

## DOCKETED

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*Comment Received From: Gene Nelson, Ph.D.*

*Submitted On: 7/30/2015*

*Docket Number: 15-IEPR-11*

## **Summary of Social Costs of Substituting Natural Gas for SONGS Nuclear Power**

Almost 20 million people are experiencing Extreme levels of ozone pollution in California, per the U.S. EPA's 2008 8-hour standard of ozone exposure in excess of 0.104 PPM. As can be determined from the attached spreadsheet and national map, no other region in the U.S. is in such respiratory peril, which disproportionately harms the very young and very old. An enlarged map of California is also attached showing the localization of this problem in the Los Angeles - South Coast air basin and in the San Joaquin Valley air basin.

Ground level ozone, a component of photochemical smog, is produced by the interaction between oxides of nitrogen, volatile organic compounds, and sunlight. Ozone is produced in conjunction with the operation of millions of hydrocarbon-fueled vehicles in California and from the operation of fossil-fueled power generation plants, which generate millions of megawatts in California, among other ozone sources. When the CEC and CPUC held a hearing at UCLA on 15 July 2013 regarding the adverse consequences of the January, 2012 San Onofre Nuclear Generating Station (SONGS) closure, a 296 page transcript resulted. The term "ozone" appeared exactly once in the text on page 160. Emission Reduction Credits (ERC) are mentioned four times, but not in conjunction with ozone.

Some short news articles regarding the substitution of fossil-powered generation for the emissions-free and carbon dioxide-free SONGS generation are included in this docket entry. As noted in previous filings and in the author's public comments to the CEC at the 24 July 2015 15-IEPR-11 workshop, the abundant, reliable, economically-priced emissions-free power generated by PG&E's Diablo Canyon Power Plant is not being properly valued by California state regulatory bodies, who appear to promote the burning of fossil fuel instead. California policies that support the aggressive substitution of electric vehicles powered by truly clean nuclear power are the only realistic solution to California's ozone pollution crisis. Absent a needed change to California's regulations, additional power needs to be imported from out-of-state nuclear power stations.

*Additional submitted attachment is included below.*

# Natural gas replacing nuclear power in SD



By [Morgan Lee](#) | 6 a.m. Feb. 19, 2015

<http://www.sandiegouniontribune.com/news/2015/feb/19/natural-gas-replaces-nuclear/>



State regulators are weighing authorization of a new power plant the would replace the adjacent Encina Power Station in Carlsbad, pictured above.

Accusations that the state of California failed to consider clean energy options in replacing power once supplied by the San Onofre Nuclear Generating Station are falling on deaf ears, as utility regulators and the state's top court rejects appeals from local and national environmental groups.

The complaints are centered around power supplies to the San Diego area, which once relied on San Onofre for 20 percent of its electricity, and two gas-fired power plants that have been embraced as early substitutes.

San Onofre was retired in 2013 because of a botched replacement generator project. **Environmentalists warn that new investments in natural gas plants will undermine California's aggressive goals for reducing greenhouse gas emissions linked to global warming.**

One of the successor plants, the Pio Pico Energy Center southeast of San Diego in Otay Mesa, is slated for construction starting March 9 after the California Supreme Court declined to hear a challenge by environmental groups. Opponents contend the plant, capable of powering nearly 200,000 homes at a time, is not needed to meet San Diego's energy needs.

**San Diego Gas & Electric is seeking approval for a second gas-fired power plant twice that size at Carlsbad, to replace nuclear power and prepare for the imminent retirement of the 60-year-old, gas-fired Encina Power Station.**

**New Jersey-based NRG would develop the Carlsbad facility, under a \$2.6 billion contract underwritten by San Diego-area utility customers.**

**As the California Public Utilities Commission weighs whether to approve that Carlsbad plant, SDG&E also gathered competing bids in January from developers of both conventional fossil fuel generators and clean energy sources. The goal is to fill an 800 megawatt gap left by the retirement of San Onofre.**

The Sierra Club has asked SDG&E to disclose publicly more about the competitive bids — including the amount of energy proposed for each technology and possible start dates for the facilities.

Environmental groups, including the Sierra Club, say approval of the Carlsbad plant as proposed would leave only a tiny slice of the energy pie for alternatives that produce less air pollution.

SDG&E disclosed that it received bids that when stacked together would meet 14,000 megawatts of demands for power — more than six times the prior power capabilities of San Onofre.

SDG&E said further public disclosures sought by the Sierra Club would jeopardize the confidentiality of sensitive information and could lead to market manipulation that adversely affects utility customers. The utilities commission sided with SDG&E on Tuesday, in a shortly worded ruling by administrative law judge Hallie Yacknin.

Matt Vespa, senior attorney for the Sierra Club, said the public deserves more information.

“We just wanted details of how much clean energy was bid in, and how much conventional (fossil fuel), to give a sense to the public, who is very curious about this,” he said. “The public should have some sense of what goes on in there. It’s all going into this black box.”

SDG&E is seeking authorization for the Carlsbad Energy Center at the same time it evaluates the new bids. The overlapping quests for a new energy source in the San Diego area are the peculiar outcome of a race by grid operators to find an appropriate replacement for nuclear power. State law requires consideration of clean energy solutions, like solar power and conservation schemes that reduce peak electricity demands, before new fossil fuel burning power plants are commissioned.

SDG&E says quick-start generators proposed at the Carlsbad Energy Center would replace a much less efficient power plant and help integrate more renewable energy into the grid by filling in gaps in solar and wind power. The project is planned adjacent to existing Encina plant on already developed land, minimizing some environmental impacts.

In filings with the utilities commission, SDG&E noted that the Sierra Club and a long list of consumer groups and special interests have access to sealed information about the bidding process that cannot be shared with the public.

The commissioner overseeing the Carlsbad Energy Center evaluation, Mike Florio, has been swept up in accusations of overly cozy relations between the commission and Pacific Gas & Electric in the aftermath of the deadly San Bruno natural gas pipeline explosion in 2010.

At a conference in September about the Carlsbad power plant application, Florio told consumer groups and special interests with objections to the Carlsbad plant — also known as intervenors — that they might be wasting their time.

“To be quite frank, if I were an intervenor trying to decide how to allocate scarce resources, I would not allocate them to this proceeding,” Florio said at a September meeting about the Carlsbad Energy Center contract.

He did not respond to a request for comment.

As lead commissioner in the case, Florio will either write or strongly influence final recommendations that are voted on by the commission. He also will recommend to the commission how much — if anything — advocacy groups should be reimbursed for their contribution to deliberations.

## Selected Comments

[Bob Shafer](#) · Grossmont High School

I find it hysterical that the Sierra club says we need "Clean" energy. This is the organization that a few years ago had a Windmill project in Julian shut down and protested the Solar plant out in the Imperial Valley. The sad truth is that the cleanest Base Load power source we had was that Nuclear power plant we just tore down.

Feb 19, 2015 8:41am

[Bob Shafer](#) · Grossmont High School

Exactly what source of energy would you suggest with this Community Choice Energy? Solar and Wind are intermittent energy sources and the only way to get around that is through cheap battery systems that don't yet exist. So what form of energy would you have us use?

Feb 19, 2015 8:37am

[Bob Shafer](#) · Grossmont High School

I currently own a 5.3 kwh rooftop solar system, but then I have the luxury of owning my own home and having the disposable income that allows me to do this. Not everyone is so fortunate, and in fact most are living in buildings that they either rent or are not good candidates for solar. Battery systems are still at least 10 years away, and I have been hearing the 10 years away story for the last 20 years. So at some point you have to face reality which is that our base load power supply is going to have to come from natural gas plants. And the reason that we have managed without SONGS is because of a couple 60's era plants that should have been torn down but instead were brought online until new plants could replace them. I know you want to believe that SDG&E is some greedy monopoly that is only looking out for number one, but the truth is that their profit margins are about 10 percent meaning for every dollar they bring in they get to keep 10 cents in profit. Compare that to a company like Apple whose profit margins are three times that. So given all of that I ask you "What does the average person living in a two bedroom apartment do for Electricity?"

[Robert Freehling](#)

Bob Shafer Given that you own a rooftop solar system, you might be aware of "off-grid" systems that use batteries for power at night. Thousands of homes in California--usually in rural areas that are far from the grid-- already do this, and have for many years. For these people it can be less expensive than paying for running a wire to the utility grid, and off-grid solar with batteries is far less expensive than running a diesel generator. The generator itself is not too expensive, but 24/7 diesel fuel will burn a deep hole through a wallet.

Feb 19, 2015 10:57pm

[Bob Shafer](#) · Grossmont High School

Perhaps you would like to give me a price on those Battery systems! See to people like you it wouldn't matter if the battery system costs a million dollars, or if the technology even exists, you have no problem putting that out there as a solution to justify your belief that solar power is the only solution that is acceptable. Common sense simply need not apply. I only bought a solar system in the last year, and only then because the cost of such a system finally fell to the point where I could economically justify the costs. Now maybe 10 years from now I can make the same argument about a battery system, personally I hope I can but right now that isn't the case. And my original point still stands, what does the average person living in a 2 bedroom apartment do for power? In fact do you and Masada there own a home in San Diego and do either of you have a Solar system installed much less a battery system. Roof Top Solar right now is about 4 percent of SDG&E's base of customers, and I wouldn't expect it to get much past around 20 percent over the next 20 years.

Feb 20, 2015 7:51am

[Bob Shafer](#) · Grossmont High School

Robert Freehling As for Nuclear plants, you and I both know that a plant hasn't been built in this country since the 70's. You can't very well expect a mechanical device to keep running for 50 or 60 years without problems. The logical answer would be to replace those old plants with 3rd or 4th Generation plants which are not only cheaper but far safer than our aging 60's era plants. But that isn't the game plan of the Anti Nuclear folks like yourself, your plan is to prevent any plants from being built and then point to the ones that have any problems as proof of how dangerous they are. The reality is that no one in this country has ever been killed from a Nuclear plant, which is something you can't say about other forms of power generation like Coal. But as we both know it's only a matter of time before one of those 50 year old plants breaks that streak and then you will all point your fingers at the Nuclear industry and say "See I told you so"

Feb 20, 2015 8:01am

<http://www.nucnet.org/all-the-news/2014/04/08/study-says-san-onofre-shutdown-led-to-higher-electricity-prices-increased-co2/print>  
Archived 07 29 15 by Gene A. Nelson, Ph.D. Please note the updated link for the cited paper below. It was revised in May, 2014.



The Communications Network for Nuclear Energy and Ionising Radiation

08.04.2014\_No112 / **News in Brief**

## Study Says San Onofre Shutdown Led To Higher Electricity Prices, Increased CO2

*Research & Development*

**8 Apr (NucNet):** During the year after the February 2012 closure of California's San Onofre nuclear power plant, the cost of generating electricity in the state increased by 15 percent and carbon dioxide emissions climbed more than nine million tonnes, the equivalent of putting two million additional cars on the road, a study says.

The study, released by the Energy Institute at UC Berkeley's Haas School of Business, says the wholesale cost of electricity rose by 369 million US dollars (268 million euros) during the first 12 months after the reactors were shut down, although the increase was masked by a large decline in natural gas prices that year, which the study calls "a lucky coincidence."

According to the US Nuclear Energy Institute, the study confirms previous studies that found increased prices and higher carbon emissions since the plant's closing.

Between 2005 and 2011 the two reactors at San Onofre produced 16 million megawatt-hours of electricity annually, or eight percent of the state's total and enough to serve 2.3 million households.

In January 2012, plant workers discovered a small leak in a tube in the recently installed steam generator at one of the reactors while the other one, which had a similar steam generator, was down for maintenance and refuelling. Tubes in both steam generators showed signs of premature wear. Testing of both reactors continued for months, and in June 2013 San Onofre owner Southern California Edison, while awaiting a decision from the Nuclear Regulatory Commission on operating one of the reactors at reduced power, decided to close the plant permanently.

The shutdown was "abrupt, permanent, and unexpected," the study says, and "had a pronounced impact on the wholesale market, requiring large and immediate increases in generation from other sources."

"In the months following the closure, almost all of the lost generation from San Onofre was met by natural gas plants inside California," the study found, which led to higher costs and a large increase in carbon emissions.

The study says these benefits from keeping San Onofre open must be compared against several significant costs including "the real uncertainty" about the cost of required repairs, and even about whether San Onofre would have ever been allowed to restart.

The UC Berkeley study is online:

[http://ei.haas.berkeley.edu/pdf/working\\_papers/WP248.pdf](http://ei.haas.berkeley.edu/pdf/working_papers/WP248.pdf)

Revised paper link: <http://ei.haas.berkeley.edu/research/papers/WP248R.pdf>

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**Related reports in the NucNet database (available to subscribers):** US Nuclear Operates At 'Nearly 100 Percent' Capacity During Record Cold (News in Brief No.8, 10 January 2014)

**Source:** NucNet  
**Editor:** David Dalton

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*The NucNet database contains more than 15,000 reports published since 1991. To subscribe or ask for any further information email [info@nucnet.org](mailto:info@nucnet.org).*

## EIA: Natural gas accounts for over 60% of California's new generation capacity in 2013

Posted on April 10, 2014 by CaliforniaCarbon.info in Energy, News -

<http://californiacarbon.info/2014/04/10/eia-natural-gas-accounts-60-californias-new-generation-capacity-2013/>

Archived 07 29 15 by Gene A. Nelson, Ph.D., who **emphasized several passages below**.



**CaliforniaCarbon.info, April 10, 2014:** Latest figures published by the US Energy Information Administration (EIA) earlier this week have highlighted California's leading role in creating new generation capacity. A combination of state regulation, energy needs, natural gas prices, and the shuttering of the San Onofre Nuclear Generating Station (SONGS) in 2012 are believed to be contributing factors.

In 2013, California added 6,375 MW of generation capacity, 47% of the total 13,500MW added across the entire nation. The total added capacity in California was over four times as much as that in the next states on the list – Texas, Florida, and North Carolina.

**Of the 6,375MW, more than 3,900MW, or over 60% of California's added generation capacity, came from natural gas. California contributed nearly 60% of the total national natural gas capacity addition (6,861MW). There are two major types of natural gas plants that came online in 2013 – the combustion turbine 'peaker' plant serving peak demand, and the combined cycle plant providing baseload and intermediate power.**

Natural gas prices have dropped in the last couple of years, and may be expected to fall further should there be an expansion in the use of hydraulic fracturing in the state to procure shale gas. This at least in part justified the addition of more natural gas plants.

Natural gas has other advantages. **It does not suffer from intermittency in the same way wind and solar – the other two major constituents of California's capacity addition – do.** It is a cleaner-burning fuel source than coal, which in the context of the state's cap-and-trade program restricting firms' emissions made it an even more highly favourable alternative.

California similarly led the way in solar and wind capacity additions, perhaps reflecting the aggressiveness of the state's 33% Renewable Portfolio Standard (RPS) targets for 2020. **California added some 2,150MW of large-scale solar capacity** (i.e. excluding distributed solar PV) in 2013, just over a third of all new capacity installed in the state, and almost three quarters of all solar capacity added nationwide (2,959MW). This figure includes both solar PV and solar thermal projects, in both of which California and neighbours Arizona figured heavily.

**Wind contributed approximately 300MW of California's new 2013 generation capacity (5% of statewide capacity addition, and almost 30% of national wind capacity addition – 1,032MW). Wind's added capacity in 2013 was less than a tenth of its added capacity in 2012, which had largely to do with the rush to qualify for the federal production tax credit in 2012.**

**Of the four largest energy sources by added generation capacity in 2013, the only one for which California was not the biggest contributor was coal (1,507MW).** Only two coal plants came online in 2013, and with the coming Environmental Protection Agency (EPA) regulations on new generation sources likely to set target intensities that would require carbon capture and storage (CCS) capabilities, it may appear that coal is now on a downward trend.

**A large proportion of California's capacity addition in 2013 undoubtedly replaced the output from the 2,200 MW SONGS facility.** Last month, the California Public Utilities Commission (CPUC) gave approval to two of the state's investor-owned utilities - Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E)

– to source replacements for the SONGS power loss. SCE is authorised to obtain up to 700 MW of new capacity, with at least 400 MW coming from ‘preferred sources’ (i.e. renewables); SDG&E is authorised to obtain up to 800MW of new capacity, with at least 200 MW coming from ‘preferred sources’. **This potentially means that natural gas could conceivably make up some 900 MW of the shortfall.**

**The SONGS shutdown has been pinpointed as one of the major factors behind the 35% rise in emissions from the power generation sector between 2011 and 2012, and it remains to be seen if there will be a further increase in 2013 – the first full year without any contribution from the nuclear plant. According to the California Energy Commission’s Energy Almanac, with the loss of the 2.2GW plant (capable of contributing up to 8% of the state’s energy needs), the contribution of nuclear power to total grid output dropped from 15.2% to 9.0%. Along with the onset of drought, which brought the contribution of large hydropower down to 8.3% from 13.0%, this created a shortfall. The majority of this shortfall had to be made up by **natural gas, whose share increased from 35.3% to 43.4% in that time, which resulted in a greater quantity of carbon emissions.****

The increase in power sector emissions outweighed the emission reductions achieved in other sectors covered under the state’s emissions trading program, as total covered emissions inched up two percent in 2012.

*For more information on this article, please write to [contact@californiacarbon.info](mailto:contact@californiacarbon.info).*

## Related content

1. CAISO emergency highlights problems with natural gas dependence
2. SoCal utilities given approval to replace SONGS power
3. Study: Wholesale electricity cost up \$369m in 12 months after SONGS shutdown
4. Obama’s clean energy future has large role for natural gas
5. Wave energy exploratory project may unlock renewable potential three-and-a-half times SONGS output

EPA Power Plant Standards, Natural Gas, Power Sector Emissions, Renewable Portfolio Standard (RPS), San Onofre Nuclear Generating Station (SONGS), Southern California Edison (SCE), Wind Energy

# CAISO emergency highlights problems with natural gas dependence

Posted on February 9, 2014 by CaliforniaCarbon.info in News, Power, Power News

<http://californiacarbon.info/2014/02/09/caiso-emergency-highlights-problems-natural-gas-dependence/>

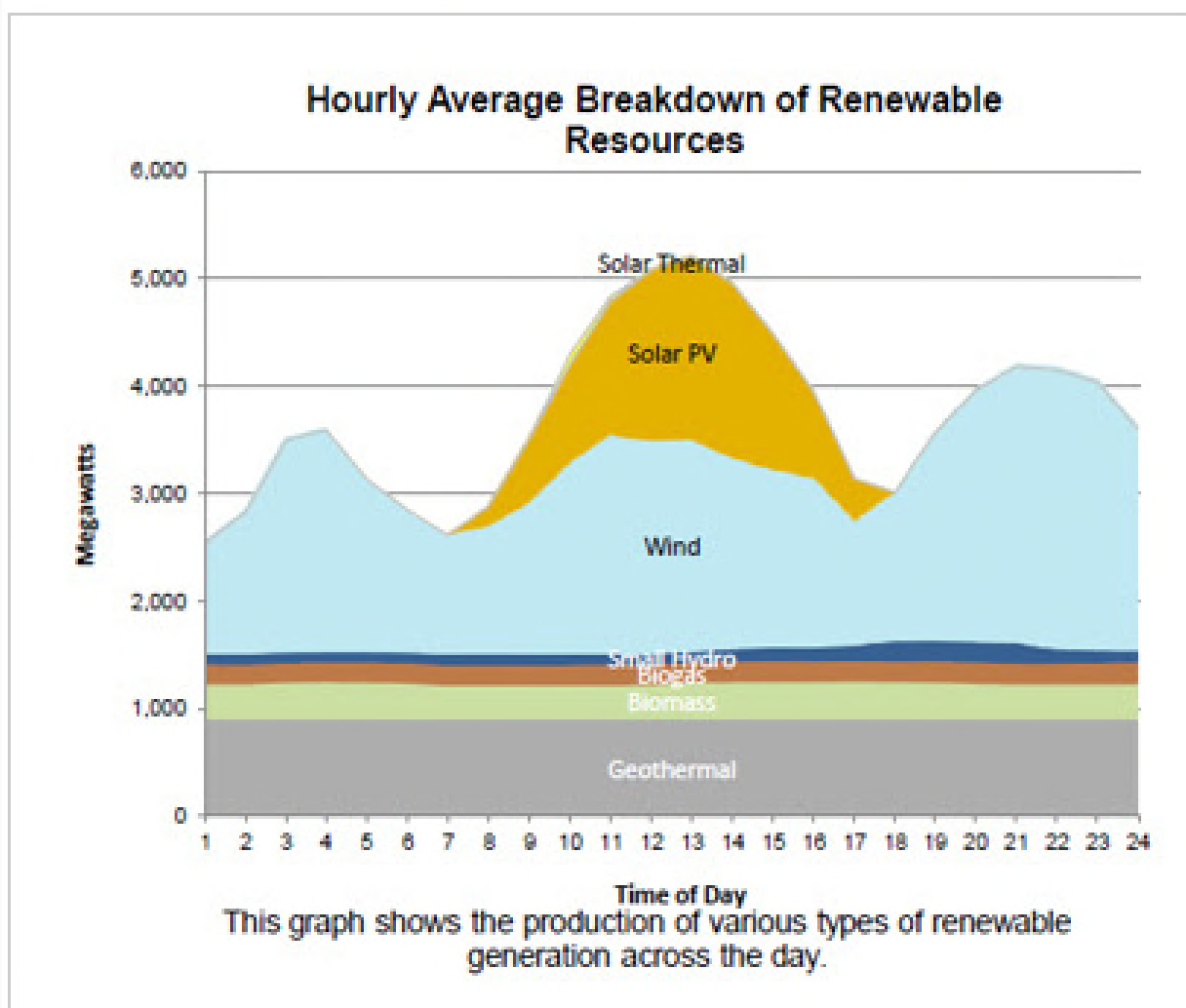
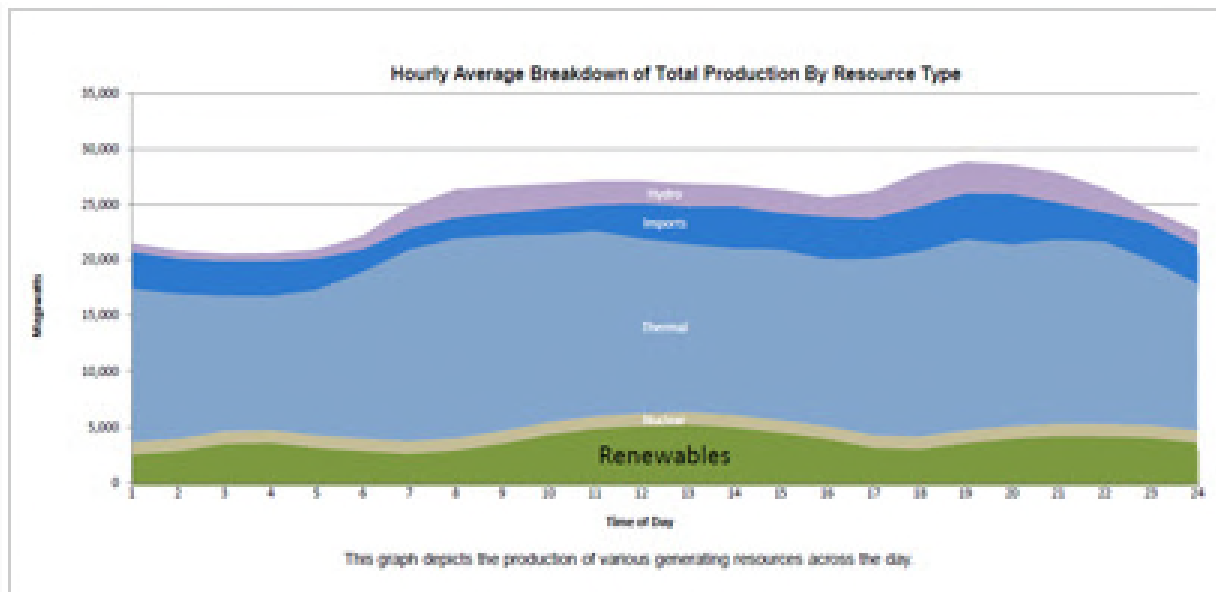
Archived 07 29 15 by Gene A. Nelson, Ph.D., who also **emphasized several passages below.**



**CaliforniaCarbon.info, February 9, 2014:** Last Thursday, February 6, the California Independent System Operator (CAISO) declared an emergency in the state. Californians were called on to cut back on the usage of electricity and natural gas when a 'Flex Alert' – the lowest level of emergency notification - was issued. Serious concerns about a natural gas shortage in Southern California led to the state-wide cry.

**Another week of low temperatures meant higher-than-usual natural gas consumption, particularly in the hard-hit Northeast. Prices at Louisiana's Henry Hub for Friday deliveries of natural gas averaged \$9 per million British thermal units – the highest average in five years and nearly triple the same figure a year ago.**

The irony that a natural gas shortage has been felt in California – the centre of a fracking legal storm that has blown over onto the federal level – has not been lost on many observers. Some have suggested that California, and the nation more broadly, should be wary of growing over-reliant on the much-vaunted shale reserves. Thursday's emergency has raised questions about the underlying pipeline infrastructure that would be responsible for the timely and voluminous delivery of the shale gas to sites where it could be processed into electricity, while doubts over the true extent of these reserves still persist in some quarters.



Source: Institute for Local Self-Reliance

**California's increasing reliance on natural gas – which has underpinned the fuel switch from coal – is visible from power mix statistics for the last ten years. In 2002, it contributed 36.5% of all power used in the state. If the same calculation methodology were to be used in 2012, by which unspecified power would be prorated to reflect the mix from specified sources, natural gas' contribution would be 50.5%.** Just last month, President Obama in his State of the Union address outlined the key role which natural gas should be allowed to play in the nation's energy future.

On Thursday, it was renewable generation that came to California's rescue. In what will surely come to be a foundation of arguments for increased renewable generation capacity or targets, a combination of geothermal, biomass, biogas, small hydro, solar, and wind power accounted for nearly 15% of the state's electricity usage on Thursday. The first four sources generated a steady 1,700 MW throughout the day, or nearly 6% of peak demand, while solar PV and wind power witnessed respective noon and evening peaks of 1,800 MW and 2,700 MW.

**It should be pointed out that, according to the Energy Almanac, renewable generation provides around 15% of California's electricity anyway, especially in the aftermath of the shutdown of the San Onofre Nuclear Generating Station (SONGS), which brought the contribution of nuclear down from 15.2% to 9.0% 2011 to 2012.**

It remains to be seen if renewable generation is to absorb any shortfall in large hydro production that may result from the current drought and the diminution of the Sierra Nevada snowpack. In 2012, the first of the 'dry years', large hydro's contribution fell to 8.3% from the preceding five-year average of 11.2%. **The majority of the combined deficit (nuclear and large hydro) in 2012 had been met by natural gas, which rose to 43.4% from a preceding three-year average of 39.7%.**

*For more information on this article, please write to [contact@californiacarbon.info](mailto:contact@californiacarbon.info).*

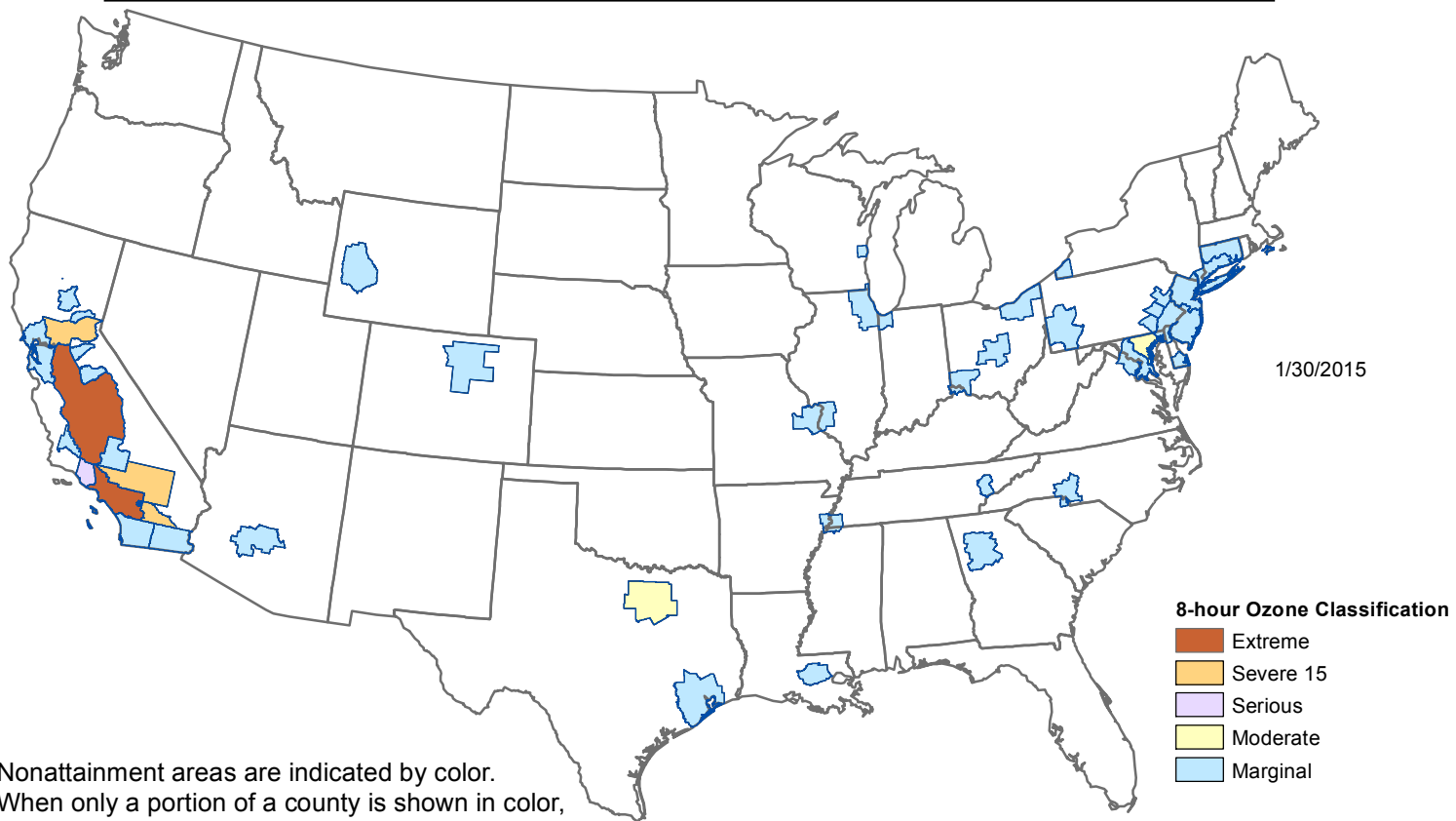
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2. Obama's clean energy future has large role for natural gas
3. US power plant emissions drop 10% in two years with increasing use of natural gas
4. ARB issues over 2 million offset credits to seven projects
5. ARB lists four early action projects in January

California Independent System Operator (CAISO), Hydraulic Fracturing (Fracking), Large Hydroelectric Generation, Natural Gas, Renewable Energy, San Onofre Nuclear Generating Station (SONGS), Weather and Climate

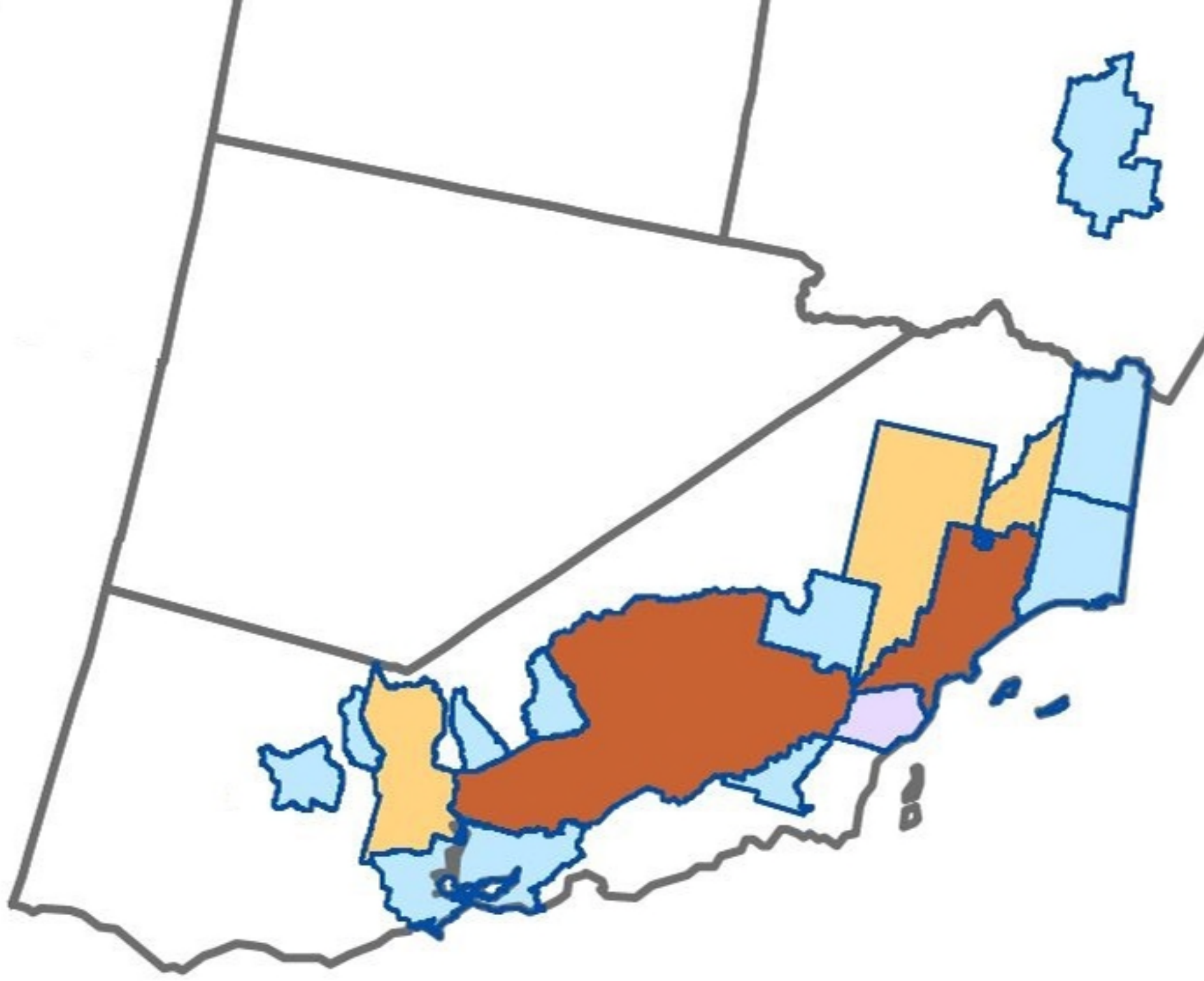
# 8-Hour Ozone Nonattainment Areas (2008 Standard)

[http://www.epa.gov/oaqps001/greenbk/map/map8hr\\_2008.pdf](http://www.epa.gov/oaqps001/greenbk/map/map8hr_2008.pdf) Archived 07 28 15 by Gene A. Nelson, Ph.D.



Nonattainment areas are indicated by color.  
When only a portion of a county is shown in color,  
it indicates that only that part of the county is within  
a nonattainment area boundary.

California 8 - Hour Ozone Nonattainment - U.S. EPA



Areas Listed Alphabetically Source: <a href="http://www.epa.gov/oaqps001/greenbk/hntc.html">http://www.epa.gov/oaqps001/greenbk/hntc.html</a> Archived 07 28 15 by Gene A. Nelson, Ph.D.	Design Values (ppm)		Class -ification	No. Counties NAA	2010 Population	EPA	
	2008 Ozone	1997 Ozone				Region	State
	at Designation * (monitored yrs)	(2008-2010)					
Allentown-Bethlehem-Easton, PA	0.076 (2009-2011)	0.076	Marginal	3	712,481	3	PA
Atlanta, GA	0.080 (2009-2011)	0.08	Marginal	15	4,753,017	4	GA
Baltimore, MD	0.089 (2008-2010)	0.089	Moderate	6	2,662,691	3	MD
Baton Rouge, LA	0.078 (2008-2010)	0.078	Marginal	5	732,587	6	LA
Calaveras County, CA	0.077 (2009-2011)	0.083	Marginal	1	45,578	9	CA
Charlotte-Rock Hill, NC-SC	0.079 (2009-2011)	0.082	Marginal	8	1,901,424	4 4	NC-SC
Chicago-Naperville, IL-IN-WI	0.077 (2009-2011)	0.074	Marginal	11	9,179,738	5 5 5	IL-IN-WI
Chico (Butte County), CA	0.079 (2008-2010)	0.079	Marginal	1	220,000	9	CA
Cincinnati, OH-KY-IN	0.079 (2008-2010)	0.079	Marginal	9	1,988,951	5 4 5	OH-KY-IN
Cleveland-Akron-Lorain, OH	0.077 (2008-2010)	0.077	Marginal	8	2,881,937	5	OH
Columbus, OH	0.077 (2008-2010)	0.077	Marginal	6	1,754,632	5	OH
Dallas-Fort Worth, TX	0.086 (2008-2010)	0.086	Moderate	10	6,280,413	6	TX
Denver-Boulder-Greeley-Ft. Collins-Loveland, CO	0.078 (2008-2010)	0.077	Marginal	9	3,330,139	8	CO
Dukes County, MA	0.076 (2009-2011)	See DV Notes	Marginal	1	16,535	1	MA
Greater Connecticut, CT	0.079 (2008-2010)	0.078	Marginal	5	1,629,115	1	CT
Houston-Galveston-Brazoria, TX	0.084 (2008-2010)	0.084	Marginal	8	5,891,999	6	TX
Imperial County, CA	0.078 (2008-2010)	0.078	Marginal	1	174,528	9	CA
Jamestown, NY	0.077 (2008-2010)	0.077	Marginal	1	134,905	2	NY
Kern Co (Eastern Kern), CA	0.083 (2008-2010)	0.083	Marginal	1	95,176	9	CA
Knoxville, TN	0.077 (2009-2011)	0.077	Marginal	3	573,452	4	TN
Lancaster, PA	0.077 (2009-2011)	0.077	Marginal	1	519,445	3	PA

Areas Listed Alphabetically Source: <a href="http://www.epa.gov/oaqps001/greenbk/hntc.html">http://www.epa.gov/oaqps001/greenbk/hntc.html</a> Archived 07 28 15 by Gene A. Nelson, Ph.D.	Design Values (ppm)		Class -ification	No. Counties NAA	2010 Population	EPA Region	State
	2008 Ozone	1997 Ozone					
	at Designation * (monitored yrs)	(2008-2010)					
Los Angeles-San Bernardino Counties (West Mojave Desert), CA	0.099 (2008-2010)	0.099	Severe 15	2	868,380	9	CA
Los Angeles-South Coast Air Basin, CA	0.112 (2008-2010)	0.112	Extreme	4	15,719,485	9	CA
Mariposa County, CA	0.077 (2009-2011)	0.083	Marginal	1	18,251	9	CA
Memphis, TN-MS-AR	0.076 (2008-2010)	0.076	Marginal	3	1,127,469	4 4 6	TN-MS-AR
Morongo Band of Mission Indians	0.112 (2008-2010)	See DV Notes	Serious	1	913	9	CA
Nevada Co. (Western part), CA	0.079 (2009-2011)	0.084	Marginal	1	82,107	9	CA
New York-N. New Jersey-Long Island, NY-NJ-CT	0.084 (2008-2010)	0.084	Marginal	24	20,217,137	2 2 1	NY-NJ-CT
Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation	0.096 (2008-2010)	See DV Notes	Moderate	1	2,844	9	CA
Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE	0.083 (2008-2010)	0.083	Marginal	16	7,437,135	3 2 3	PA-NJ-DE
Phoenix-Mesa, AZ	0.077 (2008-2010)	0.077	Marginal	2	3,849,627	9	AZ
Pittsburgh-Beaver Valley, PA	0.080 (2009-2011)	0.081	Marginal	7	2,356,285	3	PA
Reading, PA	0.077 (2009-2011)	0.079	Marginal	1	411,442	3	PA
Riverside Co. (Coachella Valley), CA	0.095 (2008-2010)	0.095	Severe 15	1	425,806	9	CA
Sacramento Metro, CA	0.095 (2009-2011)	0.102	Severe 15	6	2,241,057	9	CA
San Diego County, CA	0.082 (2009-2011)	0.088	Marginal	1	3,095,199	9	CA
San Francisco Bay Area, CA	0.080 (2008-2010)	0.08	Marginal	9	6,973,020	9	CA
San Joaquin Valley, CA	0.104 (2008-2010)	0.104	Extreme	8	3,842,365	9	CA
San Luis Obispo (Eastern San Luis Obispo), CA	0.078 (2009-2011)	See DV Notes	Marginal	1	1,649	9	CA
Seaford, DE	0.077 (2008-2010)	See DV Notes	Marginal	1	197,145	3	DE
Sheboygan County, WI	0.078 (2008-2010)	0.078	Marginal	1	115,507	5	WI
St. Louis-St. Charles-Farmington, MO-IL	0.077 (2008-2010)	0.077	Marginal	8	2,571,253	7 5	MO-IL

Areas Listed Alphabetically		Design Values (ppm)		No.	2010	EPA	
Source: <a href="http://www.epa.gov/oaqps001/greenbk/hntc.html">http://www.epa.gov/oaqps001/greenbk/hntc.html</a>				Counties	Population	Region	
Archived 07 28 15 by Gene A. Nelson, Ph.D.		2008 Ozone	1997 Ozone	Class	NAA		State
		at Designation *	(2008-2010)	-ification			
		(monitored yrs)					
Tuscan Buttes, CA		0.076 (2009-2011)	See DV Notes	Marginal	1	0	9 CA
Upper Green River Basin Area, WY		0.078 (2008-2010)	See DV Notes	Marginal	3	11,498	8 WY
Ventura County, CA		0.086 (2008-2010)	0.086	Serious	1	823,262	9 CA
Washington, DC-MD-VA		0.081 (2008-2010)	0.081	Marginal	15	5,136,216	3 3 3 DC-MD-VA
<b>Totals</b>					<b>232</b>	<b>123,003,795</b>	