



# Earth Manifesto

## The Reality and Ramifications of Peak Oil

An Earth Manifesto publication by Dr. Tiffany B. Twain  
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Human beings, ever since ancient times, have always been on the horns of a dilemma with regard to energy use. The means to make fire was discovered many millennia ago, and when human populations got large enough, they began to excessively chop down nearby forests for wood to burn and use as a building material. They found that this depletion had deleterious effects on their ability to sustain their settlements. Much later, when oxen and horses supplied the power to pull buggies and plows, it was always an inconvenient bother to feed the animals and clean up after the crapulent messes that they made, as one can well imagine.

Southern plantation owners in the United States relied on slave labor. This dependence had even more serious drawbacks: slaves were expensive to buy, feed and house, and sometimes it was downright hard to keep them in line. When the slaves eventually cottoned on to the fact that they were human beings who deserved some rights, it became a logistical, political and moral nightmare for the landed gentry. A terrible Civil War was fought over this slave-based economic system, and more than 600,000 Americans died in the conflict.

In the first two-thirds of the nineteenth century, millions of whales were slaughtered to produce whale oil that was commonly used to light homes and cities. These creatures are among the most wondrous of marine mammals, and some of the largest living things ever to exist on Earth. The use of whale oil use was an exceedingly messy way to provide illumination in both physical and ethical senses.

An even greater cosmic irony relates to the use of fossil fuels. Their discovery was a stroke of miraculous good fortune that has provided the human race with enormous horsepower to drive our industrial revolution and booming economic production activities and our bottomless desires to buy and consume. Cheap fossil fuels have facilitated big changes in technological innovations and an agricultural "Green Revolution", helping to enable rapid human population growth. Ironically, the very act of using this fossilized energy from the Sun involves a process of combustion that gives off toxic wastes like carbon monoxide, nitrogen oxides, ozone and microscopic particles of soot, in addition to many billions of tons of carbon dioxide every year. This heat-trapping gas is now upsetting the normal conditions of the global climate to which all forms of life on Earth are so marvelously well adapted.

Furthermore, the rapid depletion of these resources -- and the greenhouse warming effect of burning them -- are factors leading to an economic and existential crisis. If we do not switch to alternatives to replace fossil fuels in the coming decades, our economies and societies could experience catastrophic decline. Our desperate reliance on fossil fuels for transportation, agriculture, construction, home building, heating, plastic production, electricity generation, communications, and almost every facet of our lives is an Achilles heel vulnerability, serious and laden with risks. We are truly "addicted to oil" in our heavy dependence.

Crude oil first began to replace whale oil in the 1860s. This new resource proved to be relatively inexpensive and plentiful. Discovery after discovery of new oil fields has taken place, until we have now scoured the planet and found a total of maybe 3 trillion barrels of oil. We have burned up about 50% of these reserves of oil so far, and an estimated 1.7 trillion barrels of known recoverable reserves of oil remain.

We are currently burning more than 35 billion barrels per year worldwide. Do the math! Less than 50 years supply of oil remains, allowing for some new discoveries and taking into account the increasing demand worldwide. Some fuzzy math on reserves could make this time frame even shorter, while hydraulic fracturing processes -- fracking!

-- may extend it, but between now and the time oil is in effect fully used up, the price will reach prohibitively expensive levels.

Most people are familiar with a standard bell curve. Imagine in your mind's eye a bell curve of the use of petroleum between its discovery in 1860 through 2060, when this finite resource will have basically been completely depleted. We are near the top of this curve, and at the beginning of the declining slope. By the time only 500 billion barrels remain -- in perhaps 35 years -- supply shortages will become startlingly severe and the price of oil and gasoline and related products will really be skyrocketing. Economic activity will be crippled unless good alternatives are developed.

We are reaching Peak Oil in two drastically real senses. In the most obvious, we are burning through total global reserves of the non-renewable resources of crude oil, as well as natural gas and coal, at an alarming rate. This is causing us to exceed the "carbon sink" capacity of Earth's atmosphere and oceans to absorb carbon dioxide, destabilizing the global climate and warming and acidifying the oceans, devastating coral reef communities and harming many forms of life in the seas. Perhaps even worse, human activities are releasing the potent greenhouse gas methane, further contributing to the destabilization of the global climate, along with ominous changes in the chemical composition of the oceans and rises in sea levels.

No one has any idea how we will operate commercial airlines after fossil fuels are depleted, or military jets, which aggressors have been using so wantonly so far this century to achieve 'geostrategic imperatives'. The U.S. in particular has used military force to guarantee uninterrupted access to Middle East oil, and Russia is now engaging in barbaric aggression to try to take over Ukraine.

Domestic resources of oil in the United States have been so thoroughly exploited that production peaked in 1970 or so, and they have declined ever since (until widespread fracking began). In 1956, geophysicist Marion King Hubbert had predicted that we would reach Peak Oil production from domestic reserves around 1970. Many people scoffed at Hubbert's prediction, but their criticism and ridicule was nonetheless eventually rebuffed when his projections proved to be remarkably accurate. Similar techniques to those that Hubbert used have been applied to estimate the date that production of crude oil would peak in the entire world. Global Peak Oil is projected to be somewhere around NOW, give or take a few years. Those who doubt this fact should be cautioned by the reality of our experience with domestic reserves.

Crude oil production in the world increased from less than 60 million barrels per day in 1980 to over 70 million barrels per day in 2004, and then hit a plateau in the 70 to 72 million barrels per day vicinity for the next 6 years. Hydraulic fracturing has increased this output in 2012 through 2015, so this new technology is postponing the date of Peak Oil production somewhat, but we must understand that conservation and more efficient uses of energy represent the safest and smartest courses of action that we could collectively undertake. The International Energy Agency made this insight clear in its "World Energy Outlook 2012".

Factoring in an increased use of natural gas and Canadian oil sands and other unconventional sources of fossil fuel energy, Peak Oil may be delayed a bit longer, and demand for oil continues to increase. This increase in the rate of resource depletion will be achieved by exploiting reserves more aggressively and by developing even more risky and polluting activities, like extracting oil from tar sands and oil shales, and by drilling in deep-sea locations and fragile polar ecosystems, and by using the risky process of fracking in more places.

When the Paris Climate Accords were signed by nearly every nation on Earth in December 2015, humanity became more aware that a good proportion of fossil fuels should necessarily be left in the ground. The International Energy Agency made this stunning declaration in the executive summary of one of its World Energy Outlook reports: "No more than one-third of proven reserves of fossil fuels can be consumed prior to 2050, if the world is to achieve the 2 °C goal". This goal, equivalent to 3.6 degrees Fahrenheit, is considered to be the upper limit threshold at which the onslaught of "dangerous climate change" will begin to be felt. Rephrased, the International Energy Agency is stating that over two-thirds of today's proven reserves of fossil fuels *need to be left in the ground* through the year 2050 in order to prevent catastrophic climate change. Aggressive burning of oil, natural gas and coal may seem like a great idea from the standpoint of investor profit-making on fossil fuels, but from the standpoint of long-term consequences for life on Earth, it is a ridiculously costly proposition.

Energy efficiency, says the International Energy Agency, "is just as important as unconstrained energy supply, and increased action on efficiency can serve as a unifying energy policy that brings multiple benefits."

A report released by the University of Manchester in March 2022 claims the world has a 50% chance of reaching agreements set out in the Paris Accord so long as rich countries phase out oil and gas production by 2034 -- just 12 years from now. "The carbon budgets associated with 'keep 1.5°C alive' and 'stay well below 2°C' imply much more urgent cuts in emissions than any government is considering, and require the rapid and complete phaseout of all fossil fuel production."

"Report co-author and Manchester University Energy and Climate Change Professor Kevin Anderson told the Washington Post that the findings are simply 'a bit of basic arithmetic.' In order to realize the more ambitious goals set forth in the Paris agreement, the world's richest countries must lead the way when it comes to eliminating oil and gas production while also lending a hand monetarily to developing countries in order to carry out a just transition. Developing countries have until 2050 to eliminate fossil fuel production, much of which will likely be funded by richer countries because later phaseout dates alone cannot account for an equitable transition: 'An equitable transition will require wealthy high-emitting nations make substantial and ongoing financial transfers to poorer nations to facilitate their low-carbon development, against a backdrop of dangerous and increasing climate impacts.'"

The World Energy Outlook once stated that our global energy regime is not sustainable. The extreme turmoil in Arab oil producing nations starting in 2011 accelerated this crisis. Netflix offers viewing of many films online, including the documentary *Collapse* about the compelling, indeed frightening perspectives of Michael Ruppert. He gives a particularly chilling account of what may happen as Peak Oil occurs. He incisively elucidates the concept of a "bumpy plateau" in oil supply and prices as we move through the top of the bell curve of oil production, before a "cliff" of decline and cost inflation begins. Volatility of oil prices in the past decade is entirely consistent with this bumpy plateau. Check out this film ... but note that it is not for the faint of heart!

The U.S. for many years imported more than 50% of the oil it uses. This percentage doubled in the 30 years from 1980 to 2010. Aggressive use of fracking technologies in Texas, North Dakota and other states, however, reversed this trend, and domestic production has been increasing. "But still, much of the world's largest reserves are in Middle Eastern countries -- right there where we are making enemies by supporting repressive authoritarian regimes like the one in Saudi Arabia, and pursuing imperialistic economic and military policies."

Technical advances in the process of fracking -- the hydraulic and chemical fracturing of underground rock formations -- are allowing the oil and natural gas industries to fracture rocks that contain fossil fuels. This development has increased supplies of oil and natural gas in the U.S. since a peak of imports in 2005 of about 60% of the amount used. As a result, oil imports began a steep decline of annual needs, and became a net total energy exporter in 2020.

This surprising change in energy prospects is allowing apologists for the full-speed-ahead-in-dangerous-waters crowd to chortle that Peak Oil has been indefinitely delayed. The delay is indisputable, but to consider it *indefinite* is absurd. In any case, as one observer has said, it now appears that there is enough oil "to fry us all."

Enormous profits will be made in the next 50 years on fossil fuel extraction, and authoritarian petrostates like Russia and Saudi Arabia and Iran are getting a big share. This means that oil and natural gas users are helping finance anti-democratic autocrats around the world, which is a sad state of affairs.

It is instructive to evaluate the boom-and-bust nature, and unjust character, of all extractive industries that exploit non-renewable resources. Consider silver and gold mining, for instance. Huge amounts of money were made by mining companies in the area around Ouray and Silverton, Colorado during the heyday of mining in the region, but then once the mineral veins were effectively exhausted, the mining operations closed their doors and left a damaged environment and toxins leaching into streams in the vicinity. Costs for the clean up of such problems caused by mining companies are being shouldered by entirely different people than the ones who profited so handsomely from the operations that created the pollution.

Another serious developing consideration involves fresh water use. Large quantities of water are necessary to the production of energy, so wasteful usages of fossil fuels contribute to increasingly serious water shortage challenges. The energy sector accounts for around 15% of the world's total use of fresh water, and water scarcity already affects about one-fifth of all humans. This threat is projected to get significantly worse as the population grows and precipitation patterns are altered on a warming planet and mountain snowpacks are reduced worldwide. In fact, according to *Scientific American*, two-thirds of the world's population is expected to be living under "severe water stress conditions" by the year 2025 unless there are major changes in the distribution of ever-scarcer water supplies. By 2025! That's like tomorrow!

And of course countries that are suffering the most overwhelming costs, and will inevitably suffer the brunt of them, are different than the ones that have been the biggest users of fossil fuels.

Since needs are growing for water to be used in extracting increasing quantities of fossil fuels, water is becoming an increasingly important criterion for assessing the viability of energy projects.

It would be marvelous if the next 'game changer' was to be in energy conservation and energy efficiency, and this outcome would become much more likely with proactive energy policies that assess sensible green fees on carbon emissions. This is Risky Business!

Many economists and politicians believe that technology will come to our rescue in these dilemmas. Once crude oil prices become high enough to hyper-stimulate innovation and the search for alternatives, they say that inventions and new processes will be developed to solve the problem. These believers could possibly be right, though it is not currently seen as probable. In the meantime, fossil fuel production was so competitively overdone in 2016 that oil became bizarrely cheap, and since then oil prices have fluctuated wildly, and most countries are figuratively fiddling while Rome burns, instead of taking smart actions to create powerful incentives to conserve.

It is shortsighted to continue to subsidize existing fossil fuel industries and delay the need to invest boldly in alternatives. The smartest course of action would be to use the remaining reserves of fossil fuels and some of the gargantuan profits being made from their depletion to help make the transition to renewable alternatives. It takes a lot of energy to build solar panels, wind farms, fuel cells, and geothermal and nuclear power plants, so we should be using our diminishing reserves of oil for the best of these purposes rather than squandering them as fast as we can in our businesses, vehicles, homes, airplanes and power plants.

Our lives and business activities are structured around artificially cheap oil and natural gas. The actual cost of fossil fuels is far higher than the price we pay at the pump or in utility bills. That price comes in the form of generous subsidies as well as in wars and in the externalized costs of oil spills, environmental damages, mercury pollution, health costs associated with smog, mountaintop removal coal mining, and harm-engendering effects of climate change that are being caused by spewing billions of tons of carbon dioxide into the atmosphere annually.

Oil will not be easy to replace because it is a unique high-energy resource. It is a form of fossilized hydrocarbon energy that was generated by plants using light energy from the Sun and the process of photosynthesis. The extent to which fossil fuels have facilitated our industrial and agricultural revolutions is beyond our ability to fully comprehend. They have allowed us to increase the production of food so that our human population has increased from 1 billion in the year 1800 to 2 billion in 1930 to 3 billion in 1960 -- to almost 8 billion today. It may prove to be impossible to sustain our population once fossil fuels are practically gone in the next 50 years. The implications of this will likely prove to be unimaginably severe.

One thing is certain: it is foolhardy not to be taking advantage of the last 50% of the world's oil reserves to help develop and implement the transition to cleaner and safer renewable energy alternatives. The economist E.F. Schumacher made a compelling observation in 1973 in his book *Small Is Beautiful*: we should treat fossil fuels as capital resources rather than as income. The logical conclusion of such an intelligent and intuitively reasonable treatment would be that we would conserve these convenient high-energy fuels and put some of the profits obtained from burning these non-renewable assets "into a special fund to be devoted exclusively to the evolution of production methods and patterns of living which do not depend on fossil fuels ...".

Green technologies represent one of the greatest investment opportunities ever, so our government should strongly encourage them, rather than letting entities vested in the status quo oppose sensible and productive changes. With the Russian war against Ukraine in 2022 resulting in much bigger profits for Big Oil, it is a very good time to enact an excess profits tax on the windfall gains. Many voters have had enough of gouging by the oil and gas industry and support clean energy investments as a solution to achieve energy independence.

Now is the time to invest in clean renewable energy that will put us on this path towards energy independence — and Congress is close to authorizing these very investments after the House passed a package of \$555 billion in climate, clean energy, jobs, and justice investments as part of proposed Build Back Better legislation. Now is the time to demand that Joe Manchin and Krysten Sinema and Republican Senators do the same.

Some of the gargantuan profits made from fossil fuels should be used to mitigate pollution problems, and to pay for the damages associated with climate changes that are being driven by accumulating greenhouse gases in the atmosphere. See *Chapter #28 - On Climate Change, in Comprehensive Global Perspective*, for further illumination on this topic.

At the time E.F. Schumacher wrote the words above, the U.S. had more than 200 billion barrels of oil reserves, and our nation had just passed Peak Oil production from domestic reserves. Today we have used up most of our domestic oil, and we have less than 40 billion barrels of oil left. And we are wantonly intent on using up these reserves and all of the others found around the rest of the planet. While our population represents less than 5% of the people in the world, we are burning up almost 25% of the fossil fuels used each year.

Instead of wisely setting aside a portion of profits derived from the profligate depletion of these difficult-to-replace assets, we allow corporate executives, public investors and other self-interested constituencies to reap all the profits. We even give generous incentives to Big Oil corporations to add to their already gargantuan profits every year. I am not an expert, but one analyst noted that tax subsidies and loopholes, such as oil depletion allowances, drilling cost deductions and enhanced oil recovery credits, sometimes exceed 100% of the value of the energy produced by that oil. "In other words, it would be cheaper in some cases for the government to just buy gasoline from the companies and give it to taxpayers free of charge." Wow! If that is only half true, it would be obscene for us to continue to give Big Oil such subsidies.

"Rent-seeking" is the general term that economists use for gambits employed by exploitive interests to get money at the expense of the public. Rent-seeking activities often refer to efforts to capture various monopoly privileges that stem from government regulation of a market. Rent-seeking, in general, involves getting a bigger share of existing wealth, rather than actually creating any new wealth. Economist Joseph Stiglitz insightfully analyzes this concept in Chapter Two of his compelling book *The Price of Inequality*. He discusses the curious fact that countries with large amounts of crude oil, like Venezuela, Saudi Arabia, Iran and Iraq, which should be able to afford to treat their people more generously because of the huge windfall receipts of money from their large oil reserves, instead tend to have more unequal societies because of political corruption and rent-seekers abusing power. While an abundance of natural resources should allow countries to take better care of their poor people, and to invest in things like better education systems and universal healthcare, it turns out that countries with the most natural resources are often among the ones with the most extreme inequalities.

When Big Oil and Big Coal exert excessive influence in a country, tragically sky-high costs accompany this sad state of affairs. The Big Money earned by these corrupt behemoths by liquidating fossil fuel assets tends to corrupt politics, undermine democracy, unfairly impacts poor communities in sacrifice zones near drilling sites and petrochemical plants, facilitate gruesome health harms in many communities, forces millions of people to suffer the slings and arrows of externalized costs, perpetuates ecological injustices, and causes dirty damages to the environmental commons.

We are acting in a manner similar to the ancient Rapanui inhabitants of Easter Island, who devotedly carved out monumental iconic stone statues to honor their adventurous ancestors while blithely destroying the forest resources upon which their civilization was dependent. At a time when only a fraction of the original palm tree forests remained, they should have been planning ahead to use those trees in a way that would have allowed them to create sustainable lives and make a transition to a new resource base, or to build boats that would have insured

them some flexibility for finding new sources of food in the sea. But, no! -- the Rapanui were unable, or unwilling, to change course and adapt. They either did not recognize the writing on the wall, or they did not listen to cautionary voices that may have told them that the exhaustion of these vital resources would likely devastate the source of their livelihoods and prosperity, and maybe even threaten the very continuity of their survival. As a consequence, their population crashed from more than 10,000 people in the year 1600 to less than 200 people a century later.

Humanity now faces a starkly similar dilemma -- and we face it on a global scale. We are at a risky **tipping point, and yet we are complacently allowing politics-as-usual obstructionism whenever energy proposals come before Congress.** Some of the 'smartest guys in the room' have ironically joined 'a conspiracy of fools' in opposing such understandings. So instead of supporting far-sighted energy initiatives and investing in conservation and fossil fuel alternatives, we continue to allow oil conglomerates like Exxon Mobil to make some of the biggest corporate profits in world history. Meanwhile, we continue to neglect intelligent initiatives and forward-thinking ideas.

Since the more than 332 million people living in the United States represent less than 5% of the total world population, and we have only 2% of the world's proven oil reserves, and we burn almost 25% of the total amount of oil used worldwide each year, WE AMERICANS ARE THE ONES who should seize the initiative to make smart changes in our rules, policies, incentives and behaviors. We live in a time of unprecedented uncertainties, and yet we seem to be in denial of the fact that fossil-fuel consumption subsidies are seriously distorting the equations of resource usages and the necessity of a shift to fossil fuel alternatives.

Not a single country prices all of its fuels sufficiently to reflect their full supply and environmental costs. "Experts say that the subsidies are "adding fuel to the fire" of the climate crisis, at a time when rapid reductions in carbon emissions are urgently needed.

### The Woe of Perverse Incentives

Despite the fact that fossil fuel industries are among the most profitable industries in all of history, they are the second most heavily subsidized industry in the world, after agriculture. The International Monetary Fund indicates that the production and burning of coal, oil and natural gas was subsidized by a stratospheric \$5.9 trillion in 2020, and yet there continues to be strong opposition to reducing such subsidies and to giving incentives to develop renewable energy sources.

The reason for the strength of this opposition, of course, is due to the astonishing and excessive power of fossil fuel companies in governments worldwide.

In the U.S., subsidies total many billions of dollars per year. The only way that such an absurd status quo could have become established is to have allowed giant energy conglomerates to gain overweening power and influence in national and state politics and policies.

Cash-flush lobbyists have powerful influence in Washington D.C. They gain this power in league with corrupt politicians and operatives in 'conservative' think tanks who cook up a wide variety of ingenuous ideological rationalizations. They use their undue influence to obtain big tax breaks and other subsidies, and irresponsibly use this influence to obtain concessions that allow them to externalize pollution costs, healthcare costs, and environmental damages onto society. In addition, the costs of wars and heavy military presence in the Middle East are in some ways merely methods of protecting our access to oil reserves found there.

Corporations further manipulate us by stoking our desires and using seductive advertising to promote consumerism and wasteful depletion to satisfy their goal of making bigger profits. These strategies run contrary to the common good, and are harmful of the prospects of people in future generations who will need natural resources to thrive and survive.

Americans burn about 7 billion barrels of oil per year. Because our domestic reserves are estimated to have been less than 40 billion barrels at the end of 2020, they are diminishing to the point of exhaustion. Because we spend so much money on oil, it would be wise for us to boldly embrace an Apollo-Program-like initiative to achieve a cleaner and renewable energy independence from this dependency.

As we move past Peak Oil, a restructuring will take place in agricultural practices and policies of efficiency and conservation, and in building and transportation alternatives. The economies of the world's nations will shift, of necessity, toward *smart and sustainable* activities, and away from shrewdly profitable but shortsighted and unsustainable ones. The "endgame" of cheap oil may well be a return to more local and smaller-scale activities.

Some say that nuclear power is the best hope for the future. But nuclear power has required heavy subsidies ever since it was first developed. Many of the costs related to nuclear reactor disasters in places like Three Mile Island, Chernobyl and Fukushima have been foisted upon taxpayers in the affected countries. Today, we still have not figured out how to keep extremely long-lasting radioactive nuclear wastes safe indefinitely from contaminating the environment. The risks of accidents at nuclear power plants and in transporting and storing dangerous radioactive wastes make power derived from nuclear energy much more risky than other alternatives. There are also significant dangers involved in the possibilities of terrorist attacks or military bombings of nuclear plants. These facts should be taken into account in all decisions about the siting and construction of nuclear power plants and the commitment of public funds to give direct and indirect subsidies to this industry.

In any case, we face a new age of terrible austerity if we do not find ways to replace fossil fuels, to conserve them, and to live our lives more in harmony with resource limitations and the natural balance of ecosystems. Our current energy policies are putting us in increasing jeopardy of extreme economic instability, social upheaval, environmental calamity, and intensified resource wars.

Post-Peak-Oil societies must adapt, according to the wise Marion King Hubbert. "Our principal constraints" he said, "are cultural. During the last two centuries we have known nothing but exponential growth, and in parallel we have evolved what amounts to an exponential-growth culture, a culture so heavily dependent upon the continuance of exponential growth for its stability that it is incapable of reckoning with problems of non-growth." Food for thought!

Our collective activities are like some grand distorted Ponzi scheme on a scale so risky that much more serious considerations need to be given to them. During this moment of time, we need to do everything we can to avoid having this new age turn out to be one of wanton depletion of resources and heedless devastation of Earth's providential ecosystems. To succeed at this, let's support bold action. Let's demand fundamental changes in our economic policies, energy policies and environmental practices.

I believe we can achieve this! But we must be more assertive in courageously beginning this process NOW!

A ray of hope developed with some of President Obama's initiatives, like his Clean Power Plan, and with forward-thinking proposals like those set forth back in 2013 in the U.S. Senate by Bernie Sanders of Vermont and Barbara Boxer of California. These two senators made commendable proposals to boldly address the problem of our fossil fuel addiction and the risks of climate change by introducing two bills, a Climate Protection Act and a Sustainable Energy Act, which constituted a laudably comprehensive climate bill. Congress should approve similar legislation today!

According to my observations in the Introduction to *Common Sense Revival*:

"Under this legislation, a fee would be assessed on carbon pollution emissions, and the proceeds would fund investments in energy efficiency and sustainable energy technologies such as wind, solar, geothermal and biomass. The proposal would also provide rebates to consumers to offset higher costs of oil, coal, natural gas and electricity generated from fossil fuels.

By putting a price on carbon, polluters would pay for the damage they inflict on all of us, and the necessary transition to cleaner renewable fuels would be encouraged. A proposed fee of \$20 for each ton of carbon dioxide pollution would reduce emissions an estimated 20 percent below 2005 levels by the year 2025. These new laws would have brought in more than \$1 trillion in new revenue over the next decade, and this revenue would have been spent in smart ways. Broadly speaking, the money would serve three important functions: to protect consumers, invest in clean energy infrastructure, and reduce national budget deficits.

Since carbon fees would be regressive like other consumption taxes, in that they inordinately impact poor people and middle-income families, the Climate Protection Act and Sustainable Energy Act would have created a

rebate program to make sure these families are not unduly burdened. This idea is modeled on the dividend paid to all residents of Alaska for profits made on oil extraction from state lands, so it would ensure that pollution reduction costs are offset, and not be regressive.

It would be an auspicious move to reduce dirty energy use and replace it with cleaner energy to power our economy. These bills would have helped provide funding for the energy-efficient Weatherization Assistance Program and investment tax credits, clean energy technologies, worker training, and other programs that are crucial for making the transition to a cleaner energy future.

Also, since our nation's national debt is a growing problem, the Climate Protection Act and Sustainable Energy Act had the laudable goal of reducing budget deficit by \$300 billion over a ten-year period.

These bills would have created a sufficiently robust tax that would lead to meaningful reductions in greenhouse gas pollution and put us on a path that helps us avoid the most catastrophic effects of climate change.

These bills would have stimulated the economy, created jobs in the burgeoning clean-tech and green-jobs sectors, and encouraged businesses to make new investments in energy efficiency and renewable energy. They would also have ended taxpayer subsidies to oil and gas companies to ensure a more full cost accounting for their activities. And the bills included provisions to reduce risks from a shift to fracking in oil and natural gas production that causes local air and water pollution."

Good plans and sensible policy initiative could significantly improve our collective prospects, so I heartily encourage all decision-makers to give serious consideration to these ideas!

Let's do what is in our nation's best interest, in honor of our having commemorated our country's 245th anniversary last year of our declaration of independence from foreign tyranny!

Thanks for reading!

Truly,

Dr. Tiffany B. Twain

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