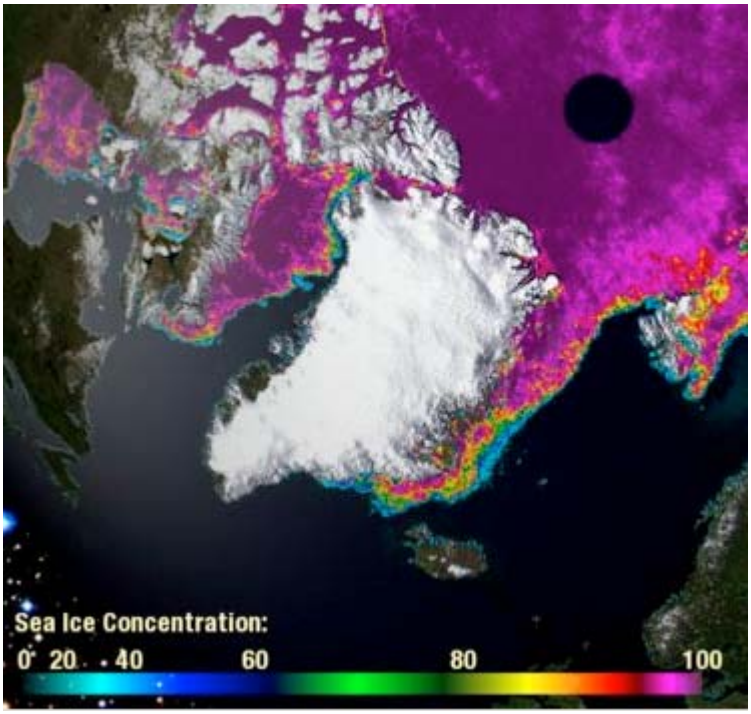
To put this picture into even sharper focus, let's take a look at Coral Harbour, located at the northwest corner of Hudson Bay in the province of Nunavut. On a typical mid-January day, the town drops

to a low of –34°C (–29.2°F) and reaches a high of just -26°C (–14.8°F). Compare that to what Coral Harbour actually experienced:

- After New Year's Day, the town went 11 days without getting *down* to its average daily *high*.
- On the 6th of the month, the low temperature was –3.7°C (25.3°F). That's a remarkable 30°C (54°F) above average.
- On both the 5th and 6th, Coral Harbor inched above the freezing mark. Before this year, temperatures above 0°C (32°F) had never been recorded in the entire three months of January, February, and March.

The extremes have been just as impressive when you look high in the atmosphere above these areas. Typically the midpoint of the atmosphere's mass—the 500-millibar (500 hPa) level—rests around 5 kilometers (3 miles) above sea level during the Arctic midwinter. In mid-December, a vast bubble of high pressure formed in the vicinity of Greenland. At the center of this high, the 500-mb surface rose to more than 5.8 kilometers, a sign of remarkably mild air below. Stu Ostro (The Weather Channel) found that this was the most extreme 500-mb anomaly anywhere on the planet in weather analyses dating back to 1948.

Farther west, a separate monster high developed over Alaska last week. According to Richard Thoman (National Weather Service, Fairbanks), the 500-mb height over both Nome and Kotzebue rose to 582 decameters (5.82 km). That's not only a January record: those are the highest values ever observed at those points outside of June, July, and August.



Large areas of open water persisted across much of the area between Greenland and Canada on 21 December 2010. (Image courtesy Cryosphere Today.)

Why so freakishly mild? One factor that both feeds and is fed by the warmth is the highly unusual amount of open water across seas that are normally frozen by late November. On the winter solstice (December 21), Hudson Bay was little more than half frozen.

Similarly, a large swath of the Baffin/Newfoundland Sea fell weeks behind schedule in freezing up. As evident in the charts at bottom, these bodies of water remain in catch-up mode. Around the south part of Baffin Island, "the boats were still in the water during the first week of January," says David Phillips, a senior climatologist with Environment Canada. "The Meteorological Service of Canada was still writing marine forecasts as of 7 January, well beyond anything we have ever done."

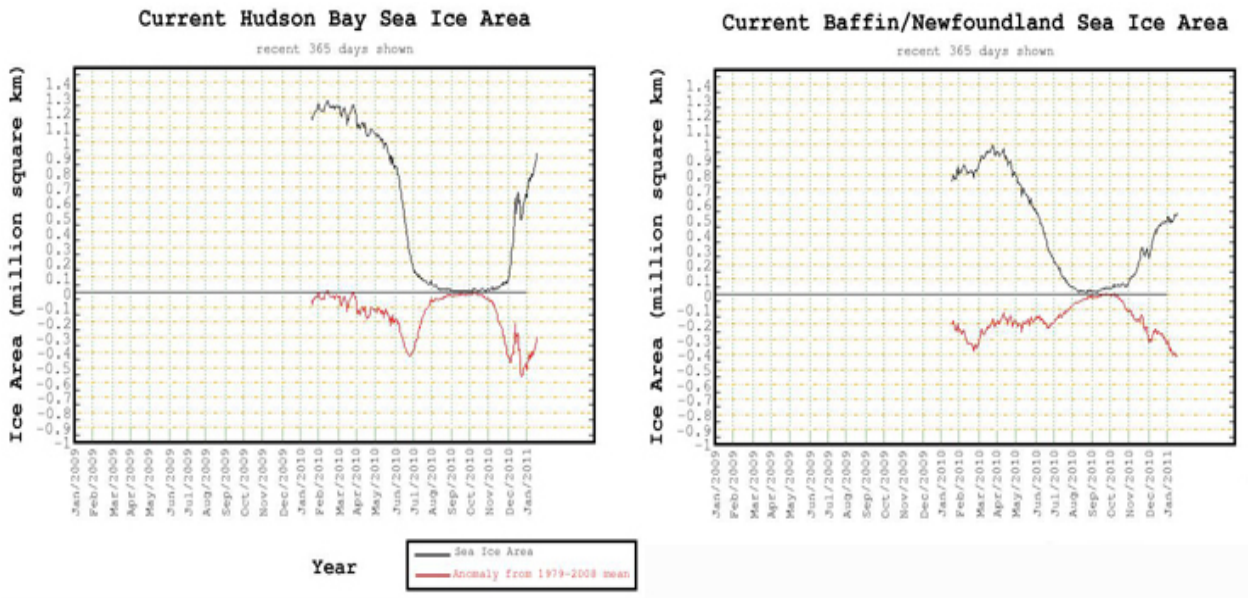
Storm after storm sweeping up the East Coast in recent weeks has pumped warm Atlantic air across eastern Canada, helping postpone the freeze-up even further and allowing temperatures over land to soar far above average.

According to Philips, the implications for people in the far north have been widespread. Nunavut's capital, Iqaluit, had to cancel its year-end snowmobile run on Frobisher Bay for the first time. "Last New Year's Eve, the big story was ice breaking up," says Phillips. "This year there was no ice to break up." Worst of all, he adds, "it's impossible for many people in parts of the eastern Arctic to safely get on the ice

to hunt much-needed food for their families—for the second winter in a row. Never before have we seen weather impact a way of life in so many small and big ways."

The extraordinary Arctic warmth and the midlatitude chill and snow bear the fingerprints of a negative North Atlantic Oscillation (NAO), the pattern that prevailed for much of last winter as well. As opposed to a positive NAO, where the jet stream whisks mild air across the Atlantic, a negative NAO—which has predominated since October—features a blocked-up jet stream that allows cold air to plunge more easily southward and mild air to take hold in the Arctic.

It seems plausible that the open water between Greenland and Canada has played a role in the record warmth observed at the surface and aloft and the associated negative NAO. However, the NAO's causes remain mysterious, and its future is impossible to predict beyond a few days. Clearly, the back-to-back punch of two winters with heavy snows in populated areas gives researchers added incentive to examine how the NAO might evolve in a warming climate.



Sea ice area remains far below average in the Hudson Bay and Baffin/Newfoundland Sea regions. The black lines indicate ice area, while the red lines indicate anomalies at each point in time. Both are shown in millions of square kilometers. (Images courtesy Cryosphere Today.)

FortZed: Net Zero Energy in Fort Collins

Source: greenbang.com

It's not there yet, but the city of Fort Collins, Colorado, has set itself an admirably ambitious goal: to become home to the "largest active net zero energy district in the world."

Dubbed FortZED, the effort was first conceived in 2007 and involves a variety of strategies from community involvement to smart-grid development. Its goal: to enable a two-square-mile area of downtown to achieve net-zero energy use, that is, to use no more energy than it can generate locally.

The district — which includes about 7,200 electric utility customers, both individuals and businesses — aims to achieve zero-energy status by producing local renewable energy, reducing energy use in buildings, using energy storage and load management to use energy efficiently and deploying smart-grid technologies and infrastructure.

The effort recently got a jump start with the launch of a Renewable and Distributed Systems Integration (RDSI) project that seeks to reduce the area's peak electricity load while making better use of energy from renewable and distributed sources. The three-year project is being supported through a combination of funding from the US Department of Energy and from local investors and partners.

For example, New Belgium Brewing, one local partner, is implementing smart-grid technologies that will let it reduce its own energy consumption when demand on the local grid is high. The systems will

also help the brewery integrate its on-side biogas and solar power with city energy supply and demand. (The brewery is also big into promoting travel by bike instead of car through its "Tour de Fat" challenge, which gets one person in each participating city to trade in his or her car — title and all — for a custom-built commuter bicycle.)

Individuals in the FortZed district are also being encouraged to "Take it to zero" by pledging to reduce their home energy use and, among other things, buying shares in a "community solar garden" that generates off-site solar energy for the city's grid.

Local utility company Spirae is also establishing a Centre for Smart Grid Advancement to study and promote ways to achieve the full potential of smart-grid technologies.

As city officials note on the FortZed Challenge website, meeting the zero-energy goal "won't be easy." But, by all appearances, local agencies, businesses and individuals are going all-out to try to hit that target. Their experiences over the next few years should provide some enlightening lessons for the rest of us.

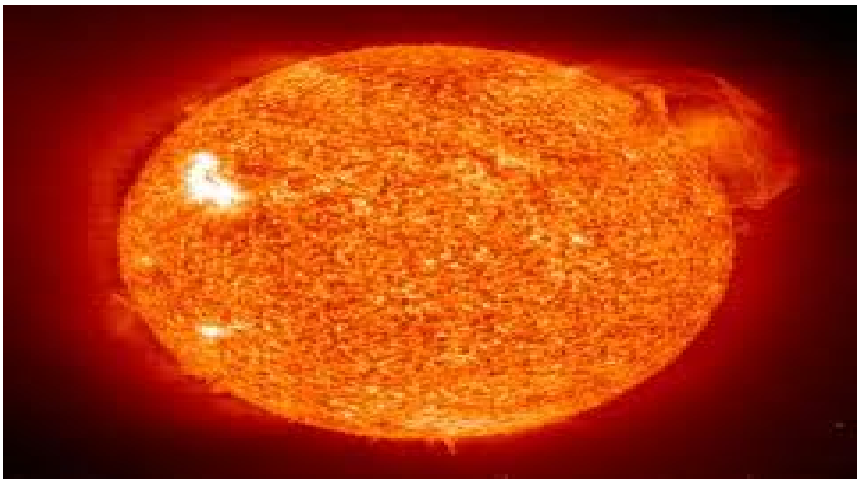
Sun Power Gets Gubernatorial Support in Five States

Source: getsolar.com

Residents of Colorado, Arizona, California, Massachusetts, and New York can expect prime opportunities to go solar in 2011, as these five state's governors have made solar energy production and solar technology development a top priority for the new year and beyond.

We begin in Arizona, where Governor Jan Brewer plans to continue adding solar generation capacity to a state that has created the most vibrant solar manufacturing industry in the nation. Through its renewable tax incentive, Arizona has been attracting manufacturing plants of some of the biggest solar companies in the world, including First Solar, Inc. and Suntech Power. Those plants have created hundreds of clean energy jobs for Arizonans. 2011 should bring more of the same, as in her inaugural address, Governor Brewer said she wants to create a solar industry that is "the envy of the world."

Governor Brewer's pledge is said to fall in line with the goals of Californians, where voters went back in time and selected Governor Jerry Brown. Brown already served two terms as the state's governor from 1975 to 1983. While former California Governor Arnold Schwarzenegger was very much in favor of clean energy development, Brown also has an ambitious goal for a state that leads the nation in solar capacity. In his inaugural address, Brown said he wants to install an additional 20,000 megawatts (MW) of solar energy to the state's electric grid by 2020.



Former Colorado Governor Bill Ritter's message to Coloradans was in line with Governor Brewer's plan in Arizona: more clean energy will lead to more jobs. When still in office, Ritter joined clean energy advocates in announcing a new report suggesting that, if Colorado were to increase its renewable energy capacity by 20 percent, it would add $1.9 billion to the state's gross domestic product. And, in an effort to appeal to the economic needs of Coloradoans, Ritter noted that using more renewable energy would create over 4,000 new state jobs with a combined yearly salary of more than $570 million.

By reelecting Governor Deval Patrick, Massachusetts has shown its approval for solar energy production and legislation. Since taking office in 2007, Governor Patrick has helped along the installation of 29.8 megawatts (MW) of solar energy capacity throughout the state and created several key incentive programs that are being credited for the up-rise in clean energy: the Commonwealth Solar Program (versions I and II), the 2008 Green Communities Act and the Commonwealth Solar Stimulus. Governor Patrick's clean energy goal for his second term? Install another 250 MW of solar capacity by 2017.

We finish our tour in the Empire State where, en route to his recent Gubernatorial victory, New York Governor Andrew Cuomo made solar energy a top campaign priority with Power NY — a plan to stimulate New York's solar energy industry. The plan includes a renewable energy credits program, increasing the use of solar thermal technology for water heating and replacing old power plants with modern plants that will increase clean energy capacity and reduce carbon

General Info

→ CSU's continuing education offers ongoing courses in green careers. For more info go to: http://www.learn.colostate.edu/courses/noncredit/?subject_cat=44349#courselistings

→ **Colorado Climate Network has been launched**. The Colorado Climate Network supports efforts by local governments and allied organizations in Colorado to reduce greenhouse gases and to adapt to climate change. The Network will help its members develop and implement programs, learn of funding and other resources, and interact more productively with other local and state programs in Colorado. The Network is administered by the Rocky Mountain Climate Organization and endorsed by Colorado Municipal League and Colorado Association of Ski Towns.

→ **Colorado's Small Business Development Center Network is rolling out new programs and initiatives to help small businesses start, grow, and prosper in Colorado.** The 12-14 week Leading Edge course focuses on creating an all inclusive business plan. SBDC Network offers additional courses focused on existing businesses, creative industries, bioscience, aerospace, technology, veteran-owned businesses, women-owned businesses, and minority-owned businesses. Other conferences, expos and trainings are announced in the newsletter and on the website www.coloradosbdc.org and www.vetbizassist.org.

→ The 2011 Chevrolet Volt received the North American Car of the Year. The car runs on electricity for 40 miles before a backup gas engine kicks in.

→ Colorado Republicans claim that renewable energy requirements are hurting consumers. The Senate is crafting a bill to undo a requirement passed last year requiring that utilities get 30 percent of their electricity from renewable sources such as wind and solar by 2020. Senate Bill 71 would roll that requirement back to 10 percent, a renewable energy standard utilities already exceed.

Upcoming Events

Global New Energy Summit
April 17-19, 2011
The Broadmoor
Colorado Springs, Colorado

The Global New Energy Summit is designed as an annual retreat of new energy (which includes new innovation in old energy) leadership from across the key disciplines of science, industry, policy and finance. By bringing together national and international leadership from across these key disciplines it is believed that unique discussions will lead to a more complete understanding of the critical issues needing attention for success in transitioning our energy economy over time. This will in turn lead to better informed public and private initiatives designed to succeed.
Rocky Mountain Technology Alliance
1150 Academy Park Loop, STE 136
Colorado Springs, CO 80910
Helen Porter, Program Director
Email: hmporter@rmtech.org
Phone: 719.785.0399

2011 ACEEE National Conference on Energy Efficiency as a Resource (EER)
September 25 - Tuesday, September 27, 2011
Sponsored by Xcel Energy
Hyatt Regency Tech Center
Denver

Energy efficiency's importance as a utility resource has never been greater. Improving energy efficiency in our homes, businesses, and industries reduces energy costs, creates jobs, and improves the environment. Energy efficiency programs offered by utilities and related organizations are seeking unprecedented savings driven by both economic and environmental concerns. The 2011 ACEEE National Conference on Energy Efficiency as a Resource (EER) will highlight the latest legislative and regulatory developments in the energy efficiency field, and review the important advances being made in the design and delivery of customer energy efficiency programs. This is the number one forum for addressing the many issues facing utilities as they seek to acquire and integrate this resource into their planning and operations. Make plans now to attend this important and unique industry event! http://www.aceee.org/conferences.

Correction:

In the November edition of this newsletter, I incorrectly cited the order of the globes biggest carbon emitters as Japan, US, Russia, China and India. Karen Ehrhardt-Martinez of the Renewable and Sustainable Energy Institute at the University of Colorado kindly pointed out that they are in fact: China, US, India, Russia and Japan. My apologies (especially to Japan) and thanks to Karen.

CSU Energy Website
To learn more about wind, solar, geothermal, and biofuels, visit our energy website at: http://www.ext.colostate.edu/energy**.**

Furthermore
Go to http://hes.lbl.gov/hes/db/zip.shtml and you can do an online calculation of your own energy use and carbon footprint. It's easy to use. Tell your communities about it.

Send me anything that's newsworthy that you're doing in the world of energy efficiency and renewables. We need to keep our colleagues up to date on what's going on in Extension and the value of our role.