Hidden Hills Solar Electric Generating System

According to a prospectus filed by Bright Source with the Security Exchange Commission on June 9, 2011, a summary of risk factors to investors included: "*…our solar thermal technology may be rendered obsolete by the technological advances of others…*"

A preliminary comparison analysis between the recently proposed Hidden Hills Solar Electric Generating System (HHSEGS) and Bloom Energy Servers suggests their day of obsolescence is already here.

With the target goal of generating 500 MWs p/day, basic data from each system was compared. In every instance, the Bloom Energy Servers (or Boxes) produced the same amount of energy with significantly less environmental impacts and cost.

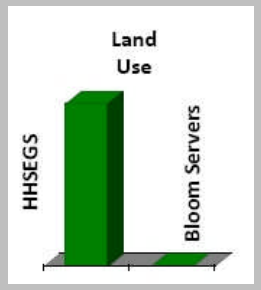
Comparing the acre or less needed by Bloom Boxes to generate the same electricity as HHSEGS (requiring 3,227 acres) is just one of the many dramatic differences between the two technologies.

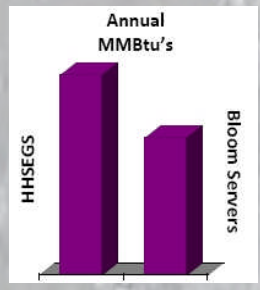
Due to their small size and high mobility, Bloom Boxes can be placed at already disturbed sites and unlike HHSEGS, do not require additional transmission or gas lines nor pose significant threats to wildlife, vegetation, soil loss, water, or cultural and visual resources.

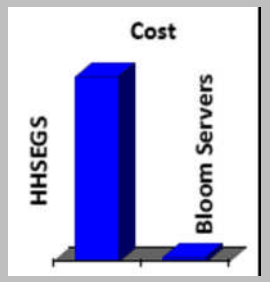
Current Bloom Box customers now include Google, Walmart, CocaCola, Ebay, FedEx, Bank of America, Adobe, Safeway, Adobe, Kaiser Permanent, Cox Entertainment and Sutter Home.

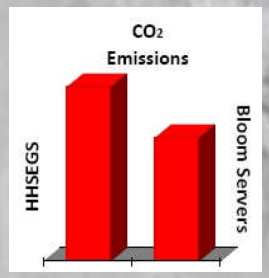
Designed, written and compiled by C.R.MacDonald, January 2012.

ALTERNATIVE
Bloom Energy Servers
http://www.bloomenergy.com/









"60 Minutes" reported a Bloom Box costs $800k p/unit. Generating 500MWs p/day requires 100 units totaling $80M dollars vs. HHSEGS projected cost of $2.7B.

ALTERNATIVES	Electrical Output Per Day	Land Use/ Acres	Annual Natural Gas Requirements MMBtu's	Annual Emissions in Pounds* NOx	SOx	CO	VOCs	CO2
HHSEGS	500 MWs	3,227	1,696,376	24,600	3,600	60,400	9,600	1,994,000,000
BLOOM ENERGY SERVERS	500 MWs	1	1,156,320	12,700	---	18,250	3,650	1,410,725,000

*Pounds were determined using the "short ton" of 2,000 lbs. applied to HHSEGS Annual Emission Tables, 5.1 Air Quality, Table 5.1-27 and Table 5.1-28.

COMPARISON

The applicant has submitted documents regarding the projected impacts of the Hidden Hills Solar Electric Generating System (HHSEGS). Included in Section 5.1 Air Quality, is Table 5.1-39 (pp. 64), which compares green house gas emissions of different types of power plants to the project. In Section 6.0 Alternatives, the applicant also compares a variety of power generation options to the HHSEGS including well-known renewables such as wind and photo-voltaic's.

However, in both instances the applicant failed to include, evaluate or compare a recently emerging technology known as Bloom Energy Servers or Bloom Boxes.

Based on the available data, calculations were performed comparing the two technologies with the target goal of generating 500MWs of electricity p/day. What was found was startling.

Not only are Bloom Boxes capable of delivering the same amount of energy on an acre or less, significant and often dramatic differences were noted on every level. Attached are the results of these comparisons, including a worksheet detailing how these conclusions were reached.

Besides major differences in land use requirements, Bloom Boxes would cost 94.2% less than the projected cost of HHSEGS, require 19% less natural gas, emit 32% less NOx, 45% less VOCs, 53% less CO, 3,600% SOx and 17% less CO_2. However, the CO_2 figure may be deceptive because it doesn't take into account HHSEGS requires miles of new transmission lines that may increase the SF_6 emissions rate, which – according to my current understanding – is being calculated in a separate analysis by the BLM. Also note this comparison does not include emissions or impacts from the construction required to complete the HHSEGS.

The overall difference in footprints between these two technologies appears to be too large to ignore. As a result, decision makers and the public deserve a rigorous and objective evaluation of Bloom Boxes as an alternative to the HHSEGS before being locked into a 25-30 year agreement for what may potentially be an already obsolete technology.

Additional benefits may include lower utility costs to consumers, reduced national security risks due to a lack of concentration of power generation at a single site and may help act as a deterrent to Enron type activities of power manipulation, which cost the state of California at least $30B dollars and is still most likely impacting its citizens to this day.

Therefore, I'm requesting Bloom Boxes be explored as an alternative to the HHSEGE project and submit this base comparative analysis for review.

Cindy MacDonald

Hidden Hills Solar Electrical Generating System (HHSEGS)
Maximum Emissions From New Equipment

(includes boilers, emergency engines, diesel fire pump engines and WASC's)

NOx	24,600 lbs (12.3 tons)
SOx	3,600 lbs (1.8 tons)
CO	60,400 lbs (30.2 tons)
VOCs	9,600 lbs (4.8 tons)
CO2e	1,994,000,000 lbs (99,700 tons)

Note: Ton to lb. calculation using a "short ton" of 2,000 lbs each.

Source: HHSEGS 5.1 Air Quality, pp. 44, Table 5.1-27, pp. 45, Table 5.1-28, Annual Emissions of Greenhouse Gases

BLOOM ENERGY SERVER WORKSHEET

By C.R.MacDonald, January 2012

Bloom Energy Server: Model ES-5700

200 Kw = 160 average homes
1.32 MMBtu/hr of natural gas = 210 Kw
Weight: 17 tons
Height: 26'5"L x 8'7"W x 6'9"H

Emissions Output

NOx <0.07 lbs/MW-hr
SOx Negligible
CO <0.10 lbs/MW-hr
VOCs <0.02 lbs/MW-hr
CO2 @ specified efficiency:
773 lbs/MW-hr on natural gas.

Source: ES-5700 Energy Server
http://www.bloomenergy.com/fuel-cell/es-5700-data-sheet/

Electrical Output: 500 MWs p/day

1 Server = 210 Kw p/hour x 24 hours = 5,040 Kw p/day
5,040 Kw/p/day = 5 MWs p/day
Needed To Produce 500 MWs p/day: **100**

Land Use Requirements

Dimension of Server: 26.5 x 8.7 = 230.55 sq.ft.
Sq. ft. needed p/server: 230.55
Total Sq. Ft. Required for 100 Servers = 23,055
Square foot p/acre = 43,555
# of acres needed to achieve 500MWs: **1**

Cost $800k p/Server x 100 = **$80,000,000**

Source: "The Bloom Box: An Energy Breakthrough?"
http://www.cbsnews.com/stories/2010/02/18/60minutes/main6221135.shtml

Estimated Annual Emissions Output

NOx 12,700 lbs p/yr
SOx Negligible
CO 18,250 lbs p/yr
VOCs 3,650 lbs p/yr
CO2 1,410,725,000 lbs p/yr
(70,536 tons)

Natural Gas Requirements

Each Server Requires 1.32 MMBtu's p/hr
1.32 x 24 hours = 31.68 p/day
Annual Natural Gas Use
31.68 x 365 days = 11,563.2 MMBtu's p/yr
11,563.2 x 100 = **1,156,320 MMBtu's p/yr**

Emissions Worksheet

NOx

0.07 lbs/MW-hr
Each Server produces 5 MW p/day.
5MWs x .07 = .35 lbs p/day
.35 x 365 days = 127 lbs p/yr
127 lbs. x 100 = **12,700 lbs p/yr**

CO

<0.10 lbs/MW-hr
Each Server produces 5 MW p/day.
5MWs x .10 = .50 lbs p/day
.50 x 365 days = 182.5 lbs p/yr
182.5 lbs. x 100 = **18,250 lbs p/yr**

VOCs

<0.02 lbs/MW-hr
Each Server produces 5 MW p/day.
5MWs x .10 = . lbs p/day
.10 x 365 days = 36.5 lbs p/yr
36.5 lbs x 100 = **3,650 lbs p/yr**

CO2 @ specified efficiency
773 lbs/MW-hr on natural gas
Each Server produces 5 MW p/day.
5MWs x 773 = 3,865 lbs p/day
3,865 x 365 days = 1,410,725 lbs p/yr
1,410,725 lbs x 100 = **1,410,725,000 p/yr**
1,410,725,000 lbs divided by 2,000 (ton) = **70,536**