Pacific Petroleum Geology NEWSLETTER

Pacific Section • American Association of Petroleum Geologists

January & February • 2009

Pacific Section AAPG-SEPM-SEG 2009 Annual Convention Field Trips

Offshore Oil Seeps

Tertiary Sedimentary Environments in the Transverse Ranges

Pacific Section AAPG
P. O. Box 1072
Bakersfield, CA 93302

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Every Issue

This Issue

Message from the President

Don Clarke

Happy New Year!

The fluctuations in the price of oil in 2008 were dramatic and the importance of a stable inexpensive energy source was made clear. The recent crash of oil prices after last summer's highs has left the public confused. Refined and unrefined oil inventories, recession, the collapse of the banks and the big three auto companies and the general failure to adjust to change seems to have also shaken our local oil industry. Are today's players going to be the players of tomorrow? Only if they plan and move forward with long term goals that consider both the national and international situation. So where does the Pacific Section AAPG fall in this?

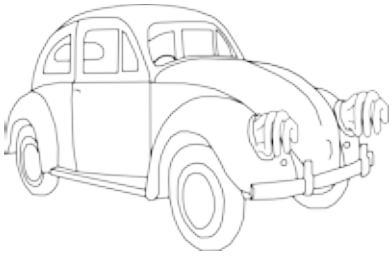
AAPG is preparing to present a new organization proposal to the House of Delegates for consideration at the annual meeting in Denver, Colorado this spring. The intent of the organization is to strengthen AAPG globally and provide financial security. The specifics of the new organization will be released to the AAPG Delegates right after the HOD midyear meeting. Marlan Downey chairs the Reorganization Committee. It is my understanding that this new organization will be an umbrella organization where AAPG will be one of many partners that reside under the umbrella. AAPG will be the general partner. I suspect the Pacific Section will reside under the AAPG like the other domestic sections. As details are released we will post them at PSAAPG.org and in this newsletter.

We need to increase the public's awareness to the Earth Sciences. This is a crucial time in our history where public awareness will help our legislators to forge better environmental laws and energy policy. California, Hawaii, Oregon, Washington and Alaska residents have special concerns when it comes to geology. We produce a lot of oil, we generate solar, wind and hydroelectric electricity and we have many geological hazards. Subsidence and tsunamis threaten coastal areas, earthquakes threaten the entire area and volcanoes threaten Hawaii and the northwestern states. Landslides threaten the hills of southern California to the suburbs of Anchorage. I've heard some say that rising sea level and glacier melt will result from anthropogenic climate change. How ever you feel about global warming, fossil energy and geohazards you must agree that it is in the best interest of all to have a better educated public.

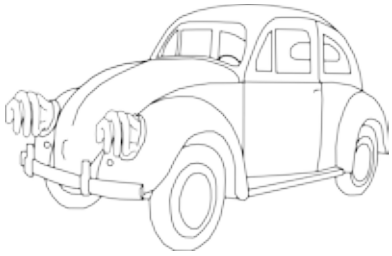
We need to do several things to increase public awareness of the geosciences. First we need to let our neighbors and friends know that we are geoscientists and share with them what we do for a living. Consider volunteering to speak with elementary school children. I have found that K-12 teachers usually welcome guest speakers. In this way you will bring life to a profession the children never realized existed. I have found this to be both fun and rewarding. We need to get geology taught formally to as many high school students as possible. To do this we need to convince the University of California Regents to accept geology as a laboratory science for admission to the University of California. Currently Physics, Chemistry and Biology are the accepted laboratory sciences. Knowledge of earth systems is arguably more important to most people than the other three sciences. It should be noted that geology incorporates the other three lab sciences and applies them to the earth.

I plan to write a letter to the University of California Regents suggesting this change. Once instituted the high schools will start adding geology classes to their schedules. More students will be exposed to the earth sciences. Many of those students will take geology in college and some will major in one of the geosciences. It is these geoscientists who will be the future finders of fossil energy and keepers of the environment.

New Technology still has to make sense!



from
"Drill - Baby -Drill"
to
"Bankrupt the Coal Industry"



Are we next?

Our nation needs a public policy framework that ensures future energy security for our nation. We need elected and appointed officials who understand the energy challenges we face. We need a greater commitment to increased energy efficiency. We need to diversify our energy resources, drawing upon the full range of energy sources, including alternatives. And, we need to enhance energy technologies, remaining on the cutting edge of advanced technology.

But of utmost importance, America needs policies that promote greater supplies of oil and natural gas, not policies that hinder the industry's ability to provide consumers the energy they demand and need. The U.S. could significantly improve its energy security by allowing access to domestic oil and gas resources.

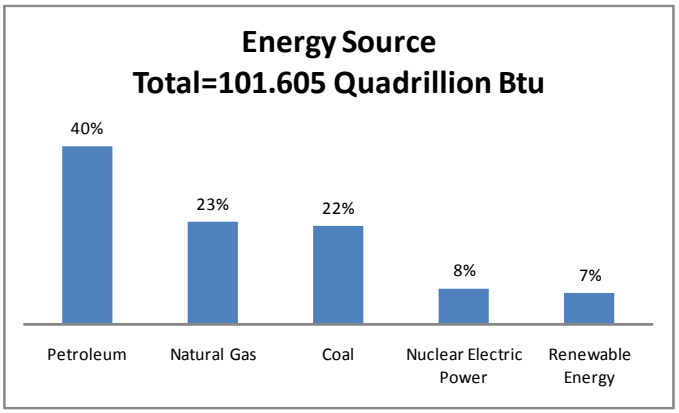
A recent study from ICF International shows more access to domestic energy resources could generate $1.7 trillion in government revenue, create thousands of new jobs and enhance America's energy security by significantly boosting energy production here in the United States.

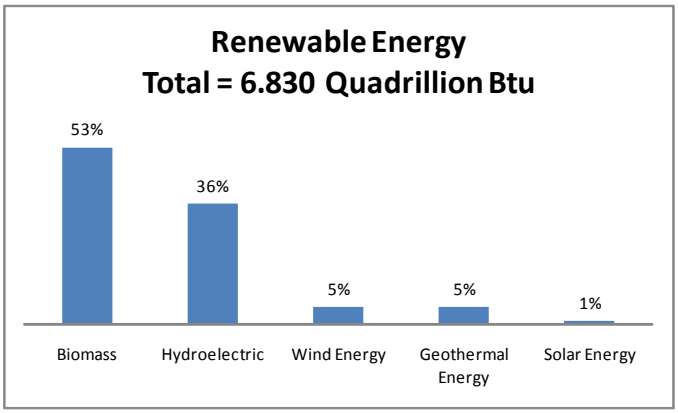
The study, commissioned by API, shows that developing offshore areas previously off-limits to exploration, as well as ANWR and a small portion of off-limits land in the Rockies, would increase U.S. crude oil production by as much as two million barrels per day in 2030, offsetting nearly a fifth of the nation's imports. Policies that will allow energy companies to make the most of the energy resources we have here at home are crucial to the U.S. economy. We need to get it right on energy. Too much is at stake for our nation to do otherwise.

API website: http://energytomorrow.org/energy/

How do we compare the cost of generating electricity power from the various sources and the costs are blurred by direct and indirect subsidies, market mechanisms, transmission and distribution costs? If we are to carry on a sensible dialog with our elected officials, we need to sort through the commercial sensitivities and competing claims.

In the meantime, this issue will cover some of the basic facts about alternative energy sources. I will leave out articles claiming that the biodiesel industry, which is subsidized by our tax dollars, is selling their product to European countries and that Oregon gives $1,000,000 dollars in tax credits for every renewable job that has been created in the state.





Note: Sum of components may not equal 100 percent due to independent rounding.
Source: EIA, Renewable Energy Comsumption and Electricity Preliminary 2007 Statistics, Table 1: U.S. Energy Consumption by Energy Source, 2003-2007 (May 2008).

Renewable Energy Plays a Role in the Nation's Energy Supply (2007)

Renewable energy consumption decreased by about 1% between 2006 and 2007, contributing 7% of the Nation's total energy demand, and 8.4% of total U.S. electricity generation in 2007.

Most Renewable Energy Goes to Producing Electricity

Electricity producers consumed 51% of total U.S. renewable energy in 2007 for producing electricity. Most of the remaining 49% of renewable energy was biomass consumed for industrial applications (principally paper-making) by plants producing only heat and steam. Biomass is also used for transportation fuels (ethanol) and to provide residential and commercial space heating. The largest share of the renewable-generated electricity comes from hydroelectric energy (71%), followed by biomass (16%), wind (9%), geothermal (4%), and solar (0.2%). Wind-generated electricity increased by almost 21% in 2007 over 2006, more than any other energy source. Its growth rate was followed closely by solar, which increased by over 19% in 2007 over 2006.

The United States Is Second in Renewable Electricity Production

China leads the world in total renewable energy consumption for electricity production due to its recent massive additions to hydroelectric production, followed closely by the United States, Canada, and Brazil. However, the United States consumes the most non-hydro renewable energy for the production of electricity. The United States consumes twice as much non-hydro renewable energy for electricity production as Germany and more than three times as much as Japan.

The Share of Renewable-Generated Electricity in the United States Is Expected to Grow

The Energy Information Administration (EIA) projects that renewable-generated electricity will account for 12.5% of total U.S. electricity generation in 2030. This growth (from 8.4% in 2007 to 12.5% in 2030) is fueled by the rapid expansion of non-hydro renewable generation technologies that qualify to meet State mandates for renewable energy production.

However, EIA projects renewable energy's share of total worldwide electricity generation will decrease slightly: from 18% of generation in 2005 to 15% in 2030. Although worldwide renewable energy is expected to increase, it will be outpaced by growth in other electricity generation sources.

Why We Don't Use More Renewable Energy

Renewable energy sources and generating technologies are environmentally benign compared with fossil fuel and nuclear technologies, but there are two main reasons why we don't use more renewable energy.

1. Renewable Energy is Expensive and Capital-Intensive: Renewable energy plants are generally more expensive to build and to operate than coal and natural gas plants. Recently, however, some wind-generating plants have proven to be economically feasible in areas with good wind resources, compared with other conventional technologies, when coupled with the Renewable Electricity Production Tax Credit.

2. Renewable Resources Are Often Geographically Remote: The best renewable resources are often available only in remote areas, so building transmission lines to deliver power to large metropolitan areas is expensive.

Policies Aim to Increase the Use of Renewable Energy

Three kinds of policies to increase the use of renewable energy are:

1. Tax credits: The Renewable Electricity Production Tax Credit, a federal incentive, has encouraged a quadrupling of wind energy capacity over the past few years. EIA's projections assume these credits will expire at the end of 2008, as provided for under current law. Extension of the credit would increase the projected growth in renewable generation.

2. Targets: Many States have Renewable Portfolio Standards (RPS), which require electricity providers to generate or acquire a percentage of generation from renewable sources. However, many RPS programs have "escape clauses" if renewable generation exceeds a cost threshold. Some States have delayed compliance and others lack enforcement procedures. As a result, States may not always meet their RPS goals. Since it is difficult to project which States will have success, EIA assumes nearly all States will meet their mandated generation.

3. Markets: A number of States have built Renewable Energy Certificates/Credits (RECs) into their Renewable Portfolio Standards. This allows electricity providers to sell renewable energy certificates/credits and use their proceeds for renewable projects. Some States have made REC markets mandatory, requiring electricity providers to produce or acquire renewable generation to reduce reliance on fossil fuels to generate electricity.

(http://tonto.eia.doe.gov/energy_in_brief/renewable_energy.cfm)

L. Stoddard, J. Abiecunas, and R. O'Connell
Black & Veatch Overland Park, Kansas

Subcontract Report
NREL/SR-550-39291
April 2006

In Collaboration with the Interfaith Environmental Council and the Coalition on the Environment and Jewish Life of Southern California
Los Angeles, California

Complete report available at: http://www.nrel.gov/csp/troughnet/pdfs/39291.pdf

1.0 Introduction

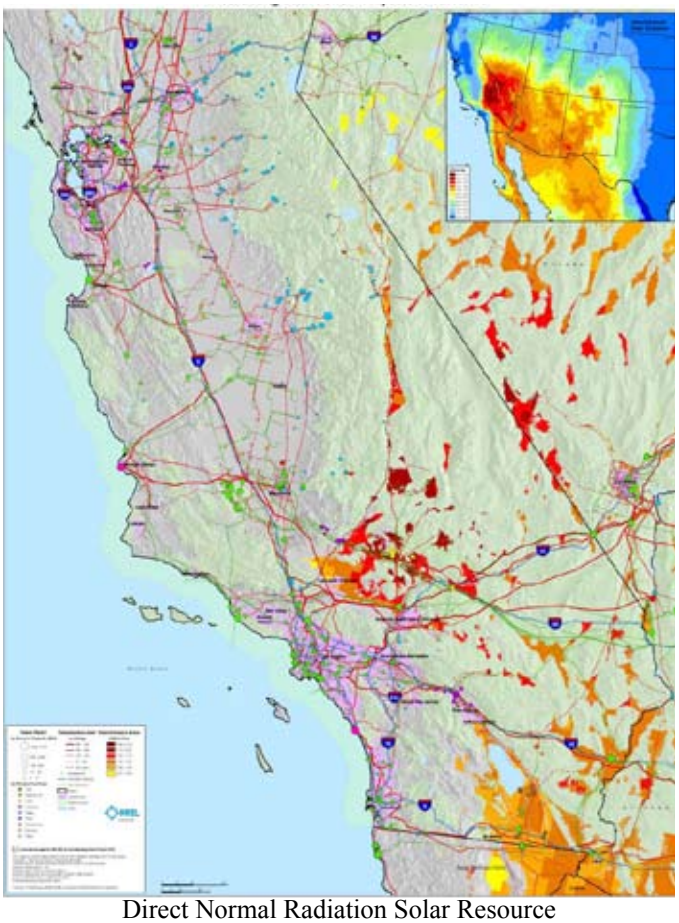
This report documents work performed by Black & Veatch Corporation (Black & Veatch) on the "Economic, Energy, and Environmental Benefits of Concentrating Solar Power in California," a study funded by the National Renewable Energy Laboratory (NREL) under subcontract AEK-5-55036-01. The objective of the study was to characterize commercial and developing CSP technologies and estimate the direct and indirect economic impacts of CSP deployment. The economic impact of CSP deployment was calculated by considering the impact to Gross State Output, earnings, employment, and to state tax receipts. The study was divided into five tasks:

- Task 1: Technology Assessment
- Task 2: Solar Resource Assessment
- Task 3: Cost of Energy and Economic Impact Evaluation
- Task 4: Environmental and Energy Attributes and Specific Benefits toCalifornia
- Task 5: Review and Reporting

This report relies on information gathered by the Black & Veatch team which performed the "New Mexico Concentrating Solar Plant Feasibility Study," performed for the New Mexico CSP Task Force under contract to New Mexico Energy, Minerals and Natural Resources Department. The study also made extensive use of Excelergy, the NREL solar parabolic trough performance and cost modeling program. Economic impacts were calculated using the Regional Input-Output Modeling System (RIMS II model), developed and maintained by the US Bureau of Economic Analysis

8.0 Conclusions

The purpose of this study was to determine the economic and environmental impacts on California resulting from the installation of concentrating solar power plants. The primary focus was on economic and employment impacts and the comparison of these findings with the corresponding impacts from conventional gas fired generators that would otherwise be employed. To ensure that projected installation scenarios were realistic, the electricity supply characteristics of potential CSP technology variants were examined and the availability of California solar resources to support estimated solar plant output was addressed. The environmental impacts of power production were quantified as well as the possible "hedge" value against increases in natural gas price. Having completed the foregoing, Black and Veatch reaches the following conclusions:



Direct Normal Radiation Solar Resource
Land Greater Than 1 Percent Slope Excluded

- California has high quality solar resources sufficient to support far more concentrating solar installations than either of the 2,100 MW or 4,000 MW capacity scenarios postulated for this study.

- Depending on the CSP plant interconnection point and the load profile of the local electricity provider, concentrating solar power installations with 6 hours storage could perform peaking and/or intermediate generation roles for the utility.

- Investment in CSP power plants delivers greater return to California in both economic activity and employment than corresponding investment in natural gas equipment:

  - Each dollar spent on CSP contributes approximately $1.40 - $1.50 to California's Gross State Product; each dollar spent on natural gas plants contributes $0.90 - $1.00 to Gross State Product.

  - The 4,000 MW deployment scenario was estimated to create about 3,000 permanent jobs from the ongoing operation of the plants.

- Operational period expenditures on operations and maintenance create more permanent jobs than alternative natural gas fueled generation.

- For each 100 MW of generating capacity, CSP was estimated to generate 94 permanent jobs compared to 56 jobs and 13 jobs for combined cycle and simple cycle plants, respectively.

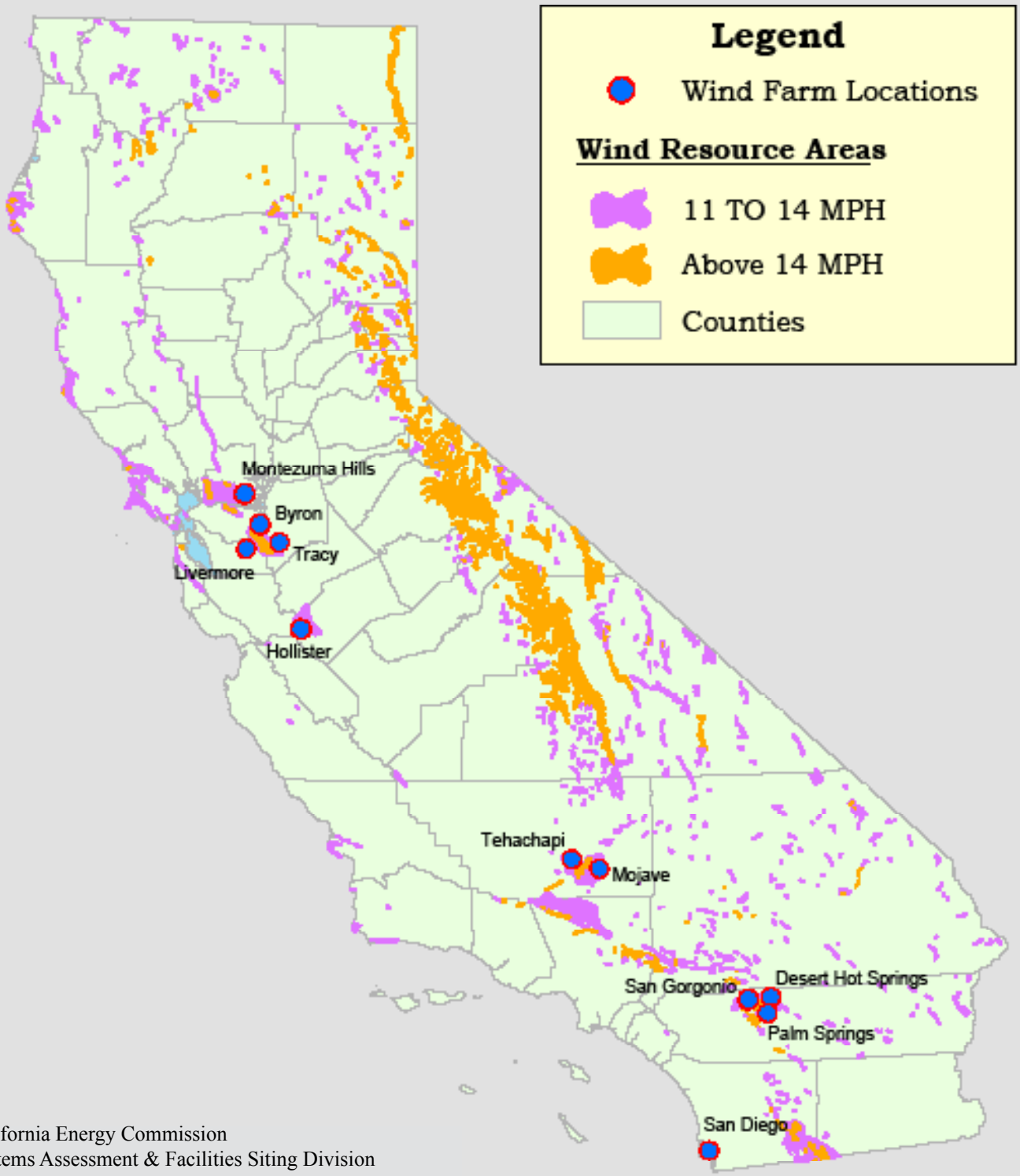
- Energy delivered from early CSP plants (startup in 2007) costs more than that delivered from natural gas combined cycle plants32 ($157 per MWh vs. $104 per MWh, based on a 30 percent ITC for CSP). With technologyadvancements, improvements to CSP construction efficiency, and withhigher gas prices consistent with 2015 MPR projections, CSP becomes competitive with combined cycle power generation ($115 per MWh vs. $119 per MWh, even with the permanent 10 percent ITC). Most of the economic and employment advantages are still retained.

- CSP plants are a fixed-cost generation resource and offer a physical hedge against the fluctuating cost of electricity produced with natural gas.

- Each CSP plant provides emissions reductions compared to its natural gas counterpart; the 4,000 MW scenario in this study offsets at least 300 tons per year of NOx emissions, 180 tons of CO emissions per year, and 7,600,000 tons per year of CO2.

The economic and employment benefits, together with delivered energy price stability and environmental advantages, suggest that the CSP solar alternative would be a beneficial addition to California's energy supply. While early CSP plants are more costly than their traditional gas counterparts, subsequent plants are estimated to become nearly cost competitive on a levelized cost of energy basis.

California
Wind Resource Potential



California Energy Commission
Systems Assessment & Facilities Siting Division
Cartography Unit
www.energy.ca.gov
To inquire about ordering this map or information on
other types of maps call the map line at (916) 654-4182 or
E-Mail: JGILBREA@ENERGY.STATE.CA.US

U.S. Department of Energy
Energy Efficiency and Renewable Energy

Complete Report available at:
http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf

20% Wind Energy by 2030
Increasing Wind Energy's Contribution to U.S. Electricity Supply

Assessment Participants:

U.S. Department of Energy (DOE)
- Office of Energy Efficiency and Renewable Energy (EERE)
- Office of Electricity Delivery and Energy Reliability (OE)
- Power Marketing Administrations (PMAs)

National Renewable Energy Laboratory (NREL)
- Lawrence Berkeley National Laboratory (Berkeley Lab)
- Sandia National Laboratories (SNL)

Black & Veatch engineering and consulting firm

American Wind Energy Association (AWEA)
- Leading wind manufacturers and suppliers
- Developers and electric utilities
- Others in the wind industry

INTRODUCTION

In 2006, President Bush emphasized the nation's need for greater energy efficiency and a more diversified energy portfolio. This led to a collaborative effort to explore a modeled energy scenario in which wind provides 20% of U.S. electricity by 2030. Members of this 20% Wind collaborative produced this report to start the discussion about issues, costs, and potential outcomes associated with the 20% Wind Scenario. A 20% Wind Scenario in 2030, while ambitious, could be feasible if the significant challenges identified in this report are overcome.

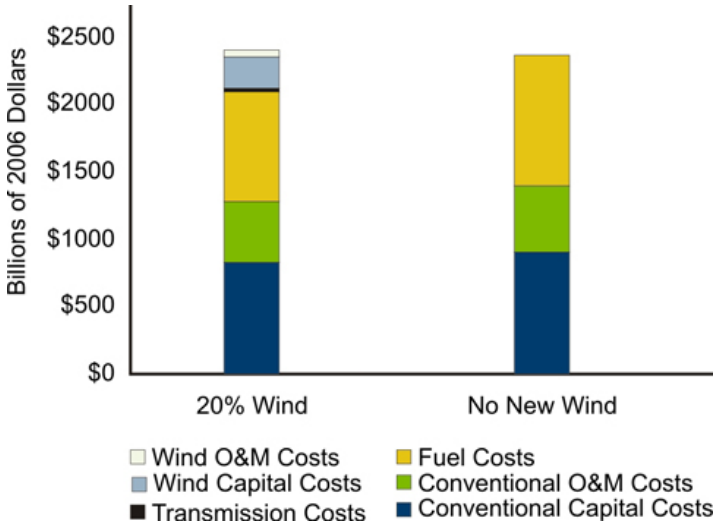
20% Wind Scenario: Major Challenges

- Investment in the nation's transmission system, so that the power generated is delivered to urban centers that need the increased supply;
- Larger electric load balancing areas, in tandem with better regional planning, so that regions can depend on a diversity of generation sources, including wind power;
- Continued reduction in wind capital costs and improvement in turbine performance through technology advancement and improved manufacturing capabilities; and
- Addressing potential concerns about local siting, wildlife, and environmental issues within the context of generating electricity.

COST OF THE 20% WIND SCENARIO

The overall economic cost of the 20% Wind Scenario accrues mainly from the incremental costs of wind energy relative to other generation sources. This is impacted by the assumptions behind the scenario. Also, some incremental transmission would be required to connect wind to the electric power system. This transmission investment would be in addition to the significant investment in the electric grid that will be needed to serve continuing load growth, whatever the mix of new generation. The market cost of wind energy remains higher than that of conventional energy sources in many areas across the country. In addition, the transmission grid would have to be expanded and upgraded in wind-rich areas and across the existing system to deliver wind energy to many demand centers. An integrated approach to expanding the transmission system would need to include furnishing access to wind resources as well as meeting other system needs.

Compared to other generation sources, the 20% Wind Scenario entails higher initial capital costs (to install wind capacity and associated transmission infrastructure) in many areas, yet offers lower ongoing energy costs for operations, maintenance, and fuel. Given the optimistic cost and performance assumptions of wind and conventional energy sources, the 20% Wind Scenario could require an incremental investment of as little as $43 billion net present value (NPV) more than the base-case scenario involving no new wind power generation (No New Wind Scenario). This would represent less than 0.06 cents (6 one-hundredths of 1 cent) per kilowatt-hour of total generation by 2030, or roughly 50 cents per month per household. Figure 1-15 shows this cost comparison. The base-case costs are calculated under the assumption of no major changes in fuel availability or environmental restrictions. In this scenario, the cost differential would be about 2% of a total NPV expenditure exceeding $2 trillion.



The total installed costs for wind plants include costs associated with siting and permitting of these plants. It has become clear that wind power expansion would require careful, logical, and fact-based consideration of local and environmental concerns, allowing siting issues to be addressed within a broad risk framework. Experience in many regions has shown that this can be done, but efficient, streamlined procedures will likely be needed to enable installation rates in the range of 16 GW per year.

Figure 1-15. Incremental Investment Cost

CHALLENGES TO 20% WIND ENERGY BY 2030

Labor

One potential gap in achieving high rates of wind energy development is the availability of a qualified work force. In a report published by the National Science and Technology Council (NSTC), the percentage of 22-year-olds earning degrees in science and engineering will continue to drop in the next 40 years. More support from industry, trade organizations, and various levels of government could foster university programs in wind and renewable energy technology, preparing the work force to support the industry's efforts.

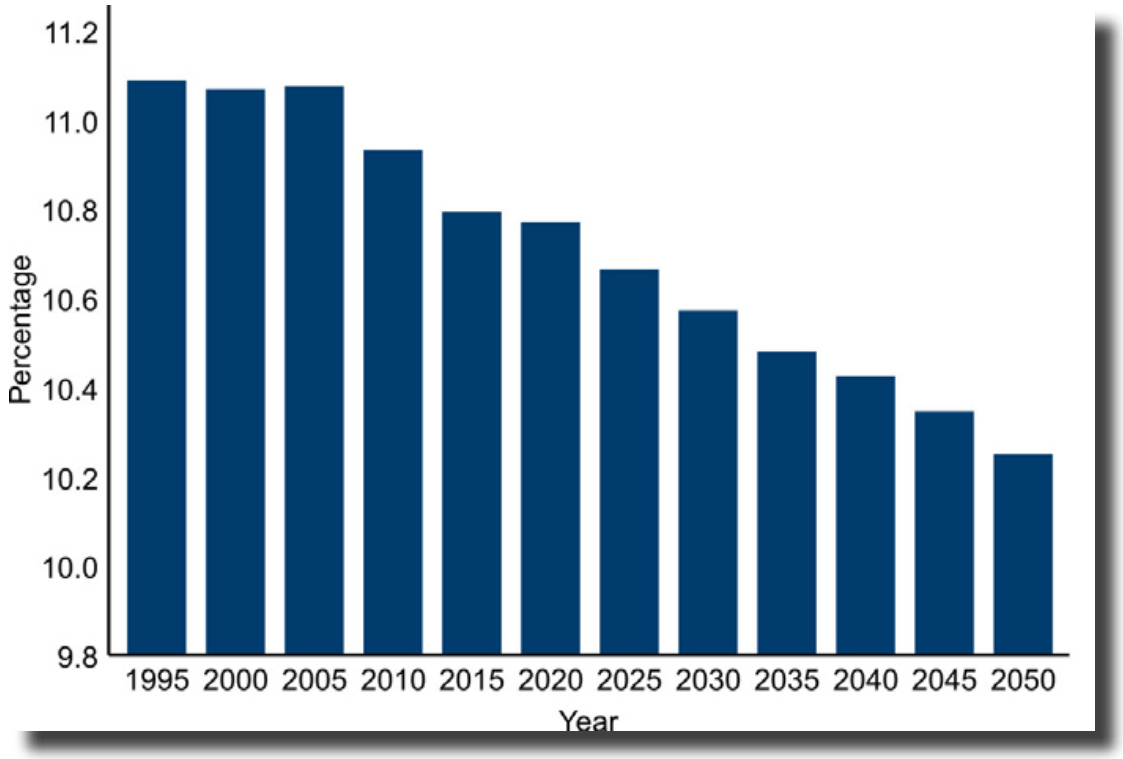


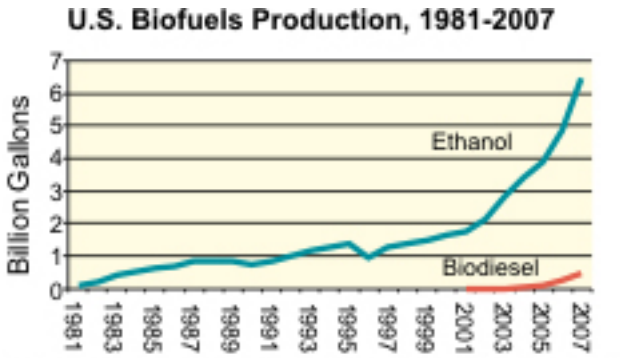
Figure 3-4. Projected percentage of 22-year-olds with a bachelor's degree in science and engineering through 2050

At this rate, the United States will be unable to provide the necessary trained talent and manufacturing expertise. Unless this trend is reversed, even with major new wind installations in the United States, most of the technology will be imported, and a significant portion of the economic gains will be foreign rather than domestic.

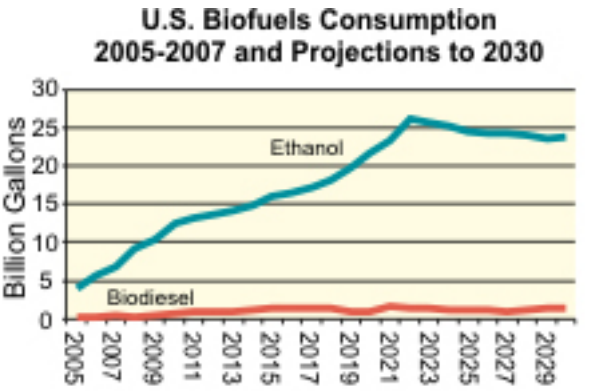
Editor's Note:

Why didn't this make the major challenge list?

If one of the points of going green is in part due to national security, we will be still be transferring energy dollars outside of the United States.



Source: Energy Information Administration, *Renewable Energy Consumption and Electricity Preliminary 2007 Statistics* (May 2008).



Source: Energy Information Administration, *Annual Energy Outlook 2008* (March 2008).

Targets for Renewable Fuels Usage as Established by the Energy Independence and Security Act of 2007.

Year	Total Renewable Fuels Standard (billion credit gallons)
2008	9.00
2009	11.10
2010	12.95
2011	13.95
2012	15.20
2013	16.55
2014	18.15
2015	20.50
2016	22.25
2017	24.00
2018	26.00
2019	28.00
2020	30.00
2021	33.00
2022	36.00

Source: Energy Independence and Security Act of 2007 (P.L. 110-140).

Note: A gallon of biofuel with greater energy content per gallon than ethanol would count as more than one ethanol gallon equivalent. For example, each gallon of biodiesel counts as 1.5 gallons toward the advanced and total biofuels requirements.

What are biofuels and how much do we use?

Biofuels are liquid fuels produced from biomass materials and are used primarily for transportation1. The term biofuels most commonly refers to ethanol and biodiesel. In 2007, the United States consumed 6.8 billion gallons of ethanol and 491 million gallons of biodiesel. By comparison, 2007 consumption of motor gasoline and diesel (not inclusive of biofuels) was 139 billion gallons and 39 billion gallons, respectively.

Biofuels are made by converting various forms of biomass such as corn or animal fat into liquid fuels and can be used as replacements or additives for gasoline or diesel. Biofuels generally have lower life-cycle carbon dioxide emissions than do their fossil fuel counterparts. In recent years, several new Federal laws designed to increase the production and consumption of domestic biofuels have been enacted. The Energy Policy Act of 2005 established the Renewable Fuel Standard, which mandated that transportation fuels sold in the United States contain a minimum volume of renewable fuels2, the level of which increases yearly until 2022. In December 2007, the Energy Independence and Security Act of 2007 increased the mandatory levels of renewable fuel blending credits to a total of 36 billion gallons by 2022, including 16 billion gallons of cellulosic biofuels.

What Is Ethanol?

Ethanol is a clear, colorless alcohol—the same as is found in alcoholic beverages. In fact, ethanol is produced when yeast ferments sugar in a process similar to that used to produce beer. Ethanol can be made from the tarches or sugars found in various agricultural crops, such as corn, barley, and sugar cane, or from cellulosic esidues from woody biomass, such as bark or switchgrass. Cellulosic ethanol is considered an "advanced" biofuel and involves a more complicated production process than conventional ethanol made from starches or sugars; however, its commercial viability has yet to be demonstrated.

How Is Ethanol Used?

Prior to the passage of the Energy Policy Act of 2005, gasoline sold in certain geographic areas was required to contain oxygen, which helps the fuel mixture combust more completely. Originally, a chemical called methyl tertiary butyl ether (MTBE) was the preferred oxygenate, but it was phased out due to concerns about seepage into groundwater and ethanol was mandated as a replacement. The usage of ethanol also

gained market share due to the Renewable Fuel Standard requirements of the Energy Policy Act of 2005. Today, a little more than half of the gasoline in the United States has some amount of ethanol blended into it, and these blends are named by their thanol content: for example, a blend of 90% gasoline and 10% ethanol (by volume) is known as E10. However, because ethanol contains approximately 67% the energy content of gasoline per gallon, usage of ethanol blends results in decreased gas mileage. Despite this reduced gas mileage, high crude oil prices and government incentives have resulted in the consumption of increasing amounts of ethanol.

While almost any regular gasoline car can run on blends of ethanol up to E10, special cars known as "flex-fuel" vehicles are required for use of blends above E10. Flex-fueled vehicles are currently available from every major American automobile manufacturer and are almost identical to regular gasoline vehicles, except for a few modifications to the fuel system and minor engine components. On a mass production basis, it costs less than $200 extra per car to make a flex-fuel automobile compared with a conventional gasoline vehicle. As of August 2008, more than 1,400 of a total of 170,000 gas stations in the United States are offering E85 to the public. Ethanol is expected to play a major role in helping to reach the annual minimum renewable fuel consumption required by the Renewable Fuel Standard.

What Is Biodiesel?

Biodiesel consists of chemicals known as fatty acid methyl esters (FAME) that can be used as a diesel fuel substitute or diesel fuel additive. Biodiesel is typically made from oils produced from agricultural crops such as soybeans or canola but can also be made from various other feedstocks such as animal fats.

Currently, most biodiesel in the United States is produced from soybean oil, but recent increases in soybean crop prices have caused producers to switch to other feedstocks such as waste animal fats from processing plants or recycled grease from restaurants. Biodiesel can be made from virtually any feedstock that contains an adequate amount of free fatty acids, which are the raw materials that are converted to biodiesel through a chemical process. Research is underway to harvest algae for biodiesel production because they contain fat pockets that help them float, and this fat can be collected and processed into biodiesel. Continued biodiesel production and usage will help he United States meet levels of biofuels consumption mandated by the Renewable Fuel Standard.

In addition to biodiesel derived from FAME, it is also possible to make a diesel fuel substitute from cellulosic material. This fuel, sometimes called renewable diesel, would also count towards meeting the Renewable Fuel Standard mandate. Like cellulosic ethanol, however, its commercial viability has yet to be demonstrated.

How Is Biodiesel Used?

Biodiesel has chemical characteristics much like petroleum-based diesel and, therefore, can be used as a direct substitute for diesel fuel or blended with petroleum diesel in any percentage without suffering any significant loss of fuel economy6. Blends are named in the same manner as ethanol-gasoline blends, for example, a blend of 20% iodiesel with 80% petroleum diesel is known as B20. Low level, i.e., B2-B5, biodiesel blends are a popular fuel in the trucking industry because biodiesel has excellent lubricating properties, and therefore usage of the blends can be beneficial for engine performance. Biodiesel also has virtually no sulfur content, making it a popular additive for low- and ultra-low-sulfur diesel fuels required by the Environmental Protection Agency.

How Much Do We Consume?

In 2007, the United States consumed 6.8 billion gallons of ethanol and 491 million gallons of biodiesel. According to EIA's Annual Energy Outlook 2008, ethanol usage is predicted to increase to nearly 24 billion gallons in 2030, which would represent approximately 16% of total gasoline consumption by volume in 2030. Thirty-one percent of corn production in 2008 is projected to be used for ethanol, and this percentage is expected to rise to 36 percent by 20308. Biodiesel consumption is predicted to increase to 1.2 billion gallons by 2030, or approximately 1.5% of total diesel consumption. Consumption of renewable diesel, made from cellulosic materials, is expected to substantially exceed biodiesel consumption by 2030.

NEW INSIGHTS IN HISTORIC AREAS

PACIFIC SECTIONS AAPG-SEPM-SEG

ANNUAL CONVENTION

MAY 2-6, 2009

VENTURA, CALIFORNIA

VENTURA BEACH MARRIOTT

MESSAGE FROM THE GENERAL CHAIR

In May, 2009, you will have an opportunity to share New Insights in geoscience with your colleagues at our Annual Pacific Section AAPG-SEPM Convention in Ventura, California – a beautiful city on the sparkling Pacific at the southern tip of California's Central Coast. In addition to a great technical program, choose from golfing, hiking, biking, fine dining, deep-sea fishing, kayaking, and just hanging out at the beach to round out your enjoyment of this meeting by the sea.

Whether driven by opportunities from higher prices or by necessity from lower prices; whether from academia, government, or private industry; and whether from geoscience, engineering, or environmental fields, the need to apply New Insights to both new and existing problems and areas is always with us.
Coast Geological Society, our host, welcomes you to Ventura and will be working hard to make this an exciting and memorable Convention.

MESSAGE FROM THE PROGRAM CHAIR

Recent increases in the price for crude oil and our need for increased domestic energy production have opened the door for using new techniques to produce more from older historic areas. This was the inspiration for our Convention theme, "New Insights in Historic Areas", which easily extends to all areas of the geosciences. To make the meeting successful we need a few good short courses and field trips and a major outpouring of abstracts for presentation at the oral and poster sessions. A tentative list of session topics is on the next page along with a list of those session chairs that have already been selected. If you are interested in submitting an abstract and participating in one or more of the sessions, feel free to contact one of the Chairs through the email address listed.
You are encouraged to write up your recent thoughts and discoveries and submit an abstract. If your abstract doesn't fit into one of the tentative categories, we will make a place for it. Please accept our invitation to advance the practice of our profession by documenting and sharing some of your valuable insights and the fruits of your labor with your colleagues and to learn about their insights.
Please submit your abstract(s) to the technical program committee through the PSAAPG website at <http://psaapg.org>. Click on the convention information logo and follow the links to the instructions for abstract submittal. Submit your abstract by January 31, 2009, and be an active participant in this meeting and in your profession.

Abstract Deadline	**Tom Hopps**	**Gene Fritsche**
January 31, 2009	**General Chair**	**Program Chair**

PACIFIC SECTION, AAPG-SEPM-SEG CONVENTION
TENTATIVE TECHNICAL SESSIONS

New Insights in Historic Areas
Chairs: Jon Kuespert <jkuespert@breitburn.com>
Michelle Glascock <mglascock@aeraenergy.com>

Renewed Offshore Drilling in California: Pros and Cons
Chairs: Terry Budden <t.budden@compassgr.com>
John Minch <jmainc@earthlink.net>
Ken Hunter <khunter@vaqueroenergy.com>

Energy Minerals of the Pacific Region
Chairs: Creties Jenkins <cjenkins@demac.com>
James Clough <jim.clough@alaska.gov>

New Insights into Recent and Past Global Climate Change
Chair: Tessa Hill <tmhill@ucdavis.edu>

New Insights into Pacific Region Shale Reservoirs
Chair: TBA

New Insights into Pacific Region Gas Production
Chair: Scott Hector <scott@hobbyenergy.com>

New Insights in Exploration Technology and Seismic Interpretation
Chair: TBA

New Insights into Stratigraphy and Sedimentology within the Pacific Region
Chairs: Ray Ingersoll <ringer@ess.ucla.edu>
Kathie Marsaglia <kathie.marsaglia@csun.edu>

Modern Sea-Floor and Quaternary Turbidite Systems Offshore the Western Margin of the United States in Honor of Bill Normark
Chairs: Jacob A. Covault <jcovault@stanford.edu>
Andrea Fildani <AndreaFildani@chevron.com>

Making the Link from Modern to Ancient Turbidite Systems: An Integrated Approach in Honor of Bill Normark
Chairs: William R. Morris <william.r.morris@conocophillips.com>
Brian W. Romans <Brian.Romans@chevron.com>

New Insights into Marine Geology and Oceanography within the East Pacific Region
Chairs: Mark Legg <mrlegg@verizon.net>
Marc Kamerling <marckam@cox.net>

New Insights into Structural Geology and Tectonics within the Pacific Region
Chair: Nate Onderdonk <nonderdo@csulb.edu>

New Insights into Neotectonics and Paleoseismology within the Pacific Region
Chair: Doug Yule <douglasyule@gmail.com>

New Insights into Engineering Geology within the Pacific Region
Chair: Mark Oborne <Mark.Oborne@lacity.org>

New Insights into Hydrogeology within the Pacific Region
Chairs: Jordan Kear <jkear@dbstephens.com>
Ali Tabidian <ali.tabidian@csun.edu>

New Insights into Environmental Remediation within the Pacific Region
Chair: TBA

Session Commemorating the 100th Anniversary of the Texas Bureau of Economic Geology
Chair: TBA

The Importance of K-12 Geology Education to the Future of Our Planet
Chair: Bob Ballog <bobballog@aol.com>

TENTATIVE FIELD TRIPS
PACIFIC SECTION, AAPG-SEPM-SEG CONVENTION
MAY 2-6, 2009 – VENTURA, CALIFORNIA

Saturday, May 2 – Field Trip

CRETACEOUS AND EOCENE TURBIDITES IN THE TRANSVERSE RANGES
Leaders: Kirt Campion and Morgan Sullivan

Observe and discuss Cretaceous and Eocene submarine fan deposits and gravity flow structures in the Transverse Ranges north of Ojai.

Sunday, May 3 – Core Workshop and Field Trip

PLIOCENE TURBIDITES OF VENTURA BASIN
Leaders: Jon Schwalbach and Don Miller

Study core samples of Pliocene turbidites in the morning, and then study surface exposures of the same rocks in oil fields in the vicinity of Ventura.

Sunday, May 3 – Boat Trip

OFFSHORE OIL SEEPS
Leader: Mike Wracher

Board a boat in Santa Barbara and travel to the location of well documented ocean-bottom oil seeps where their surface expression can be observed and their history and importance discussed. See photo on cover.

Wednesday, May 6 – Field Trip

UNIQUE TERTIARY SEDIMENTARY ENVIRONMENTS IN THE TRANSVERSE RANGES
Leaders: Gene Fritsche and Tony Reid

Travel north of Ojai to Sespe Creek to observe sedimentary structures formed in a possible Eocene storm surge deposit and a Miocene submarine dune field. Delta front parasequences will also be seen. See photo on cover.

Mark your calendars and plan now to attend one or two field trips while attending the 2009 Pacific Sections AAPG-SEPM Convention. Convention registration is not required in order to attend a field trip. More details for the trips, including fees and times and places of departure, will be available at a later date and in the Convention Announcement that will be mailed out in March.

Imperial Barrel Award Program Student Competition

IBA is

* 30-year program adopted by AAPG from Imperial College London
* Team-based, prospect presentation competition for graduate geoscience students
* Opportunity for students to analyze geologic, geophysical, land, economic, and production data
* Access for students to energy industry experts for coaching and scouting
* Advancement of winning teams from local IBA competitions to the IBA final competition on June 5-6, 2009, prior to the AAPG Annual Convention in Denver, Colorado, USA

Benefits to Participating Students and Universities

* Marketable energy industry skill development using technology and real data
* Introductions to industry leaders and potential employers
* Large cash prizes to top 3 universities and trophies to top 3 student teams
* Unparalleled international networking opportunity

2008 IBA winning team from the University of Oklahoma

IBA Provides

* Industry data sets via AAPG
* Uniform judging criteria at local and final competitions
* Financial assistance (airfare, lodging, and meeting registration) for teams advancing to the finals

For More Information, Contact

Connie Mongold, 2008 AAPG IBA Committee Chair clmongold@aeraenergy.com
• USA: 1-661-665-5585 (office) • 1-661-703-6922 (cell)
Mike Mlynek, AAPG Student Program Coordinator mikem@aapg.org
• USA: 1-918-560-2653
Carol McGowen, AAPG Sections & Regions Manager cmcgowen@aapg.org
• USA: 1-918-560-9403

For more information and to view sample IBA data set, go to: www.aapg.org/iba

NEW INSIGHTS IN HISTORIC AREAS
AAPG PACIFIC SECTION ANNUAL MEETING
MAY 2-7, 2009 - VENTURA, CALIFORNIA

CALL FOR PAPERS AND PROPOSALS FOR FIELD TRIPS AND SHORT COURSES

MESSAGE FROM THE GENERAL CHAIR

In **May, 2009**, you will have an opportunity to share **New Insights** in geoscience with your colleagues at our **Annual Pacific Section AAPG Convention in Ventura, California** – a beautiful city on the sparkling Pacific at the southern tip of California's Central Coast. In addition to a great technical program, choose from golfing, hiking, biking, fine dining, deep-sea fishing, kayaking, and just hanging out at the beach to round out your enjoyment of this meeting by the sea.

Whether driven by opportunities from higher prices or by necessity from lower prices; whether from academia, government, or private industry; and whether from geoscience, engineering, or environmental fields, the need to apply **New Insights** to both new and existing problems and areas is always with us.

Coast Geological Society, our host, welcomes you to Ventura and will be working hard to make this an exciting and memorable Convention.

MESSAGE FROM THE PROGRAM CHAIR

Recent increases in the price for crude oil and our need for increased domestic energy production have opened the door for using new techniques to produce more from older historic areas. This was the inspiration for our Convention theme, **"New Insights in Historic Areas"**, which easily extends to all areas of the geosciences. To make the meeting successful we need a few good **short courses** and **field trips** and a major outpouring of **abstracts** for presentation at the **oral and poster sessions**. A tentative list of session topics is in the column to the right. You are encouraged to write up your recent thoughts and discoveries and submit an abstract. If your abstract doesn't fit into one of the tentative categories, we will make a place for it. Please accept our invitation to advance the practice of our profession by documenting and sharing some of your valuable insights and the fruits of your labor with your colleagues and to learn about their insights.

Details for abstract submittal are at the top of the next column. **Submit your abstract by January 31, 2009**, and be an active participant in this meeting and in your profession.

Tom Hopps
General Chair
tom@ranchoenergyinc.com
805-652-0066

Gene Fritsche
Program Chair
geneandsuef@dslextreme.com
818-882-8468

SUBMITTING ABSTRACTS AND PROPOSALS

Please submit your **abstract(s)** to the technical program committee through the PSAAPG website at http://www.psaapg.org. Follow the links to the instructions for abstract submittal.

Deadline For Abstract Submittal
JANUARY 31, 2009

Proposals for **field trips** or **short courses** should be sent **ASAP** by way of email to Gene Fritsche at geneandsuef@dslextreme.com.

SOME SUGGESTED TECHNICAL CATEGORIES

- Theme Session: New Insights in Historic Areas
- Renewed Offshore Drilling in California: Pros and Cons
- Energy Minerals of the Pacific Region
- New Insights into Global Warming
- New Insights into Pacific Region Shale Reservoirs
- New Insights into Pacific Region Gas Production
- New Insights in Exploration Technology and Seismic Interpretation
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- Modern Sea-Floor and Quaternary Turbidite Systems Offshore the Western Margin of the United States in Honor of Bill Normark
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- New Insights into Engineering Geology within the Pacific Region
- New Insights into Hydrogeology within the Pacific Region
- New Insights into Environmental Remediation within the Pacific Region

Alaska Geological Society

www.alaskageology.org

P. O. Box 101288
Anchorage, AK 99510

Contact: Jim Clough
907.*451.5030*

Luncheon meetings are held monthly September through May, usually on the third Thursday of the month, at the BP Energy Center (1014 Energy Court) from 11:30 a.m. to 1:00 p.m. The hot lunch cost is $20 for members with reservations; $22 for non-members with reservations; and $25 without reservations. The box lunch cost is $13 for members with reservations; $15 for non-members with reservations; and $18 without reservations.For reservations, call the AGS reservation voice mail at 907-258-9059 or contact David Hite at hiteconsult@acsalaska.net by noon on Monday before the meeting.

President:	Jim Clough	907.451.5030	Jim.clough at alaska.gov	DNR/DOG
President-Elect:	Tom Homza	907.770.3701	Shell Oil	
Vice-President:	Tom Morahan	907.230.1672	PRA	
Secretary:	Ken Helmold	907.269.8673	Ken.helmold at alaska.gov	DNR/DOG
Treasurer:	David Shafer	907.263.7864	Chevron	
Past-President:	Art Banet	907.334.8241	Arthur.banet at mms.gov	BLM

Coast Geological Society

www.coastgeologicalsociety.org

P. O. Box 3055
Ventura, CA 93006

Contact: Bob Ballog
805.498.6294

Dinner meetings are held monthly September through June, usually on the third Tuesday of the month, at Biedermann Hall at Sacred Heart Church - 10800 Henderson Road in Ventura. Social hour starts at 6:00 p.m., dinner is served at 7:00 p.m., and the talk starts at 8:00 p.m. The cost of dinner is $18 (with reservations), $25 (without reservations), or $10 (students and K-12 teachers); the talk is free. For reservations, please email Christine White at cwhite@dcorllc.com or make reservations online at www.coastgeologicalsociety.org. Reservations should be made by 4:00 p.m. on Friday before the meeting.

President:	Bob Ballog	805.498.6294	president@coastgeologicalsociety.org
Past President:	John Minch	805.682.4711 x137	pastpresident@coastgeologicalsociety.org
Vice President:	Bill Bilodeau	805.493.3264	vicepresident@coastgeologicalsociety.org
Secretary:	Christine White	805.535.2074	secretary@coastgeologicalsociety.org
Treasurer:	Muriel Norton	805.658.1550	treasurer@coastgeologicalsociety.org

Los Angeles Basin Geological Society

www.labgs.org

515 So. Flower Street, Ste 4800
Los Angeles, CA 90071

Contact: Jon Kuespert
213.225.5900 x224

Luncheon meetings are held monthly September and October; and January through June, usually on the fourth Thursday of the month, in the Monarch Room at The Grand at Willow Street Conference Centre (4101 E. Willow Street) in Long Beach. Lunch is served at 11:30 a.m., and the talk starts at 12:15 p.m. The cost is $20 (with reservations), $25 (without reservations), or $0 (students are covered by Halliburton and Schlumberger). Reservations can be made online at www.labgs.org or by contacting Marieke Gaudet at 562.624.3364 or marieke_gaudet@oxy.com. Reservations must be made prior to Tuesday before the meeting.

President:	Jon Kuespert	213.225.5900 x224	jkuespert@breitburn.com
Program Chair:	Bill Long	213.225.5900 x205	william.long@breitburn.com
Treasurer:	Jean Kulla	949.500.3095	k2mobile@MSN.com
Secretary/webmaster:	Marieka Gaudet	562.624.3364	Marieke_Gaudet@oxy.com

Northern California Geological Society

www.ncgeolsoc.org

9 Bramblewood Court
Danville, CA 94506-1130

Contact: Barb Matz
Barbara.Matz@shawgrp.com

Evening meetings are held monthly September through May, usually on the last Wednesday of the month, at the Masonic Center (9 Altarinda Road) in Orinda. Social hour starts at 6:30 p.m., and the talk starts at 7:00 p.m. (no dinner). For reservations, leave your name and phone number at (925) 424-3669, or at danday94@pacbell.net before the meeting. Cost is $5 per regular member; $1 per student member; and $1 per K-12 teachers (new!).

Northwest Energy Association

dlgellar@msn.com

P. O. Box 6679
Portland, OR 97228-6679

Contact: James Jackson
503-771-3887

Luncheon meetings are held monthly September through May, usually on the second Friday of the month, at the Multnomah Athletic Club (1849 SW. Salmon Street) in Portland. Meeting time is at 7:30 - 9:00 am. The cost is $15. For information or reservations, contact Shelley Thomas at 503-848-2947 or Treck Cardwell at 503-226-4211 ext. 4681.

Sacramento Petroleum Association

P. O. Box 571
Sacramento, CA 95812-0571

Contact: Rick Blake
925.422.9910

Luncheon meetings are held monthly January through November, on the third Wednesday of the month. Location to be announced. The meetings starts at noon. The cost is $20. For information or reservations, contact Pam Ceccarelli at 916-322-1110 or pceccare@consrv.ca.gov.

President:	Rick Blake	blake2@llnl.gov
Secretary	Pam Ceccarelli	Pam.Ceccarelli@conservation.ca.gov
Treasurer	Pam Ceccarelli	Pam.Ceccarelli@conservation.ca.gov
Editor	Pam Ceccarelli	Pam.Ceccarelli@conservation.ca.gov

San Joaquin Geological Society

www.sjgs.com

P. O. Box 1056
Bakersfield, CA 93302

Contact: Rob Negrini
rnegrini@csub.edu

We have dinner meetings on the second Tuesday of the month at the American Legion Hall at 2020 “H Street” in Bakersfield. There is an icebreaker at 6:00 pm, dinner at 7:00 pm, and a talk at 8:00 pm. Dinner is $20.00 for members with reservations and $25.00 for nonmembers, $25.00 for members without reservations and $30.00 for nonmembers without, and the talks are free.

President:	Kurt Neher	kurt_neher@oxy.com
President-Elect:	Kurt Johnson	kurt_johnson@oxy.com
Vice-President:	Jack Grippi	JGrippi@aeraenergy.com
Secretary:	Anne Draucker	AnneDraucker@chevron.com
Treasurer:	Kelly Blackwood	K.Blackwood@chevron.com

Advertising Rates

Members	*Single Issue*	*Year (6 issues)*
Full Page	*$400.00*	*$1600.00*
Half Page	*$250.00*	*$1050.00*
Quarter Page	*$150.00*	*$650.00*
Business Card		*$250.00*

Societies Free Advertising

Convention	*Unlimited Space*	*PSAAPG Newsletter*
Societies	*1/4 Page*	*AAPG Explorer*

Newsletter Deadline

March • April Issue

February 20th

- Images (graphics, photos, and scans) must be at least 300 dpi resolution. Text should be scanned at least 600 dpi.
- Scanned photos, illustrations (line art) or logos must be scanned at 300 dpi minimum and saved as a tiff or eps.
- Avoid clip-art and images from the internet. These images are low-resolution (72 dpi).

Photo courtesy of Andreas Mulch

Investing in Energy to Support Education and Research

"Today's computational capacity and the availability of large volumes of data from ground-based observations and satellites offer new opportunities for understanding how the Earth system works and how human activities interact with Earth processes. The Sanford Center for Computational Earth and Environmental Science will enable the development of sophisticated models to address questions about energy and freshwater resources, natural hazards, climate change, and other global issues."

Jerry M. Harris, Director, Center for Computational Earth and Environmental Science, Professor and Former Chair, Department of Geohysics, Stanford University; Director, Stanford Wave Physics Laboratory; Past Distinguished Lecturer, Society of Exploration Geophysicists, American Association of Petroleum Geologists, and Society of Petroleum Engineers.

The alumni-managed Stanford Petroleum Investments Funds own, manage, and acquire producing oil and gas royalties and other energy investments. Income from these investments provides essential discretionary funding in support of energy and environmental education and research and other programs of the Stanford School of Earth Sciences. The Petroleum Investments Funds provided seed funding to help launch the Stanford Center for Computational Earth and Environmental Science.

If you would like to sell or donate producing oil and gas royalties or learn more, visit **http://earthsci.stanford.edu/support/pif** or call or email David Gordon, Associate Dean, Stanford School of Earth Sciences, at (650) 723-9777 or dsgordon@stanford.edu to see how you can help.

PIF
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