

DOCKETED

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Solar Thermal can Reduce Natural Gas' GHG Impact and Save Money for Low Income Rate Payers

Additional submitted attachment is included below.



Dear CEC Commissioners and Staff:

We are pleased that the Commission has presented research findings and has sought public comment regarding California's 2050 emission objectives. When the government gives the public an opportunity to make such comments, it demonstrates its faith in its constituency. It is indeed a challenge to address California's robust emissions objectives; particularly, as it regards its investment in the existing natural gas infrastructure. We propose an approach that will reduce, and hopefully someday eliminate California's dependency on natural gas.

This comment is presented by Black Sky Management, Inc. Black Sky is a construction management and consulting firm dedicated to the construction of infrastructure, and the development of technology that reduces greenhouse gas emissions, and reduces light pollution.

Workshop Topic 2: Technology characterization of options to reduce or eliminate the greenhouse gas (GHG) emissions footprint of the natural gas system in the long term.

California's emissions objectives must address improvements to the existing infrastructure. The installation of solar thermal technology to existing natural gas plants, creating a hybrid plant, will reduce natural gas emissions. A hybrid plant involves the addition of steam generated by a solar thermal field to the conventional steam cycle. This would add solar energy to the existing generation fleet, and assist utilities to meet renewable energy targets, reduce plant emissions, and will result in lower fuel costs. A hybrid solar thermal system that injects solar-generated steam into the steam cycle of a natural gas plant assists to solve the problem of the intermittency challenge of integrating solar power into the grid, without compromising the reliability of supply.

We also propose the development of a power-to-gas pilot project at an existing natural gas plant which would convert solar thermal heat to produce hydrogen that is blended into the gas distribution system, or that is combined with carbon dioxide by-product to produce synthetic methane. The existing natural gas network would store and deliver that energy to homes and businesses. There should also be an accompanying hydrogen blending study to assess how much hydrogen can safely be blended into the existing system.

Workshop Topic 3: Potential transformation pathways of the natural gas system considering the overall potential evolution of the energy system to comply with GHG reduction targets and goals.

The world's post fossil fuel environment and economy will rely on the production of hydrogen. Approximately 95% of hydrogen is produced using natural gas. The natural gas is burned for a steam reforming reaction, which reacts natural gas with water to produce a syngas. This is reacted a second time and produces hydrogen and carbon dioxide, yet another environmental pollutant. California is one of the three major hydrogen producing states. The other two being Louisiana, and Texas, whose environmental policies are drastically different than our home state. Another way to produce hydrogen is through electrolysis, which may be produced from renewable sources, or fossils fuels. In using renewables as the source to separate hydrogen

in water, you have no environmentally detrimental by-product. However, an even better way to produce hydrogen is through thermochemistry (solar thermal).

Solar thermal can use the heat from concentrated solar power to induce chemical reactions. When electrolysis is powered by PV, there is an efficiency of approximately 13 percent, whereas solar thermal applications have efficiencies that reach 60%. When hydrogen is made with solar thermal energy instead of natural gas, the feedstock is water, not a fossil fuel. An additional advantage of solar thermal is that a solar thermal plant can incorporate thermal energy storage, thus effectively delivering solar energy when there is limited sun exposure, or even at night by utilizing latent heat in material that have a high thermal conductivity, making the solar thermal infrastructure a dispatchable form of solar energy.

The proposals we have set forth will result in a reduction of greenhouse gas production, and in aggregate will reduce the cost to produce downstream embedded energy, and therefore the cost of energy services to rate payers; in particular, rate payers in disenfranchised communities. Furthermore, investment in solar thermal will result in job creation, grid reliability, and improved resilience across lifeline sectors. Solar thermal technologies will greatly assist the diversification of California's energy matrix, and will ultimately provide an important hedge against increased emissions, and a future of natural gas price increases.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Brown", written in a cursive style.

Chris Brown, President / CEO, Black Sky Management, Inc.