

Reassessing the Allegiance to Renewable Energy, Considering the Needs to Adopt Zero Emission Energy and Restore Our Soil

Coty Keller with insights from John E Darovec and Jack & Carmen Merriam

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Note for readers: underscored links in the text provide references to sources

We are running out of time to act effectively on the climate crisis. Every minute, every ounce of personal and physical energy, every dollar is crucial in the race to keep global warming below 1.5°C increase over preindustrial levels. With that in mind, let's take a look at the adequacy of various so called "renewable energy." We will find that while some forms of renewable energy are beneficial, other renewables are not acceptable.

Defining the problem and the solution

The climate crisis is the result of human activity upsetting the balance of the natural carbon cycle. Heat-trapping gases in the atmosphere have two causes: Human caused heat-trapping gas emission (the **UP arrow** in the illustration), and deforestation and poor soil management which eliminate nature's ability to remove heat-trapping gases (the **DOWN arrow**).

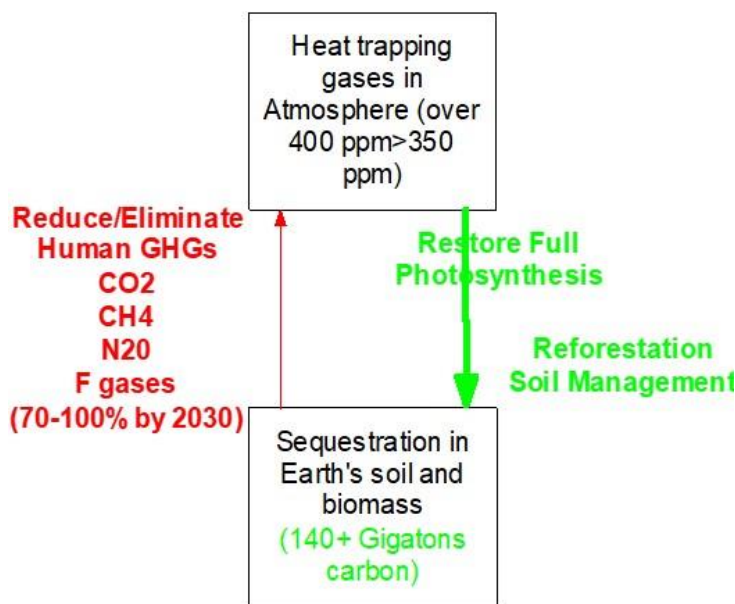


Illustration credit : [Urgency & Action: Drawdown to reverse global warming.](#) Florida Veterans for Common Sense.

The general solution, depicted in the illustration, is to get greenhouse gases down below 350 ppm, which comes from two specific solutions (1) **reduce and then eliminate human caused emissions, which has to happen quickly- 70-100% by 2030** and (2) **remove** heat trapping gases

from the atmosphere by **restoring photosynthesis through reforestation and good soil management.**

Defining and distinguishing between renewables and zero emission energy sources

According to the [NRDC](#), [EIA](#), and [DOE](#), renewable energy is energy that comes from natural sources or processes that are constantly replenished. The table lists the major types of renewable energy. On the left we have the renewables that have become part of the climate problem because they emit heat trapping gasses (plus some are harmful to our soil); on the right we have non emitting renewables.

Major Types of Renewable Energy	
<u>Biomass</u> sources of energy - create heat trapping gases.	Non emitting sources of energy
<ul style="list-style-type: none"> • Wood and wood waste • Municipal solid waste • Landfill gas and biogas • Ethanol • Biodiesel 	<ul style="list-style-type: none"> • Hydropower • Geothermal • Wind • Solar
Sources NRDC , EIA , DOE	

Biomass is organic material that comes from plants and animals, and includes crops, waste wood, and trees. The US Energy Information Administration ([EIA](#)) points out that Biomass is often mistakenly described as a greener alternative to coal and other fossil fuels. However, recent science shows that many forms of biomass—especially from forests—produce higher carbon emissions. The old idea behind biofuels, another type of biomass, is that they can - in theory- offer a carbon neutral fuel source because the emissions caused by burning them has already been offset by the carbon dioxide taken up in their creation.

The [Union of Concerned Scientists](#) notes, however, that the farming and machinery used to grow, harvest and take biofuel crops to market emit more heat trapping gases than the biofuel crops take from the air. Ethanol and biodiesel are destructive to the soil because the way corn and soybeans are farmed relies on heavy doses of pesticides, synthetic fertilizer and a monoculture farming practice that depletes microbes needed for healthy soil. This leaves the soil susceptible to erosion, unsuitable for farming healthy produce and takes away its ability to capture and store heat trapping gasses. Biofuels are wreaking havoc on both sides of the **up/down** illustration.

It is important to recognize that **all forms of biomass emit heat-trapping gases when burned,**

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and thus contribute to the climate crisis. Others, particularly biofuels also degrade soil health, further contributing to the problem. We need to stop using them.

Zero emissions, not renewability is the important property for our energy sources

To reduce, and expeditiously eliminate human caused emissions, the technical solution is pretty much agreed on by the experts ([Project Drawdown](#), Union of Concerned Scientists -[Solutions](#). Bill Gates- [How to Avoid a Climate Disaster](#)). We must reduce energy consumption. We need to electrify almost everything and generate all our electricity from zero emission sources of energy. It is therefore of utmost importance that everyone understands what those sources are.

[Project Drawdown](#) is the result of meticulous research by leading scientists and policymakers from around the world. They detail the 100 most substantive solutions to the climate crisis. Seven zero emission energy sources are included in the solutions. They are listed in the table below.

Zero Emission Energy Sources
<ul style="list-style-type: none"> • Wind turbines (Onshore is #2 of 100; Offshore is #22) <ul style="list-style-type: none"> • Solar farms (#8) • Rooftop Solar (#10) • Geothermal (#18) • Nuclear (#20) • Solar hot water (#41) • Small hydropower (#48)
<p>PS: The highest ranked solutions are not energy source related. They are Refrigeration Management (#1) and Educating Girls (#6) & Family Planning (#7) – the two of which combined top the whole list.</p>
<p>Source: Hawken, Paul editor. 2017. <i>Drawdown: the most comprehensive plan ever proposed to reverse global warming</i>. Penguin Books. https://www.drawdown.org/</p>

The wind, solar and geothermal sources need no explanation. **Small hydropower** systems are worthy of note because they capture the energy of free-flowing water, without using a dam. They can replace dirty diesel generators with clean electricity generation. Old style hydropower conjures images of massive, landscape-shattering dams, such as the Three Gorges on upper tributaries of the Yangtze River in China. Large hydroelectric dams produce enormous amounts of electricity, but they also swallow up vast swaths of natural and human habitat. They impact water movement and quality, sediment patterns, and fish migration. Smaller in-stream turbines are different. Placed within a free-flowing river or stream, they capture water's kinetic energy without creating a reservoir and its repercussions. The underwater analogue to wind turbines,

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their blades rotate as water moves past, generating relatively continuous electricity. No barriers, diversions, or storage are required, only limited structural support. And best of all, no heat trapping gases are emitted.

The [Union of Concerned Scientists](#) and [Project Drawdown](#) recognize what they call the “**nuclear dilemma.**” Nuclear power is slow, expensive, risky, and creates radioactive waste, but it has the potential to avoid emissions from fossil fuel electricity. Stopping emissions is the goal, so nuclear power must be allowed to compete with other zero emission sources. As far as risks go, this fact may put things in perspective: [nuclear power has never killed an American.](#) Fossil fuel pollution is killing Americans every day and that number is increasing exponentially, with climate related disasters. On a personal note, I must (as a Navy veteran) add that nuclear power has driven US Navy vessels including ships the size of cities, for 75 years. without serious incident. Nuclear power is an important contributor of zero emission energy.

What about Hydrogen? Hydrogen itself is not an energy source, but hydrogen fuel cells are an energy source that produce no heat trapping gas emissions. They will be valuable (if not essential) to power aircraft, long haul trucks and other modes of transportation that will not be solved by electric motors due to battery/range constraints. What matters is [the source of energy used](#) to create the hydrogen and store it in the fuel cell. Hydrogen fuel cells are beneficial if the hydrogen is created and stored by using zero emission energy sources (wind, solar, geothermal, nuclear, small hydro).

What to do with this information?

We can all be part of the solution. Here are some ideas for action.

We need to stop emitting heat-trapping gases and improve soil management. Given the urgency of the situation ([IPCC 2018](#): severe economic and humanitarian crises by 2030 if we don't take bold action), a radical shift in thinking and action is required. This requires abandoning certain renewable sources of energy. We should **commit to not uttering the term “renewable,” and when others use the term, take their remarks with a grain of salt.**

Consider giving up the use of **your fireplace.** Burning firewood (or any biomass) emits heat-trapping gas and contributes to the problem. You can seal off your fireplace to help preserve your home's heating/cooling envelope. If you use the fireplace to heat your home, consider the [shift to electric heat pump](#) and ideally power your home from solar energy (community solar or your own rooftop solar).

Stop supporting campaigns for “100% clean and renewable energy.” While some of these programs have produced marginal improvements, they are not efficient or effective enough to get us to 70-100% reduction/elimination of emissions by 2030. Instead, encourage the use of resources -including political capital -on programs that implement concrete, effective and efficient policies such as [low carbon portfolio standards.](#) LCPSs are a more effective and affordable way to reduce carbon emissions because they require utilities to purchase low carbon electricity produced from zero emission sources.

Support Carbon Fee and Dividend. A national price (a fee) on emission, is the fastest and most equitable way to reduce our nations emissions. It's equitable because the dividends are returned monthly to households and help low and middle income families pay the elevated cost of a fossil fuel economy.

Let's **re-purpose and re-name government agencies** (for example the [National Renewable Energy Lab](#), and DOE's [office of energy efficiency and renewable energy](#)) to focus on mitigating the climate crisis instead of the proliferation of exclusively renewable energy programs.

The **plant-rich diet** is #4 of Drawdown's 100 solutions. As Zen master Thich Nhat Hanh has said, making the transition to a plant-based diet may be the most effective way an individual can stop climate change.

We also can **stop subsidizing farmers to grow corn and soybeans to make biofuels**. Let's stop paying people to produce harmful energy and deplete our soils using pesticide requiring monocrops. Instead, we should be **paying farmers to store carbon, help the climate and save farms**.

We should **understand the solutions that farmers could employ** because they not only attack the climate crisis, but they also improve our food system. A few of them are shown in the table.

Some Food System Solutions	
Silvopasture (9 of 100)	Regenerative Agriculture (#11)
Source: Hawken, Paul editor. 2017. <i>Drawdown: the most comprehensive plan ever proposed to reverse global warming</i> . Penguin Books. https://www.drawdown.org/	

Silvopasture is an ancient practice that integrates trees, pasture, and forage into a single system. Incorporating trees improves land health and significantly increases carbon sequestration. Carbon aside, the advantages of Silvopasture are considerable, with financial benefits for farmers and ranchers. Livestock, trees, and any additional forestry products, such as nuts, fruit, and mushrooms, generate income on different time horizons. The health and productivity of both animals and the land improve. Because silvopasture systems are diversely productive and more resilient, farmers are better insulated from risk.

Conventional wisdom has long held that the world cannot be fed without chemicals and synthetic fertilizers. Evidence points to a new wisdom: The world cannot be fed unless the soil is fed. Regenerative agriculture enhances and sustains the health of the soil by restoring its carbon content, which in turn improves productivity—just the opposite of conventional agriculture. **Regenerative agricultural** practices include:

- no tillage,
- diverse cover crops,
- in-farm fertility (no external nutrients),

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- no pesticides or synthetic fertilizers, and
- multiple crop rotations.

Together, these practices increase carbon-rich soil organic matter. The result: vital microbes proliferate, roots go deeper, nutrient uptake improves, water retention increases, plants are more pest resistant, and soil fertility compounds.

It makes sense to incentivize silvopasture and regenerative agriculture instead of the madness of paying farmers to grow corn and soybeans for biofuels.

We can act in or **own yards and neighborhoods**. Using electric or battery operated landscape equipment, powered by the sun, **eliminates the pollution from gas and diesel fuels**. Using **composting** (#60 on the Drawdown list) instead of synthetic fertilizer results in less heat trapping gas emissions and soil better able to store carbon. **Native** trees, shrubs and grasses are able to tolerate natural soils and local rainfall patterns, salt air, etc. Natives also fight off the loss of diversity by their long-established relationships with the local insects, birds and other wildlife. Through photosynthesis, they sequester carbon. **Replacing lawns** that use fertilizers can reduce heat trapping gas emissions. Nitrous oxide emissions (including those from fertilizer) are 300 times more potent than carbon dioxide.

Projects that **replace parking lots, and other spaces with native trees and shrubs** can work wonders for our communities. Afforestation, creating new forests where there were none before, is Project Drawdown's #15 of 100 solutions for the climate crisis.

Conclusion

Some forms of renewable energy can help solve the climate crisis, but others contribute to the problem by creating emissions and degrading our soils. Focusing on renewable distracts us from the urgent task at hand of STOPPING all emissions, restoring full photosynthesis, and improving the management of our soil. Let's drop the renewable concepts and instead focus on zero emission sources of energy (wind, solar, geothermal, nuclear, and small hydro) and beneficial farming/land management practices (regenerative agriculture, silvopasture, afforestation, composting). We don't have time or energy to waste. There is plenty for us all to do NOW.

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