

Before The California Energy Commission

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2009 Integrated Energy Policy Report

Docket No. 08-IEP-1

**Comments of the Advocates for Clean Responsible Energy, (ACRE)  
For the 2009 Integrated Energy Policy Report Scope**

**Submitted June 16, 2008 by:  
Edwin D. Sayre**

**Introduction and Summary:**

ACRE is a group of engineers and scientists with over 30 years of experience in the energy industry, mostly retired who live in Northern California. Their goal is to educate the public about the technology of nuclear power plants.

In the previous Integrated Energy Policy Reports the California Energy Commission has been completely ignoring nuclear power as a critical part of the California energy future.

The science and engineering of energy provides the facts that for California to meet its goals for environmentally clean, safe and economical energy a well planned mixture of renewables, hydro and nuclear energy sources must be applied. The goal of around 30% renewables must be carefully controlled because of the low capacity factor of wind and solar energy. The amount of wind and solar power must be limited to about 15% with geothermal and biofuels making up the rest of the renewables. The amount of hydro-electric cannot be increased very much because of its effect on the aquatic environment, thus limiting it to about 5%. This leaves the balance of about 65% to be fulfilled by nuclear energy taking the place of fossil fueled power plants.

Because of the time to do the planning for the building of the nuclear plants the Warren Alquist Act must be revised so that planning can proceed by the power companies. CEC should start planning in 2009 for the change in the act and develop a licensing and building plan with the legislature and the power companies and the NRC.

Reprocessing and recycling used nuclear fuel is a critical economic factor for long term economics of nuclear power. We recommend the California Energy Commission should get involved in future technology development in reprocessing and recycling used fuel and in the development of fast reactors.

**Technical and Economic Review of Clean Sources of Power:  
Renewables:**

**Advantages:** Solar and wind are very clean energy sources. Geothermal can be clean if harmful elements in the steam and water from the high temperature Earth core are prevented from coming into the environment. Biofuels can be very clean, in fact, fuel from animal waste can clean the environment.

**Disadvantages:** Solar requires a very large coverage for a large quantity of energy. Solar only provides energy when the sun is shining at the highest angles, thus providing a very small capacity factor, 20%. This makes it primarily a peaking energy source for air conditioning in the summer. Wind power is also only an uncontrolled peaking power

because there is no control of when the wind is blowing. It also has an average capacity factor of 20%. Biofuels made from grown plants require a lot of energy for their production. Removing forests for growing biofuel plants can also be bad for the environment. Using corn and other edible plants for biofuels can also cause a social problem.

### **Nuclear power:**

**Advantages:** Nuclear power has proven to be the safest, most economical and environmentally clean energy source there is over the past 50 years. With what the world has learned from experience combined with the advanced knowledge the new reactor plants should be even safer, more economical and with reprocessing and recycling used fuel cleaner than the current operating nuclear power plants. The industry analysis suggests that the cost of building new nuclear plants will possibly top 10 billion per 1000 megawatts. If people plan properly and use what was learned when building the last reactors in the US and Japan plants we can be built for much less.

**Disadvantages:** There are no technical disadvantages. The major problem has been the media promoting the incorrect information put out by the antinuclear organizations supported by the fossil fuel industry. In 1976 an issue to stop building nuclear plants in California was put on the ballot. It was defeated by 65%. A few months later the California legislature under strong lobbying passed the Warren Alquist Act which prevents the planning for building more nuclear plants in California. Many people think that mining uranium provides a very bad environmental effect. Many people who have no knowledge of its content think that used nuclear fuel is a very hazardous waste.

### **Reprocessing and Recycling Used Nuclear Fuel**

Reprocessing and recycling is an important factor in the future of nuclear power and the California Energy Commission should be involved in the GENEP program with DOE. Used nuclear fuel is not a waste it is a valuable asset for the power industry. Many people think that if we reprocess and recycle used fuel we will have many tons of high level radioactive waste that must be safely stored for thousands of years. This is absolutely not true. The actinides are to be economically recycled in thermal reactor fuel and fuel for fast breeder reactors. Once the actinides are removed the balance is very valuable metals that are not radioactive beyond what is required for regular commercial use when they are separated, purified and reduced for commercial use. One year's used fuel from a 1000 Megawatt reactor with a 90% capacity factor will have a value of over 20 million dollars at the 2008 market price. The commercial value of the used fuel will offset the cost of reprocessing and recycling used fuel.

There are only a few grams of isotopes that have no commercial value. Some of these isotopes with short half lives can be stored for 200 years and then put back safely into the environment. The balance of the waste isotopes will be put back into the reactors and spare neutrons will transmute them to either non-radioactive or short half life isotopes that can be stored for 200 years and then put back into the environment safely. We recommend the California Energy Commission should get involved to become leaders in this critical technology for our future.