



Solar Electricity Will Rule



“Clean, renewable solar-generated electricity is a golden opportunity for America”.

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Note: Communicating this information as news to others is free of charge. 7

Introduction

- **The danger from climate change is described in the “Climate Change Solutions” presentation.**
- **Solar Electricity for homes, businesses, organizations and vehicles will be implemented rapidly this decade and beyond.**
- **All Americans should educate themselves on the justification, financial, and implementation aspects of this 21st Century technology.**
- **It is easy to think “it costs too much, “it is too much trouble”, etc...**
- **When thinking such thoughts, the person should look at the children in America and consider the dire predications for life on Earth in 30+ years.**
- **When a person goes solar... it is for everyone else... How unselfish can one be ?**



A Word on Economic Comparisons

- For decades, the champions of fossil fuel have cited the “lower cost” of natural gas compared to electricity from renewable sources. **Baloney.**
- This flawed evaluation omits the huge cost for environmental damage and the need for clean-up by future generations, which could be in the tens of trillions of dollars. (1)
- So are we saving money now, just to bring untold financial misery on future generations?
- Americans have allowed this problem to grow by focusing on short-term thinking.
- We should be thinking 3-4 generations out.



Manufacture of Solar Panels must be Eco-Friendly

- There are at least 15 rare earth metals required for solar, wind, battery and electric vehicle technology.
- The current sourcing of these metals does not nearly meet the demand for full transition. In addition, there are questions about how to mine for these metals in a responsible manner. (2)
- Also, the sourcing is largely in other countries, such as China. However, new sources are being found all the time, such as in Texas. (3)
- There is significant hope. The rare metals of the future could come from recycling old batteries and other devices. (4)
- The easy, short-term view statements that “we don’t have enough rare metals so we cannot transition to the new technology” are flawed... and ignore the lessons of history... America has time and again overcome technical challenges.



What can Solar Electricity Power ?

- **Solar Electricity can power:**
 - **Vehicles, including semi-trucks and buses**
 - **Boats, motorcycles, campers, most anything that moves**
 - **Home air conditioning and heating systems (electric heat pumps)**
 - **Hot water heaters**
 - **Cooking appliances**
 - **All garage tools (re-chargeable battery technology)**
 - **Patio cooking grills**
- **This is true for homes, schools, universities, churches, businesses, non-profits and government organizations.**
- **The first step is to ensure electricity from 100% renewable sourcing.**
- **The next step is to create a plan and timing on the transition to the new equipment.**
- **Along with these steps, the majority of Americans should encourage their government representatives to pass laws banning the manufacture or construction of any new equipment or building that burns fossil fuel.**

Solar Electricity Examples from Texas

- **Most families and organizations would prefer to get solar electricity from large utilities, which eliminates the need to install and maintain equipment on-site.**
- **This is exactly what is happening in Texas.**
- **Texas has a state-wide system called ERCOT, Electric Reliability Council of Texas. ERCOT manages the electrical power that flows to 90% of Texans. (5)**
- **ERCOT has a renewable energy credit (REC) system where consumers can purchase renewable credits for their electricity. (6)**
- **However, in recent years, the cost of solar has dropped, and large Texas Utilities are now actively marketing 100% renewable electricity to customers. (7)**
- **Early word indicates consumers will know the location of the solar farm that provides their electricity. Imagine a busload of school kids on a day trip to visit the solar farm that provides electricity to their school !**



Across America, Solar Electricity is becoming the “Go-To” Technology

- Recent studies indicate in 2020, 75% of all new electrical generating capacity in the U.S. will be renewable. (8)
- Solar is growing so quickly, it is having a devastating effect on the Oil and Gas Industry. This will continue. (9) (10) The impact on companies and jobs is discussed in “The Great Sustainability Compromise” presentation.
- Predictions are for Solar Electricity Installations in the U.S. to triple in the next decade. (11)
- This is positive news, but not good enough for our children. Considering the harm and future clean-up cost due to fossil fuel, Americans should support 6-7 times more Solar Electricity installations across the decade of the 2020s.
- A key: Utility-scale size has better economics than solar panels for individual homes.



A Word on Solar Panels for Homes and Buildings

- **Physical Installation of Solar Panels on Buildings is happening all over America.**
- **There are many, many news stories and vendor companies.**
- **This approach would be attractive if:**
 - **the owner wanted to ensure electricity supply when the main grid is down.**
 - **The state-utility electricity system available to the building does not have a renewable option.**
- **Cautions:**
 - **These installations can cost thousands of dollars.**
 - **Leasing the equipment is common, with electricity savings equaling the monthly lease cost. Be sure to understand the details of any lease agreement.**
 - **Also, installing the equipment to be resistant to wind damage is important, and requires added clips and structural design.**



Location of Solar Farms

- The creative possible locations for solar farms are numerous.
- Large numbers of solar panels can be installed on farm land; where goats and cows can eat the grass under and around the structures, keeping the growth under control, and feeding the animals at the same time.
- Huge arrays of solar panels can be mounted on floating structures on a lake or reservoir. This reduces water loss due to evaporation and generates electricity at the same time.
- These ideas are just the beginning of what the United States will look like 20 years from today.



Solar Electricity – Every American can Help

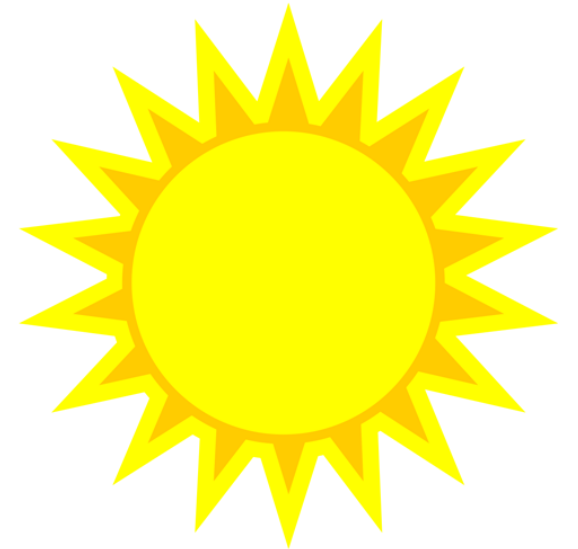
- **Any American can:**
 - **communicate with their school or church about the importance of implementing renewable electricity.**
 - **communicate with business leaders that you expect them to implement renewable electricity to stop harmful carbon pollution.**
 - **write government representatives about laws to require renewable electricity, and an active time-line to retire old fossil fuel electricity installations.**
 - **write government representatives about laws to ban the future new construction of buildings with any fossil-fuel use.**
- **How many Americans have done this in the last two years? Probably not many... but that has to change if we are to make progress.**



Solar Electricity – The Big Picture

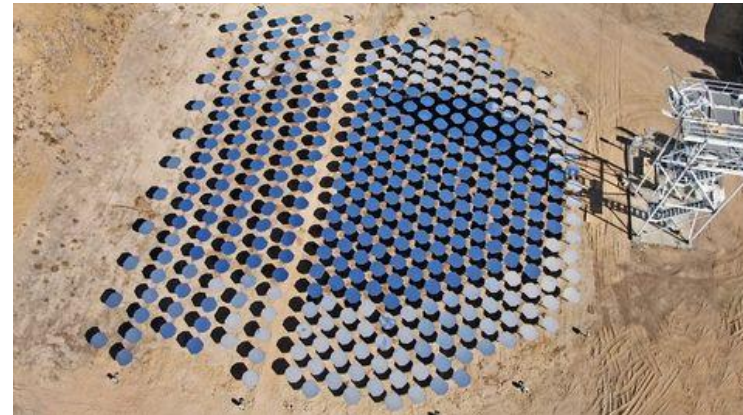
- **The enormous fossil-fuel electricity generation system in the U.S. has trillions of dollars invested.... and voting citizens in American allowed this to happen. We are all responsible.**
- **A typical industry response in the face of new technology is to make the transition slow in order to reap the financial benefits of the former investments.**
- **We, as Americans, cannot allow this transition to be slow.**
- **The support Electricity Utilities will need is described in “The Great Sustainability Compromise” presentation.**

Note: Wind-generated electricity is growing also, and will be the subject of a future presentation.



Important Recent Breakthrough in Solar Technology

- For decades, and still today, steel, glass and cement have been manufactured in industrial processes using temperatures in excess of 1,000 deg C, by burning fossil fuel.
- A high-tech start-up, Heliogen, led by Bill Gates, founder and CEO, recently demonstrated temperatures in excess of 1,000 deg C. (12)
- The equipment uses artificial intelligence and a field of mirrors to concentrate the sun's heat and basically create a "solar oven".
- There is more development needed, but the technology could lead the way to manufacturing these much-needed products without consuming fossil fuel.
- This new process could significantly help reduce carbon emissions from industrial processes.



Citations

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