

The Clean Energy Manifesto

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Clean energy is everyone's problem and everyone's responsibility. Homeowners, renters, landlords, homebuilders, employees, employers, business owners, and corporations each have a role to play in creating a clean energy planet.

To create a clean energy planet, we need to make many new tangible changes...changes that we can see and measure. But we also need to make several intangible changes, namely changes that require us to redefine what is right and what is wrong. We need to adopt three new beliefs on a global scale as soon as possible, otherwise all the tangible changes we make will be for not.

Global Belief One

David Attenborough, the broadcaster and naturalist, said when he was a child it was expected that you would eat everything on your plate because it was considered morally wrong to waste food. He believes that if we as a civilization want to avoid climate change, we will need to adopt a belief that it is morally wrong to waste energy.

So, the first belief we need to adopt on a global scale is the belief that wasting energy is morally wrong.

Global Belief Two

We need to accept the fact that we have not been paying the full cradle-to-cradle price for energy production. Up until recently we have been willing to exchange today's comfort for tomorrow's polluted air, water, and land. The Earth is not a giant landfill. This practice is killing the planet and forces future generations to pay the true cost of the energy we consume today. This has to stop. From now on we must pay as we go. To do this we will need to adopt a global belief that creating waste and damaging the planet is morally wrong.

Global Belief Three

This belief is an extension of Global Belief Two. Saul Griffith in his lecture "Climate Change Recalculated" (video of this lecture is available on the internet) outlines a plan to convert the world to clean energy. It calls for us to replace 11.5 TeraWatts (TW) of dirty energy production with new clean energy production in the next 25 years. Saul Griffith warns that we will need to have the collective will to turn off the production of dirty energy. To do this we will need to adopt a global belief that producing dirty energy is morally wrong.

Summary

Yesterday's energy solutions no longer serve us as a people or as a planet. The challenge of creating a clean energy planet is huge. The effort required to retool the world is unprecedented. The success of these changes requires our species to quickly adopt the following strongly held beliefs.

- It is morally wrong to waste energy
- It is morally wrong to create waste and damage the planet
- It is morally wrong to produce dirty energy

We are stewards of this planet and the environment. It is morally wrong to damage the habitat of humans, animals, and plants. To ensure the survival of the human race it, citizens of the world must quickly adopt these moral beliefs.

As the ancient proverb states: We do not inherit the Earth from our ancestors; we borrow it from our children.

WHAT CAN YOU DO TODAY?

Let's be honest. We need to do what has never been done before. We need to voluntarily change the course of civilization for our benefit and the planet's benefit. We need to quickly stop a system of bad habits and adopt a system of good habits.

Creating a clean energy planet requires individuals and governments to make wise decisions, embrace change, and act boldly.

As individuals and as a civilization we need to take responsibility, make a commitment to do the right thing, and be held accountable for our actions and inactions.

We need to adopt the three Global Beliefs and make them inform our actions.

We need to consider all of our options. The best solution may require that we create a combination of strategies.

Blake Jones, co-founder of Namaste Solar says, in terms of developing clean energy solutions, "we don't need a silver bullet solution. We need silver buckshot solutions." We need to change our mindset from "either/or" to "all the above." In other words, we have to use every resource and strategy possible.

We need to get smart and take informed action at the same time. We need to act locally and globally at the same time. We need to:

- take concrete action in our daily lives
- make wise long-range policy decisions

WHAT WE CAN DO IN OUR DAILY LIVES

For Homeowners

As a homeowner you can make a difference.

Most homes leak energy the way a pasta strainer leaks water.

Our homes and businesses were built with poor insulation and air leaks in the days of cheap and plentiful fossil fuels. In the past, it did not matter if a home or business was energy inefficient. Today, it does matter. The days of cheap fossil fuels are gone. As a result we need to apply 21st century energy-saving technology to homes built using energy-wasting technology.

As a homeowner you can take action by reducing your home energy consumption. We have the technology to reduce energy consumption and remain comfortable. We just need to use that technology.

Here are three things you can do to reduce your energy consumption:

- Get a home energy audit.
- Weatherize your home. Based on your home energy audit you may need to install more insulation and make your home air tight.
- Consider installing a geothermal heat pump and perhaps a solar or wind energy system to your home.

The Eight Step Master Plan for Homeowners

If you follow these eight steps in the order they are listed, you will dramatically reduce your home energy usage, dramatically lower your monthly utility bill, help the environment, save money on the installation of a solar energy or geothermal heat pump system, and live at a comfortable temperature in your home year-round.

As Blake Jones of Namaste Solar says, In terms of developing clean energy solutions, “we don’t need a silver bullet solution. We need silver buckshot solutions.” We need to change our mindset from “either/or” to “all the above.” In other words, we have to use every resource and strategy possible. This *Master Plan* is your personal silver buckshot solution.

1. Get smart.

- Read the book *Homeowners Handbook to Energy Efficiency* by John Krigger. This book is available at www.HomeownersHandbook.biz
- Quantify the amount of energy your house uses annually
- Get a home energy audit
- Attend a National Solar Tour near you. Find out how your neighbors are using 21st century energy technology. For times and locations go to www.NationalSolarTour.org

2. Set a goal. Based on what you learned in Step 1, set a goal such as, in the next two years I’m going to cut my home energy usage in half.

3. Create a plan. Based on step 1 and step 2, create a plan of what you need to do to make your home more energy efficient. Create a list of what you can do to reduce the amount of energy your house uses annually, including big and small projects. Determine how much insulation you need to install, decide on how you are going to reduce air leakage in your home. Determine what work you can do yourself and what work you plan to hire someone else to do.

4. Subsidize. Determine the government subsidies and tax credits you qualify for. To get this information: go to www.dsireusa.org, ask your contractor, and ask your accountant.

5. Prioritize. Based on what your house needs and your budget can afford, prioritize the items in your plan.

- What is the sequence of projects you will work on?
- Can you combine projects together to save money?
- Can you combine energy-efficiency projects with remodeling/rehabbing work to save money?

6. Reduce. Make your home more energy efficient and reduce the amount of energy you use. Add lots of insulation and reduce air leaks. Make your house air tight. If necessary, add a mechanical ventilation system to control the moisture and air flow in your house. Consider the four factors of comfort as described in the *Homeowner’s Handbook to Energy Efficiency* book by John Krigger.

7. Install an energy-efficient heating and cooling system. Consider installing a geothermal heat pump. *

8. Generate your own electricity. Consider installing a clean renewable energy source (solar PV system and/or small wind system) to generate electricity. *

* The work you do in step 6 reduces your energy usage AND reduces the size of the system you need in steps 7 and 8, thereby saving you thousands of dollars in the cost of the systems you buy in step 7 and 8.

For Homebuilders

If you are a homebuilder, commit to only building energy efficient houses. By doing so, you are helping future generations reduce their energy consumption and saving them money.

For Everyone

Get smart. Learn more about clean energy and energy efficiency.

Teach others what you have learned.

Sign the Clean Energy Pledge (www.CleanEnergySecrets.com/pledge.pdf)

Discover the advantages and disadvantages of all sources of clean and dirty energy.

Discover what people in your neighborhood are doing. Attend an expo or a conference on clean energy. Attend a National Solar Tour in your area. For times and locations go to www.NationalSolarTour.org

Find out what the American Lung Association says about the health impact of power plants.

Discover some startling facts about clean energy. (later in this document)

Discover some startling facts about dirty energy. (later in this document)

Discover how nuclear energy is not clean, renewable, or sustainable. (later in this document)

Question the integrity of all parties in a debate. Ask yourself, what is the agenda of this speaker/writer? When you hear someone with a strong opinion about energy, question their sources and their motives. Are they cherry-picking the “facts” to defend their position? Is their opinion related to their income? It can be very difficult to argue the facts about energy with someone who is paid to have a certain opinion. As Upton Sinclair once said, “It is difficult to get people to understand something when their salary (or other reward) depends upon them not understanding it.” To learn how information can be presented with integrity, read books by Edward Tufte. (www.edwardtufte.com)

If you are a numbers kind of person, here are two places you can go to study the numbers related to climate change:

- *Sustainable Energy – Without The Hot Air* by Cambridge physicist David MacKay available at www.withouthotair.com
- “Climate Change Recalculated” lecture by Saul Griffith available at http://fora.tv/2009/01/16/Saul_Griffith_Climate_Change_Recalculated

“The era of procrastination, of half-measures, of soothing and baffling expedients, of delays, is coming to its close. In its place we are entering a period of consequences.”

-- Winston Churchill

MAKE WISE LONG-TERM POLICY DECISIONS

As consumers we must all become technically literate AND participate in the discussions required to help form sensible policy.

We must consider the cradle to cradle lifecycle of energy sources we use. The health and well being of our planet and our civilization depends upon it.

Tell your political leaders what you want.

Tell them you strongly support projects and policies that support the dramatic increase in production of solar energy, wind energy, and geothermal heat pumps.

Tell Congress, your governor, and legislators that:

- you support subsidies for energy efficiency and clean energy
- you support subsidies for geothermal heat pumps
- you support subsidies for job training so that we have the skilled workforce to help the nation become energy efficient and convert to clean energy
- you don't support subsidies for dirty energy
- subsidies for nuclear power should be switched to renewable energy subsidies
- we need stronger energy efficiency laws. We need to require all new homes and office buildings meet strict energy efficiency standards
- we need to require new homes (and businesses) be able to generate a certain amount of electricity per square foot living space
- we need a strong clear focused commitment to a 25 year clean energy retooling goal which includes local, national, and global objectives
- we need to put a price on carbon emissions so that green power is even more price competitive.
- we need laws and other incentives to create a new energy system for the 21st century. We need a system that creates clean, cheap, abundant, and reliable electrons that go into smart homes and smart cars. For details on this, read books such as *Hot, Flat, Crowded* by Tom Friedman.
- we need to act NOW

“Carbon dependence has eroded our economic power, destroyed our moral authority, diminished our international influence and prestige, endangered our national security, and damaged our health and landscapes. It is subverting everything we value.”

-- Robert F. Kennedy, Jr.

SOME STARTLING FACTS ABOUT CLEAN ENERGY

- The American Midwest is the Saudi Arabia of wind power.
- The American Southwest is the Saudi Arabia of sun power.
- Enough solar energy falls on the Earth's surface in one hour to power all human civilization for a year.
- Ancient Romans were among the first to use geothermal energy to heat houses.
- Hawaii is home to the largest wind turbine in the world. It stands 20 stories high! And its blades expand the length of a football field.
- More than one million ground-source heat pumps have been installed in the US. About 50,000 to 60,000 new installations per year in homes, schools, and office buildings.
- Heat pumps are much more efficient than conventional electric heating and cooling systems. The EPA considers them to be one of the most efficient systems available, reducing electricity consumption by 30-60 percent.
- According to a study in Scientific American, photovoltaic and solar-thermal installations across just 19 percent of the most barren desert land in the Southwest could supply nearly all of our nation's electricity needs without any rooftop installation, even assuming every American owned a plug-in hybrid car.
- In 2006, renewable energy and energy-efficiency technologies generated 8.5 million new jobs, nearly \$970 billion in revenue and more than \$100 billion in industry profits.
- According to the National Renewable Energy Lab, the major barriers to a more rapid adoption of renewable energy and energy efficiency are not financial, legal, technical, or ideological. One of the biggest barriers is green employers can't find enough trained, green-collar workers.
- Germany and Japan have the largest demand share for new solar installations. Solar PV growth in Germany and Japan has been driven by aggressive government support programs.
- The United States is the world's largest generator of wind energy, producing roughly 18,000 megawatts of electricity from the wind, enough to power up to 5.4 million average U.S. homes.
- By 2030, the Department of Energy predicts that as much as one-fifth of the nation's power might come from wind.
- Denmark gets 20 percent of its energy from wind.
- The International Energy Agency estimates that investment in the generation, transmission, and distribution assets required to meet electricity demand worldwide will be \$10 trillion over a 30 year period.
- Government subsidies for clean energy are intended to level the playing field. In fact, the government subsidizes all sources of energy (clean and dirty).

SOME STARTLING FACTS ABOUT DIRTY ENERGY

The status quo (business as usual) is killing us and the planet.

Here are some startling facts about dirty energy.

- America borrows a billion dollars a day to buy foreign oil.
- America pays more than a trillion dollars in annual subsidies to oil and coal producers.
- Coal industry destroys mountains. Many coal companies now use mountaintop removal (MTR) to extract coal. The process involves:
 - clear-cutting forests
 - using dynamite to blast away as much as 800–1,000 feet of mountaintop
 - dumping the waste into nearby valleys and streams
- Mountaintop removal coal mining (MTR) has destroyed over 500 mountains across Appalachia.
- According to Wikipedia, at current rates, MTR in the US will mine over 1.4 million acres by 2010, an amount of land area that exceeds that of the state of Delaware. For more information on MTR, visit www.ilovemountains.org
- “Coal-fired power plants are among the largest contributors to particulate pollution, ozone, mercury, and global warming. The EPA should immediately take action to reduce emissions and expand clean-up requirements for power plants nationwide. The American Lung Association has taken legal action repeatedly to fight to require power plants to clean up.” (Source: Executive Summary of American Lung Association State of the Air Report 2009)
- Burning coal emits mercury. Coal-fired power plants are the largest source of man-made mercury pollution. Mercury can interfere with the development of babies’ brains and neurological systems. 49 U.S. states have issued fish consumption advisories due to high mercury concentrations in freshwater bodies throughout the country, largely due to coal emissions.
(Source: “Reel Danger: Power Plant Mercury Pollution and the Fish We Eat.” U.S. PIRG report (2004).
<http://static.uspirg.org/us.asp?id2=13986&id3=USPIRG&>)
- The mining and burning of coal are two of the dirtiest activities occurring in the United States.
- “Clean coal” represents a breakthrough in *marketing* of coal, but not in *science* of burning coal.
- “Clean coal” technology does not exist. What the coal industry is marketing as “clean coal,” is a hypothetical technology that may one day capture carbon dioxide from power plants and store it underground. However, the scheme has never been successfully demonstrated at a commercial scale, is wildly expensive, and can’t deliver in time to help with the climate crisis.
- Sulfate particles are more strongly linked to human mortality than any other component of particulate matter. 68% of sulfate-forming sulfur-dioxide comes from power plants, while 90% of sulfur dioxide emitted by all power plants comes from coal-burning power plants. (Source: “Dirty Air, Dirty Power”, Written by Conrad G. Schneider. Maria Padian, Ed. Clear the Air: June 2004.)
- The total national health costs of power plant pollution, including emergency room and hospital treatment, as well as lost work days, is estimated to be \$167.3 billion each year. (Source: “Dirty Air, Dirty Power”, Written by Conrad G. Schneider. Maria Padian, Ed. Clear the Air: June 2004.)

NUCLEAR ENERGY IS NOT A SOLUTION

Nuclear energy is not clean, renewable, or sustainable.

- The public does not pay the true cost of nuclear energy because government subsidizes nuclear energy in two ways:
 - liability. The government limits the liability of a nuclear power plant.
 - disposal of spent fuel rods. The government assumes the responsibility of disposing spent fuel rods.

These are unknown costs not included in the consumers' utility bill. The cost is shifted to the tax payer in the future.

- According to Bo Nordell of the Department of Civil and Environmental Engineering at Luleå University of Technology in Sweden, nuclear power does not produce carbon dioxide emissions in the same way as burning fossil fuels, but it does produce heat emissions equivalent to three times the energy of the electricity it generates and thereby contributes to global warming significantly.
- Nuclear power is not sustainable or renewable because its fuel source is non-renewable. There is only so much uranium in the ground.
- Uranium mining is one of the most CO₂ intensive industrial operations. CO₂ emissions are expected to rise as demand for uranium grows and core grades decline.
- Highly toxic nuclear waste poses new threats from terrorists who would love to blow up a nuclear power plant or nuclear waste facility.
- Constructing a nuclear power plant requires large amounts of concrete. The process of creating concrete spews tons of carbon into the atmosphere.
- Most proposed plants won't come online for decades – long past the window for urgently needed reductions.

When you consider the cleanliness of an energy source, it's important to consider the cradle-to-cradle lifecycle of that energy source. What does it take to create the raw material? What does it cost to build the infrastructure? What does it cost to close the plant and dispose of the byproducts? What is the social and environmental impact of the entire lifecycle?

How Safe is Nuclear Energy?

Safety plan calls for the distribution of potassium iodide (KI) within a 20 mile radius of nuclear power plants.

According to the American Thyroid Association:

"The seminal event that opened the world's eyes to the importance of KI distribution was the 1986 Chernobyl nuclear accident, releasing a fallout cloud that spread radioactive iodine and other radionuclides throughout eastern and central Europe. Starting a few years later, infants and children who had been exposed to the fallout were diagnosed with an unusual and aggressive form of thyroid cancer, except in Poland where the government had distributed KI pills".

FEMA's Nuclear Power Plant Preparedness Document states:

"The thyroid gland is vulnerable to the uptake of radioactive iodine. If a radiological release occurs at a nuclear power plant, States may decide to provide the public with a stable iodine, potassium iodide, which saturates the thyroid and protects it from the uptake of radioactive iodine. Such a protective action is at the option of State, and in some cases, local government".

On August 29, 2005, the Department of Health and Human Services (DHHS) published draft guidelines for State, local, and tribal governments, for the expanded distribution, stockpiling, and utilization of KI in the event of a radioactive iodine release from a commercial nuclear power plant incident

Section 127 of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the Bioterrorism Act) requires State and local governments through the national potassium iodide (KI) stockpile to distribute KI tablets to population within 20 miles of a nuclear power plant. The Bioterrorism Act also directed the National Academy of Sciences (NAS) to study the expanded distribution of potassium iodide and report back to the President on the best distribution methods to accomplish such an expanded distribution.

DON'T USE HYDROGEN TO FUEL YOUR CAR

Q: Is hydrogen an environmentally friendly fuel? Why not use hydrogen to fuel our cars?

A: An internal combustion engine does not use oxygen from a tank. Instead, it uses air from the atmosphere, free of charge.

That air is 80% Nitrogen (N₂) and 20% Oxygen (O₂). When you combine hydrogen with “air” you generate water (H₂O) and Nitrogen Oxide (NO_x).

Most people don't realize that when you run Nitrogen (N₂) through the combustion chamber you end up generating Nitrogen Oxide (NO_x), which is the precursor to smog.

If you want to improve urban air quality, hydrogen fuel in cars is probably moving in the wrong direction.

Other issues concerning the use of hydrogen fuel cells:

- Cost. Hydrogen is NOT cheap.
- Safety. In case of a collision the car must be able to maintain the safety of the hydrogen. This means the hydrogen fueled car must be built heavier which makes the car less fuel efficient.
- Environmental impact of producing hydrogen. Hydrogen can be produced by two methods:
 - **Electrolysis of water.** Electricity can be used to split water molecules to create pure hydrogen and oxygen. Where does that electricity come from? Burning coal, usually.
 - **Reforming Fossil Fuels.** Oil and natural gas contain hydrocarbons (molecules that contain hydrogen and carbon) Hydrogen can be split off of the carbon. But when you remove hydrogen from a hydrocarbon you generate a byproduct called carbon dioxide. Generating hydrogen from fossil fuel does not make it a renewable or clean energy.

The environmental impact of an energy source requires us to consider the cradle to cradle lifecycle of that energy source. It does not make sense to burn coal to generate electricity to produce hydrogen to fuel our cars. It does not make sense to use a limited supply of a dirt energy source to generate hydrogen.

To be successful, the hydrogen economy must have a large supply of electricity to be used to separate hydrogen from water. The electricity MUST be generated from a clean energy source.

ONE LAST THING

If you got anything out of this manifesto, if you highlighted or circled or Post-it-ed, give a copy of the *Clean Energy Manifesto* to someone else.

Ask them to read it. Offer to read it to them.

Start a conversation about clean energy.

Create a dialogue that focuses on what you can do to solve our energy problems.

Clean energy is everyone's problem and everyone's responsibility.

Spread the word.

Thanks.

PROMOTE CLEAN ENERGY

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