EVIDENCE SHOWS
LONG BEFORE 2029, WHEN LIMERICK'S LICENSE EXPIRES

LIMERICK NUCLEAR PLANT'S ELECTRIC CAN BE REPLACED

- **There Is No Need To Relicense Limerick Nuclear Plant And Increase Grave Harms and Threats To Our Region.**
- **NRC Can Choose Safe, Clean Available Alternatives That Won't Threaten Us With Cancer and Meltdowns. According to NRC's Documents For Relicensing:**

An Alternative To Limerick License Renewal Includes: NRC Choosing Reasonable Alternative Energy Sources

SAFE, CLEAN, CHEAPER ALTERNATIVES ARE AVAILABLE

WE DON'T NEED

LIMERICK'S DIRTY, DANGEROUS, COUSTLY ELECTRIC!

- **The case supporting use of solar is included in this report. News, reports and studies show Limerick's electricity can be replaced with solar and a variety of truly safe, clean, cost effective alternatives.**
- **Renewable energy sources can be built and operational in a matter of 18 months or less.**
- **Clean, safe, renewable energy use will continue to increase and become more prevalent. Energy conservation and efficiency will continue to reduce energy consumption, save money, and create jobs.**
- **Large back-up systems make 100% Solar and Wind Possible - Already in New York, coming soon to PA. (Flywheel Energy Storage making solar and wind viable base-load power), dispel false claims from the nuclear industry, their lobbyists and apologists that solar and wind can't supply base load power.**
- **Substantial energy loss through transmission is drastically reduced by producing and using solar and wind directly at homes and businesses. Solar is becoming the best alternative with few or no moving parts and negligible operating costs.**

NRC Can And Must SAY NO To Limerick Relicensing Until 2049

Every day Limerick operates, our region faces on-going radioactive contamination of our bodies and our environment, increasing deadly wastes building up in our back yards, and the risk of meltdown and a catastrophic nuclear disaster. There is no way to eliminate those threats.

Clean, safe, alternatives are available and being used right now. it is unacceptable to continue to subject millions of people to dirty, dangerous technology that threatens the entire Philadelphia region with harmful routine radioactive contamination and risk of catastrophic meltdown.

CONTACT ELECTED OFFICIALS AND NRC

TELL THEM TO SAY NO
TO LIMERICK NUCLEAR PLANT RELICENSING

Limerick License Renewal - NRC I.D. Docket 2011-0166

Write To: U.S. NRC License Renewal Mailstop TWB-05-BO1 M Washington, D.C. 20555

For More Information On Why Limerick Must Close Before 2029,
Review Other Sections Of ACE's Website
Or Call ACE For An Appointment to Visit The ACE Office (610) 326-2387

- **Don't Let Elected Officials Be Fooled By Scare Tactics Of The Nuclear Industry And Their Defenders Who Falsely Claim We Need Nuclear Power And That Nuclear Power Is Safe, Clean, and Reliable. None Of That Is True.**

- **Solar News and Reports Compiled In This Report by ACE, Dispel Nuclear Industry "MYTHS". They Prove Our Lights Won't Go Out When Limerick Closes!**

RESEARCH AND REALITY DISPEL NUCLEAR INDUSTRY "MYTHS" :

- **RESEARCH SHOWS LIMERICK'S ELECTRIC CAN BE REPLACED WITH ENERGY THAT WON'T CONTINUOUSLY POISON US WITH RADIATION AND THREATEN US WITH NUCLEAR DISASTER!**
- **REDUCING ELECTRICITY USE - ENERGY CONSERVATION, WITH A WIDE RANGE OF EFFICIENCY STRATEGIES AND PRACTICES, AND ENERGY SAVING WINDOWS, APPLIANCES, ELECTRONICS.**
- **INCLUDED IN THIS REPORT IS A LIST OF PA SOLAR INSTALLATIONS THAT PROVE SOLAR IS VIABLE IN PA WITHOUT TAKING UP LARGE AMOUNTS OF LAND.**
- **SOLAR POWER NEWS AND REPORTS IN THIS SECTION SHOW SOLAR COSTS ARE COMPETITIVE AND GOING DOWN AND THAT SOLAR CAN BE BASE LOAD POWER. IT PROVES SOLAR COULD PROVIDE ALL OUR ELECTRICITY NEEDS IN THE NEAR FUTURE – WITHIN SEVERAL YEARS.**

FACTS DISPUTE NUCLEAR INDUSTRY FICTION

PA SOLAR POWER

Nuclear Lobbyists And Others, Including Some Elected PA Officials:

- ✓ Inaccurately Claim Solar Power is Not Feasible or Dependable for PA
- ✓ Inaccurately Claim We Need Nuclear Power To Keep The Lights On

SOLAR INSTALLATIONS IN OUR REGION

Examples of a long and growing list of regional business and personal solar installations

- Westtown School – 34-kilowatt system – 1 of the largest solar panel installations locally
- French Creek and Stargazers Vineyards
- Manatawny Creek Winery – 64 Panels
- Merck & Co. Solar Panel Installation - 6400 solar panels top of Merck parking deck in Upper Gwynedd - Reported 2010
- GlaxoSmithKline - 406 kW rooftop solar power system - Upper Providence - Announced 2010
- Grows Landfill, Bucks County - 3-megawatt power plant – largest east of Arizona
  17,000 solar panels – Power for 400 homes - Joint project – Exelon, SunTechnics, Epuron
- Vast numbers of local residents have installed solar power at their homes on rooftops, on property, and by solar poles (too numerous to list), including the ACE Office / Cuthbert Residence in North Coventry, which includes a battery back-up system

Since 2002 over 350 photovoltaic (PV) and solar thermal energy projects were installed for commercial customers, universities, and government buildings. **PA Examples:**

- South roof of the governor's residence in Harrisburg - 2.8-kilowatt PV system
- DEP Southeast Regional Office in Norristown - 4.8-kilowatt system
- Tredyffrin and Willistown Township Buildings

Philadelphia Was Named A "Solar American City" by DOE - April, 2008

1 of 25 cities aimed at jump-starting solar power projects and improving technology - Examples:

- Philadelphia Navy Yard - Brownfield closed since 1996
  1.4 megawatt solar power plant on 6 to 8 acres - 6,000 to 8,000 solar photovoltaic panels generating enough power for hundreds of homes per year.
- Friends Center Building in Philadelphia - 10-kilowatt system
- Eagles Stadium - Lincoln Financial Field in Philadelphia
  To generate all its own power with turbines and solar panels by the end of 2011, estimated to save $60 million in energy costs. Eagles owner, Jeffrey Lurie, told the Associated Press that the Eagles are going off the grid as part of their plan to be a socially responsible organization.

SOLAR

NEWS, FACTS, AND REPORTS DISPEL NUCLEAR INDUSTRY MYTHS

Compiled By The Alliance For A Clean Environment (ACE)
January, 2012

1999

Renewables Are Ready

Union of Concerned Scientists

Today a Host of Safe, Clean, Renewable Energy Technologies Are More Than Ready. Combined, Importantly, With Energy Efficiency, They Tender Nuclear Power As Unnecessary.

2006

SOLAR POWER Can Provide 55 Times Our Nation's Energy Needs.

U.S. Department of Energy (DOE) Report

We Don't Need New Nuclear Plants. Solar Power Is Faster, Safer, Less Costly to Taxpayers.

- PV technology can meet electricity demand on any scale.
  - Currently available sites—such as vacant land, parking lots, and rooftops—could be used.
  - Alternatively, PV systems built in the "brownfields"—the estimated 5 million acres of abandoned industrial sites in our nation's cities—could supply 90% of America's current electricity.

July 26, 2010

Nuclear Energy Loses Cost Advantage

By Diana S. Powers, The New York Times

"Solar photovoltaics have joined the ranks of lower-cost alternatives to new nuclear plants," Dr. John O. Blackburn, a professor of economics at Duke University, in North Carolina

New solar-nuclear cost report www.ncwarn.org.

Shows why the "nuclear revival" is unnecessary and why the industry demands that the enormous financial risks be transferred to the public, a scheme that could **waste trillions of taxpayer and ratepayer dollars**. Note:

- Building nuclear plants would "greatly impede market access for competing energy sources.
- Spending years considering new nukes is making climate change worse by diverting time and money from efficiency and clean power.

9-21-10

Solar Cell Production Climbs to Another Record in 2009

11-10

New Solar Power is Projected to be Cheaper Than Nuclear Power - DOE's Energy Information Administration Report

Projects off mid-Atlantic coast - are beginning to become reality.

1-28-11

Cheap Solar Energy Set to Displace Nuclear Power

http://www.upi.com/Science_News/Resource-Wars/2011/01/28/Cheap-solar-energy-set-to-displace-n-power/UPI-61211296221080/

Energy Resources WASHINGTON, Jan. 28 (UPI) -- New research has established that sophisticated new solar energy production methods make it far and away the cheapest and least hazardous energy source, certainly cheaper and safer than nuclear power.

March 14, 2011|David R. Baker, Chronicle Staff Writer
http://articles.sfgate.com/2011-03-14/business/28686980_1_solar-market-solar-power-ron-pernick

Solar power market tops $71 billion in 2010

The growth has not been smooth. Sales of photovoltaic solar equipment, for example, grew steadily for most of the decade but nearly doubled last year, jumping from $36.1 billion in 2009 to $71.2 billion in 2010. A flood of solar cells pouring out of new factories in China pushed prices down and sales up. A separate report, released Thursday by the Solar Energy Industries Association, found the U.S. solar market to be worth $6 billion in 2010, up from $3.6 billion the previous year.

3-27-11

Concentrated solar thermal power could replace nuclear reactors

http://blog.hasslberger.com/2011/03/concentrated_solar_thermal_pow.html

3/29/11

Renewables Are More Than Ready

Huffington Post - Karl Grossman - Professor of journalism, SUNY/College at Old Westbury

There's no need for nuclear power because there are safe, clean, renewable energy technologies, not coal, oil and gas, here to substitute for nuclear power.

- *Scientific American*, a most conservative scientific publication, in a cover story on October 26, 2009 -- unveiled its "A Plan for a Sustainable Future." It declared in its "Plan to Power 100 Percent of the Planet with Renewables" that, "wind, water and solar technologies can provide 100 percent of the world's energy, eliminating all fossil fuels."
- British magazine *New Scientist*, October 11-17, 2009, issue on safe, clean, renewable energy technologies -- titled "Our Brighter Future" -- presented a United Nations report declaring that "renewable energy that can already be harnessed economically would supply the world's electricity needs."
- From solar to wind (now the fastest-growing and cheapest new energy technology) to wave-power to tidal-power to bio-fuels to small hydropower to co-generation (combining the generation of heat and electricity) and on and on, a renewable energy windfall is at hand.

3-30-2011

Study: Global Solar Transition Achievable in 20 Years – Even With Peak Oil*For* *more information contact info@iprd.org.uk and/or call +44(0)7824 441 044*

4-8-11

GE goes more solar

5-23-11

Sungevity, Lowe's Cut Deal To Bring Solar To The Masses

6-13-11

NEW SOLAR POWER PLANT CAN GENERATE ELECTRICITY AT NIGHT

Improves reliability and nighttime availability of solar energy

6-14-11

Google invests $280 million in SolarCity

7-5-11

U.S. – Based Renewable Energy Production Surpasses Nuclear Energy Production.

Monthly U.S. Energy Review Said - Renewable energy passed a milestone – increasing electrical output by 25.82% in the 1st 3 months of 2011, compared to same time in 2010. - Solar-generated electricity increased by 104.8%.

7-6-11

Alternative energy production surpasses nuke in us

http://www.solarindustrymag.com/e107_plugins/content/content.php?content.8223

7-7-11

Gov't Report : U.S. Now Receives More Power From Renewables Than Nuclear

Study found solar energy generation increased by 104.8 percent since early 2010, while wind power has increased by 40.3 percent during the same time frame. This renewable thrust bodes well for the United States, particularly given the continued environmental and health impacts expected following the Fukushima disaster in Japan earlier this year.

7-8-11

Switching The Energy Economy Of San Antonio

San Antonio's mayor says he wants to make the city a hub for alternative and renewable energy businesses. Ira Flatow and guests discuss how a city can change its energy habits. Plus, smart meters let utilities know how much energy a house is using minute by minute.

7/28/11

Solar Power Co Plans Giant Arizona Tower

http://abcnews.go.com/Technology/solar-power-giant-arizona-tower-planned-generate-clean/story?id=14163138

Centerpiece of a giant non-polluting power plant, making electricity from the heat of the sun.

- The project was started by an Australian company called EnviroMission, which says it hopes, by the time it is finished construction in early 2015, to provide enough electricity to power the equivalent of 200,000 homes. It would burn no fuel. Nothing quite like it has ever been tried in America before...
- When completed, the facility will consist of a tower approximately 2,000 feet tall and a canopy 2,000 feet in diameter covering the ground at the base of the tower. The sun will heat the air inside the canopy, and the heated air will be sucked into the tower and rise to the top.
- The rising air will be used to turn turbines to make electricity. The heated air would then be vented out the top of the tower. More air would be drawn into the system through openings at the base of the canopy.
  http://www.parkerpioneer.net/articles/2011/07/05/news/doc4e13456176ef2622908813.txt

September 28, 2011

Google: Rent Your Solar Panels From Us

By: Candace Lombardi

Google has created a $75 million fund with Clean Power Finance, a company that offers financing for residential solar panel installations. The investment will enable 10,000 homeowners to install solar panels on their homes.

November 09, 2011 Bloomberg

Biggest Solar Silicon Maker Adds Production as Prices Sink

http://www.businessweek.com/news/2011-11-09/biggest-solar-silicon-maker-adds-production-as-prices-sink.html

Nov 11/10/11

SOLAR: Calif. hits 1-gigawatt rooftop milestone

California has installed 1 gigawatt of solar power, equaling the power generation capacity of two typical coal-fired power plants, on rooftops across the state, according to a report by the nonprofit Environment California. The state's rooftop solar capacity is enough to power 750,000 homes, a milestone matched by only five countries: Germany, Spain, Japan, Italy and the Czech Republic

January 03, 2012

Storehouses for Solar Energy Can Step In When the Sun Goes Down

By MATTHEW L. WALD New York Times

Two California companies are planning to deploy a new form of solar storage technology to power tens of thousands of households throughout a summer evening.

Jan 01/05/12

MillionSolarRooftops.com Announcing the Florida Citizens' Solar Electricity Bid... A naked rooftop is a terrible thing to waste. Florida's first group-based, citizen-led competitive sourcing event to help homeowners negotiate solar energy systems at volume discounts!

Research Shows Limerick Nuclear Plant's Energy Production Can Be Replaced

The nuclear industry, and their lobbyists, promote a false argument claiming that solar and wind can't supply baseload power. **UNTRUE!**

Many New Technologies Are Being Used Right Now For Storage, Making Solar and Wind Available 24 Hours A Day.

For Example:

- A new flywheel energy storage technology facility opened in 2011 in New York makes 100% solar and wind possible now.
- A second facility is planned for Hazle Township, PA, for completion by late 2012.
- Solar battery back-up systems are already in use by residents in our region.

A U.S. Department of Energy (DOE) Report Was Released In 2006 That Triggered ACE's Research and Activism Around Solar Power To Replace Limerick Nuclear Plant's Dangerous, Dirty, Costly Energy.

U.S. Department of Energy (DOE) 2006 Report Stated:

SOLAR POWER

Can Provide 55 Times Our Nation's Energy Needs.

DOE's 2006 Report Said:

- **PV Technology Can Meet Electricity Demand On Any Scale.**

The solar energy resource in a 100-mile-square area of Nevada could supply the United States with all its electricity (about 800 gigawatts) using modestly efficient (10%) commercial PV modules.

A realistic scenario: Distributing PV systems throughout the 50 states.

- On currently available sites—such as vacant land, parking lots, and rooftops.
- Land requirement to produce 800 gigawatts would average about 17 x 17 miles per state.
- Alternatively, **PV systems built in the "brownfields"**—the estimated 5 million acres of abandoned **industrial sites** in our nation's cities—could supply 90% of America's current electricity.

It Soon Became Clear That:
We Don't Need To Be Subjected To The Unprecedented Harms and Threats From Limerick Nuclear Plant and Others.

New Solar Installations Are Far Safer Than New Nuclear Plants, Could Be Completed Far Faster, And Would Be Far Less Costly To Taxpayers.

ACE did extensive research on the viability of solar power in our region, including local solar installations.

By July, 2007, ACE produced a one hour TV show with a local solar installer. By 2009, ACE had solar installed for the ACE office and Cuthbert residence and completed another TV show with the owner of the company who did the installation.

ACE Report #59	**Solar Power – Personal Energy Independence**	**July 2007**
ACE Report #78	**Solar Power Today** **With Pat Hastings, Epoch Solar Innovations**	**December 2009**

JUST ONE EXAMPLE OF

LOCAL RESIDENTIAL SOLAR PROJECTS

Cuthbert Residence and ACE Office
1189 Foxview Road
Pottstown, Pennsylvania

In 2007, Lewis and Donna Cuthbert, residents of North Coventry Township, in northern Chester County in Pennsylvania, and officers of The Alliance For A Clean Environment (ACE), started researching the feasibility of residential solar energy for their home and office.

By the end of 2009, they had completed the installation of a solar PV residential system. The system involved the use of an 18 panel solar pole in the backyard, as the roof of the structure did not provide a suitable southern exposure. Installation was completed by a local solar company.

The system was unique in that it included a three day battery backup system connected to the inverter. Six selected circuits providing identified essential functions during an outage were connected to the backup including heat, water, refrigerator, computer station, bedrooms etc. This shows there is battery back-up available even for residents, and it dispels the nuclear industry myth that solar is unreliable when the sun doesn't shine.

In August 2011, the Cuthberts added a roof mounted solar hot water heater and solar attic fan system. The collection equipment was small enough to be installed on the southern corner of the roof of the structure, using angled mounting brackets to provide optimal southern exposure. An 80 gallon hot water tank was included.

- **The combination of the 18 panel PV solar system and a variety of energy conservation and efficiency measures has reduced monthly electric bills by about 50%.**

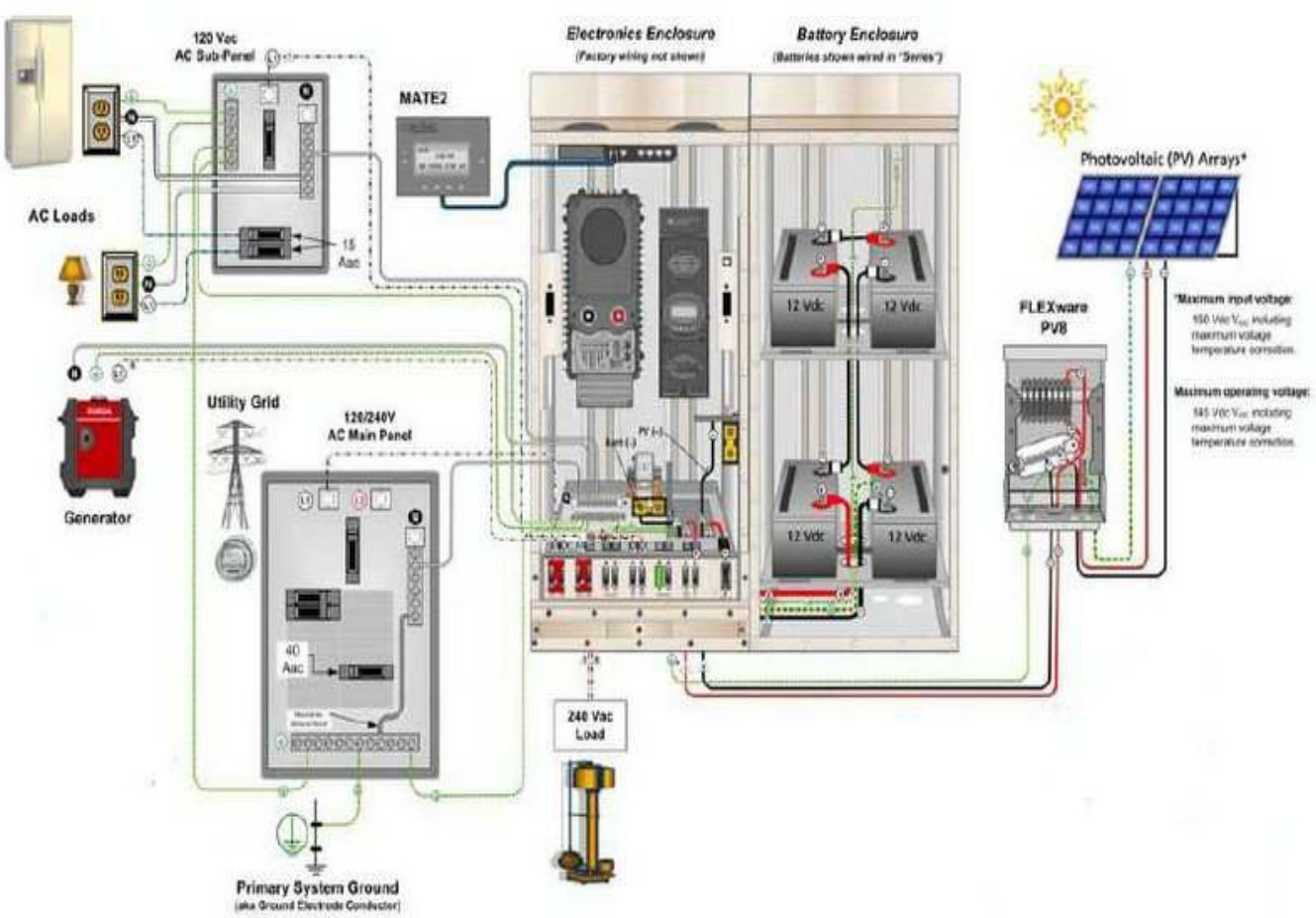
- **The solar hot water system has resulted in substantial cost savings through reduced oil burner use and the related costs for fuel oil.**

- **State and federal incentives and tax credits covered approximately 65% of both installations. Conservative estimates project full recovery of costs in seven years or less.**

For Flywheel Energy Storage

Large Scale Back-Up

see: http://www.energyjustice.net/node/165



This Diagram Shows

The Cuthbert Residence

Solar

<u>Battery Back-Up</u>

(How It Operates)

For other studies on alternatives,

see: http://www.energyjustice.net/solutions/c_and_e and http://www.ieer.org/carbonfree/ (though IEER promotes biomass and biofuels),

24 Clean Energy Studies Done Within The Last Five Years.

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The Stella Group, Ltd. is a strategic technology optimization and policy firm for clean distributed energy users and companies which include advanced batteries and controls, energy efficiency, fuel cells, geo-exchange, heat engines, minigeneration (natural gas/propane), microhydropower, modular biomass, photovoltaics, small wind, and solar thermal (including daylighting, water heating, industrial preheat, building air-conditioning, and electric power generation). The Stella Group, Ltd. blends distributed energy technologies, aggregates financing (including leasing), with a focus on system standardization. Scott Sklar, the Group's founder and president, lives in a solar home and has a zero energy office buiding in Arlington, Virginia and his coauthored books:The Forbidden Fuel was re-released in 2010 for its 2nd printing, and A Consumer Guide to Solar Energy, was re-released for its third printing.

Scott Sklar serves as Steering Committee Chair of the Sustainable Energy Coalition, composed of the renewable energy and energy efficiency trade associations and analytical groups, and sits on the national Boards of Directors of the non-profit Business Council for Sustainable Energy, Renewable Energy Policy Project, and the Policy Committee of the Sustainable Buildings Industry Council.. Sklar is an Adjunct Professor at the George Washington University teaching a unique multidisciplinary sustainable energy course. On November 4, 2010 Secretary Locke approved Sklar's appointment to the Department of Commerce Renewable Energy and Energy Efficiency Advisory Committee (RE&EEAC).

SKLARâ€™S TOP 24 CLEAN ENERGY REPORTS

1. GREENPEACE/DLR
The world could eliminate fossil fuel use by 2090 by spending trillions of dollars on a renewable energy revolution, the European Renewable Energy Council (EREC) and environmental group Greenpeace said. The 210-page study is one of few reports -- even by lobby groups -- to look in detail at how energy use would have to be overhauled to meet the toughest scenarios for curbing greenhouse gases outlined by the U.N. a Climate Panel. "Renewable energy could provide all global energy needs by 2090," according to the study, entitled "Energy (R)evolution." EREC represents renewable energy industries and trade and research associations in Europe. http://www.greenpeace.org/usa/Global/usa/report/2009/4/energy-r-evolution.pdf

2. **ASES/NREL** U.S. Energy Experts Announce Way to Freeze Global Warming
On January 31, 2007 at a press conference in Washington, D.C., ASES unveiled a 200-page report, Tackling Climate Change in the U.S.: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy by 2030. The result of more than a year of study, the report illustrates how energy efficiency and renewable energy technologies can provide the emissions reductions required to address global warming. U.S. Carbon Emissions Displacement Potential from Energy Efficiency and Renewable Energy by 2030 - 57% Energy Efficiency, 43% Renewables
http://ases.org/images/stories/file/ASES/climate_change.pdf

3. **GOOGLE** Google.org, the philanthropic arm of the search giant, has unveiled a plan to move the U.S. to a clean-energy future. The vision: In 2030, electricity will be generated not from coal or oil but from

wind, solar, and geothermal power. Energy demand will be two-thirds what it is now, thanks to stringent energy-efficiency measures. Ninety percent of new vehicle sales will be plug-in hybrids. Carbon dioxide emissions will be down 48 percent. Getting there will cost $4.4 trillion, says the plan -- but will recoup $5.4 trillion in savings. The Clean Energy 2030 plan would require ambitious national policies, a huge boost to renewables, increased transmission capacity, a smart electricity grid, and much higher fuel-efficiency standards for vehicles. http://googleblog.blogspot.com/2008/10/clean-energy-2030.html

4**. National Research Council Renewables Report** - June 09
Renewable energy resources in the U.S. are sufficient to meet a significant portion of the nationâ€™s electricity needs says a new report from the National Research Council. Press and link to report at:
http://www8.nationalacademies.org/onpinew s/newsitem.aspx?RecordID=12619 or
http://tinyurl.com/neka69
http://www.nap.edu/openbook.php?record_id=12619&page=1#

5. **INSTITUTE FOR LOCAL SELF RELIANCE** (October 2009) report by David Morris â€œSELF RELIANT STATESâ€ -- Excerpted Executive Summary Conclusion: "All 36 states with either renewable energy goals or renewable energy mandates could meet them by relying on in-state renewable fuels. Sixty-four percent could be self-sufficient in electricity from in-state renewables; another 14 percent could generate 75 percent of their electricity from homegrown fuels. Indeed, the nation may be able to achieve a significant degree of energy independence by harnessing the most decentralized of all renewable resources: solar energy. More than 40 states plus the District of Columbia could generate 25 percent of their electricity just with rooftop PV. In fact, these data may be conservative. The report does not, for example, estimate the potential for ground photovoltaic arrays – although itt does estimate the amount of land needed in each state to be self-sufficient relying on solar – even though common sense suggests that this should dwarf the roofftop potential..... It is at the local level that new technologies like smart grids, electric vehicles, distributed storage, and rooftop solar will have their major impact.â€
Contact for David Morris at: cell 612-220-7649 or dmorris@ilsr.org
http://www.ilsr.org/pubs/selfreliantcities.pdf

6. **Geothermal according to MIT study**
Jan 22, 2007 ... MIT study: Get more energy from Earth's heat. Geothermal could meet 10 percent of U.S. needs by 2050. www.msnbc.msn.com/id/16755646 ; www.mit.edu
http://web.mit.edu/newsoffice/2007/geothermal.html

7. **Concentrated Solar Power** from Earth Policy Institute http://www.earth-policy.org/Updates/2008/Update73.htm ; - easy 15%
also see: SOLAR ENERGY COULD PROVIDE 8000+ MW OF CAPACITY IN WESTERN STATES BY 2015 www.sustainableenergycoalition.org/factoids/factoid_12.html

8. **WAPA and Sandia/NREL Studies** - similar conclusions: A USDOE report for the Western Governorsâ€™ Association (WGA) in 2005 provided an assessment of the potential impact of CSP. It found that by using only available land with the most intense sunshine, over 6,800 GW of electricity could be generated in the Southwest.17 To put this in perspective, the electric generating capacity of the entirecountry is currently about 1,000 GW.18 http://www.nrel.gov/docs/fy07osti/41233.pdf

9. **CSP Report**
Assessment of Parabolic Trough and Power Tower Solar Technology Cost and Performance Forecastsâ€ Draft 3, Sargent and Lundy, LLC, October 2002
http://www.nrel.gov/csp/troughnet/pdfs/41233.pdf

10. **Rooftop solar power** Energy on and in Rooftops - bottom line is probably half the energy for buildings can be generated on-site - so let's say 15% in US http://www.nrel.gov/docs/fy06osti/39830.pdf
The solar energy potential of commercial building rooftops in the USA - United States commercial building rooftops may be the most wasted real estate in North America. Combined, these predominantly flat rooftops represent an area of more than 1,000 square miles that, outside of their sheltering function, do nothing more than soak up the sun, literally. More than half of this space has the potential to produce

energy using simple photovoltaic, or solar electric, generating stations. Bill Jeppesen, for RWE SCHOTT Solar, Inc., USA reports (8/20/04)

11. **Navigant / Energy Foundation 2005** market study - technical potential of PV in the US. Using only roof space (per Census) and using average amounts of shading, tilt, etc., within the US, their estimate was maximum technical potential in the US of 1,037,519 MWp , which would represent almost 1/3 of total electricity US usage MWh for MWh
http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B73D84D4M8HD16&_user=10&_coverDate=07%2F01%2F2004&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1427914091&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=f5ebf83afb41e029ef31f3d8e1999534

12. **Worldwide Capacity of Solar Thermal Energy** Greatly Underestimated -- 2004 (10 November 2004). The International Energy Agencyâ€™s Solar Heating and Cooling Programme and major solar thermal trade associations publish new statistics on the use of solar thermal energy. The new data â€“ expressed for the first time in GWth, rather than in square meters of installed collector area – shows the global installed capacity to be 70 GWth (70.000 MWth).
http://www.iea.org/textbase/nppdf/free/2007/Renewable_Heating_Cooling.pdf13.

13. **Water Energy** - EESI, EPRI, NHA, OREC www.eesi.org/060807_Hydropower
Several studies conclude that upgrading existing dam turbines, installing free-flow hydropower (no dams or diversions) tidal, wave and ocean currents and thermal could produce 10% of US energy.
http://www.eesi.org/060807_Hydropower

14. **Waste heat to produce electricity**
ACEEE, EPA and DOE conclude that an easy 8 % of US electricity and probably more in displacing other thermal applications could be displaced by CHP. http://www.aceee.org/pubs/ie983.htm

15. **WIND** A new analysis by the U.S. Department of Energy (released 5\08) finds that wind can be a major contributor to the country's energy mix, supplying up to 20% of electricity by 2030. For the report and executive summary: www.20percentwind.org
http://www.20percentwind.org/20percent_Summary_Presentation.pdf

16. **REN 21: Global Status Report**: Renewables / 2009 Update (pdf, 880KB) **.**
www.**ren21**.net/**globalstatusreport** /g2009.asp

17. **Annual biomass resource potential** from forest and agricultural resources . **.....** potential biomass sources, this **study** found over 1.3 billion dry www1.eere.energy.gov/**biomass** /.../final_billionton_vision_report2.pdf

18.**The United Nations Environment Program** and the **Renewable Energy** Policy Network for the 21st Century today reveal in a pair of new **reports .** Jul 15, 2010 **...**techcrunch.com/**2010**/07/15/global-clean-**energy**- **report**-un-2009/

19. Special **Report Renewable Energy** Sources and Climate Change Mitigation. Contents **...** 02-05 March **2010** 3rd Lead Author Meeting for the SRREN, Oxford, UK **...** www.ipcc-wg3.de/...**reports** /special-**report**-**renewable**-**energy**-sources -

20. **100% Renewable Electricity** - A roadmap to 2050 for Europe and North Africa
http://www.ukmediacentre.pwc.com/imagelibrary/detail.aspx?MediaDetailsID=1694&ClientID=1%20

21. **Clean Energy Investments Report** documents the dawning of a new worldwide industry-clean **...** businesses and installers in **2010** and 2011. **Clean energy** investments are forecast to **...**
www.pewtrusts.org/uploadedFiles/.../**Reports** /Global.../G-20%20**Report**.pdf

22. **EIA International Energy Outlook 2010**: **Renewable Energy** Grows, But **...** by Harry Tournemille on

June 1, **2010 ...** New **Report** Says **Renewable Energies** Will Dominate World's Energy Supply System Â· **Renewable Energy** Good For Workers' **...** www.**energy**boom.com/.../eia-international-**energy** - outlook-**2010** - **renewable**- **energy**-grows-fossil-fuels-dominate

23. **WWF** report indicates how its vision of a 100 per cent **renewable** and sustainable energy supply could be realized. In 2050, ambitious energy saving **...** www.worldwildlife.org/climate/energy-**report** .html

24. The Intergovernmental Panel on Climate Change said in a May 15, 2011 released report that the availability of renewable sources like the wind and sun was virtually unlimited, and could provide up to 77 percent of the worldâ€™s energy needs by 2050, but governments needed to adopt policies to take advantage of them.
http://www.ipcc.ch/news_and_events/docs/ipcc33/PRESS%20RELEASE%20Updated%20version%20-%20Potential%20of%20Renewable%20Energy%20Outline.pdf

FACTS ARE CLEAR:
LIMERICK CAN AND SHOULD BE CLOSED, NOT RELICENSED

Exelon Should Start To Transition To Safer, Cheaper 21ST Century Technologies Now, And Begin Retraining Workers

If Exelon Really Wants To Be A Good Corporate Neighbor, They Should Purchase Both The Oxy Superfund site and The Kinsey Hazardous Waste Site, Both Within A Mile From Limerick Nuclear Power Plant.

Both Hazardous Sites Could Be Turned Into Solar Parks To Begin A Transition Away From Limerick Nuclear Plant's Dirty, Dangerous Energy.

EXELON IS ALREADY COMMITTED TO,

AND INVOLED IN, SOLAR PROJECTS ELSEWHERE,

INCLUDING IN PHILADELPHIA AND CALIFORNIA.

WHY NOT HAZARDOUS SITES CLOSE TO LIMERICK NUCLEAR PLANT TO BEGIN THE TRANSITION AWAY FROM LIMERICK'S DANGEROUS, DIRTY ELECTRIC?

Occidental Chemical Superfund Site: A Photographic Essay for a Brighter Future

The US EPA has made its final decision regarding the Occidental Superfund Site. It has ordered Occidental to remove contaminated sludges from four lagoons. While this is good news – it's not a complete solution. Under the current plan, large quantities of toxic waste in the site's landfills and other areas remain at the site permanently. EPA's solution is to impose a deed restriction limiting the site's future solely to industrial use. ACE fears that this approach will result in yet another industrial polluter locating at the site.

We have a better idea – one that fits the definition of industrial land use, but that would benefit the environment, area property values and the area's image and economic future. Our idea is to turn the site into a solar energy park. This would involve covering portions of the site with an array of photovoltaic (solar electric / PV) panels. There are also cost-effective technologies that integrate photovoltaic

cells into energy-saving "cool roofing" for commercial buildings such as the site's warehouses.

Science fiction? Hardly. In fact there is a growing movement to turn Superfund and Brownfield sites into "Brightfield" sites. According to the US Department of Energy, PV systems built in the estimated acres of Brownfields could supply 90% of the nation's current electricity. Many examples already exist:

10,000 buried drums and contaminated soil were removed from the Picillo Pig Farm Superfund Site in Coventry, Rhode Island. Now New York-based Allco Renewable Energy Group will fill the 100-acre site with hundreds of solar panels – enough to generate 8 megawatts of electricity and power about 7,200 homes, making it the largest solar energy project east of the Mississippi.

Epuran and Exelon are collaborating on a solar energy plant in South Philadelphia at the Philadelphia Navy Yard that is expected to power 200 homes.

In nearby Bucks County Exelon Generating Company has committed to building one of the largest solar electric facilities in the nation – and it will do so using 16,500 solar panels on a buffer property located adjacent to Waste Management's GROWS Landfill in Falls Township. The project will cost between $16 million and $20 million to build and will generate 3 Megawatts of electricity.

In Brockton, MA a 425-kilowatt array of nearly 1400 solar panels were installed across 3 acres of the abandoned and contaminated Brockton Gas Works site. The Brockton PV project produces enough energy to power City Hall and meet a portion of the police station's energy demand. The City of Brockton received major grants from both Massachusetts and the U.S. Department of Energy to support the project.

The Brockton project also spurred further development of solar energy -- Solar Powered Condos. Each town house in Johnson Square Village, a 26-unit development being built on Foster Street, will have an 18-panel solar array that will harness the sun's energy to power TVs, computers, and other appliances. Solar power will provide more than half the needed electricity, saving condo owners hundreds of dollars every year. The $6 million project is located at a former shoe factory.

The “Brightfields” program, a U.S. Department of Energy initiative, specifically promotes the redevelopment of brownfields to use solar technology, clean energy, and produce revenue for the community. Solar energy technologies and photovoltaic systems are especially well-suited to application on brownfields sites. They require very little maintenance and can stand directly on the ground without penetrating the surface or disturbing any existing contamination.

Brocton, MA PV installed following cleanup of former contaminated industrial site.

Frontier Fertilizer Superfund Site in California

Brocton, MA

Frontier Fertilizer Superfund Site in California

PV integrated roofing at warehouse Frito-Lay Plant, Torrance, CA. Frito-Lay Warehouse

(Solar-Integrated, Inc.) The highly reflective roof reduces energy use for cooling and refrigeration during the warm season. This scene could be replicated at the Occidental Site. Northern climates work as well; a major federal warehouse that includes building-integrated photovoltaic roofing is located in Waltham, Massachusetts.

Pennsylvania already has a growing number of companies and plants producing photovoltaics and other renewable energy systems. These include:

AE Polysilicon a large producer of high quality silicon for solar cells located in Fairless Hills. The company recently announced that its new facility will bring approximately 145 fulltime jobs and 60 plus contract/construction jobs to the community and surrounding areas over the next few years.

Solar Power Industries with state-of-the-art facilities in the Pittsburgh area manufactures a variety of photovoltaic products from solar cells, to finished modules and fully customized systems. The company is building two new facilities in order to take advantage of the rapidly rising demand for PV.

Furthermore, the state is investing substantially to make Pennsylvania one of the nation's leading centers for solar energy. For example,

Governor Edward Rendell, in July, signed into law a program to invest $650 Million to help fund renewable energy projects in the state with nearly a third of the funding going to solar. Senator John Rafferty and Senator Andrew Dinniman supported solar power as a big winner in state funding initiatives for residents and businesses.

Enacted in 2007, the Pennsylvania Solar Initiative will provide production grants and consumer rebates to jumpstart the use of solar energy and attract solar manufacturing companies to the state.

Pennsylvania's portfolio standard requires that 18% of the electricity sold to retail electric customers come from eligible alternative and renewable energy sources by 2021. This requirement means that by 2021, another 850 megawatts of solar power will be generated in Pennsylvania.

We believe that our proposal for a PV installation at the Occidental site would have many positive benefits for the community and will help to promote Pennsylvania's emerging renewable energy industry. A University of California Study showed that solar technology creates more jobs per megawatt of installed capacity than energy derived from fossil fuels (the last thing we need at the site). Installing a photovoltaic solar park at the Occidental site would help the Greater Pottstown area get its share of the growing renewable energy sector and the green jobs that it brings.

For all of these good reasons, we urge all parties – EPA, PA DEP, Occidental Chemical our elected officials to join with the PV industry to create a solar energy park at the Occidental site. Concerted, forward thinking leadership will be necessary to ensure that the Occidental Site's future is brighter than its past.

Dr. Henry S. Cole, President Henry S. Cole & Associates Environmental, Inc.	Dr. Lewis Cuthbert, President Alliance for a Clean Environment (ACE)

Comparison of Nuclear, Solar, and Wind Power

ACE Summary 2010

Nuclear power is a deadly and dangerous distraction from real solutions to climate change and our energy needs. New nuclear plants are too expensive to build, take too long to complete, cost too much to operate and protect, and create irresolvable waste issues. Nuclear power is too polluting, too dangerous, too costly to taxpayers. It is unsafe, uneconomical, and unnecessary.

1. Costs of solar and wind (relatively quick to install) will continue to plummet, while costs for new nukes (taking many years to complete), will continue to rise. Independent estimates are that new nuclear plants will produce energy at 25-30 cents per kilowatt hour, and be the most costly form of new energy.

2. Cost-overrun history for construction shows triple the original estimates for new nuclear plants. Cost estimates for a new nuclear plant planned in PA, started between $8 and $!0 Billion and are now up to $13 to $15 Billion.

3. Clean, safe energies like solar and wind, along with energy efficiency, are estimated to provide more jobs per dollar spent than nuclear power.

4. The Department of Energy 2006 report stated solar power and wind power could provide far more energy than our nation needs - That solar alone could provide 55 times our entire nation's energy needs. Wouldn't it be wise to start to make that happen now for faster, safer, cheaper energy?

5. Costly security is not needed for solar or wind energy installations. They can't be turned into nuclear bombs like nuclear plants can, resulting in tens of thousands of deaths and hundreds of billions of dollars in damages and spreading radioactive contamination across vast areas for centuries. Meltdowns from nuclear plant accidents caused by human error or mechanical failure could cause that same kind of devastation. Accidents at solar or wind energy installations would not cause such a disaster.

6. Producing solar and wind energies closer to where they are needed, provides more energy security, removing the necessity for huge grids that can be attacked by terrorists.

7. Solar and wind would clearly be a far safer and less costly investment for taxpayers, considering the CBO determined the risk of default on nuclear loans is well above 50%. From licensing through construction to operation, reactors take too long to come on line.

8. Solar and wind won't create million-year high-level radioactive waste storage problems, with costs to taxpayers beyond meaningful calculation. New nuclear plants will add to the growing piles of this deadly waste and even higher costs to taxpayers. Reprocessing is not the solution to high-level radioactive waste problems. In fact, evidence in our report shows reprocessing makes waste problems worse. It's costly, ill-conceived, dangerous and environmentally damaging. Vitrification is also costly and has not been proven safe.

9. Nuclear plants are not emissions-free. Solar and wind energies won't routinely release radioactivity harmful to health. New nuclear plants will. Radiation exposure can alter DNA, cause cancer, and shorten life-expectancy. In fact, our investigation on the Title V Permit for Limerick Nuclear Plant proves this facility is a major polluter under the Clean Air Act, which includes 30 air pollution sources and a broad range of other air pollutants, including greenhouse gases. In fact, from uranium mining to waste storage, nuclear power emits greenhouse gases.

10. Solar and wind energies don't present enormous threats to water as does nuclear power. They are more dependable in heat and drought when you need power most. Nuclear reactors require enormous quantities of water to operate. If water sources diminish significantly or become too hot, due to droughts and heat waves (expected to increase under global warming), reactors cannot operate safely.

STOP Taxpayer Funding
For Dangerous, Polluting, Costly Nuclear Power

April, 2010

The hypocrisy is astonishing! Some in Congress used fiscal responsibility as an excuse to oppose health care reform, yet they support an outrageous attempted money grab in risky taxpayer loans (tens of billions to a trillion) to the wealthy nuclear industry, when the Congressional Budget Office estimates over 50% risk of default.

Taxpayers should be outraged. The nuclear industry has already externalized most of its costs, risks, and liabilities onto taxpayers, ratepayers, and future generations, both financially and radiologically.

Nuclear power is a dangerous distraction from real solutions to climate change and our energy needs, yet the nuclear industry, that already got the lion's share of energy subsidies for the past 50 years, is shamelessly attempting to rob the clean energy fund from the Climate Bill and Energy Bill. In reality, new nuclear plants are not the answer to global warming or the energy crisis.

Solar and wind don't produce high-level radioactive wastes for which there are crushing taxpayer costs and no safe solution. Reprocessing is also too costly to taxpayers and too environmentally damaging.

Nuclear plants routinely release radiation that can alter DNA, cause cancer, and shorten life-expectancy. Producing nuclear power emits greenhouse gases and other toxics. Limerick is a major polluter under the Clean Air Act. Solar and wind energies won't routinely release radiation or other harmful air pollution.

Nuclear reactors require enormous quantities of water to operate. They routinely release radiation into nearby water. If water sources diminish or become too hot, due to increasing droughts and heat waves, evidence shows nuclear reactors cannot operate safely, making them less dependable.

- Myths used by the nuclear industry are debunked in the Nuclear Monitor December 11, 2009 / No. 699 at www.nirs.org.
- Learn about France, including serious flaws, cost overruns, and delays related to the new French EPR nuclear design planned for six new U.S. nukes. www.beyondnuclear.org.
- Learn about routine radiation releases and the thyroid cancer epidemic linked to nuclear plants. www.radiation.org
- ACE recently completed a 53-page expose on nuclear power, including costs, deceptions, threats, limitations, NRC negligence, and investigations on Limerick Nuclear Plant's air pollution, water contamination, radioactive wastes, casks, lax security, and increased cancers. This report is based on 10 years of ACE compiling documentation. Call ACE (610) 326-2387

We don't need and can't afford new nuclear plants.

To protect taxpayers, ratepayers, the environment, and public health, all taxpayer funding should go to only the fastest, safest, cleanest, and least costly real solutions to global warming and our energy crisis.

Contact U.S. Senators and Congressmen TODAY.

URGE them to OPPOSE All Taxpayer Funding for Dangerous, Polluting, and Costly Nuclear Power.

Solar - Nuclear COST Comparison per kW

Reported November, 2009

Construction Costs per kW

Solar $1,250 - $4,750 and DROPPING

Nuclear $5,000 - $8,000 and RISING

Examples of Exploding Costs For New Nuclear Reactors:

"Nuclear Costs Explode" Tampa Tribune 1/15/08 FPL's plans for 2 nuclear reactors at Turkey Point
12/07 – Estimated Cost – a shocking $24 Billion

Proposed:
Nuclear plant proposed in PA on the Susquehanna River NO ENERGY would be produced before 2016
PPL's CEO ESTIMATED - $10 Billion Cost
$8 Billion - Federal Loan Guarantees - Only $2 Billion – PPL Partners

New Nuclear Plant Under Construction in Finland
New York Times 9-2-09 - "More Delays at Finnish Nuclear Plant" - Areva, French nuclear construction company mired in delays and overrun costs.
OVER BUDGET - $3.3 BILLION - Costs steadily increasing
Areva wouldn't even commit to a date for completion

"Solar Photovoltaics Have Joined The Ranks Of Lower-Cost Alternatives To New Nuclear Plants," John O. Blackburn, a professor of economics at Duke <http://topics.nytimes.com/top/reference/timestopics/organizations/d/duke_university/index.html?inline=nyt-org>

The Costs Of Solar Photovoltaic Systems Have Declined To The Point Where They Are Lower Than Rising Projected Costs of New Nuclear Plants, According To.<http://www.nytimes.com/2010/07/27/business/global/27iht renuke.html>http://www.nytimes.com/2010/07/27/business/global/27iht-renuke.html
"Historic Crossover," @ 16 Cents Per Kilowatt Hour in 2010.

1999 - The Union of Concerned Scientists Wrote:
Renewables Are Ready - Today a Host of Safe, Clean, Renewable Energy Technologies Are More Than Ready. Combined, Importantly, With Energy Efficiency, They Tender Nuclear Power As Unnecessary. Since At Least 1999, for over a decade, it was clear that we don't need nuclear power.

Powerful nuclear industry interests keep the U.S. from making greater progress in competing in the solar power market and installations.

UNFAIR NUCLEAR SUBSIDIES

For Over 50 Years The Nuclear Industry Received The Lion's Share of Taxpayer Funding.

ENERGY SUBSIDIES (1943 to 1999)

Taxpayers Paid Nearly $151 BILLION (1999 dollars)

Of The $151 BILLION Taxpayer Dollars:

96.7% - To Nuclear Power

3.3% - To Wind and Solar

SOLYNDRA

AN EXAMPLE OF THE POWER OF NUCLEAR INDUSTRY LOBBYISTS ON CONGRESS. IT SHOWS HOW THEY MANIPULATE CONGRESS TO DESTROY FUNDING FOR CLEAN ENERGY AND CONTINUE TO GET MOST OF THE ENERGY SUBSIDIES.

Congressman Ed Markey (D) Massachusetts Said:

"For Insight On Solyndra Loan, Ask The Nuclear Industry"

2005 - The Solyndra Loan Was First Approved By the Bush Administration and the Republican Congress.

In 2005 - Every Republican on the Energy and Commerce Committee Approved Solyndra, including Those Now Claiming Outrage and Blaming It on the Obama Administration.

- **From "Birthing of Solyndra" by Dana Milbank - 9-26-11 Washington Post**

Solyndra was only turned into a scandal after the nuclear industry complained about nuclear loans coming too slow. The same Congressmen complaining about Solyndra are still supporting risky taxpayer loans for 100 new nuclear plants, estimated at $1 Trillion, with a 50% risk of default (according to non-partisian CBO).

Solyndra Was Turned Into A "Political Football" To Benefit Nuclear Power.
The Influence Of Nuclear Industry Lobbyists and Campaign Contributions Is Clear.

CONGRESSIONAL HYPOCRISY!
Outrage Over $500 Million, When Still Supporting A Risky Trillion Dollar Taxpayer Loan To The Nuclear Industry For 100 New Nuclear Plant That CBO Says Will Result In Over 50% Risk Of Default - Potentially Over $500 BILLION Taxpayer Dollars Lost.

BELOW: A creative approach and option for solar power that eliminates upfront costs to homeowners.

RENTING YOUR ROOF FOR SOLAR

A GREAT IDEA TO REPLACING LIMERICK NUCLEAR PLANT ELECTRIC

RENTING YOUR ROOF FOR SOLAR:
Another potential component for replacing Limerick Nuclear Plant's electricity in our region.

Google: Rent Your Solar Panels From Us

By: Candace Lombardi September 28, 2011

This home in Santa Clarita, Calif., sports a 4.14-kilowatt solar system owned by Google and put in place by American Vision Solar, an installer affiliated with Clean Power Finance. (Credit: American Vision Solar)

Google has created a $75 million fund with Clean Power Finance, a company that offers financing for residential solar panel installations.

The investment will enable 10,000 homeowners to install solar panels on their homes.

The upfront cost is the largest obstacle to installing residential solar panels, and solar installation companies don't always have the means to offer financing. Clean Power Finance seeks to overcome that hurdle by offering installers a way to provide financing to potential customers, while also giving companies without ties to the solar community a way to invest in the industry.

Google, the investor in this case, will technically own the solar panels, while the maintenance and upkeep responsibility of the solar panels stays with the installer and Clean Power Finance.

The homeowners, who are essentially giving roof space in exchange for a chance to buy solar-generated electricity, will pay a monthly fee. Google's return on investment comes via the electricity that is generated by the solar panels and sold to customers.

The big advantage of residential solar to the community at large is consumption at the source. Because much of solar electricity is consumed close to where it's generated, residential solar panels reduce the inevitable waste in electricity and money that happens when current must be transported via transmission lines from distant power plants.

"It greens our energy mix by using existing roof space while avoiding transmission constraints, and it can be cheaper than drawing electricity from the traditional grid," Rick Needham, Google's director of green business operations, pointed out in the company's green blog.

A solar proponent for quite some time, Google made headlines in 2007 when it installed 1.6 megawatts worth of solar panels at its Mountain View, Calif., headquarters. Google proudly touted at the time that within four days its panels had generated enough electricity to power 251,073 hours of television viewing.

Google has also been developing its own solar technology, and it's an investor in solar companies eSolar and BrightSource. Google has invested a total of $850 million in clean-energy related projects.

Read more: http://news.cnet.com/8301-11128_3-20112778-54/google-rent-your-solar-panels-from-us/#ixzz1ZH2wyIr9

BELOW:

Another Innovative Homeowner / Property Owner Innovative Solar Concept That Could Be A Valuable Tool For This Region To Replace Limerick Nuclear Plant Electric Sooner.

MillionSolarRooftops.com

Date: 01-05-2012

Announcing the Florida Citizens' Solar Electricity Bid...

A naked rooftop is a terrible thing to waste.

Florida's first group-based, citizen-led competitive sourcing event to help homeowners negotiate solar energy systems at volume discounts!

Homeowners and property owners across the state will have the opportunity to put their business out to bid in our statewide citizen-led Request for Proposals (RFP) that will go out to certified solar contractors who wish to compete for their business. Provided enough homeowners express an interest in participating, we will conduct an online competitive bid with the goal of finding the best solar service providers at the best prices. For more details, read more here.

Indications of interest can be submitted at
MillionSolarRooftops.com/florida_solar_bid.

Five Reasons to Put Solar on Your Roof

What's not to like about a source of energy that doesn't have to be mined, refined, gasified, or blown out of a mountain? Solar's about as green as it gets, and -- unlike a coal plant or a hydroelectric dam -- you can even put it on the roof of your house! Even better, it might not cost you anything to start saving on electricity.

Read Sierra Club Executive Director Michael Brune's list of five reasons why every homeowner should seriously consider buying or leasing solar panels. You've got nothing to lose but skyrocketing electric bills.

06/21/2011

Every Rooftop Matters

As I stood on the sunny Oakland roof of Sierra Club member Dan Rademacher, the view toward San Francisco and the Golden Gate Bridge was nice. But in my mind's eye, I was marveling at an even brighter vista -- a future when all the unadorned rooftops around us would feature the solar panels like the brand new ones that Dan was happily showing off.

I don't think that future's far off. There has never been a better time for homeowners to add solar panels to their roofs. The Sierra Club is so excited about rooftop solar solutions that we've begun a pilot program in California with two solar vendors to reach out to our members and supporters and spread the good news. And we really do think it's just a matter of "getting the word out," because once homeowners find out how easy, affordable, and beneficial adding solar power is, there'll be no stopping the rooftop revolution.

Here's why you owe it to yourself to find out more:

1. If you care about the environment, rooftop **solar is as green as it gets.** Every kilowatt hour of solar you generate either replaces electricity that might otherwise come from burning coal or frees up some other form of energy so that *it* can replace electricity from burning coal. Remember: No one ever had an asthma attack because of a solar panel.

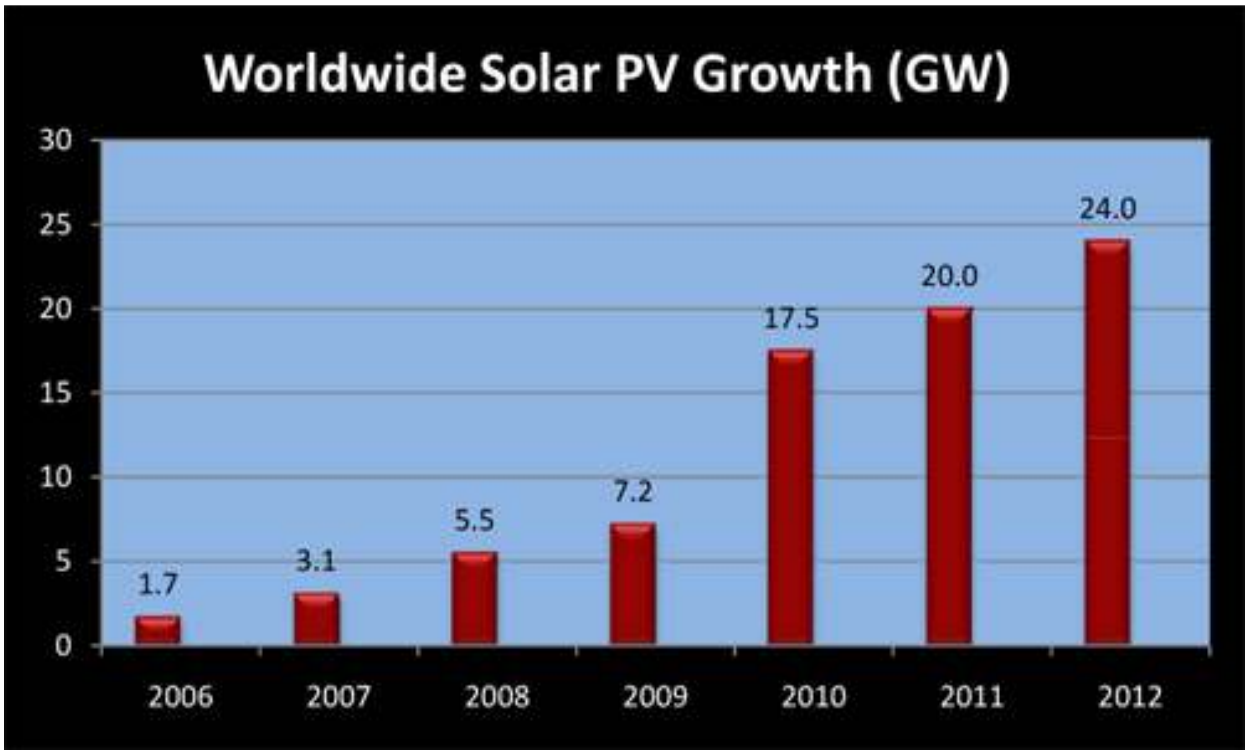
2. Solar has **never been more affordable.** The materials costs for solar rooftop installations have fallen dramatically, and for now, you can still benefit from significant federal and (depending on where you live) state incentives for installing solar that bring down the cost of both purchased and leased systems.

3. **Solar-leasing programs,** where you basically rent or purchase power from a system for 10 to 20 years, have made it possible for homeowners to put solar on their roofs for as little as $0 and still save on their utility bills. You get all the environmental benefits as well as a locked-in electrical-utility rate that will protect you against soaring electricity rates in the years ahead.

4. Rooftop solar also **helps the U.S. economy** by providing work for the people who design and install the systems. A stronger economy based on good green jobs at home helps us all.

5. Not only are you greening your electrical use at home but you are also making it possible to **green your personal transportation** by charging an EV or plug-in hybrid at home. How can you not love an energy solution that displaces both coal *and* oil? Ever hear of a catastrophic solar-power spill threatening fish and wildlife?

If you're interested in the Sierra Club's solar pilot program, check it out here. We're starting with just two companies and one state, but we're expecting to expand it nationwide later this year. The outlook is sunny, indeed.



As can be seen from the graph, the solar industry has seen remarkable 2010 growth as a rebound from the recent recession.

The bars represent the actual annual installed amount of PV solar systems by manufacturers expressed in giga-watts (1 GW = 1 billion watts).

The approx-imate growth rate from 2007 to 2011 was 60% per year!

For reference purposes, one nuclear reactor produces about 1.3 GW of electricity.

The growth rate from 2009 to 2010 was a whopping 143%.

We are forecasting 14% for 2011. The reason for the slowdown in 2011 is the reduction of incentives in several European countries. While the growth numbers are very impressive, the 20

PV Solar Installations By Country

Country	2009	2010	2011	2012
Germany	3.8	7.3	6.5	5.8
Italy	0.7	3.9	4.0	2.0
United States	0.4	0.9	2.0	4.5
Japan	0.5	1.0	1.4	2.0
Czech Republic	0.5	1.2	0.5	0.2
China	0.2	0.7	1.5	3.0
India	0.0	0.1	0.8	1.2
ROTW	1.1	2.4	3.3	5.3
Total Market	**7.2**	**17.5**	**20.0**	**24.0**

The chart shows Germany is by far the leader in solar power. Germany has a goal to discontinue all nuclear power by the year 2020 and replace it with renewable resources. This goal prompted a government policy called feed-in-tariffs (FITs).

A feed-in-tariff is a policy designed to encourage the adoption of renewable energy of all kinds to help accelerate the cost of renewables move towards grid parity.

FITs typically include three provisions: 1) guaranteed grid access, 2) long-term contracts for the electricity produced, and 3) prices that are based on the cost of renewable energy generation with a downward trend towards grid parity.

They include besides PV solar, other technologies such as concentrated solar power (CSP), wind, and geothermal.

In almost all of Africa, Pakistan, Hawaii, Italy and large portions of Japan, the price of electricity is already in excess of what the cost of electricity is from solar.

Therefore there is a ready market for today's solar electricity without any subsidies.

As the price of solar electricity comes down every year, more and more locations will benefit from making the switch to solar when new capacity is added.

Other countries with major PV feed-in-tariff programs are Italy and Japan. These countries will help take up the growth slack from Germany who has achieved their initial goals and will be reducing incentives in the future.

As can be seen above, the US is way behind in installations. The US has considered a feed-in-tariff but has yet to form a federal concensus to pass legislation.

However, there are 14 US States and the District of Columbia that regulate retail electricity markets in which customers may choose "alternative" power suppliers. In addition, some states such as California and Arizona, have implemented their own aggressive incentive programs to encourage alternative power.

The US, especially California and Arizona, have several extremely large installations in progress, which when finished will catapult the US into a major position internationally.

PA ENERGY SOURCES

Based On 2004 Data

98% - DANGEROUS DIRTY ENERGY

LESS Than 2%
Was Clean Energy Like Solar and Wind
That 2% Includes Burning Dirty Energies Like Landfill Gas

Dirty Energy Has Poisoned PA
Air, Water, Soil And People For Generations

PA Needs To Reduce Dirty Dangerous Energy
Progress Has Been Too Slow

Source For Data Below: Department of Energy
Prepared by Edison Electric Institute 2004 Classifications: Energy Justice Network

- **Coal** **37%**
- **Nuclear Power** **36%**
- **Natural Gas** **17%**

- **Hydro Electric** 6%
- **Fuel Oil** 2%

98% Total Dirty

- **PA Renewables** 2%

PA Must Do Better - Renewable Energy Mandate Comparisons:

- **PA** 18 % by 2020
- **New York** 25 % by 2013
- **New Jersey** 22.5% by 2021

- **While Percentages Changed Slightly Since 2004, PA Still Has Far Too Much Dirty, Dangerous Energy.**
- **ACE encourages you to contact your state representatives and senators.**

Ask Repeatedly Urge Elected Officials to:

SUPPORT ONLY "CLEAN" RENEWABLE ENERGY SOURCES.