Why it is so urgent that we take action to reduce carbon emissions; and what we can do about it

Florida Veterans for Common Sense

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Preface

The *Florida Veterans for Common Sense* are committed to a significant reduction in carbon (here short for carbon dioxide) emissions. This article provides the underlying conceptual basis for a forthcoming program to achieve that goal.

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Introduction

Most Americans want to do something about climate change, but many are unsure of what can/should be done. This piece is designed to provide a practical guide for what ***you*** can do as an individual, business owner or manager/executive, and as a citizen.

The article is structured into two parts. First we have an explanation of why we (the human race) are at such a crucial moment in our existence. Part I makes clear the urgency of the situation, and why we cannot delay taking action. In the second part, we outline a plan of action for each citizen. By extension this plan includes actions by our businesses and governments.

Part I: Urgency

To help us recognize the gravity of the problem, we will look at the problem of climate change/global warming from three perspectives: the history of life on earth, the threat to national security, and the point of view of current scientists. Together these perspectives can help us put the problem into context and help us conclude that the time to act is now.

The Anthropocene Extinction

Biologist and Air Force veteran John Darovec, like many scientists, is concerned that life on Earth is being eliminated. Here, John shares his view of our present situation:

> Earlier this year I was surprised to see Neil deGrasse Tyson explaining evolution on the Fox TV Network. The program was *Cosmos*, not Fox News or a commentary, and he eased into the subject beginning with artificial selection in dog breeding. Nevertheless, Tyson not only explained how species originate as they develop beneficial adaptations, he explained how they become extinct as the environment changes and those once beneficial adaptations become detrimental.
>
> In the history of life on Earth there have been six major periods of mass extinction. One was caused by cold; one was caused by heat; and another was caused by an asteroid impact. We are living in, and are the cause of, the sixth. By its rate, if not yet its extent, it promises to be the worst. We disrupt environmental balance; we pollute; we irradiate; we poison; and we heat the world enough to overwhelm the astronomical cycles that determine our climate.
>
> We know what's happening. The sea is acidifying, and its level, due to ice melt, is rising. Permafrost is melting and releasing methane or carbon dioxide, and weather (from droughts to floods) is becoming more severe. As these processes progress, feedback mechanisms cause them to go even faster and worsen.
>
> The living things we know on Earth evolved in a cooler climate. Many of them have not been able to adapt to the heating that has already taken place, and they are now extinct. The current rate of extinction is higher than ever before. Even the great Permian extinction, which

> eliminated over ninety percent of the sea and land creatures, happened over a much longer period than our current Anthropocene extinction.
>
> I did not hear many frogs this spring, and frogs are possibly the hardest hit group at the time of this writing. Man's turn will come. Something must be done, and soon.

Threat to National Security

According to Admiral Samuel Locklear, Commander of the Pacific Theater, significant upheaval caused by the warming planet "is probably the most likely thing that is going to happen . . . that will cripple the security environment, probably more likely than the other scenarios we all often talk about. "

Rather than highlighting Chinese ballistic missiles, the new Chinese Navy aircraft carrier, North Korean nuclear weapons, or other traditional military threats, Admiral Locklear looked to a larger definition of national security when addressing a 2013 meeting of security experts at Harvard. "People are surprised sometimes" that he highlights climate change -- given his ability to discuss a wide-range of threats, from cyber-war to the North Koreans. However, it is the risks to Pacific nations of long-term sea-level rise, that has the Admiral's deepest attention. "You have the real potential here in the not-too-distant future of nations displaced by rising sea level. The ice is melting and sea is getting higher," Locklear said, noting that 80 percent of the world's population lives within 200 miles of the coast. "I'm into the consequence management side of it. I'm not a scientist, but on the island of Tarawa in Kiribati, they're contemplating moving their entire population to another country because [it] is not going to exist anymore." (Siegel).

The threat from climate change has been recognized for some time by the defense establishment. The 2010 U.S*. National Security Strategy* states, "The danger from climate change is real, urgent, and severe. The change wrought by a warming planet will lead to new conflicts over refugees and resources; new suffering from drought and famine; catastrophic natural disasters; and the degradation of land across the globe. " (Mullen). The 2014 Quadrennial Defense Review speaks directly to the impact of climate change on national security:

> Climate change poses another significant challenge for the United States and the world at large. As greenhouse gas emissions increase, sea levels are rising, average global temperatures are increasing, and severe weather patterns are accelerating. These changes, coupled with other global dynamics, including growing, urbanizing, more affluent populations, and substantial economic growth in India, China, Brazil, and other nations, will devastate homes, land, and infrastructure. Climate change may exacerbate water scarcity and lead to sharp increases in food costs. The pressures caused by climate change will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty,

> environmental degradation, political instability, and social tensions – conditions that can enable terrorist activity and other forms of violence. (Hagel, Chapter 1, Pg 8)

A recent report reminds us that sea level rise threatens many of the Navy's coastal installations. Norfolk, Virginia, vulnerable to damage by rising sea levels, is home to the world's largest naval base as well as a nuclear submarine construction yard.

We can sum up the reality of the threat by quoting John Conger, the Pentagon's Deputy Under Secretary of Defense for Installations and Environment. "The department certainly agrees that climate change is having an impact on national security, whether by increasing global instability, by opening the Arctic or by increasing sea level and storm surge near our coastal installations..." (Davenport)

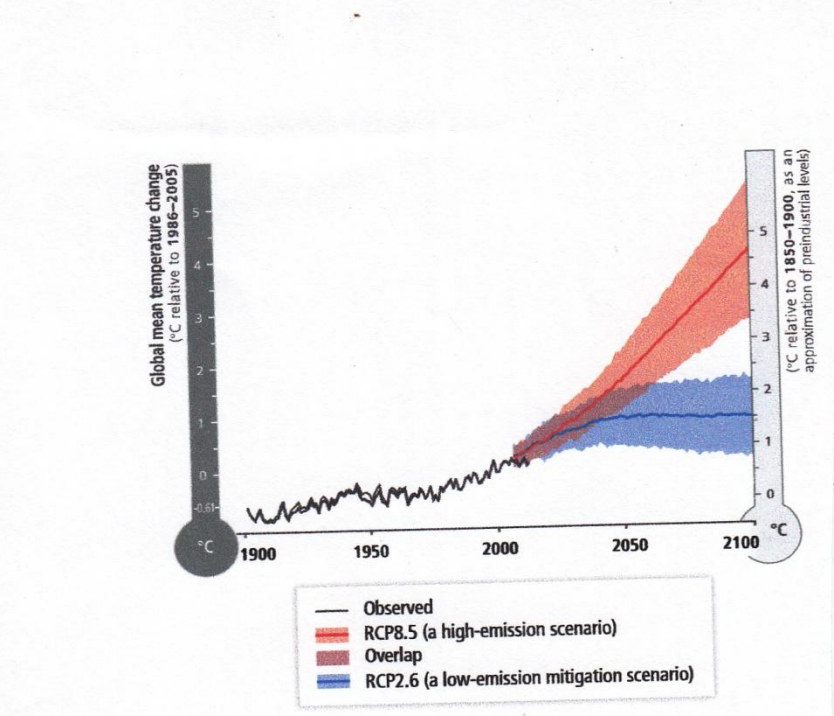
Running Out of Time

The United Nations Intergovernmental Panel on Climate Change (IPCC) is made up of hundreds of the world's leading climate scientists. They have issued several reports recently. They pull no punches and make clear the stark realties:

- Global warming is caused by humans' burning of fossil fuels and, to a lesser extent, by deforestation.
- The effects are already being felt around the world, including mounting damage to coral reefs, shrinking glaciers and more persistent droughts. There will be worse to come — rising seas, species loss and dwindling agricultural yields.
- Annual emissions of greenhouse gases have risen almost twice as fast in the first decade of this century as they did in the last decades of the 20th century. This means we are certain not to achieve the previously agreed on target limit on warming to no more than 2 degrees Celsius (3.6 degrees Fahrenheit) above the pre-industrial level. We seem certain to go beyond that limit, and as a result the world will face truly alarming consequences.
- Avoiding this fate will require a ***reduction of between 40 percent now and 70 percent in greenhouse gases by midcentury***. And even more, to zero by the end of the century.
- Timing is key: The world has only about ***15 years left in which to begin to bend the emissions curve downward.*** Otherwise, the costs of last-minute fixes will be overwhelming. ***"We cannot afford to lose another decade,"*** says Ottmar Edenhofer, a German economist and co-chairman of the committee that wrote the report. "If we lose another decade, it becomes extremely costly to achieve climate stabilization." (United Nations/IPCC, Gillis, Editorial Board, Greenfieldboyce)

The graph in Figure 1 is from the IPCC report's *Summary for Policy Makers*. It shows global temperatures (left vertical axis) and relative changes in temperature from pre-industrial level (right vertical axis) over time on the horizontal axis. You can see actual observed temperatures from 1900 until now, and then a split. The red trend line (called RCP8.5) shows the projected temperatures for a high emission scenario (the path we are on); while the blue trend line (RCP2.6) is the forecast for a low-emission scenario (the path we need to be on if we want to preserve life as we know it).

Figure 1-Fork in the Road



This graphic shows two things: One is how small a temperature rise we have had in the last 100 years (about 0.8 degrees C). Two, more importantly, is the fork in the road. It predicts the temperatures in the coming decades depending on whether we take action or do nothing. If we do nothing, we take the red path; if we take action now to reduce carbon emissions by 40 to 70%, we can take the blue path.

It is staggering to think of what this means to our heirs. Children born today (our children and grandchildren) will almost certainly be seriously and directly affected by climate change. Imagine our offspring and their brood suffering in an environment of global chaos. There will be a decline in national security, more drastic and frequent weather calamities, flooded cities and communities, a shortage of food and water, and gruesome economic consequences (reduced property values, depressed world markets, and increasing poverty). Life will be extremely to terminally difficult for our heirs, unless we take immediate action.

Urgent Indeed

People, through our emission of greenhouse gases, are threatening to destroy life as we know it. This is a matter of civilian economics, a matter of national security, and even a matter of life and death. The main point of this section has been to make clear that time is running out. The consequences of not acting now to reduce carbon emissions are unthinkable. Clearly it is time for individual citizens, businesses and governments to take action. Our task is clear: to reduce carbon emissions by 40 -70%.

Part II: What To Do To Reduce Carbon Emissions

Our program begins with citizens taking the action needed to accomplish our goal of reducing emissions by 40-70%. Ours is a proactive approach which is decidedly unlike the skeptical, excuse laden, "if only government did something" way of looking at this problem.

Our program calls for active involvement by each of us as citizens of the US and inhabitants of the planet. Figure 2 on the next page shows how each of us is at the center of what we must do to reduce carbon emissions. We will go into detail later, but for now we want to show that action involves working in three interrelated areas:

1. Reducing your own carbon footprint, at home and at your business. This will involve conservation and replacing carbon emitting energy sources with "clean" sources. For citizens holding interests in fossil fuel (and other carbon emitter) products, it's time to divest from dirty energy stocks and bonds.
2. Motivating those you know to take similar action to reduce their carbon footprints, and divest of fossil fuel holdings, at work and in their businesses. You will also help your friends and colleagues to see the need for them to lobby government.
3. Influencing government at the polling place and through lobbying. We as citizens want our government to enact the kinds of laws, and create the kinds of policies, that will alter peoples' and business' behaviors in order to reduce emissions.

This is our model, our strategic plan for how to attack the problem. It is a three-pronged approach, all based on each of us taking responsibility and acting proactively.

Adapting to Climate Change vs. Reducing Carbon Emissions

Before we launch into our prescription for reducing carbon emissions, it should be recognized that there are two sets of strategies for dealing with the climate change crisis: adapting to the changes and slowing/reversing the causes. Building dikes and elevating buildings are examples of the former. We do not discount the unfortunate need to adapt to the effects of climate change. They should play a part in a comprehensive plan to deal with the problem of global warming/climate change. However, we will focus on the second kinds of actions, those designed to remove or lessen the cause of the crisis by reducing carbon emissions in a significant enough amount to minimize the effects of global warming.

We believe this is a noble and rational approach, because as was reported in the recent UN/IPCC Report, *climate change is already having sweeping effects on every continent and throughout the world's oceans , ...the problem is likely to grow substantially worse unless greenhouse emissions are brought under control*. (Gillis). Plus, as IPCC co-author Michael Oppenheimer says, *Everyone agrees that if we don't slow the warming down, our prospects for adaptation are not good*.(Mufson).

Adaptation is important, indeed. But our focus is on attacking the cause of the problem.

Figure 2 - How to Act to Reduce Carbon Emissions

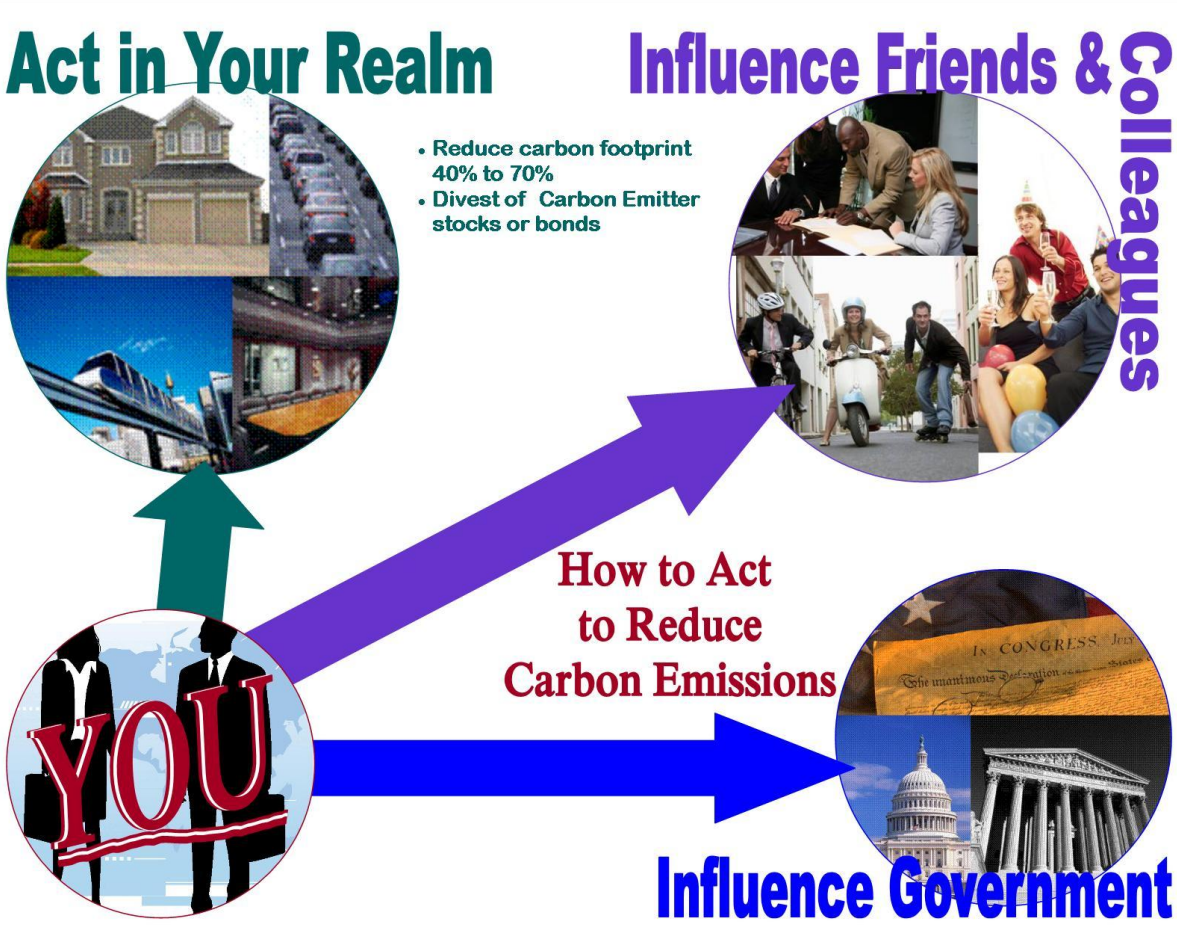


Illustration credit: Thank you to Jutta Tolbert

Three-Pronged, Four-Step Strategy

Our strategic objective is reducing carbon emissions 40% in the near term and 70% by mid-century. The underlying approach is for each of us to be proactive in three ways: taking personal action, motivating friends and colleagues, and influencing governments.

How do you get started, and how can you achieve success? We offer a four-step plan:

1. Commit to action
2. Take direct action in areas you control
3. Influence the decision-makers in areas outside of your direct control
4. Follow up to evaluate progress

The rest of this article is dedicated to explaining how this four-step strategy can be put to work.

1. Commit to Action

For decades, people have been expending incredible amounts of time and energy debating and arguing about the nature of the problem, about who is at fault, and about what the dangers are. Does carbon dioxide have an impact on the environment? Do man-made carbon emissions hasten climate change? We think this is ninety seven percent likely. We should consider the small chance that carbon emissions can continue without hurting the planet.

Some will cling to the slight possibility that greenhouse gasses are not actually approaching a crisis level or that human activity is not contributing to the pending calamity. They will ask, why go to all this trouble and expense when it may not be needed or it may not do any good?

Our choice is to act or to do nothing. Let's put the choices and the uncertainties into a decision matrix (Table 1), so we can examine the consequences of our choices.

Table 1- Our Choices

Decision Matrix		**Uncertainties**	
		Man made carbon emissions can hasten climate change	Carbon emissions can continue without hurting the planet
ALTERNATIVES	Status Quo : Do nothing significant to reduce carbon emissions	The worst-case forecasts include severe food shortages as warming makes it harder to grow crops; an accelerating rise of the sea that would inundate coastlines too rapidly for humanity to adjust; extreme heat waves, droughts and floods; and a large-scale extinction of plants and animals (UN/IPPC).	Life should continue as we know it
	Take action to drastically reduce carbon emissions	We will have taken the lead, and set an example for the rest of the world to follow thereby making it possible to save the planet, and life as we know it.	We will have invested lots of money in unnecessary alternative sources of energy and sacrificed many conveniences. However, these investments would make money in the long run, and we would have created lots of jobs and new businesses. The environment would be cleaner. Fossil fuel company profits will suffer.

The right choice is straight forward if we examine the worst things that can happen. If we do nothing, and, as expected, we hasten the disastrous effects of climate change, we are doomed. If it works out

that we can get away with carbon emissions, and we have taken serious action, the consequences would be mostly positive anyway.

There is an oft-heard excuse for not taking serious action to reduce carbon emission. Why should we invest and give up convenience when the rest of the world could fail to take similar action to curb emissions?

According to economist and Nobel Laureate Paul Krugman, it is likely that China, for example, will find it in her best interest to reduce emissions.

> China is enormously dependent on access to advanced-country markets -- a lot of the coal it burns can be directly/indirectly attributed to its export businesses --and it knows that it would put this access at risk if it refuses to play any role in protecting the planet. If and when wealthy countries take serious action to limit greenhouse emissions, they are very likely to start imposing "carbon tariffs" on goods imported from countries that are not taking similar action. (Krugman, June 2014).

While it is unlikely that China and others will not play fair, we do need to take that possibility into account in our decision making. We are only able to control our own choices, and we should strive to make the best decision we can, given the uncertainties and the consequences.

The decision matrix in Table 2 lays out the choices and the uncertainties.

Table 2 - What If China and Others Don't Play?

Decision Matrix		**Uncertainties**	
		Other countries take action to reduce emissions	Other countries do not reduce emissions
ALTERNATIVES	Status Quo: We do nothing significant to reduce emissions	We will not have done our part to save the planet	We will have no hope of saving life as we know it
	We take action to drastically reduce carbon emissions	We may be able to save the planet and life as we know it	Alternative energy investments would make money in the long run, and we would have created jobs. The environment would be somewhat cleaner because the US is are responsible for 17% of worldwide emissions. [1] Our actions may incentivize other countries to take action also.

[1] The US Energy Information Administration reports that in 2011, the most recent year for comprehensive international data, the US emitted 5.5 billion metric tons of carbon pollution; total world emissions were 32.6 million metric tons. (Davenport)

As before, we can see that it makes sense to pursue drastic action, in spite of the possibility that others will not cooperate. Taking action can lead to saving the planet.

In all, there is no reasonable or logical alternative to taking action to reduce carbon emissions, and there is nothing to lose. We should commit to action.

2. Act in Your Own Sphere

Would a dog trainer have any credibility if he/she did not own a dog? Would you follow someone advocating for reducing carbon emissions if he/she had not taken the lead by actually reducing emissions himself/herself? Leadership by example is something that most veterans can vouch for as being effective, if not essential for success in difficult ventures. This is why we believe we each should be taking ***direct action*** where we control things - in our family and in our businesses (if we are owners or in top management). You may also be in charge of a non-profit organization, religious institution or agency. These are the first places to act on carbon emission reduction.

As we know, time is of the essence, and we cannot afford to waste another decade. We have no time to wait for government policies to change. Plus as we have discovered, there is nothing to lose and everything to gain.

What needs to be done is to reduce emissions by at least 40% immediately and 70% by 2050. These goals come from the hundreds of scientists who contributed to the IPCC reports, and they coincide with the 70-80% reductions that the Union of Concerned Scientists have advocated for years. To accomplish this, we need to do two things:

1. ***Use less energy – conserve.***
2. ***Shift from combustion sources of energy*** (fossil fuels, wood, bio fuels, etc.) ***to sources that don't burn things*** (wind, water, solar)

Technology alone does not provide the whole answer to our problem. We need to change our behaviors so that our energy needs are less, and we need to begin using alternative sources of energy. This will require changes in our daily lives, such as being willing to live in warmer buildings during the summer and cooler ones during the winter, altering our means of transportation, and monitoring our energy use to assure we are actually achieving the reductions we hoped for.

For those of us who have already taken some initiatives (solar panels on the roof, a Prius in the garage, a CNG fleet of trucks for the business) we need to make sure our green lifestyle actually has a meaningful impact.

Table 3 shows this process for reducing carbon emissions. It starts with figuring out how much you (your family, business, religious institution or agency) are emitting now. This evaluation is done by first counting the amounts of the various energy sources you are presently using (gallons of heating oil/gasoline/diesel, kilowatt hours of electricity, therms of natural gas) over the course of a year. You

then convert these measures to pounds of carbon dioxide, so you can see how much you are emitting each year. (Gershon)

There are two general ways to make the conversions:

1. Do the research to find out how much carbon is emitted by each energy source. Then do the math. [2]
2. Use a quick, canned program like the one associated with the *Low Carbon Diet* (Gerson). [3]

Table 3 - Framework for Carbon Emission Reduction

Framework for Carbon Emission Reduction

• Measure carbon footprint (lbs of carbon emissions) from major emitters (electricity generators, transportation, etc.)
• Brainstorm, create/evaluate alternatives
• Develop Strategies
  ○ to reduce energy use through conservation/behavior modifications
  ○ to replace carbon emitters with solar, wind, water and alternative modes of transportation
• Change behaviors, Invest, implement
• Measure to assure results, adjust the strategy to keep on track

For a frame of reference, the "typical" American household emits about 60,000 pounds of CO_2 each year (Gershon). To do your family's part to save the planet, you want to reduce that by 24,000 pounds (40%)in the near term and by 42,000 pounds (70%) in the long term.

After establishing the baseline of current emissions, and the goal for reductions, the fun part of the process begins. How do you reduce your contribution to global warming by what may seem like an unrealistic amount? What are the options?

Everyone's situation is different, and therefore, most families and businesses will come to different solutions in terms of specific means. But the ends will be similar in that they will involve changing behaviors and substituting non-combustible sources of energy for fossil fuels. The solutions will also involve significantly altering the means of transportation.

Table 4 shows the example of how one American family achieved significant (almost 75%) reduction in their carbon emissions.

These reductions experienced by this particular family were not costly. In fact the investments resulted in handsome returns, which are summarized in Table 5.[4] Finding that these initiative are affordable is

[2] For example, burning a gallon of gasoline releases 19.6 pounds of carbon dioxide.
[3] You enter the miles driven in your cars, gallons of heating oil used, kilowatt hours of electricity used, therms of natural gas, bags of garbage put to the curb, etc. The program estimates the pounds of carbon you emitted in a year.

an important revelation, one that has been confirmed by the Intergovernmental Panel on Climate Change.

Table 4 - Household 75% Reduction Carbon Footprint

Initiative	Reduction in Annual Carbon Emissions
Commuting by bike/public transportation	6,113 lbs
Solar Domestic Hot Water	6,720 lbs
Solar Pool Heat	7,636 lbs
Photo Voltaic	10,965 lbs
Electric Boat	1,362 lbs
Electric Car	6,680 lbs
Total Annual Reduction	39,476 lbs
Baseline (Carbon Footprint before initiatives)	53,343 lbs
Reduction	74%

As economist Paul Krugman reports, our *Salvation Gets Cheap*. Economic growth will not suffer by an increase in the use of non-carbon emitting energy sources. "There is no reason we can't become richer while reducing our impact on the planet. " (Krugman).

Table 5 - Household Economic Benefits

Investment	Return
Commuting by bike/public transportation	Annual savings $1,950
Solar DHW	29% ROI
Pool Heat	23% ROI
PV	9% ROI
Electric Boat	Annual savings $243
Electric Car	Annual savings $500

Everyone's situation is different. Larger companies and agencies have more of an opportunity to make an impact because their baseline of emissions is larger. They have more resources to devote to emissions reduction, and more benefits to reap. Think of a large company or a university with all its employees and students who commute. Imaginative changes to transportation, coupled with telecommuting polices, are just one way large organizations can have enormous impacts on carbon emissions.

Leading firms are starting to find that they can reduce carbon emissions and make money doing it. A large solar array powers Apple services like iTunes and Siri. Timothy Cook, Apple's chief executive

[4] See the *40,000 lb. Carbon Diet* in the Reference Section for the details behind this middle class (teachers) family's experience (Keller).

debunked the idea that we must choose between economic growth and environmental protection. Referring to their large solar farm in North Carolina, he said “People told us it couldn’t happen, it couldn’t be done, but we did it. It’s great for the environment, and by the way it’s also good for economics.” (Gillis).

On a smaller scale local mid-sized businesses are proving the viability of using the sun to power operations. As a Tampa Bay Times editorial noted, "Even without a smart state energy policy, solar costs are declining and there are success stories such as Great Bay Distributors, which is building the largest private solar power system in the state on the roof of its new St. Petersburg headquarters."

Each of us should take action in his/her own realm for several reasons. Leading by example is the way to get others to follow; we can have a marked impact on carbon emissions while we are waiting for the government to act; such actions can be profitable; and finally, it can make us feel good.

3. Influence Others

What we do as individual is the first step. However, until we have a worldwide movement with ***everyone else*** doing his/her part, we will not be able to save the planet. Look again at Figure 2 to see how two-thirds of our model for reducing carbon emissions involves influencing friends, colleagues and our governments.

Many citizens are already doing more than their share , and some will get to work on the problem as soon as they are informed. However, ohers will need more motivation and explanation before they will get onboard. A variety of strategies, including information and coercion, may be called for.

Resistance from Special Interests

Perhaps the largest challenge will be the resistance from special interest groups who view the shift from the use of carbon emitting sources of energy to non-combustible sources as a threat to their profits or even their existence. Think of the big oil and gas companies, and utilities who have had their way for decades. How about nations like Saudi Arabia, whose status has been determined by the oil reserves it sits on? These entities have enormous resources and powerful lobbies in our halls of government. While they cannot vote, they buy influence. They also have the ear of regular Americans through paid media advertising, and have little trouble making people believe that alternative sources of energy are a waste of money.

Here in the Sunshine State, we face especially formidable obstacles because of the extraordinary influence the special interests hold. As a recent editorial in the *Tampa Bay Times* explains, in Florida, the utilities call the shots:

> Utilities such as Florida Power & Light, Duke Energy and Tampa Electric Co. have long dominated the Pubic Service Commission, where there is a history of commissioners and top staffers siding with the industry and magically winding up with lucrative utility jobs later. One clean-energy group recently counted one utility lobbyist for every two legislators and five former PSC commissioners working for FPL. On the rare occasion

> when more independent minds were on the PSC and voted against a rate increase, industry lobbyists pressured the Senate not to confirm them and forced them out...This is a state where the electric utilities have done everything they can to thwart the development of solar power..... And this is a state where the PSC is listening only to utility companies and is likely to reduce energy conservation goals. (July 22, 2014)

We all resist change. The way to overcome such resistance is to convey the urgency of the need for change and to make clear that the change will benefit the stakeholders. This is the thrust of our strategy to influence others: to share the information on the urgency of the situation, and to support and explain the kinds of changes that will reduce emissions and at the same time benefit mankind in other ways.

The obstacles to change are daunting. But the alternative , leading to the elimination of life as we know it, is unthinkable. We can overcome the barriers by alerting folks to the urgency, through a combination of voting (at the ballot box and in the market place) and by extending our influence in a number of ways.

Vote at the Ballot Box and in the Market Place

While special interests can try to buy votes, they cannot cast votes. A properly informed and motivated citizenry can elect officials who promise to legislate the kinds of changes we need to have in order to preserve life as we know it. If our legislators learn that we will not vote for them if they don't forego special interests in favor of the public welfare, we may get them to cast votes that help save the planet, instead of enriching the conventional energy industry.

Increasing the price of carbon is perhaps the most logical, practical and effective way to alter people's behavior in a way that can have significant effects on emissions. With a consistent and predictable increase in the price of combustible energy sources, the market will favor radical shifts towards the use of non-carbon emitting energy sources. Not only will people, businesses and agencies be more motivated to conserve energy, they will invest in wind, water and solar for their own use. Habits will shift away from the traditional use of cars and planes to alternative means of transportation such as electric vehicles and public transportation including rail. Similarly with homes, office buildings and factories--new paradigms will emerge for energy conservation and energy sources. Why? The new ways will be less costly, and more sustainable than the status quo. As a good friend of the FLVCS says, *People don't care until it hits them in the pocketbook.*

We offered an example earlier of how an average middle class American family reduced their carbon emissions by almost 75%, and made money doing it. Imagine a price on carbon, often referred to as a carbon tax, being in place that would influence countless others to take similar actions and reward them with even greater savings. And those who are reluctant to switch to non-combustible sources of energy would find their decision to be a costly one as the price of fossil fuels increases. Many folks would be coerced to make the switch, and in the long run they would be happier for it. As a noted professor of economics at Harvard put it, citing the consensus on this issue, a carbon tax is a no-brainer! (Mankiw).

Eduardo Porter, reporting for the *NY Times*, explains how the carbon tax can work to reduce emissions and improve the economy.

> At first blush, the proposition that replacing fossil fuel with more expensive energy could produce a net economic gain seems implausible. Until now, even many supporters of tough action accepted the idea that there would be a necessary price to pay initially to achieve the long-term goal of avoiding catastrophic climate change.
>
> But the new thinking turns that on its head by taking more careful account of the hidden benefits of mitigating climate change.
>
> "The cost of action is well known," said Helen Mountford, director of economics at the World Resources Institute, which worked on the "New Climate Economy" report. "The co-benefits, like reduced health costs, are less known."
>
> The findings are not isolated. Research published this month by Ian Parry and Chandara Veung of the International Monetary Fund and Dirk Heine of the University of Bologna concluded that almost every one of the top 20 carbon emitters would reap economic gains by imposing a hefty carbon tax, if they deployed the revenue to reduce taxes on income.
>
> A tax of $63 per ton of CO_2, for instance, would not only cut China's emissions by some 17 percent, it would also cut the number of Chinese sickened or killed by pollution from coal. If Beijing used the money to cut other taxes, it would increase economic efficiency, adding up to a net economic gain — on top of any climate impact — of more than 1 percent of China's gross domestic product.
>
> This finding does not depend on any technological breakthroughs. It happens whether solar energy is cheap or expensive.
>
> While this is all theory, some empirical research also supports the finding. In 2008, for instance, the Canadian province of British Columbia unilaterally imposed a carbon tax that rose from 10 Canadian dollars per ton of CO_2 in 2010 to 30 dollars in 2012, using the money to reduce personal and corporate income taxes.
>
> An assessment of the experience published last year by economists at the Organization for Economic Cooperation and Development found that fuel use declined, but economic growth remained on the same trajectory as the rest of Canada's. Notably, British Columbia ended up with the lowest income tax in the country.

An important finding is that the carbon tax only works to improve the economy if the money is given back to the people. If carbon revenue is not used to reduce other income taxes, the net gain from a carbon tax evaporates and becomes a net cost. (Porter)

No Subsidies, No Rebates.

We often hear complaints, especially in Florida, about unreliable or non-existent subsidies for clean energy or rebates for wind/solar generators. It provides a handy excuse for not investing in solar or

wind. Our position is that we do not want government to subsidize any form of energy. Nor do we want the state or federal government to be offering rebates or tax breaks for renewable sources of energy.

First, the existence of a subsidy or rebate implies that the product needs an unfair playing field to survive, that it is not worthy on its own merits. We have already shown that this is not true. Non-combustible energy sources and alternative means of transportation can be effective and good investments as well.

Second, once the price of combustible sources of energy are adjusted to include their social costs (i.e. taxed in proportion to the carbon they emit), the clean energy sources will become relatively less expensive. In the end, clean energy will gain market advantage.

Also, dirty fuels are now receiving various subsidies. The argument for removing them is easier to make if no energy sources get subsidies.

Specific Actions

Let's shift from abstract ideas to reality. How can you put these ideas to work in a practical sense?

- ***Get informed, stay informed, and spread the word.*** Signing up for the e-mailing lists of responsible non-profits like the ***Natural Resources Defense Council (NRDC)*** and ***350.org*** can help you stay abreast of current energy events. They send alerts when Congress and the Executive branch are about to do something anti-environmental (i.e. giving another pass to big oil and gas), and they provide insights and tips in the form of letters and petitions for how we can influence government officials.
- ***Join and get active in Citizens' Climate Lobby (CCL)***. CCL is an international grassroots non-partisan group that trains and supports volunteers to build relationships with their Members of Congress in order to influence climate policy. The CCL's purposes are to 1) create the political will for a stable climate and 2) empower individuals to have breakthroughs in exercising their personal and political power.

  CCL proposes a revenue neutral tax on carbon that returns all revenues to households . As we explained earlier, putting a steeply rising price on carbon is a key to influence people to shift from carbon emitting fuels to those that do not.

  The CCL proposal has been evaluated by Regional Economic Models, Inc. In their study the CCL plan will

  - lower carbon emissions 33% in 10 years and 55% after 20 years
  - save 13,000 people from early deaths annually due to inhaling toxins
  - create 2.2 million jobs! (REMI)

  What's not to like? Is this too good to be true? As Lynn Meyer of the New York chapter of CCL explains, there are costs. And we should be aware that there is no such thing as a free lunch.

Well, yes people will pay more for gas. After distribution of the revenue about two thirds of the public would come out ahead considering how high the dividend checks would go, beginning at about $50 per month and ending up in the hundreds, perhaps $300 per month. That's if they don't alter their way of life at all. People with an extravagant lifestyle, of course, would lose out.

Some people in the fossil fuel industry would lose their jobs. But there would be a net increase in jobs for two reasons: 1- Wind and solar are labor-intensive compared to fossil fuels, and that labor cannot be outsourced. 2- when you put money in the pockets of middle-class people, they tend to go out and spend it. Therefore, the main street economy – restaurants, doctors, movie theaters, etc.- would all pick up business.

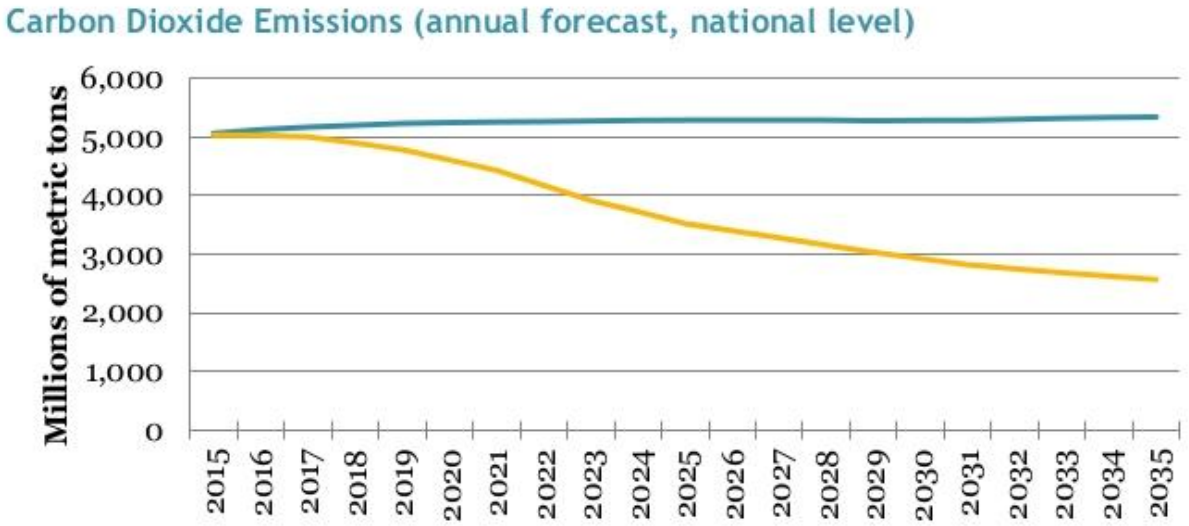
A few states would definitely suffer, for example Wyoming and West Virginia. There could be a provision in the final bill for aid to these states and to individuals who have lost their jobs and/or might need to relocate.

Overall, the benefits of implementing CCL's proposal far outweigh the costs. Figure 3 shows the dramatic reduction in US carbon emissions. You can see the impact the steadily increasing tax ($10 each year) will have on emissions. In 10 years we will have reduced our emissions by 33%, a large chunk of the 40% near term goal set by IPCC to save the planet. By 2035 US emissions will have dropped 55%, which will have us well on our way to the 70% reduction needed by mid-century.

Citizens' Climate Lobby is on the right track, with a worthy cause and a strategy to break through the logjam in Washington and enact meaningful climate change legislation. Your active participation and support adds weight to our chance of success.

- Join the ***Movement to Amend the Constitution.*** A national problem exists: who runs our government? No issue can be resolved in favor of the people while corporate interests have the power to buy elections and government. A grassroots movement, Move to Amend has rightly concluded, "We, the People of the United States of America, reject the U.S. Supreme Court's ruling in *Citizens United* and other related cases, and we should amend our Constitution to firmly establish that **money is not speech**, and that **human beings, not corporations, are persons entitled to constitutional rights**. The Supreme Court is misguided in principle, and wrong on the law. In a democracy, the people rule."

Figure 3 - Impact a Carbon Tax Can Have on Emissions in the USA



The upper line predicts CO_2 emissions if no change is made. The lower line predicts CO_2 emissions if a revenue neutral carbon tax is enacted by 2015. (Source: REMI report, figure 3.14)

- ***Divest***. Many Americans are enabling the status quo by virtue of their investment portfolios. Do you own shares or bonds of traditional energy companies or publicly owned utilities? If your mutual funds are indexed or diversified without filters, you are probably an owner of major carbon emitters, and you are part of the problem. Many large investment companies have socially responsible fund choices that allow you to divest yourself, or your company, of "dirty" holdings. For religious institutions, *Green Faith* has a Divest & Reinvest Campaign that offers education and organizing on fossil fuel divestment and reinvestment in a clean energy future. They offer this program to all faith communities.
- ***Extend your influence to boards and vestries***. If you serve on a board, whether for a business, non-profit, or religious institution, you can appeal to their ***social responsibility***. Why not help save the planet and make a return on their investments along the way?
- ***Convey the Urgency***. The magnitude of the change needed to reduce carbon emission significantly is daunting. Even less drastic changes are always met with resistance, for many reasons including human nature. And let's not overlook the resistance from the oil and gas industry, utility companies, and countries such as Saudi Arabia who see their livelihood threatened. The key to influencing people to make real change is helping them see the urgency of the situation. If we can, for example, explain to people in Florida that National Geographic (Folger) predicts they may not be able to sell their property when flood insurance (and consequently a mortgage) is not affordable, they may take notice. The primary means for getting people to believe there is a need for change is for them to believe the situation is urgent. So, let's get the word out!
- ***Give an Ultimatum to elected officials***. Because political affiliation is not as important as mankind's survival, you can let candidates as well as those in office know that to earn your

vote they must support legislation and policies that aim to reduce carbon emissions. You can tell them they need to get behind a carbon tax that returns revenues to the taxpayers, and they need to support an amendment to the Constitution that states corporations are not people and money is not free speech.

We must Inform and influence others if we are to succeed. One economist wrote, "All that stands in the way of saving the planet is a combination of ignorance, prejudice and vested interests." (Krugman). It is time to overcome these roadblocks, and it is up to us as citizens to make it happen. You can take action by voting for those who promise to legislate the kinds of changes needed to reduce emissions, joining Citizens' Climate Lobby, pushing to amend the constitution so we can legalize democracy, divesting of dirty energy stocks and bonds, making good socially responsible choices on your boards and vestries, and always conveying the urgency. If people understand the urgency, they will change. For those who don't get the message, we will coerce them with a steadily increasing price on carbon.

4. Follow Up

Feeling good about "being green" and actually having an impact on climate change can be two different experiences. We know people with solar panels on their house who did not notice the system was not working for weeks until the flashing "please reset" indicator was noticed by a visitor. And there is the family happily driving their hybrid SUV, feeling cool while they were only getting the same 23 MPG one of us used to get in a old VW van. They really had no handle on what they were emitting, nor did they consider the alternatives. They were feeling good and not doing good.

Problems are only truly solved when decisions are verified. This means that we must check to assure our carbon reduction strategies are having the intended effect. A sure way to do this is to follow up, measure the emissions, and compare the actual results with the planned outcome. To assure you are meeting the strategic objectives you need to answer the question, ***have you achieved that 40% to 70% reduction*** within your realm? If you are on track, celebrate and keep on track. If you have fallen short, it's time to adjust the plan and make it more effective.

And are you being influential?

- Have you lobbied sufficiently to implement a revenue neutral carbon tax?
- Have you lobbied for an amendment to establish that corporations are not people and that money is not free speech?
- Have you divested yourself (and your business) of carbon burning energy stocks?
- Have you given your politicians the ultimatum?

According to the US Energy Information Administration, we emitted almost 33 billion metric tons in 2011. If we do our job as citizens, businesses and governments, we will be at or below 20 billion metric tons in 2021.

Conclusion

Time is running out; the situation is urgent. Unless we (as individuals, businesses and governments) take immediate action to reduce carbon emissions, our children will almost certainly be impacted by the gruesome consequences of climate change: severe food shortages as warming makes it harder to grow crops; an accelerating rise of the sea that would inundate coastlines too rapidly for humanity to adjust; extreme heat waves, droughts and floods; and a large-scale extinction of plants and animals. National security will be at risk.

The excuses not to act are not acceptable. The possibility that man is not causing climate change is too small to accept, and even if we are wrong, nothing really bad happens if we stop polluting with carbon. In fact, the world gets better with less pollution, and it gets more new businesses and jobs. The only ones to suffer will be oil and gas companies, and utilities who do not shift to non-combustible sources of energy. Saying that the rest of the world won't follow our lead is not a worthy excuse either. We can only control what is in our realm, and without the US taking the lead, the targets for emission reductions are unlikely to be met.

Action starts NOW by taking stock of the carbon footprint in your realm, and making changes to reduce it. Following up is essential to assuring success. Another important individual action is to divest of fossil fuel holdings.

The other half of your strategy involves influencing others. Get involved in groups with a clear goal of saving the planet, like CCL and Move to Amend. Use your influence at the ballot box and in the market place. Get the word out on the urgency of the situation and what people can do to fix it.

The Chairman of the UN IPCC uses a quote from Lao Tsu to make clear the consequences of our choices. "If you do not change direction, you will likely end up where you are headed." Let's get started, now. We cannot afford to lose any more time.

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