Zero

Part 2 of 3 in our Journey to Living `Zero Carbon` by Gord Kubanek

Goodness as Right Action

Evil triumphs when good people do nothing – Edmund Burke

(1)

This is the story of how my wife and I came to a place where living 'zero carbon' (without using fossil fuels) was a natural and necessary step in our attempts to have our beliefs, money and actions align. As we are members of the middle class (I am on disability) a primary challenge has been to make this attempt affordable. Surprisingly, with a bit of good timing, patience, persistence and luck, our investments in Zero Carbon technologies have paid off, both for our wallets and the environment. I want to make it clear right now that this journey remained relatively stress free, slow, realistic and affordable only because my wife kept me connected to reality and on budget. This article is divided conceptually into three parts: Truth, Goodness and Beauty – the three ideals of Platonic philosophy. As I examine our relationship with climate change I equate Truth with Science, Goodness with proper conduct, and Beauty with Morality.

Prelude: The Curse of Akkad

"May your holy walls, to their highest point, resound with mourning! May your *walls* be reduced to a pile of dust! May your temples with the standing deities fall to the ground like tall young men drunk on wine! May your clay be returned to dust, may it be clay cursed by the gods! May your grain be returned to its furrow, may it be grain cursed by all! May your timber be returned to its forest, may it be timber cursed by Ninilduma! May the cattle slaughterer slaughter his wife, may your sheep butcher butcher his child! May water wash away your pauper as he is looking for a last crumb to eat before he dies. May your prostitute hang herself at the entrance to her brothel! May your pregnant cult prostitutes abort their children! May your gold be bought for the price of silver, may your silver be bought for the price of pyrite, and may your copper be bought for the price of lead!" (2)

"For many years, the events described in "The Curse of Akkad" were thought, , to be purely fictional. However in (year) when____(first name)_ *Weiss (archaeologist) and his team dug in (place), they also encountered a layer of dirt that contained no signs of human habitation. This layer, which was more than three feet deep, corresponded to the years 2200 to 1900 B.C., and it indicated that, around the time of Akkad's fall, the city of Tell Leilan had been completely abandoned. In 1991, Weiss sent soil samples from Tell Leilan to a lab for analysis. The results showed that, around the year 2200 B.C., even the city's earthworms had died out. Eventually, Weiss came to believe that the lifeless soil of Tell Leilan and the end of the Akkadian empire were products of the same phenomenon—a drought so prolonged and so severe that, in his words, it represented an example of "climate change(CC)."(3)*

Thus fell the world's first civilization: a precautionary tale if there ever was one.

Our Goal: To Reduce Our Carbon Footprint to Zero

All of us are supposed to live eventually within the Carbon Budget agreed to in the Paris Accord of 1.6 tons/yr (world avg), a reduction of 90% for the average Canadian (4), if we are to keep the average global temperature increase below 2°C. To put this number in perspective: one return flight from Australia to England is 4.6 metric tonne (5) and the current world average carbon emission is 4 t/person/year.

(6)

Why?

Setting an example not the main means of influencing others – it is the ONLY means. - Einstein

I want to because I have to - *M.Stegmann,* my Grandmother

Aftermath of Hurricane Harvey (7)

The quotes above support my wife and my commitment to zero carbon. First, our efforts are a result of our strong desire to set an example to our children to show that they too can live well without destroying the planet with fossil fuels. Motivation for this came from an unexpected quarter (?): I got very sick 14 years ago and felt extremely mortal. This forever changed my perspective on life as I realized that life is brief and that having regrets is very painful. I resolved to live without regrets and that meant, for us, 'walking the talk' in all parts of our life. We found that when we lived out what we believed we were much happier and optimistic and so, in a certain way, these efforts can be seen as a type of medicine – the medicine of hope. The second quote from my grandmother came back into my mind as I was writing this article, because I believe that IF we are to overcome the CC challenge we will have no choice but to live 'carbon neutral' –Thus why not choose to do now what we will be forced to do later? io me It's just good psychology to put yourself in charge of your life rather than to let external forces drive you. It's a slight of hand, a perspective , but it helps us be more optimistic.

Although we have been "greenies" for many decades we, like most, talked a lot but did very little to curb our use of fossil fuels. Quite frankly, to turn the abstraction of CC into reality took a bit of convincing. As an Engineer I felt that I had to **really** understand it as a threat to human life and our civilization before we would change our lifestyle and spending habits. However, like for so many change is very, very difficult. As mentioned above, I had time because of an illness,so I was able reflect on my life and the world around me and my musings coloured my wife and my conversations. . After a lot of reading ,pondering and discussions we came to the conclusion that we wanted to be able to say the following to our grandchildren: we did our very best to NOT be a lemming as humanity destroyed itself and other life by the wanton destruction of the environment and CC in particular. We decided that with our lives we would be an example of what could practically be done in regards to these challenges.

And so it was that 10 years ago we started sharing and learning about what can be done to lessen our carbon footprint with friends, family and I even became a Green Party candidate. However, nothing much changed in our own lifestyle until a family member bluntly told me):

"Gord, it seems to me like your talk is just that – talk. Where are your actions? What you doing concretely to reduce the amount of CO_2 you generate? Until you take concrete steps I will find it difficult, no impossible, to take what you tell seriously in a way that will change decisions I make."

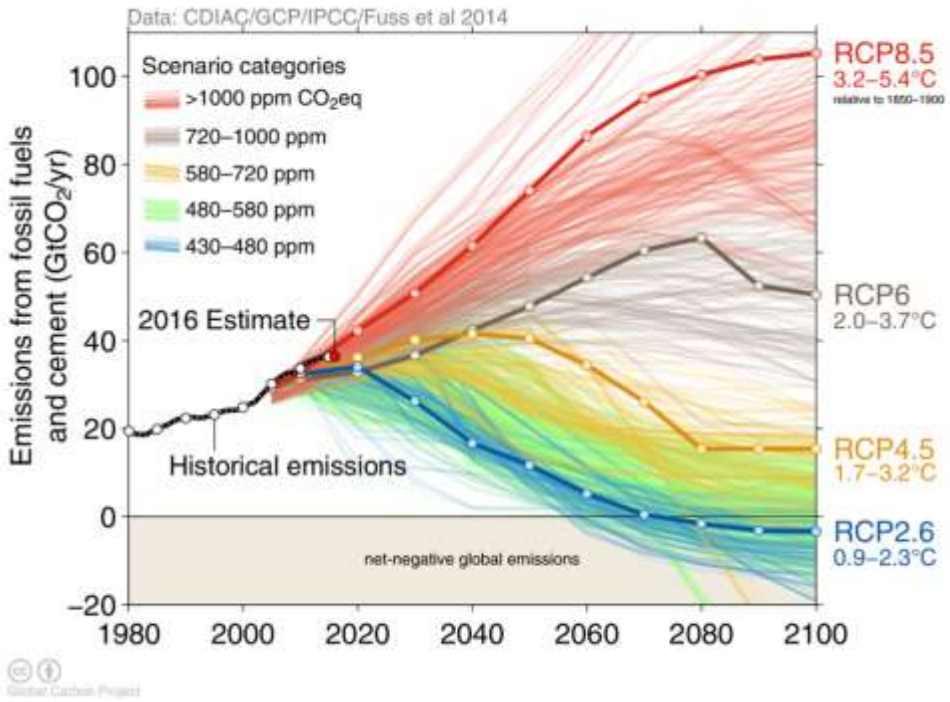
And so with this direct verbal reprimand (?), it was that we were moved to **action.** However stepping out of the main stream "lemming way" was not understood by those around us. Most people would react to our efforts by saying:

"That's all well and good but our situation is different. Even if I could act I am but one person on a planet with 7.5 billion. My individual efforts count for nothing. Even if a lot of people tried just the sheer mass of humanity doing what it needs to do just to survive day to day means CC efforts will come to nothing…until it is too late."

I must admit that this is a rational and probably true response. However, I take the view that at the end of the day we all die, so death or defeat is not the enemy: the enemy is, not living a life that is full and joyful. Thus, while inaction is rational for an individual, it is possibly fatal for humanity. What we, or anyone else trying to live Carbon Free are doing, is setting an example for young people, trying to leave a legacy of hope, showing that each of us, them included can make a difference. Change can only happen if we try and if there is an example to follow. After having taught teenagers for 30 years, I know that credibility is earned by deeds, not words alone, however inspiring they are. As well in many ways our efforts are a kind of 'enlightened self-interest' because we want our children and grandchildren to be able to live as rich a life, in quality NOT quantity, as we have. It is beyond the scope of this short article to get into the real risk that CC poses but needless to say we have been convinced that the danger of CC is serious enough to warrant drastic action.:

*"Climate change is occurring at a faster rate than has previously been predicted, according to a new study which suggests that the most extreme estimates of the effects of global warming are likelier than more optimistic predictions. With the current level of greenhouse gas emissions remaining steady, researchers say, there is a 93 percent chance that the planet will be more than **four degrees** Celsius warmer than it is now by 2100. Earlier estimates held that there was about a 62 percent chance of this level of warming". (8)*

As you can see all the talk of a 2 C rise is pretence; the real danger is 4 C, but I imagine the powers that be do not want everybody to panic so are not talking about the unthinkable because it is just too overwhelming much like our friends and family believe . According to the latest understanding (9) EVEN IF the whole world went zero carbon today the Earth's temperature would rise about another 0.6°C. (called committed warming) As you can see from the graph below (10) we are, sadly, more on track for warming well above 2 C, IF we continue our current emissions. But to simply accept the inevitable and not try to do something to change would be ceding (?) to hopelessness.



What Concrete Actions Can We take?

It's not that we have too short a time to live, it's just that we waste so much of it. – Seneca

Living without fossil fuels seems impossible, but is not IF you live in a jurisdiction where electricity if made by renewables. Fortunately for us Ontario produces 95% of its energy from nuclear, water, wind and solar so by only using electricity we think we can bring our carbon footprint close to zero. Now that we had decided to act we needed to know our Carbon Footprint, we did so using a carbon footprint calculator (11). This exercise made it clear that were a few key activities that generated the most CO_2, namely: food (red meat), home heating and cooling (very dependent upon how the energy was produced), transport (flying, cars) and consumption (did we buy new things often?). Here is an energy breakdown of a typical family in a first world country (12):

house build	*8%*
house operational energy (gas and electricity)	*22%*
consumables (including food)	*34%*
motor cars & holidays	*22% & 4%*
financial/other services	*8%*

I tried the online carbon footprint calculator exercise out with many of my classes at High School and found it enlightening in two ways: first, it really helped my students understand how their daily lives were impacting CC, and second, when they tried to reduce their CO_2 footprint they discovered how difficult, nay, almost impossible, it was to change to live a low carbon life without huge changes in how they lived. For them the sacrifices were too high: no red meat, no flying, no more dreaming about a sports car, no more upgrading to a new cell phone every year. So once again I was forced to put action to our seemingly lofty dream of zero carbon. Our action plan, in order of priority based on funds and opportunities unfolded as follows:

1. install Solar panels
2. Install Ground Source Heat Pump
3. Purchase an Electric car
4. Consume No Red meat or Shrimp
5. Reduce Waste by 90%
6. Grow Our own Food
7. Stop Flying
8. Live in a Smaller house
9. Live with less stuff

A key challenge in this journey has been to make it affordable. Our total expenditure has been $127,000 over a nine year period ($14,000/yr). This does not include choices that have no cost, such as not flying, but it does give you sense that we had to make sacrifices in other parts of our life to make this possible. You may think: "But only wealthy people can afford this." Not true – we had to use our line of credit for this investment and forgo expensive travels and new cars. I truly believe that for many middle class Canadians it is a choice – gratification today or short pain for long term gain. According to this recent article (13) a 'Middle Class' income depends on where you live – the National range is from $33,000 to $130,000 – that's quite the spread! Thus, if you earn within this range (see 13 for location details) you could, theoretically, with some belt tightening, afford to do what we have done. Note that although we tried to make this an affordable project money was NOT part the motivation for doing this in any way; only combating CC mattered to us.

At the start of this journey we had thought if we only stopped using fossil fuels that we would have brought our carbon footprint to zero – we could not have been more wrong. More detailed analysis (14) of our individual carbon footprint leads to the conclusion that you must <u>produce</u> as much renewable energy as you consume from a 'clean' grid to compensate for all the services/resources you use outside of your home (externalities) – this is called being 'carbon neutral' or 'net zero carbon'. This includes things like government services, place of employment, shopping centres/banks/etc., purchases made (as most things you buy are made using fossil fuels). To make this concrete, let us <u>*pretend*</u> our electricity use is 100 kWhr/yr – this means that we would then need to produce <u>*another*</u> 100 kWhr/yr to compensate for all these 'externalities'. We did this by installing solar panels, as explained below.

<u>*Caveat:*</u> *It is only possible to live 'zero carbon' the way we did in areas where the power grid is powered by renewables or nuclear power. This recounts our efforts only and is <u>not</u> meant as an example for others to follow. Each of us as is living in a unique situation so each of our responses must match the reality of that situation to be achievable. However, we do hope that our example will spur you onto some form of action by provoking you to ask: "Did we <u>**do our best**</u> to combat Climate Change?"*

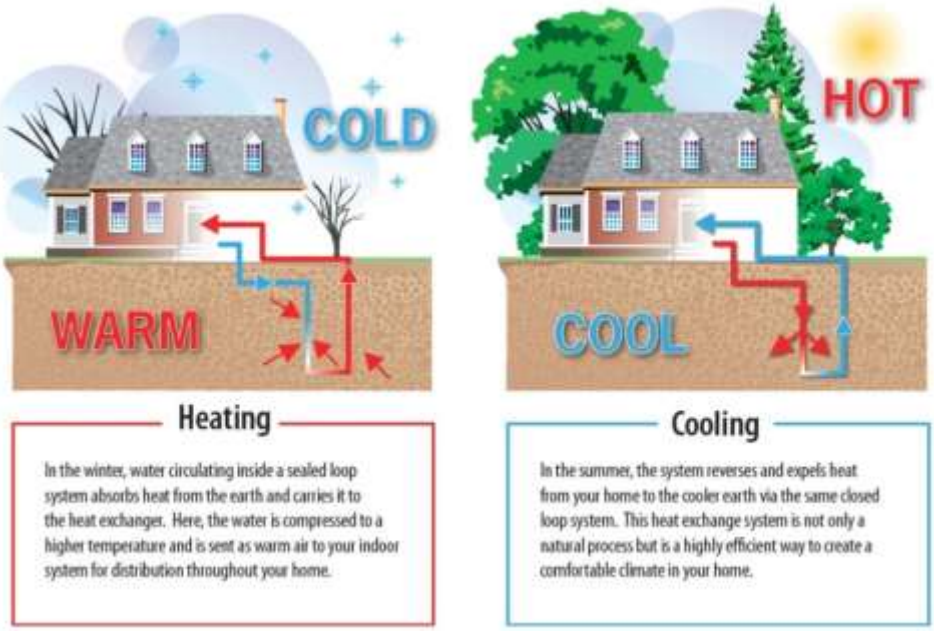
To be is to do – *Emmanual Kant*

1. Our Solar Panels

The old Roman saying "Luck is with the Bold" proved true when we started our actions. Almost nine years ago, in 2009, the Ontario government, tabled the Green Energy Act, which, among things, allowed for 10 kW of power to be installed on private roof tops so that the electricity could be sold into the grid for 80 cents/kWhr, with a 20 year contract – a GREAT deal ! We signed up and have been receiving $8000/yr income ever since: after subtracting my initial investment of $60,000 (the price is less than ½ now) our 20 year *net* income (after taxes) will be $80,000! Although we are very happy with our solar panels we have not been able to reduce our electricity use to the point that we produce as much as consume, a key point made in the previous section needed to be totally carbon neutral – but we are close! . Just in case you think being 'net zero carbon' is crazy and unreasonable consider that according to the Canada Green Building Council ALL buildings around the world must operate at net zero carbon emissions by 2050 if global warming is to remain under two degrees Celsius, the limit in the Paris Climate Agreement – a tall order ! (15) To reach this goal we would need a new, energy efficient building – this is explained in the section Smaller House.

2. Ground Source Heat Pump

In 2011, the Federal and Provincial governments had a large subsidy for geothermal heating/cooling systems. After a quick check to learn a bit about this technology (16) we jumped right in. When we ditched our oil furnace our insurance company was thrilled and reduced our annual home insurance by $500! Although the capital investment of $20,000 (after subsidy) hurt reductions in our annual operations costs gave us a return on investment (ROI) of 7 years (17). Although the most expensive option, it is also the most energy efficient. So, with that boost to our courage we looked at what our next step would be.



3. Electric Car

Who killed the Electric Car? is a 2006 documentary film that explores the creation, limited commercialization, and subsequent destruction of the battery electric vehicle in the United States, specifically the *General Motors EV1* of the mid-1990s. Back then electric cars seemed like a pipe dream. However, by 2014 the tide had turned and electric cars had become affordable and practical for city driving, with most cars having a range of around 120 km, eg. Nissan Leaf or Electric Smart. Then Tesla started producing the Model S for the rich, ($100,000+) with a range of 500 km, which proved an electric car for long distances could be built. However the game only really changed dramatically in 2016 with the announcement of the Tesla Model 3, promised to be on sale in 2017: over 200,000 people put down $1,000 to reserve one! With an excellent Super Charger charging system on all major highways, an affordable price of $36,000 US and a range of almost 400 km all car makers are now scrambling to enter the electric car market. Just to give you a sense of how real this is the world leader right now for electric cars is Norway, where 42% of all new car sales were this past July were electric! (19)

So, in 2015 we jumped onto the electric car bandwagon (0.6% of car sales in Canada in 2016) and purchased a used 2014 Electric Smart ($11,000). Although only a year old it was only 60% of the new price – it seems that there is not a market for used electric cars as most people are scared off by fears of battery decay, but as they are warrantied for 8 years I see no need to worry. The ROI was surprisingly fast, at 3 years, as my wife could charge for free at work. Although the real world range of the car is only 100 km (as you want to avoid using reserve power) we have been very happy with the car: it is very comfortable - with AC & electrically heated seats. It handles brilliantly as the batteries are underneath the chassis lower the centre of gravity and we feel very safe in it as it is rated very highly in crash tests. While the Smart is a great car it can only be used for city driving so we waited until an EV with range became available: that happened this year.

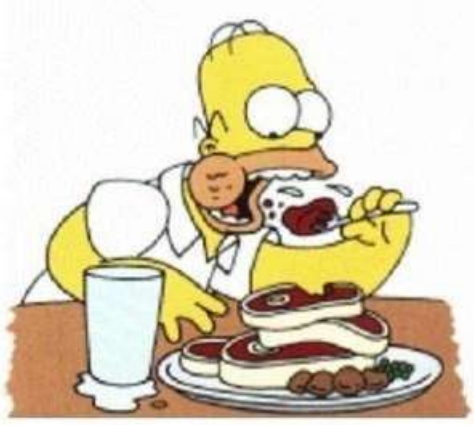
After Tesla's big announcement of the Model 3 we put money down for one but once we saw the production difficulties Tesla was having, and also realized Canadians would only get a car once all American customers had theirs we had second thoughts. More important to the timing of our purchase was our concern that the current $14,000 subsidy from the Ontario government would come to an end if the Liberals lost the election in June 2018 (they are 3rd in the polls). So, we switched our choice to the Chevy Bolt – the only current long range EV available. I put my name on a list and also emailed or phoned dealers every day to avoid the long wait. Every day I was told "the car was ordered months ago by a customer but it is listed as for sale because our computer system automatically puts all cars on our lot on our website". This did not deter me as I have learned by now that life has all sorts of hiccups and surprises. Finally my efforts paid off when I called a dealer in Montreal who had a customer cancel their order at the last second. We were the first to call so off to Montreal I went (by bus) to pick up our new 2017 red Chevy Bolt. It is a dream to drive and has that most important feature: a heated steering wheel!

Of course, before I could justify our first new car to my wife (we only buy used) I had to convince her that the $36,000 price tag (after rebate, including taxes) made sense. So, on the back of an envelope, we did a cost comparison with the Chevy Equinox (because it has the same body, plus 1 foot as the Bolt). Here are our numbers for 10 years, assuming 20,000 km/yr: Note: at 30,000 km/yr the savings are $32,000

	Equinox		Bolt	
New price	$32,000		$36,000	
Price of energy	$24,000	($1.20/L, 10 L/100km)	$2,000	(20 kWhr/100 km, $0.15/kWhr)
Repairs:	$3500	(Ref.20)	$1700	
Insurance:	9,000	(Ref.21)	$8,000	
Total cost	$68,500		$47,700	

Savings driving Electric Car: $20,800

So, you can see that if you are persistent and lucky you can find an electric car that saves both the environment and your pocket book. We are in process of selling our gas car so that in 2018 we will ONLY have electric cars.

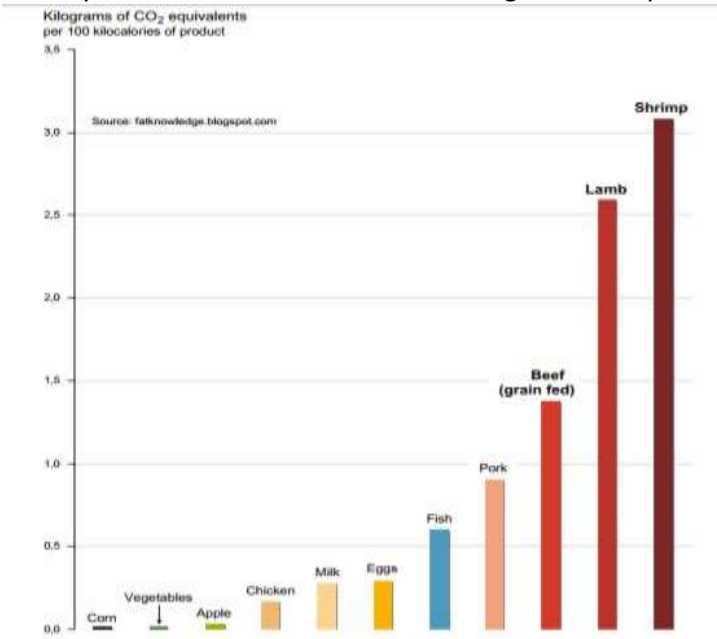


If you are supposed to eat cows, why are they made of food? – Homer Simpson

(22)

4. Eat (almost) no red meat

An estimated 14.5 per cent of the planet's global warming emissions stem from the keeping and eating of livestock – more than from the entire transport sector (23). So, although we had already shifted to only buying local meat and chickens (from farmers on the country road we live on) it has become time to reduce our meat and dairy significantly. At first we did this by shifting to seafood, but as you can see from the graph (24) below fish and particularly shrimp are also terrible options. This surprised us, yet again proving the value of researching your topic. This means we have shifted to local chicken – it helped that we raised chickens and know that they aren't too smart ,so we don't feel bad about eating them. The main reason that we have reduced our meat consumption significantly without becoming vegetarian is that my wife is aneamic and without eating meat every few days she becomes light headed.



So, as in all things, we do the best we can – perfection remains for Saints. Fortunately for your future, the Israelies (25) have invented a way to grow protein in a lab, so you won't have to feel about eating meat and the methane gases emitted by the lifestock it comes from. Another surprise: we also found that junk and processed foods contributed much more CO_2 than cooking from scratch. According an Australian study*: "If we could reduce highly processed foods like salty snack foods, pies, cakes, soft drinks, sweets and processed meats and eat according to dietary guidelines, greenhouse gases would be 12 per cent lower in Australia"(26).* Fortunately, getting rid of junk food was easy for us as we don't buy any!

5. Reduce Our Garbage & Food Waste by 90%

By your garbage shall you be known and remembered

Garbage in the oceans is killing wildlife at an alarming rate (27). We have reduced our garbage to 1 garbage can per month, but this does not compare to our heroine Bea Johnson (28) whose family of 4 produces 1 mason jar of garbage per year or even the local couple who only fill1 garbage can per year. Part of the problem lies in the fact that plastic bags and wrap are not recycled where we live (91% of US plastic is not recycled (29) but the real issue is non-recyclable packaging; which is most of our garbage. According to Bea the only option an individual has is buy goods from stores that have no packaging or who will accept their packing back and recycle it. With this in mind a local Ottawa entrepreneur has opened up a store in Westboro where you must bring all your own packaging (mason jars, cloth bags, etc.) - http://nugrocery.com. We have shopped there a couple of times but it is a long way for us but we did learn this from Bea: Bulk Barn will allow you to bring your own containers and thus not use their plastic bags.

Although reducing garbage is mostly an environmental issue because plastic is made from oil it does have a carbon footprint as well. The interlinking of environmental stewardship and the climate change fight is clearly seen in the debate over plastic water bottles. Not only are these bottles are significant source of garbage and ocean pollution the processing and transportation of water thousands of km has a carbon footprint that is easy to eliminate: don't buy it! Eating ocean fish has a similar story (30) as the #1 source of the Great Pacific Garbage Patch (TGPGP) or 705,000 tons is made up of lost, broken or discarded (ghost) fishing nets. Furthermore, these ghost nets are estimated to kill 300,000 whales, dolphins and seals each year (31). Once again, life is not as simple as it seems and research is a must if we seek a true path to a zero carbon life.

We are especially terrible with regards food waste: most of the time of the time our left overs turn into science experiments. Quite frankly, we are struggling with this one and all I can claim so far is that all our food that goes bad ends up in our compost heap, so at least it is not completely wasted. I was not surprised to learn that 47% of food waste happens in Canadians' homes (32). While some may choose to prevent the problem by living without a fridge (33) realistically the trick is to avoid leftovers or eat them immediately.


Our Clothesline

6. <u>Grow Your own Food & Doing the Little Things that Add Up to a Lot</u>

Beware of little expenses; a small leak will sink a great ship. – B. Franklin

We originally moved to the country to have the property become a hobby farm, but then I got very sick and could no longer do lots of heavy labour. While have tried to be farmers I would qualify our results as 'good effort' at best: it turns out that farming requires a lot of knowledge, hard work, money and time! Who knew? When our children lived at home and could help us with the work we had chickens and turkeys both for eggs and for eating plus several large gardens, which was especially important in having the children see how food is grown and helped develop an excellent work ethic in them; even now when they are in their 20s they know how to work hard! Now we have only one small garden and a garlic patch along with bees and many, many perennial flowers to provide pollen for the bees. While growing your own food clearly reduces your carbon footprint I think what is even more important is that growing your own food brings you in touch with the Land.


Our Apiary

Growing your food makes it very clear that you are part of your landscape: any illusion of people being separate is destroyed. There are people how have taken this to a higher level and earn a living growing vegetables on only an ordinary city lot (34). So, you can, with hard work, grow a LOT of food on a suburban lot! Beekeeping has been a particularly joyful and enlightening activity that has taught me so much that I now give presentations about bees and am writing a short book about what we need to learn from bees to survive our current predicament.

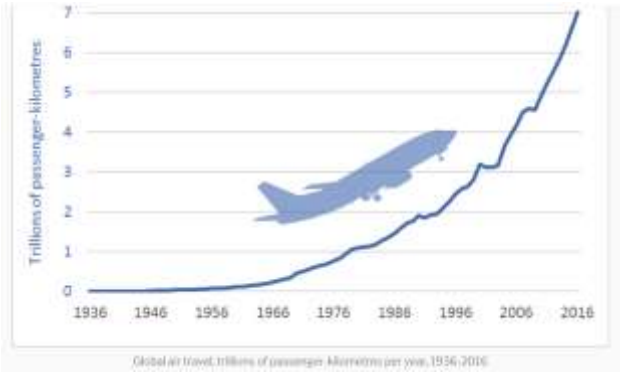
On a lighter note, there are activities that are much less work that also save waste, shown below; namely shaving with an old fashioned shaver, using home-made deodorant in reusable jars and the best of all: using isopropyl alcohol to reduce your need for deodorant! I will not recount the details on all the little things that you can do to help reduce your energy use as they are well documented elsewhere (35) but here is a sampling of easy changes you can do that make a big difference to reducing your carbon footprint: stop using the dryer, have all electronics on a power bar that you turn off when you leave it to stop phantom power, reduce the size of your fridge & buy the most efficient one, use LED bulbs, etc. This will not save the world, but it puts you in the right frame of mind.

7. Stop flying

Fact: *One return trip from Europe to Australia creates about 4.5 tonnes of carbon.*
The Paris accord required a world average per capita GHG emissions of 1.6 tonne to meet its targets.

(36)

This one choice has sparked the most number of queer looks. It seems that for most people I have met see flying as a `right` and any thought of removing it from the dinner menu is a travesty in the extreme.(37) To put it bluntly, I have not yet met anybody who is sympathetic, this response being typical: "…but my daughter is having a wedding in New Zealand and I just have to be there!" Really? I too have family in that part of the world (Australia) and in my "youth" even lived there for a year (and loved it so much I wanted to immigrate there). So, although a few others (37) agree with us, I still feel this is THE most 'in your face' statement that we are serious about climate change, although it is only 3% of the average American's carbon footprint (38). Once again, though, we need to examine the trends to see if this source of carbon is growing in significance – and, surprise, surprise – it is – the graph below makes this obvious (39). The forecast is that in the next 20 years air travel will double. This surge in growth expected over the next 20 years could push up carbon emissions to the point where one industry consumes a quarter of the world's carbon budget by 2050. (40) In other words, when a few people flew the world could survive the damage, but NOT when flying becomes the norm. To meet our Paris Accord targets we will have no choice but to switch from flying to electric trains powered by renewables when travelling on land. We must ground most of the global airline fleet if we want to meet our emission-reduction goals by supporting the current companies who build jets to switch to building fast trains instead.



8. Smaller House & Our Future Passiv Haus

In 2015 40 percent of U.S. energy consumption came from residential and commercial buildings (41). This makes buildings the #1 consumer of energy. As mentioned in the first section on solar panels we have not reached our goal of zero carbon emissions because our current very typical two story home is not that energy efficient so that we consume more power than we produce with our solar panels (remember – to account for external service provided that use fossil fuels we must pump as much renewable energy as we consume back into the grid to be totally carbon neutral). We did not think that this justified moving, partially because we learned from several realtors that the investments we had made in solar panels and geothermal would not add any value to the house if we tried to sell it. The alternative we choose was to have more people living in the house, as our three children had left to attend University. First, we renovated the basement (which already had a full bathroom) into an apartment: we were fortunate in that there was already a private entrance to this space. Next, we asked each of our Mothers, who were both over 80 and living alone, if they wanted to move in and one of them did! She has her own bathroom and bedroom on the ground floor and a stair-lift on a second set of stairs that we do not use – this gives her access to her own living room with her TV. Together these spaces reduced our living space by 40% which made us very happy! However, the fact remains that our house is not energy efficient enough enable us to either live 'off grid' or to live totally 'carbon neutral'.

Fortunately building efficiency goals were revolutionized by the Passiv Haus building standard (42) of the1980s when a German and Swedish Physicist decided to apply their expertise to the reduction of energy use in buildings. The standard does not tell a designer how to do things, but rather sets goals that reduce energy and water use in buildings by 90%, these goals being:

1. **Space Heating/Cooling Energy Demand** is not to exceed 15 kWh/m^2/yr
2. **Renewable Primary Energy Demand** for all domestic applications must not exceed 60 kWh/ m^2/yr
3. **Airtightness**, a max of 0.6 air changes per hour at 50 Pascals pressure
4. **Thermal comfort**: all living areas are not over 25 °C more than 10% of the hours in a given year

There are over 40,000 Passive Houses worldwide but only a very few in Canada. In spite of these small numbers what is more important is that this standard has kick started many organizations to created designs that are not only energy efficient but use less carbon in their construction, with the added bonus of being designed to be healthier for the building occupants (see CDN Green Bldg. Council, 43). When properly designed the construction costs are claimed to only increase by 10% (43). Given that the City of Ottawa (44) allows the construction of a "Coach House", that is 40% of the footprint of the existing dwelling to be built in your backyard, we look forward to living in such an energy efficient home by the time we are both retired.

9. Less Stuff = More Hope

Minimalism & Buen Vivir: two models to live a Life where Stuff matters less than friendships

Anything you cannot relinquish when it has outlived its usefulness possesses you, and in this materialistic age a great many of us are possessed by our possessions." (45)

(46)

Like all of us we too want `to have our cake and eat it too', in this situation meaning we want to both save the planet from our greed and improve our quality of life. Here is a concrete example of what I mean: Cuba is the ONLY country in the world with a very *high* human development index AND low ecological footprint (47). It is a unique example of a country which has, out of necessity, focussed on quality of life rather than quantity of stuff. Of the many ideas out there with this goal I will only highlight Minimalism and Buen Vivir, not because they are the best, but simply because I am the most familiar with them. "Minimalism is really all about is reassessment of your priorities so that you can strip away the excess stuff — the possessions and ideas and relationships and activities — that don't bring value to your life." (48) One of the main results is that minimalists get rid of 90% of their stuff and refocus their energies on experiences, especially social experiences. Buen Vivir (49), comes from Latin American indigenous movements, and implies "right living" or life in balance with community, natural systems, and future generations. Finally, given that humour is often our best medicine watch `The Story of Stuff` by Annie Leonard, first shown in 2007, a hilarious analysis of consumerism run amok (50) and the brilliant comedy clip by George Carlin entitled 'Stuff' (51) – both will have you weeping and laughing simultaneously and help your realize that less stuff means more hope.

Conclusion: Action = Hope

"People everywhere are waking up to the reality that the American dream is, well, not so dreamy. Having a bigger house, super-size portions and all the latest toys can only lead to an unsustainable mortgage, poor health and a crushing debt. "The scripts we've inherited about material prosperity are wearing us out, robbing our joy and destroying the planet,"
Mark Scandrette (52)

I'd like to conclude with the admission that we understand that our efforts alone cannot solve the global challenges that we face. Happily there are others living the carbon zero (net zero) lifestyle; such as John & Debbie Pitney, (53) , and the retired couple described in an article (54) in LA who, after seeing *An Inconvenient Truth*, wanted to part of the solution and built a net zero home. All that we can claim is that we are 'walking the talk' and are not one of the lemmings joyfully running towards the cliff that CC represents. Really, CC should be looked upon as an opportunity to live a better life, confirming the ancient Chinese view that 'Crises = Opportunity'. A good example of this is the 'Food Forest' in Israel which is doesn't require as much upkeep as a garden by using permaculture principles (55) to grow vegetables and fruits that don't need to be replanted season after season(56). Others doing activities like these share with us a belief that there is hope. Only by infecting those who are doing nothing or who are full of despair can they see that there is hope and once you have hope, you act. It is our sincere belief that spreading the good news that there is an affordable way to live without fossil fuel that improves your quality of life will inspire others to believe that ethics matter: that the means ARE the end, as made clear by Calvin and Hobbes, shown on the next page. Once we 'got it' we have no choice but to act.

We'd like to wrap up by saying that we hope that our example demonstrates that given time, persistence and an ability to suffer short term financial pain for long term financial gain living 'Zero Carbon', that is, without fossil fuels in your life, is not only practical but improves your quality of life. Zero Carbon living is not about denying yourself, rather, it is about choosing hope over despair, quality over quantity, long term for short term thinking, and goodness over greed. In other words, it is about an effort to live a life without regret, for at the end of the day all that we can all say is

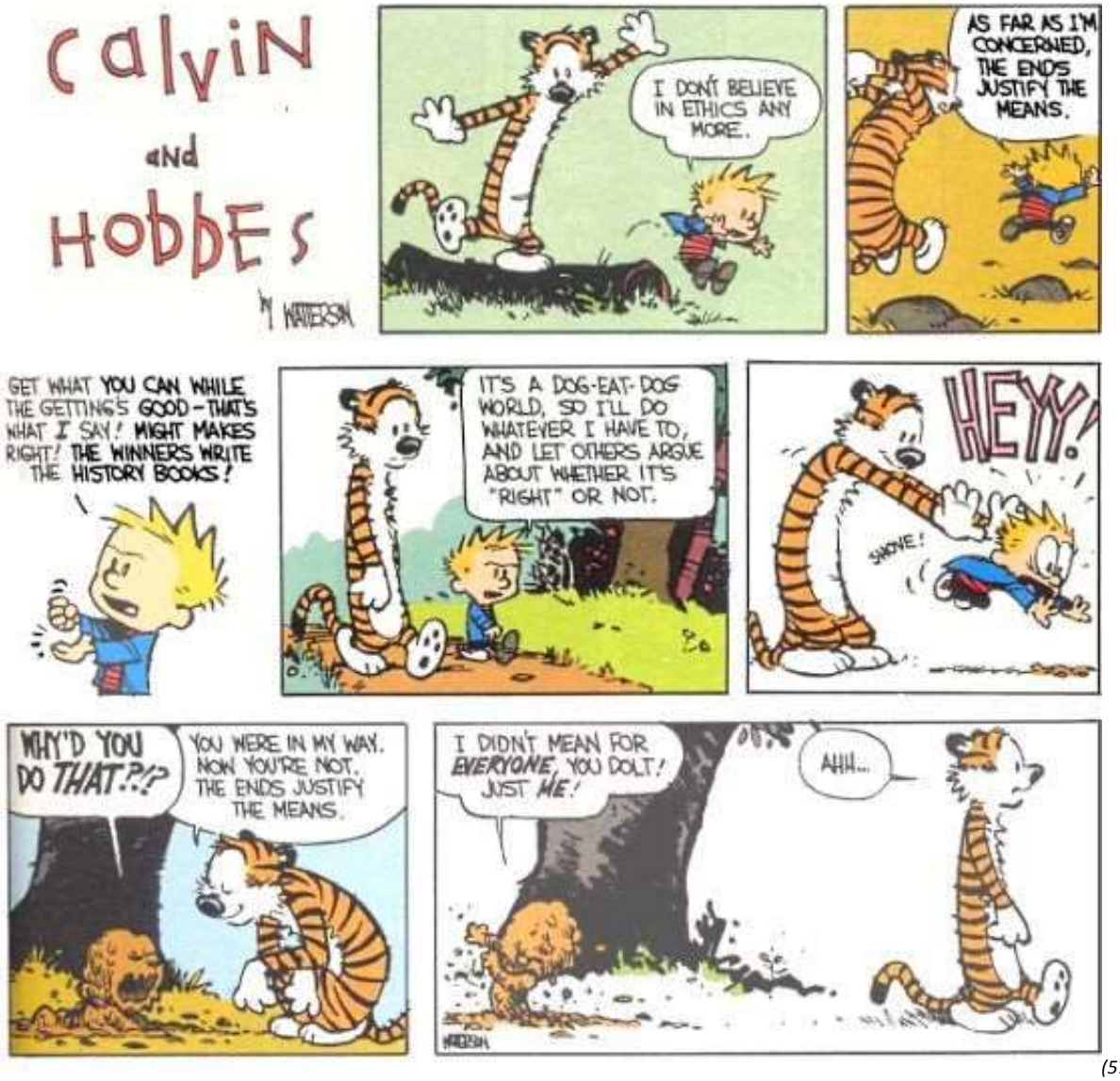
"I did my best"

Caveat:

There is no inference here that you should do what we have done: each of us in a unique life situation; all that we can ask of each other is we all do our very best.

First they came for the Socialists, and I did not speak out—
Because I was not a Socialist.
Then they came for the Trade Unionists, and I did not speak out—
Because I was not a Trade Unionist.
Then they came for the Jews, and I did not speak out—
Because I was not a Jew.
Then they came for me—and there was no one left to speak for me.
M. Niemöller, German Pastor

First they came for the fungi, and I did not speak out—
Because I was not a Fungi.
Then they came for the Dodo birds, and I did not speak out—
Because I was not a Dodo bird.
Then they came for the Bees, and I did not speak out—
Because I was not a Bee.
Then they came for me—and there was no one left to speak for me.
G. Kubanek, Franciscan Beekeeper



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