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### Stretch Goals for the Environment

I recall many platforms in my 30 or so years at this Washington Ethical Society. It's a honor and a pleasure, as well as a little awesome to be standing here. I am especially grateful for my supportive family and dear friends within our Earth Ethics Committee and beyond, many of whom are here today.

My talk today is Stretch Goals for the Environment.

Nature is not another. We are part of it - a continuum of creatures from amebas to whales. Think about being in a wooded forest. Look around and take in the green trees, the small creatures around, hear the wind and the birds chirping in the distance, smell the sweet blossoms, and feel the soft earth beneath your feet.

When something affects nature - from phonemes to pesticides, it affects us humans too. No matter what we do to our natural world, it will remain - it may just not be the soothing and nurturing world we now know.

E. F. Schumacher wrote clearly in his classic book 1973 "Small is Beautiful": "Modern man does not consider himself a part of nature, but as an outside force destined to dominate and conquer it." He forgets that "if he won the battle, he would find himself on the losing side." Schumacher stresses two other key concepts: "Natural Capital" and the too common insatiable desire for material wealth.

Many economists deny nature's value. In contrast, natural capitalism asserts the so-called non-productive value of nature, such as a clean environment or a pristine vista.

Today, we see many indulge in an insatiable desire for material wealth in 3-ton SUVs and 5,000 square-foot McMansions, which deplete natural resources, while others are deprived of the necessities of life.

Schumacher wrote his book before the current emphasis on global warming, but his work is certainly relevant for our times. Consider how the carbon emissions of someone taking a helicopter at an affordable (for him) \$1000 to bypass traffic from New York City to the outer reaches on Long Island could affect the climate and thus life in Bangladesh - a country facing a rising sea caused by global warming. (This is not to mention the thousands who endure the unnecessary noise.)

This brings me to "stretch goals". What are they?

Stretch goals inspire efforts to go well beyond what is currently fashionable and considered feasible. These goals stimulate and inspire creativity and innovation.<sup>i</sup> For the environment, they require some sacrifice, but they spiritually enrich us and lead us to a sustainable world and a healthier life.

An example is the question of taking paper or plastic bags at the supermarket.

Why not use a reusable bag or no bag at all?

Why do I care?

We are spiritually connected to nature, as noted by William R. Murry, Unitarian Universalist Minister in his sermon, "Reason and Reverence"

We find the sacred and the spiritual in nature.

However, nature is unthinking and can be cruel, as we see with disease and natural disasters.

We supplement it with human ethical principles of fairness and justice.

I wish for sustainability for my daughters and all future generations.

I believe that we only have this life and this place - no supernatural heaven or hell – we must make the best of it.

I feel a kinship to all of humankind and indeed all earthly creatures.

Rachel Carson, my hero and author of Silent Spring, achieved much through the synergy of her scientific and literary talents.

Although I'm much less talented, perhaps my engineering and environmental perspectives are useful.

An individual who does not live within his financial means has two possible solutions:

- Increase income - get a second job – train for a better job
- Decrease expenditures - eat out less often – don't buy a new car

Our choices are similar in the environmental realm.

The earth provides and humans spend a huge store of natural capital including fossil fuels, clean air, and clean water.

Over hundreds of millions of years plants used photosynthesis to convert the energy of sunlight into organic materials. Geologic processes converted and stored (or sequestered to use a current term) these materials as fossil fuels.

Since the beginning of the industrial revolution some 150 years ago, we humans released vast quantities of global warming gases and other pollutants into the air by burning these same fossil fuels.

Fossil fuels are not the only resource being used up. We draw down huge stores of clean water such as the Ogallala aquifer to irrigate the former dust bowl of the lower mid-west.

Using a balance sheet approach does not mean that we attach dollar symbols to health and nature. In the carbon cycle, nature emits and absorbs about a thousand megatons of carbon per year. Humans disturb that balance less than a few percent. However,

this is like just adding a few calories each day to an otherwise balance of food and exercise; that person soon becomes overweight. Consider that:

- About 75% of our energy usage emits global warming gases such as CO<sub>2</sub>.
- There are two ways of approaching this issue - we need to follow both paths:
  - Income - getting a higher percentage of energy from carbon neutral sources such as wind.
  - Reducing energy use through conservation and efficiency

An essential quality in approaching the problem is humility. In 1958 Rachel Carson wrote to her friend Dorothy Freeman: "And man seems likely to take into his own hands - ill-prepared as he is - many of the functions of [nature] ... man must [act] with humility rather than arrogance." <sup>ii</sup> Environmental justice is a corollary; we should not burden the disadvantaged with our excessive use. James Madison wrote in the Federalist Papers that humans have a moral duty to share nature's bounty with other animals. We should strive to use no more than our share of the world's natural and limited bounty. Capitalism glorifies the accumulation of personal wealth, but we need ask how much is enough.

I can think of examples of wasteful energy use - pleasures that many find hard to give up:

- Jet and water skiing, snowmobiles, and outside hot tubs on a cold winter night
- Using incandescent lamps

I'm sure you can think of many as well.

Garret Hardin in his 1968 seminal essay "The Tragedy of the Commons", applied the essential concept of commons to the environment. Hardin began his essay by showing that farmers with a shared pasture, also known as the commons, have different interests as individuals than as a community. Each farmer gains more milk by placing another cow on the commons as he degrades this shared resource. Hardin applies this concept to our shared air, water, and planet. The prospect of Global Warming calls humans to consider and weigh individual and community limits and values. Hardin's concepts show that there are limits to unfettered private property rights.

We can imagine the scope of the problem by focusing on global climate change. (It must be said, that it is only one key problem that humans must face and solve together.) One measure, the fraction of atmospheric global warming gases, has increased by 30% since the beginning of the industrial revolution. This is the result of:

- Exploding population
- Living large - big cars, long commutes, big houses
- Inefficiency in many aspects of our lives

Our limits are our planet's capacity to supply energy and other resources and to absorb pollution such as greenhouse gas emissions. Clearly conflicts among people

exacerbate these limits as these limits cause these conflicts as we currently see in Iraq and Nigeria. We also have a wise unwillingness to forgo the spiritual beauty of nature

As an engineer, I'd like to address the false promises of future "breakthrough" technologies that make us think that we don't have to do something more challenging now. We need to separate science fiction and fact in considering tantalizing and unlikely salvations:

- Colonizing other planets is not feasible based upon energy distance, the number of people to relocate, limits on human space travel, and bareness of other worlds.
- A new energy source, such as nuclear fusion, would buy us time. However, for the past 60 years, nuclear fusion technologists have promised that commercialization is just 20 years away.
- Nuclear fission entices us to bet that we will come up with a safe way to dispose of its wastes and that these materials won't fall into the hands of terrorists.
- As a gas, hydrogen is only an intermediate form of energy, like electricity. To form hydrogen gas one must add lots of energy; most of that energy cannot be recovered. Then there are the difficult problems of storing and transporting hydrogen gas.
- Al Gore gave carbon sequestration extra emphasis in his documentary, An Inconvenient Truth. This is a risky plan to store carbon dioxide under the sea or underground at great pressure for the indefinite future.
- Converting coal to liquid fuels is counter-productive, as it puts two times as much carbon into the air as just using petroleum

However, we needn't revert to bare existence survival, another theme of science fiction.

- Solar water heating has been used for decades in many climates and it really works. My family has been using solar water heating for over 20 years and we now use it for a small apartment house we own as well.
- Wind and solar have vast potential for generating electricity but now supply only about one percent of US energy needs. At the same time we must recognize that they are not completely benign and they will not become large suppliers overnight.
- Technologies, such as LED lighting do hold great promise, although many require more research.
- A vegetarian diet puts less stress on the planet as it leaves more food for everyone. This is because livestock consume several times as much food as they produce as meat. A vegetarian diet has economic and health benefits for the individual as well.

We certainly should not succumb to the "It's too late" view as James Lovelock wrote: "The Earth is about to catch a morbid fever that may last as long as 100,000 years". (Lovelock is famous for proposing the Gaia hypothesis - that the earth acts as a giant living organism.)

- The foundation of our stretch goals is Nancy Montagna's clear philosophy of optimism, which asserts that as we set goals and work toward those goals we improve our lives and our world.
- Consider two world futures:
  - The book of Isaiah states that "the earth lies polluted under its inhabitants; for they have transgressed laws, violated the statutes, broken the everlasting covenant; therefore a curse devours the earth, and its inhabitants suffer for their guilt."
  - Sustainability - a place for us, our descendents, and other living beings for the indefinite future
- Optimists are more successful, like "The Little Engine that Could" of the children's story.
- We have done it before - in the 1980s there was the great hole in the ozone layer - now the ozone layer is recovering thanks to cooperation among industry, government, and individuals. Now many of those same institutions (such as DuPont) and people are stepping up to the plate to address the threat of global climate change.
- As individuals, we make personal choices such as using compact fluorescent bulbs instead of incandescent bulbs that in aggregate affect the health and future of the planet.
- As citizens it's our right and duty to ask our elected and appointed leaders to shape a sustainable future.

Will there be sacrifice?

- This brings me to a dirty secret. Politicians tell us that we don't have to change our lifestyles, habits, or favorite activities; we can continue to have lots of cheap energy. This is false, but the good news is that limiting energy use is good for both you and the planet.

Consider the choice of a conventional incandescent lamp versus a compact fluorescent lamp (CFL), the subject of a recent article I wrote in the Maryland Sierra Club newsletter. Judging by the way stores are stocked, there is more demand for conventional light bulbs than for CFLs. Of course this may be caused by the fact that regular bulbs burn out ten times faster than CFLs. However, being somewhat nosy, I look at lamps in use in peoples' homes and I see the same trend.

Well then what about the fact that CFLs have mercury, which can pollute and conventional lamps do not? I did the numbers; they show that amount of mercury in a CFL is less than the mercury in the extra coal needed to power a conventional lamp. Of course if a burned out CFL is disposed of properly, the milligrams of mercury in the lamp will not pollute.

Another thing about conventional incandescent bulbs that I'm sure you've noticed is that they get very hot. In fact, they cause fires. I experienced this twice. In the late 60s, a light bulb left on in a closet in my home started enough of a smoldering fire on a

pillow to summon the fire department. More recently a contractor left an incandescent droplight burning in the attic and started a smoldering fire; we had to summon the fire department – this came closer to a real disaster. CFLs are much cooler all around. In fact anyone using a conventional bulb would be wise to replace it immediately, because the monetary and environmental costs of powering any lamp is much higher than the cost of the lamp itself.

I have touched upon the effect of resource use on the environment. It is important to consider how these resources reach us. Electricity is available at the flip of a switch. Since most of the electricity we use comes from coal, consider the process. Coal is often mined by stripping off the trees, soil, and dirt above it, taking out the coal, and then hopefully restoring the land. In many parts of Appalachia, whole mountains, farms, and communities are destroyed to get that coal – restoration is quite inadequate. In other places, coal is still mined underground - a very dangerous practice as the news from Utah reminds us. The coal is then hauled to power plants where it is burned producing 2 pounds of CO<sub>2</sub> (the principal global warming gas), mercury, and other pollutants.

Thomas Friedman summed up our choices well in a NY Times Magazine article: the Power of Green. He stated many compelling reasons for going green - why green will be the new blue and red combined:

- Fewer fuel dollars will fund our enemies in Saudi Arabia, Russia, Venezuela, and other places. For example Saudi petro-dollars fund the madrassas in Pakistan, which school their students in radical Islam and jihad. When regimes must depend upon the skills of their workers, regimes become more democratic.
- Global warming is real - 2,000 experts of the Intergovernmental Panel on Climate Change are right. California Governor Schwarzenegger said: "If 98 doctors say my son is ill and needs medication and two say 'No he doesn't; he's fine', I will go with the 98."
- We can convince the developing world - principally China and India to limit greenhouse gases when we can honestly say "do as I do".
- Burning less fossil fuel will reduce local pollution and free up funds for domestic development, such as reducing energy use, building wind turbines in bird-safe areas, and developing an infrastructure that will discourage driving.
- The earth has a limited and finite store of fossil fuels and other resources. As we deplete these supplies, the process of extracting and bringing these resources to market becomes more difficult, dirty, and costly. Many have proposed that oil may have already reached its peak output.

We need to hedge our bets by doing lots of things that will help. We also need to realize that we have achieved difficult and essential goals in the past, such as conquering fascism. Creating stretch goals means challenging ourselves and others to do what's really needed. Kyoto was just a beginning - it does not cover enough time or ask enough. (And sadly the US didn't even sign it.)

The greatest good may be conservation - a stretch goal because it is sometimes thought of as doing it the hard way. It makes it possible to use less energy and other resources and still live a very decent life. Indeed, by doing it the hard way, we may walk, bicycle, and take stairs as we go about our errands. We get lots of exercise as we do every day activities the hard way; it is also less expensive and less time consuming than going to a gym or pool.

We should demand that institutions and governments help by improving our built environment to make these choices more practical. For example, in many buildings, stairways are designed only for emergencies; they are plain, bare, and behind heavy doors. In contrast the grand stairway in our rebuilt society will be open and inviting, while incorporating essential fire-safety features. Instead of building big highways like the ICC in Maryland, governments should build more and better sidewalks. As an example of financial incentives, I noted that a hardware store in Vermont was especially well stocked with CFLs because that state offers a \$1.50 instant rebate when buying them.

I spent a week in Louisiana with other WES volunteers this April to help rebuild hurricane damaged homes. It reminded me that it's harder to build a house than to destroy it. It's clear that this applies to earth, our home. The problem is that we are like firemen trying to put out the blaze of the house on fire, while others are pouring gasoline on the flames in the rush to build bigger houses and faster cars and boats. Does fun require fuel-intensive activities such as car races, Jet-Skis, and snowmobiles, or even space tourism? My family enjoys walking in the woods, riding a bicycle, and sailing or rowing a boat.

Al Gore stated in a recent NY Times op-ed piece: "The climate crisis offers us the chance to experience what few generations in history have had the privilege of experiencing: a generational mission; a compelling moral purpose; a shared cause; and the thrill of being forced by circumstances to put aside the pettiness and conflict of politics and to embrace a genuine moral and spiritual challenge." That's a stretch goal that we can all strive for.

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<sup>i</sup> Sutton, Philip, "Stretch Goals - Resources", Green Innovations, Australia, <http://www.green-innovations.asn.au/stretch-goals/Stretch-goals-resources.htm>

<sup>ii</sup> Linda Lear, "Rachel Carson, Witness for Nature", biography, Henry Holt & Co., 1997, P 311.