

Post Carbon Institute

RESPONSE TO GORE'S CALL FOR U.S. TO BE ON 100% RENEWABLE POWER BY 2018

Post Carbon Institute thanks Al Gore for so clearly and persuasively articulating the most urgent action needed to safeguard America's future, and that of the entire world in his speech on July 17, 2008. As the name of our organization indicates, we believe that our highest collective priority must be to get off fossil fuels fast.



We want to offer whatever assistance we can to Vice President Gore in his effort to move America toward 100% renewable electricity by 2018. One way we can help is to add to the public's understanding of why it is so important to end our addiction to fossil fuels as soon as possible; another is to suggest ten steps that we believe could serve as touchstones in organizing and guiding this historic effort (these are outlined below).

While Climate Change is the greatest environmental crisis humanity has ever faced, it is not the only serious challenge confronting us. Climate Change is a 'sink' problem resulting from the dumping of waste products – greenhouse gases - from burning fossil fuels into the atmosphere. But there is a simultaneous 'source' problem arising from the depletion of these very same fossil fuels.

Oil is leading the depletion charge: oil production is not only failing to keep up with rising demand, it will soon be in outright decline and no technology will be able to turn that around. This problem is known as "Peak Oil," since petroleum is the first and most important of the fossil fuels to peak and go into decline.

The world is now reeling from high petroleum prices. This is only the start of a worsening trend. On July 15, a bipartisan group of 27 ex-policymakers, including several former Secretaries of State and Energy from both parties, warned both presidential candidates of an "energy tsunami" that threatens the security of future generations unless action is taken now. Oil, natural gas, and coal are all non-renewable resources whose depletion is leading to soaring prices, regional shortages, food supply problems, social tension and international conflict.

Thus, if the climate crisis calls on us to renounce carbon fuels for the sake of future generations, the depletion and decline entailed mean that we must do so for our short-term economic survival. We *will* use fewer fossil fuels one way or another; but if we fail to adapt intelligently to the post-carbon era, the next few decades will see ever higher

energy costs and continued high carbon emissions—leaving us with a ruined environment and a shattered economy, unable to face a future without fossil fuels.

The solution to both climate change and fossil fuel depletion is to develop renewable sources of energy, use less energy, use energy differently—and to make this transition as rapidly as possible.

As global oil production begins to decline and climate change worsens, five great shifts—already underway in some places—will begin to move with great speed and become a global phenomenon:

- We will dramatically reduce overall energy and material consumption
- Private motorized transport will decline and public transport will increase
- Motorized transportation will move from using mainly oil to using mainly electricity
- The layout of settlements will change so that they use less energy, and the movement of urban dwellers into low-density suburbs will reverse.
- The supply chain of vital goods and services will be shortened and relocalized.

All of this will mean that Americans will lead more local, resilient, and self-sufficient lives.

This kind of extraordinary transformation has far-reaching implications for government, business and citizens: all major technological shifts in the past two centuries—from the building of the railroads to the flourishing of the Internet—have occurred as the result of government action, private innovation, and widespread adoption by the public.

The transition away from fossil fuels will likewise require political will and the investment of trillions of dollars in public and private money. Much must be done at the national level, but much can also be done by citizens changing their habits and priorities, and by cities rethinking transportation, food systems and power generation.

To succeed, this transition will require leadership on many levels: government vision backed up by policy, regulations and investment, and business ingenuity and private investment to shift to a low-energy system of more local, less globalized, technology, and production. It will require courage from people in all walks of life to embrace a new energy-independent way of working and living.

We will need to learn the lessons of America's historic triumphs. Achieving the goal of 100% renewable energy in ten years will take the strategy, effort, and determination exhibited in the New Deal, the Second World War, the Marshall Plan, and the Apollo Program combined. Post Carbon Institute believes America can and must realize this vision, and that it is both the responsibility and opportunity of this great nation to regain its pre-eminence as a leader in thought, innovation, and practice.

10 STEPS IN 10 YEARS TO 100% RENEWABLE POWER

Below is a conceptual plan for achieving the goal of 100% renewable energy by 2018. We will be updating this document with specific recommendations and additional resources in the near future.

1. Reduce

2. Share

3. Diversify

4. Distribute

5. Store

6. Reinvest

7. Relocalize

8. Reengineer

9. Reskill

10. Remobilize

1. **Reduce** consumption and reduce waste—not just of fossil fuels but of energy overall and of raw materials, almost all of which require energy to exploit and transport. Reducing consumption is vital in making the goal of 100% renewable electricity achievable, both to reduce the amount of renewable power we need to generate and because it will greatly reduce the cost of installing it. Such reduction will need to be planned in order to make sure that new jobs and opportunities demanded by renewable energy are brought on even as jobs dependent on cheap, abundant energy are removed by depletion. Americans need to become energy smart and self-reliant again—these were once defining aspects of the American character, and need to be revived.
2. **Share**—sharing things we do not use all the time can dramatically reduce consumption. For instance, we can reduce the energy we use for transportation by sharing both trips and vehicles. Such savings are already being achieved by ride-sharing and car-pooling, and more recently by membership-based car-sharing services.

Public transportation, especially when widespread, frequent, cheap and regularly scheduled—and thus widely used—is also a highly efficient form of sharing vehicles. It has the further great advantage being much easier to power with electricity.

Sharing is already an integral part of our energy use. The electricity grid itself is a system of sharing and balancing electricity production and load, but it's outdated and excessively wasteful. We will need to re-engineer both the physical structure of the grid to make it easier to add all kinds of distributed power sources, and we will need to make the actual wires open to the public so that local power produced by

businesses and homes can be added with economic advantage to both the user and the nation.

In general, if we share more, we will use less energy while building a self-sufficient and efficient society and economy.

3. **Diversify** sources of electricity, both in terms of generator size and location, concentrating on whatever renewable resources are locally available, such as wind, sun, biomass, geothermal, tides, and waves. There will be no single “silver bullet” renewable energy technology that works everywhere all the time; therefore harnessing efficient, practical, and abundant local sources will be vital. One of the best options for generation in many parts of the US is solar photovoltaic panels (PV). The solar industry in the US has suffered from a very unstable tax credit environment, and currently PV panel production in the US is minuscule by comparison with that of Europe and the Far East. The negative economic climate for US PV production must be addressed urgently by government.
4. **Distribute** electricity production so that households, businesses, and communities produce more of their own power. This reduces transmission losses, is good for the local economy, and builds community resilience against shortfalls and price spikes of any one energy resource. Achieving this distribution will require many creative and large-scale means of financing, often involving government help. It will also require fast-track permitting, changes in legislation and the power grid to allow easy grid access, as well as changes in the structuring of many existing utilities.
5. **Store** electricity better. We need to develop much better and more abundant electricity storage technology because most of the best renewable energy sources are intermittent (even if in quite predictable patterns). There are many different ways of storing electricity, but none of them is cheap or easy, and most of them are very expensive and in immediate need of much more research and development. In particular, battery technology, especially at large scale, is still very far from perfected, and America lags far behind the Far East in research, development, and production. This situation needs to change urgently.
6. **Reinvest**: the project of rebuilding America’s electricity infrastructure will require enormous public and private investment. The good news is that infrastructure investments pay tangible dividends for entire communities and for many generations—unlike speculative investments that only create temporary paper wealth for a few. Investing in a restructured power grid will require positive and active government involvement.

The federal and state governments can aggressively push feed-in tariff and "renewable portfolio standards" to stabilize and improve the fiscal environment for

renewable energy. State and municipal governments can issue bonds for the building and buying of renewable energy generation, so that people can borrow against them for low interest loans. Bonds could even be extended beyond capital projects to support energy conserving and generating operations.

In 2007 the federal government created the Solar America Cities program, a partnership of cities and counties, government departments, non-profit institutions, and private companies, designed to advance the installation of solar power generation across America. Solar Sonoma County, a joint effort of local government, private business, and nonprofits (of which we are a member), is a leading example of the kind of innovative initiatives which make it much easier for all kinds of investment money to be directed into solar and energy efficiency.

Community Choice Aggregation and Power Purchase Agreements can also make local renewable power cheaper and more feasible, and thus easier to invest in.

7. **Relocalize:** rebuilding the local production and manufacturing economy while shortening supply chains will reduce transportation energy and carbon emissions, while creating jobs and supporting local economies. Relocalizing is a far-reaching and powerful economic idea that will come to the fore as energy constraints cause many to re-think the far-flung, shipping-intensive global economy. Relocalizing will cultivate community resilience and self-reliance at home, and a nation independent of fossil fuels and able to maximize generation of local renewable power.
8. **Reengineer** the infrastructure of America, starting with the power grid. Even without the need to leave fossil fuels behind, America's electricity grid is in urgent need of overhaul. It needs to be repaired, strengthened, and in many cases dramatically re-wired to allow areas with large wind and solar resources to feed the demand centers. Though this will still entail long-distance transmission, it is far better to have large wind and solar farms than nuclear or coal plants, neither of which is clean or renewable. The new grid will also need to make it easy to add and stabilize small and medium-sized distributed generation sources.

The retrofitting of American buildings is another vitally necessary form of re-engineering. Most of the built environment in the US was designed in an era of cheap, abundant energy. US buildings account for nearly half of all energy use and greenhouse gas emissions. America urgently needs homes and businesses that remain warm in winter and cool summer with the minimum of energy consumption, with the aim of achieving zero-energy buildings wherever possible. This will reduce demand for both electricity and all fossil fuels.

9. **Reskill** America's workforce for the millions of green-collar jobs that will be created by our historic transition to renewable energy—quality jobs in projects that include

re-engineering the grid, installing millions of solar panels and wind turbines, retrofitting tens of millions of buildings, and rebuilding America's fractured manufacturing sector and industrial supply chain.

These skills will be needed in every community. Reskilling will require coordination between government, education, business, and industry in an unprecedented shift toward reduced job specialization and greater ability to develop local supply chains using more local resources. This will include a return to local manufacturing of many vital lighter goods, and regional manufacturing of heavier goods and industrial feedstocks, such as steel. This historic change has already begun in some areas.

10. **Remobilize:** our transportation system needs to run on renewable electricity and human power. This means developing and deploying electric automobiles with related renewable generation and charging infrastructures, reviving and re-investing in electric trolley buses, streetcars, and electric rail - both light and heavy. We also need to revive and re-invest in pedestrian and bicycle infrastructure, and bring in light neighborhood electric vehicles (NEVs) for both personal and shared use. These measures all have the aim of replacing the petroleum-powered car as quickly as possible in order to produce a transport system designed for the 21st century.

This will require nothing short of a fossil-free transportation revolution, including an electric rail revolution. Cities redesigned for human muscles and electric motors will thrive long after we have run out of fossil fuels.