

DOCKET

09-IEP-1A

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To: California Energy Commission Docket Office, MS-4
Re: Docket No. 09-IEP-1A

Subject: Comments for the Committee Final 2009 IEPR

From: Edwin D. Sayre representing ACRE, Advocates For Clean Responsible Energy, a group of retired and active engineers with many years experience in energy systems including nuclear power systems.

Comments: Comments are suggested additions to the various paragraphs of the Final Draft.

Comment Number 1: Suggested addition to page 9 **Nuclear Power Plants**, Added new paragraph after paragraph 4.

The California Energy Commission knows that the State requirements for carbon dioxide reduction cannot be met with the future electrical energy requirements without more nuclear power plants. The future nuclear power sources should include large thermal reactor plants and small thermal and small fast reactor plants. It is a known fact that as the state has more wind and solar renewables more small power plants that can be turned on when the wind and solar sources are not producing and turned off when they are to integrate the renewables with the grid. Currently and in the near future this is planned to be done with gas turbine plants. In the future however it must be done with clean power sources such as nuclear to meet our clean air requirements. In order for new nuclear plants to be built the Warren-Alquist Act must be revised by the legislature. The California Energy Commission will provide the technical requirements for changing the Warren Alquist Act to allow adding more nuclear power sources to meet California's future energy requirements.

Comment Number 2: Suggested addition to page 27 **Natural Gas and Nuclear Power Plants**, Added new paragraph after paragraph 1.

A major source of energy for California is natural gas. As the requirement for energy increase and the need to integrate renewables increases the number of new gas powered plants will increase and the state's output of Carbon dioxide will increase. This problem can be corrected by the addition of large and small nuclear power plants instead of gas powered plants. Nuclear power is also cheaper for the power users than gas power.

Comment Number 3: Suggested change and addition to page 45 **Nuclear Generation**. Change and add to paragraph 6.

California has a moratorium on building new nuclear plants until a means for the permanent disposal or reprocessing of spent nuclear fuel has been demonstrated and approved in the United States. Neither of these facilities are available in the United States. The California Energy Commission has reaffirmed these facilities for reprocessing and storage are not available. The state of California should consider establishing both of these facilities in California. It is completely nonsensical to store used nuclear fuel as it is when removed from the reactors. Most people who have no knowledge of it think it is hazardous, useless waste material. This is not so.

The used fuel coming from a thousand megawatt reactor after a year's energy production with 90 % capacity factor is worth over 20 million dollars. Only about 3% of the original fuel is changed from how it naturally started. The used fuel is 97 % uranium and other actinides which are valuable fuels for fast reactors and can be used in them to develop into recycled fuel for the large thermal reactors. Most people think the fission products which derive from breaking down the uranium atoms during the fission heating process that provides the steam power to produce the electricity are dangerous complete waste. This is not so. Most of the fission products after 40 to 50 years of aging are very valuable rare earth metal and noble metals. The value of the approximately 16 pounds of fission products is over 3 million dollars. When all the useful materials are taken from a metric ton of used fuel the amount of elements with no use today is about 100 grams. If the used fuel is reprocessed and used commercially the amount of waste to be stored for some time for each California citizen if all their energy was produced by nuclear would be less than the size of an aspirin. The California Energy Commission will start evaluating the economic advantages of reprocessing the used fuel and the development and use of fast breeder reactors in California. It will pay off tremendously in California's future.

Comment Number 4: Suggested addition to page 213 **Developing a Blueprint for the Future Electricity Systems.** Add to paragraph 4 or insert as an added paragraph after paragraph 4.

Because of the average 20% capacity factor for wind and solar power a large integrating power source is needed. For every megawatt hour of these renewables produced there must be 4 megawatt hours of integrated energy produced if there is not any safe, clean, reliable and economical energy storage available. The current plan for the integrating power is gas turbines because they can be economically turned on and off as needed, They will however produce carbon dioxide and some other contamination in the atmosphere. The California Energy Commission will review the developments in small nuclear plants that have the control capacity to provide the integrated clean power.

Comment Number 5: Suggested addition to page 221 **Chapter4: Recommendations**

Introduction Add another paragraph after paragraph 4.

The only source of electrical power that can meet the energy demands of California's future and meet the climate control is nuclear power. It is the most safe, economical, reliable and environmentally friendly source of energy. The California Energy Commission will consider the additional large thermal reactor systems and the small fast reactors to help provide an integration system that will meet the climate control requirements that can not be met with fossil fueled sources. It has been found that over 70% of California residents favor nuclear power. The key to nuclear power integration is the Legislature changing the Warren-Alquist Act.

Comment Number 6: Suggested addition to page 236 **Nuclear Plants** Add to paragraph 1.

The California Energy Commission will conduct more studies of the new nuclear power sources for the mixed energy grid that will include added renewables and a great addition of energy sources over the next 50 years. It is virtually impossible to meet our total requirements without

added nuclear power sources of different kinds. California must encourage the rapid development of reprocessing for the used fuel and using the actinides for fast reactor fuel and fast breeder reactors for recycling the used fuel. The development of the right reprocessing and recycling program will provide a very economical nuclear power system and eliminate the need for a huge waste storage site. The California Energy Commission can control the reprocessing and recycling such that there is no possibility of separating and purifying certain actinides for nuclear bombs.

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