

Wednesday, January 14, 2009 (file cac186) revised Jan 17

To: Dan Breedon

Fr: Ed Miller

Subj: Factoids of interest for the general plan and potential action items

Ref A: Solartoday, Jan/Feb 09

Ref B: C. Cullen (carrie@solaralliance.org), Feed-in tariffs (FITs) from Ref A. Reference is made to AB 1969. Before the general plan is put to bed we need to get the latest inputs on things like renewable energy certificates/renewable energy purchase agreements, production based incentives, net metering and smart metering. In some countries like Germany, up front financing is available. In some cases the reduction of the monthly electric bill is only 2-3%. Avoided cost from the utility point of view is important. Reliability is important from the point of view of the user who needs to be assured of well pumping and minimal lighting.

Ref C: D. Hayes, Tackling Climate Change, This paper is derived from Yale Environment, 360.yale.edu, ASES.org publications (American Solar Energy Society) tackling climate change and green-collar job report. Hayes who is now president of the Bullitt Foundation was originally appointed to the Solar Energy Research Institute under Carter that was later to become the National Renewable energy laboratory. This is a grand plan by an acknowledged guru and I will not attempt to paraphrase detailed recommendations except to note that he estimates that large grants of the order of \$6000 for 50 million homes for conservation, a nationwide electric power grid/corridors and electrified railroads need to be envisioned. He recommends auctioned carbon permits that initially would reduce the carbon input by 1 % in the first year followed by 2 and 3 % in following years.

Ref D: Handyman magazine editors, Save energy save money, Reader's digest 2008 (Butte Lib 644S). This book suggests DIY low hanging fruit recommended by Hayes and others.

Ref E: E. Cooper, Jokerland, Trafford Publishing 2006. This book is a novel based on hyperbolic extrapolation in a resource limited California with inappropriate/inadequate mitigation from a local Chico author. This class of literature may be a psychological driver for pushing Butte County stakeholders to accept draconian approaches that require local sacrifice.

Ref F: IEEE spectrum special report on winners and losers 2009, 3 Feb 2009. E. Guizzo Hot or not?, pp 36-38. Blacklight power claims to be able to generate electricity under 2 cents/kw-hr based on the work of Randall Mills on low level calorimetric measurements and a theory of below ground state "hydrinos" who attracted \$60million in funding. Mills is a medical school graduate who has taken several courses from MIT in the 80's. The consensus in the scientific community is that the work has not been validated, is based on notoriously difficult calorimetric measurements and would require tearing down 100 years of peer reviewed physics. The work is surrounded by secrecy. A similar scheme based on low temperature atomic fusion from Utah was found to be based on faulty experiments and discounted. The

Mills scheme should not be confused with well documented work on high temperature/pressure laser based atomic fusion energy generation under development by Lawrence-Livermore Labs.

Ref G: S. Upson, Hot rocks, IEEE Spectrum Ref A, pp39-41. This paper describes a 1 Mw geothermal pilot plant being built by Geodynamics in Queensland Australia using paired wells with heat transfer at multiple levels. A 50 Mw design is underway. Creating horizontal pancake like cracks is said to be the key to improved performance. The goal is to generate 80-100 kg/sec of heated water above 244 deg C. It will be interesting to see if this new scheme will have an influence on the PG&E Southern Oregon geothermal power plant development that could feed Butte County. The new approach minimizes the use of ground water that has been a significant criticism of geothermal electric power systems.

Ref H: R. Layard, Happiness-lessons from a new science, Penguin Press 2005 (Butte Lib 152.42 L). This book looks at fairness, commitment, activities, economics and related issues that can drive development in Butte County. At a minimum, hopefully we can develop a vocabulary that allows characterization of existing communities and help establish zoning that is in accord with well crafted polls of likely immigrants.

Potential Action Items re to Butte County:

1. In looking forward to zoning update changes we need to set a high priority on lateral setback from high voltage distribution lines. Thorough research of practice in California and elsewhere needs to be performed. It can be argued that this should be established by the State of California, but in the absence of legislation, we need to at least establish a "common practice" corridor width and or setback criteria. At a minimum, the setback should be the topple height of the associated towers. Additional safety factors should include the single leg to ground AC or DC voltage to ground that would govern worst case voltage gradients. In Ref C Hayes is advocating that the federal government establish corridors. As new standards become available we will need to factor this into local standards even before higher level government corridors in this area are established. We may need "interim" standards pending the development of a national electric grid as a function of voltage and AC/DC characteristics. The goal is to enhance safety and minimize liability. In some cases, underground high voltage lines may be economical feasible and aesthetically attractive. Fault currents for major distribution lines can approach 60,000 amperes for a significant period and dwelling wiring/surge protectors that is usually effective against lightning strikes will likely fail at values above 10,000 amperes for extended periods. We need to get major players like SPI, PG&E, and other large owners of land and county governments to start the process of assigning zones for corridors to minimize costs for both ratepayers and landowners.
2. Hayes notes in Ref C that there is a conflict of interest between retaining vegetation for minimizing GHG and wildland fire. We need to provide guidance or requirements for thinning that looks at the broad picture that includes water conservation as well as GHG reduction. Hopefully we will be harvesting optimally thinned timber on a long term basis and put the material into long lived structures for at least 50 years and accomplish our CO2 equivalent goals

by 2030. Even if Lawrence Livermore comes up with scaled up zero carbon energy before 2030, we still need to worry about water conservation and wildland fire mitigation.

3. We need to grease the skids for home owners who want to upgrade their dwelling on a government subsidized or pure money basis. Free measurements, analysis and fasttrack approval need to be pondered.
4. Leasing of land for vegetation management/processing/dwellings or independent agency vegetation management needs to be explored from the viewpoint of policies, zoning and circulation.
5. Happiness/avoidance of pain for existing and projected stakeholders in Butte and nearby counties needs to be sampled, analyzed and matched to existing resource limitations. Well crafted polls with internal consistency checking may be required. Older polls may need to be reviewed. Estimating mobility of both the work force and adapting gentrified retirees needs to be factored into the motivational drivers.
6. The policies of the new federal administration will need to be tracked and grant applications initiated/reviewed.
7. The General plan, Housing element, zoning ordinance and environmental impact reports in some form need to be in the hands of CAC members as soon as possible to minimize overload and allow for significant research. Perhaps we need to label the draft material in some fashion like preliminary, steel or concrete stages to allow for some reasonable iteration and depth. The schedule for the review waterfall should be available as soon as possible.
8. Scaling rules for the Lawrence-Livermore pulse facility need to be made available as soon as possible. Hopefully Butte and surrounding counties can develop their own facilities without the need for massive investment in large scale grids.
9. Scaling rules for cogeneration/CHP facilities with and without carbon sequestration need to be made available as soon as possible. Such systems are the key to a graceful transition to a true carbon free energy and material system. U.C. Davis is pursuing this area of concern.
10. Local schools need to recognize that stick built housing is likely to be pushed out by industrial facilities setup for prefabricated construction. Skill sets associated with chemical/civil/mechanical/electrical /environmental engineering, biology, agriculture, construction/fire/hydrology/ geosciences/remote sensing/communication specialists need to be emphasized.