

RENEWABLE ENERGY

The Better Way

These days we can hardly enjoy an hour of television without being bombarded by Big Energy commercials promoting industrial scale solar and wind projects. A great deal of time, money, and effort is being devoted to a renewable energy sales pitch that perpetuates the antiquated approach of generating electricity far from its point of use, and building long distance transmission lines to deliver it. This is shortsighted, backwards thinking.

Our lawmakers have continued to legislate in favor of Big Energy. They have failed to provide the policy drivers that will lead us towards energy independence. Generating renewable energy at the point of use is the solution to a sound energy future for our nation. Successful, locally generated and distributed renewable energy models are already operational in more than forty other countries. So why are our Federal and State lawmakers, with the help of leading environmental organizations, ignoring these models that are "The Better Way?"

National energy policy must balance the necessity to integrate renewables with the need to simultaneously protect our environment. Denying this requirement is irresponsible and unacceptable. Other countries understand this, and Germany provides a compelling success story for finding this balance.

In 2007 Germany installed 1,000 megawatts (MW) of Building Integrated Photovoltaic or BIPV capacity. Germany encourages integrating photovoltaic (PV) cells into building design and retrofitting structures with PV cells.

By September of 2008 Germany had already installed another 1,000 MW on buildings and is expected to reach a total of 1,300 MW before the end of this year. Germany is charted to achieve an annual installation rate of 2,000 MW of BIPV by 2012, bringing their total Building Integrated PV installations to an admirable 10,000 MW! They will accomplish this with only slightly more than 1/2 of the USA's solar irradiation potential according the US National Solar Radiation and the European Joint Research Center.

Germany has been able to achieve these remarkable results by implementing a feed-in tariff (FIT) law that is part of a comprehensive energy policy known as the German Renewable Energy Sources Act (EEG). In 2000 EEG emphasized environmental protection in contrast to the 2005 Energy Policy Act here in our Nation. Our legislation perpetuates the permanent destruction of public and private lands through increased remote generation and additional long distance transmission lines.

Photovoltaic investment in Germany has grown to 19.5 billion dollars (US equivalent) since enacting EEG, creating more than 230,000 renewable energy jobs and 42,000 PV related jobs. In the decade prior to EEG, Germany's annual BIPV installation averaged less than 6 MW. The German Parliament recognized the effectiveness of feed-in tariffs and further strengthened the EEG in 2004 establishing an even more aggressive premium feed-in tariff. As a result, Building Integrated PV installation jumped fourfold to an astounding 600 MW in that year. PV costs dropped 25% and continue



Kramers Junction - The Old Way



German Parliament Building retrofitted with PV cells demonstrates the government's commitment to "The Better Way"

	INDUSTRIAL WIND	INDUSTRIAL CONCENTRATING SOLAR THERMAL	INDUSTRIAL PV	POINT OF USE PV/MICROWIND
LOST ACREAGE	45-61 acres per MW, plus roads, transmission lines and staging ¹	8-16 acres per MW, plus roads, transmission lines and staging ¹	12 -15 acres per MW, plus roads, transmission lines and staging ¹	None - no new roads or transmission
WATER USE	Minimal	87,500 gallons per MW annually air cooled; 2.1 million gallons annually water cooled ²	Regular rinsing required, exact figure unavailable.	None
ADDITIONAL INFRA-STRUCTURE REQUIRED	Major new roads systems, large transmission lines (high GHG emissions)	Large transmission lines (high GHG emissions), natural gas lines (fossil fuel, GHG emissions), water lines/wells, new roads	Large transmission lines (high GHG emissions), roads	None
FOSSIL FUEL CONSUMPTION	Backup capacity in gas required because of inconsistent wind; fossil fuels used to ramp up turbines to speed	Supplemental natural gas used in most applications.	None	None
JOB CREATION	Construction by large; contractors; jobs in remote locations; modest O&M; manufacturing usually outsourced	Construction by large contractors; jobs in remote locations; modest O&M; manufacturing usually outsourced	Construction by large contractors; jobs in remote locations; modest O&M; manufacturing may be local	Installation by local contractors; maintenance by local labor; benefits remain in the community
IMPACT ON PROPERTY VALUES	Steep declines for all properties near generation and near transmission; destruction of viewsheds for miles; loud roaring sound	Steep declines for all properties near generation and near transmission	Steep declines for all properties near generation and near transmission	Steep increases - full value of system immediately recognized, most jurisdictions waive property taxes on improvement; preserves quality of life and views
EMINENT DOMAIN	Widespread for generation and for transmission	Widespread for generation and for transmission	Widespread for generation and for transmission	None
RATEPAYER PARTICIPATION	Ratepayers must pay 100% of infrastructure costs but will not own anything; passive energy dependence; minimal incentive for conservation	Ratepayers must pay 100% of infrastructure costs but will not own anything; passive energy dependence; minimal incentive for conservation	Ratepayers must pay 100% of infrastructure costs but will not own anything; passive energy dependence; minimal incentive for conservation	Everyone who pays for their system owns it themselves; active energy independence; full participation; proven increased conservation
FINANCIAL IMPACT ON RATEPAYERS	Rates will increase benefiting solely industry; ratepayers pay whatever utilities are permitted to charge for power	Rates will increase benefiting solely industry; ratepayers pay whatever utilities are permitted to charge for power	Rates will increase benefiting solely industry; ratepayers pay whatever utilities may charge for power	Rates will increase; feed in tariffs will compensate small local generators so money flows to people not just industry
IMPLEMENTATION TIME	Lead time 2-8 years, construction time of 6 - 18 months.	Lead time 2-8 years, construction time of 6 - 18 months.	Lead time 2-8 years, construction time of 6 - 18 months.	No lead time, immediate installation

Energy comparison chart. Footnotes above can be found by clicking "Notes" in the on-line Desert Report (www.desertreport.org)

to decrease at a rate of 5% annually. This demonstrates the ability of good policy to drive a clean renewable energy paradigm that protects land, not destroys it.

Here is how the German Feed-in Tariff Law works

- EEG gives priority to grid connection status for all BIPV systems.
- Utilities are required to purchase all energy produced by BIPV systems at a guaranteed rate for 20 years.
- Reducing the feed-in tariff rate by 5% each year for newly installed BIPV systems coincides with expected decreases in BIPV

system costs.

- Feed-in tariffs are tiered, emphasizing a preference for building integrated systems over open land or ground systems.
- Feed-in tariffs, guaranteed by law, and the value of the feed-in system itself are usually sufficient to receive approval for a bank loan.

In a September New York Times article, a spokesperson for The Alliance for Responsibility Energy Policy suggested that our Nation

CONTINUED ON PAGE 22

Renewable Energy - The Better Way

CONTINUED FROM PAGE 11

emulate the successful German energy policy. Responding to our statement Mr. Carl Zichella told the New York Times: "What they are proposing is not a solution at all." It seems patently obvious that the German policy emphasizing feed-in tariffs and environmental protection is clearly "The Better Way." Ignoring proven success, CEERT¹ and RETI² are instead siting industrial scale solar, wind, and transmission lines that will scrape and destroy millions³ of acres of open or undisturbed lands and consume billions of gallons of precious and limited water resources.

Concentrating Solar Power (CSP), for example, requires enormous areas of land to capture the sun's heat with thousands of ground mounted mirrors. Many use this thermal energy to convert water into high-pressure steam. The steam is fed to massive generators to produce electricity. Cooling is then required, just as with coal, nuclear, and natural gas facilities. All of this has a detrimental effect on our environment. In contrast to CSP's reliance upon outdated industrial methodology with its giant scale mechanical parts and processes, PV cells instead convert the sun's energy directly into electricity. No steam or moving parts are required! Photovoltaic cells can even capture the sun's energy on a cloudy day. CSP typically requires burning natural gas in the morning and on cloudy days to keep the profits coming in. California regulations allow CSP to generate up to 25% of their total output from burning this fossil fuel.

The Pickens plan infers that wind is reliable enough to replace on-demand generating facilities fueled by natural gas, thereby freeing up natural gas for the transportation sector. Wind's inconsistency and unreliability renders it incapable of being an on-demand peak power energy source, unlike PV solar that generates its peak power mid-day when it is most needed.

Another deceptive energy scheme being promoted by CEERT and RETI is the big wind industry. Here are just a few of the many problems associated with big wind farms:

- Giant industrial turbines only generate about 17% of installed capacity claims according to Southern California Edison's own production records.
- Wind farms can require 50 or more acres of land for every MW of installed capacity. (Bureau of Land Management West Fry Wind Energy Project 5/22/08 News release) In addition new roads and transmission lines are needed thereby requiring more land.
- Destruction of viewshed is best evidenced by the 4,000 plus industrial wind turbines that now occupy the once scenic San Geronio Pass to the west of Palm Springs.

- More and more evidence is accumulating that industrial wind turbines cause unacceptable avian fatalities.
- Industrial wind turbines consume electricity from the grid to "power-up" and use electricity for other operating processes.

Recent controversy has been generated over Carl Pope's endorsement of the big wind farms proposed by T. Boone Pickens. Growing concerns over the environmental destruction caused by wind farms, the inefficiency of their industrial wind turbines, and the departure from the traditional environmentalist role have all fueled this controversy. The Pickens plan infers that wind is reliable enough to replace on-demand generating facilities fueled by natural gas, thereby freeing up natural gas for the transportation sector. Wind's inconsistency and unreliability renders it incapable of being an on-demand peak power energy source, unlike PV solar that generates its peak power mid-day when it is most needed. Making matters worse, the Pickens plan merely trades our dependence on one fossil fuel (oil) for another (natural gas).

We must also consider that construction and maintenance of industrial scale solar, wind, and transmission line projects will produce enormous quantities of carbon emissions and other toxins that pollute our atmosphere. Scientists now believe desert ecosystems may actually absorb carbon as effectively as temperate forests (www.sciencemag.org SCIENCE VOL 320 13 JUNE 2008 Published by AAAS). The ground disturbance resulting from construction of concentrated solar plants, wind farms and transmission lines will compromise the ability of desert regions to absorb carbon. This factor must be considered when measuring the effect of CSP, wind farms, and transmission lines to reduce carbon emissions. Priority should be placed on keeping our open spaces intact, not turning them into sacrifice areas for industrial scale energy development.

We can meet and even exceed our renewable energy goals by adopting policies already working in other countries. Feed-in-tariffs encourage larger PV installations which generate surplus renewable energy to replace fossil fuel energy on the grid. Feed-in-tariffs that fairly compensate homeowners and businesses for this surplus power reduce payback times and provide financial incentives that drive the PV success model.

If we are truly concerned about balancing our need for renewable energy and protecting open lands we must work to educate and encourage our law makers to pass legislation that creates responsible energy policy. This is The Better Way. For more information about this and other energy policy issues please visit AREP's website at www.protectourlands.com. ♦

The Alliance for Responsible Energy Policy, AREP, was formed in January 2008 to address energy policy problems. AREP studies policy and technical publications, consults with experts, and summarizes documents into plain language. AREP maintains a website dedicated to educating our electorate and public officials by preparing policy comments and recommendations.

Article citations:

¹ Center for Energy Efficiency and Renewable Technologies

² The California Renewable Energy Transmission Initiative

³ Renewable Energy Transmission Initiative Phase 1B Draft Report Appendix D Page.D1

Sources for the comparison chart:

Lost Acreage per MW

Industrial Wind: Source: BLM applications chart

CACA 47043 West Fry Mountains Wind Project - Florida Power & Light Energy LLC - 2500 acres / 50 MW (**50 acres per MW**)

CACA 48658 Black Butte - Orion BP - 2442 acres / 40 - 54 MW (**45-61 acres per MW**)

Industrial Concentrating Solar Thermal: Source: California Energy Commission Applicant's data responses.

Ivanpah - Bright Source - 6,720 / 400 MW (**16.8 acres per MW**)

Beacon - Beacon Solar, LLC - 2,012 acres / 250 MW (**8 acres per MW**)

Industrial PV: Source: BLM applications chart

CACA 48818 Optisolar Opal project - 14,400 acres / 1205MW (**12 acres per MW**)

CACA 48819 Optisolar Desert Ruby project - 15,280 acres / 1000MW (**15 acres per MW**)

Water Use per MW

Industrial Concentrating Solar Thermal:

Air Cooled - Ivanpah - Bright Source - 100a/f or 35,000,000 gallons / 400 MW (**87,500 gallons per MW**)

Water cooled - Beacon - 1500 a/f or 525,000,000 gallons / 250 MW (**2.1 million gallons per MW**)