

What Is The Problem?

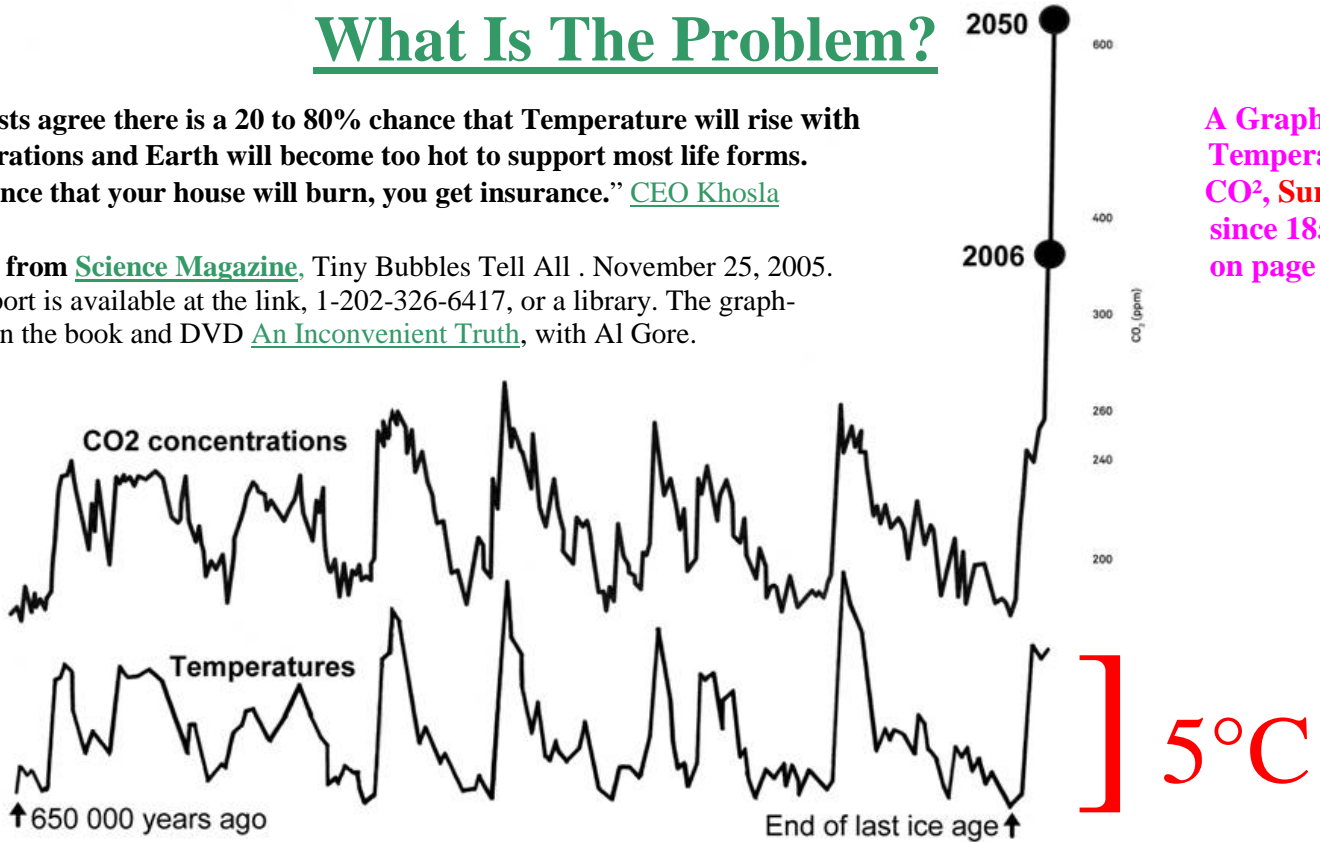
“Most scientists agree there is a 20 to 80% chance that Temperature will rise with CO₂ concentrations and Earth will become too hot to support most life forms. With 1% chance that your house will burn, you get insurance.” [CEO Khosla](#)

A Graph of Temperature, CO₂, SunSpots since 1850 is on page 6.

This graph is from [Science Magazine](#), Tiny Bubbles Tell All . November 25, 2005. The whole report is available at the link, 1-202-326-6417, or a library. The graph is also found in the book and DVD [An Inconvenient Truth](#), with Al Gore.

Other Experts:

- [NAAS](#)
- [Fun Reasoning](#)
- [US Cities](#)
- [Real Climate](#)

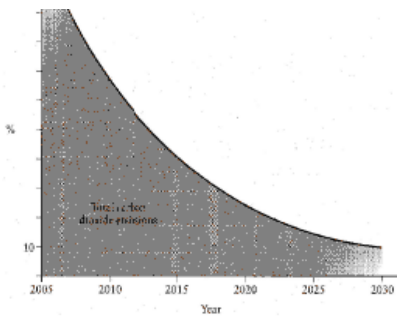


Other GHGs Methane (CH₄) and Nitrous Oxide (NO₂) have the same pattern as CO₂. “CO₂ concentrations are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.” [IPCC](#)

2005, [Joint Science Academies](#) of Canada, Brazil, US, China, France, Germany, India, Italy, Japan, Russia, and UK wrote: “Failure to implement significant reductions in net greenhouse gas emissions now will make the job much harder in future.”

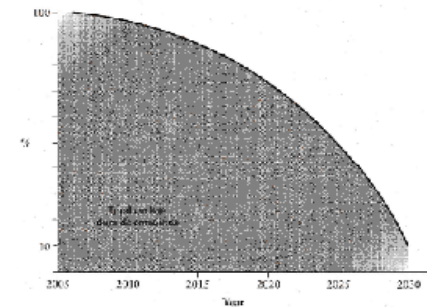
2007, [United States Climate Action Partnership](#) (GE, Alcoa, BP America, Caterpillar, Duke Energy, DuPont, and others) wrote: “The scientific understanding of climate change is now sufficiently clear to justify nations taking prompt actions. Each year we delay action to control emissions increases the risk of unavoidable consequences that could necessitate even steeper reductions in the future, at potentially greater economic cost and social disruption. **Action sooner rather than later preserves valuable options...**”

Fast CO₂ reduction => LESS TOTAL CO₂



The earlier reductions of CO₂ are essential for TOTAL CO₂ reduction. In his book “Heat”, George Monbiot shows how we need and can do a 90% reduction in CO₂ emissions by 2030 to avoid a disturbing future, but only by acting now.

Slow CO₂ reduction => MORE TOTAL CO₂



[HEAT](#)

[HERE'S THE PLAN](#)

[ANOTHER SPECIES OF DENIAL](#)

Bio-fuels (ethanol and bio-diesel) are

[A LITHAL SOLUTION](#)

(Excerpted from *Heat: How to Stop the Planet from Burning* by George Monbiot. Copyright © 2006 George Monbiot. Reprinted by permission of Doubleday Canada.)

“Except for giant meteorite strikes or other catastrophes every 100 million years or so, Earth has never experienced anything like the contemporary human juggernaut.” ([The Creation: An Appeal to Save Life on Earth](#), p. 84, 2006.)

“From excess CO₂ and species’ habitat destruction, 25% species alive today will be extinct by 2050 and 50% will be extinct by 2100, at current rates. Land and sea, animal and plant species are experiencing the same fate.” [E.O. Wilson 2006 12](#)

WITHOUT global warming problems, we all need to move to **sustainable habits very soon, or lose our habits.**
WITH global warming, we could lose much more than our wasteful habits.

What Can I Do To Lessen CO₂?

Think Globally. Act Locally. Remember: Every Tiny Bit Helps. Speak Up! Just Do It!

At Home: You can lessen your CO₂ output and lower your bills by more than 30%.

Page 2

- ❑ **Replace one regular incandescent light bulb with a compact fluorescent** using about 75% less energy and save about 70 kilograms (kg)/150 pounds (lb) of CO₂ a year per bulb replaced.
- ❑ **Move your thermostat down 1°C/ 2°F in winter and up 1°C/2°F in summer** and save about 900 kg/2000 lb of CO₂ a year, and you probably will not notice a difference.
- ❑ **Clean or replace filters on your furnace and air conditioner.** A clean air filter can save 160 kg/350 lb a year, as well as cut down on allergens. ❑ **Excellent Home or School Ideas** at [EPA Educational](#), [Cousteau.org](#), [Greenlearning.ca](#), and [Re-energy.ca](#).
- ❑ **Use less hot water.** Install a low-flow showerhead (saves 160 kg/350 lb per year) and wash your clothes in cold or warm water (saves 225 kg/500 lb per year). Use washer only when full. Hang clothes to dry inside or out, and multiply savings every time.
- ❑ **Turn off and unplug electronic devices.** Simply turning off your television, DVD player, stereo, and computer when you're not using them will save thousands of kilograms/pounds a year. If not using them for awhile, unplug things like hair dryer, cell phone chargers, or anything with a remote, like the TV off at the wall. The energy used to keep memory chips working accounts for 5% of total energy used and spews 18 million tons into our atmosphere every year!
- ❑ **Get a home energy audit and switch to green power.** Many utilities offer free audits to find where your home is poorly insulated or energy inefficient. You can save about 30% from your energy bill and about 450 kg/1000 lb of CO₂ yearly. Request energy from your utility company which is generated by renewable sources such as wind, geothermal, or solar, whether or not it is available yet.
- ❑ **Remove organic waste from garbage and stop landfill methane (CH₄) gas.** Start an aerobic (with oxygen) or no smell compost heap, and then a garden. It's Nature's brilliant recycling method.
- ❑ **Recycle more.** Save about 1100 kg/2400 lb of CO₂ yearly recycling half your household waste. Recycling any material uses a small fraction of the energy required to produce it originally. **Many materials are scarce and or non-renewable also.**
- ❑ **IF HOME IS THE FARM,** see next link for organic waste ideas for methane (CH₄) and nitrous oxide (NO₂): <http://www.climatechology.gov/> Then search the site with 'farm methane and nitrous oxides emission'. First listed is useful.
- ❑ **Generate electric power from cows:** www.pulseplanet.com/archive/Apr03/2907.html Use GHG, not emit them.

Shopping: If it's not bought, production stops.

- ❑ **Take your own bags.** If North American shoppers reused or refused bags and took an improved approach to household waste, over 500,000 tons of CO₂ and other greenhouse gas emissions end. That's like taking more than 160,000 average cars off the road for North America alone. This would stop increasing litter too. Please click: www.stopglobalwarming.org
- ❑ **Tell your supermarkets** to put doors on all freezers and coolers and to turn the lights down. Also, it's probably too hot in the winter and too cold in the summer, so tell them, and multiply your 'thermostat savings'.
- ❑ **Check the 'Energy Star' sites** <http://www.energystar.gov/> or <http://oee.nrcan.gc.ca/energystar/> They are treasures of ideas.

On the Road: About 30% of CO₂ emissions come from cars, trucks, and airplanes.

- ❑ **Turn off vehicles not moving.** If 1% of the running time for **each car** is 'not moving' time, an extra 73 pounds or 33 kg of CO₂ per year are put into our atmosphere. This means for North America only, a total of 22,000 pounds = 10 000 kg = 10 tons of useless CO₂ per year, for idling cars only. A :06 warm-up for a :60 drive, multiply by 10. A :06 for :06, times 100...
- ❑ **Reduce your mileage.** Avoiding just 16 kilometers(km)/10 miles(mi) each week would stop about 225 kg/5 00 lb of CO₂ a year! Combine errands. Walk/bike local errands. **Fly less, if at all.** Jets do far more damage/person, even at full load, than most land vehicles for each mile or km covered and jet planes go very long distances. **Car pool** and stop tons of CO₂ daily.
- ❑ **Keep your vehicle tuned and your tires properly inflated.** When just 1% of car owners properly maintain their cars, nearly a billion pounds of CO₂ are kept out of the atmosphere. Properly inflated tires can lessen gas use more than 3%.
- ❑ **When it's time for a new car, choose a fuel efficient one.** You can save 1400 kg/3000 lb of CO₂ every year if your new car gets only 3 miles per gallon (mpg) more. Hybrids can get up to 60 or 70 mpg or 4 L/100 km. For Earth friendlier vehicles check: <http://www.epa.gov/autoemissions/> Also helpful is the fuel consumption and general purpose converter at: optusnet.com.au.

At Work: Walk or bike to work and lunch. Try to work from home. Pass along these and your ideas.

- ❑ **See** What a Business Can Do on p.3, What Sustainable Energy Options Are on p.4, and What Legislators Can Do on p.5.
- ❑ **Ask** a business or legislative person to look at this information somehow, maybe with a note saying, for example, "My hope is that, once you've reviewed and considered this, you might pass it on to each of your colleagues for their review and consideration." Maybe suggest it be read with web-access and a good Reader.
- ❑ **Print** these first two pages (back to back saves paper) and keep them in a pocket. If someone leaves their car running for example, then just give them the page, with a very brief and pleasant explanation.

This document is updated at <http://edmc.net/~crystal/problem-solution-climate-change.pdf>

What Can I Suggest Organizations or a Business Do?

What is 'healthy' company culture?

Page 3

“For us, sustainability is not the low-hanging fruit of recycling or changing light bulbs, although those are very important steps; what we call **the next industrial revolution** is a momentous shift in how we see the world, how we operate within it, **which systems will prevail, and which will not.**

While there is no one solution to the impact we now have on the Earth and its ecosystems, the company shares one vision: to lead the way to **the next industrial revolution of the 21st century.** We realize it's a daunting task, but **it's making us competitive today and sustaining us for future growth.**

Interface has laid out a path designed to achieve sustainability on seven ambitious fronts.

The first is to **eliminate waste.** The first step to sustainability, QUEST - quality utilizing employees' suggestions and teamwork - is Interface's campaign to eliminate the concept of waste, not just incrementally reduce it.

Second is **benign emissions, a prioritized focus on eliminating emissions that have negative or toxic effects on natural systems.** Interface has identified 192 stacks as point sources for air pollution in North America, Europe, and Asia. Although all Interface companies comply with current environmental regulation, **our goal is to move beyond compliance and eliminate emissions completely.** Interface's Cool Carpet products carry climate-neutral third party certification, negating greenhouse gas emissions throughout the life cycle of the product.

(Note: Chimney stacks spew sulphur dioxide (SO₂) and nitrogen oxides (Nox) = Acid Rain. Search www.ecocentre.org.uk/ with 'Acid Rain')

Third is **renewable energy,** reducing energy demands of Interface processes while substituting non-renewable sources with sustainable ones.

Fourth is **closing the loop,** redesigning Interface processes and products into cyclical material flows.

Fifth is **resource-efficient transportation,** exploring methods to reduce the transportation of both materials and people.

Sixth is **sensitivity hookup,** creating a community within and around Interface that understands the functioning of natural systems and our impact on them.

Seventh is **redesign of commerce,** redefining commerce to focus on the delivery of service and value instead of the delivery of material, and **engaging external organizations to create policies and market incentives that encourage sustainable practices.”**

“This 12-year journey has brought **reassuring success and double-digit business growth.** We have seen **profits grow, exports increase, increased employment, and elevated quality and performance of product, while experiencing renowned brand recognition.**

In the last twelve years, some highlights of the Canadian facility's achievements include a total savings through sustainability efforts of \$13 million US and \$299 million worldwide.

We eliminated 9 out of 11 air emission stacks at Interface in Belleville, and we revoked the certificate from the Minister of the Environment. There was **69% of fossil-fuel-based energy reduction, 64% greenhouse gas reduction, and 92% reduction of indoor air pollution** from our products. We received the Ontario Lung Association acknowledgement through Movement for Clean Air Now, C.A.N. DO, until the program ended recently.

In 2006 we switched to 100% renewable electricity through the purchase of renewable energy certificates.

We have a zero-effluent facility through elimination of all process-connected sewage pipes. Carpet industries are known for a heavy amount of effluent, but the facility in Belleville is zero effluent. There are no effluent pipes attached to any process.

Water usage is down by 93%, landfill use is down by 97%. Last year alone, 800,000 pounds of post-consumer carpet were recycled.

We have third party certification such as EcoLogo, EPP, climate-neutral, ISO 9001, and ISO 14001... (Note: These sites are listed below), **employee awareness and incentive programs that reward sustainable practices; and above average employee pay increases.**

In essence, a sustainable business model means doing well by doing good. **We encourage the enactment of policy regulations and incentives for clean air. We also encourage governments at all levels to use the leverages they have at their disposal,** for example, to use greener procurement policies”

Senator: “What do you expect the new law to deliver for incentives making it possible for you to continue improving your performance?”

Interface Flooring's Rahumathulla Marikkar continued: “In terms of the new law, to improve the air quality in general, it's to **incent with market-based mechanisms.** We have green procurement policies within governments, and there are also many private sector organizations that look for greener products. We have a mechanism with EcoLogo to certify the top 20 products. **If there is a market-based mechanism, we take out the rhetoric** and we start moving industries in **the right direction on their own,** and it will also pull the others toward it.

Regulation-wise, we encourage the policy-makers to **regulate the bottom 20 in each sector.** It has to be considered sectorally, and then I think we will have a better direction.”

To hear Interface CEO Ray Anderson and more, please click: www.interfacesustainability.com/

EcoLogo <http://www.environmentalchoice.com/#> (is in Spanish, French, and English)

Climate-Neutral <http://www.climateneutral.com/>

ISO 14001 <http://www.bsiamericas.com/EnvironmentGateway/index.xalter>

EPP <http://www.epa.gov/epp/>

ISO 9001 worldwide <http://www.sgs.com/>

www.pembina.org has access points for all sized businesses.

"The challenge to find the right survival strategies has never been greater; and we have to find them now. Time and energy resources are both running out. Squander them on the wrong technologies and the consequences will be catastrophic. Choose the right options and we can mitigate global warming and thrive in a greener, cleaner post fossil fuel planet." This is from the preface to [Which Energy](#) which is **a must read**. The Executive Summary sections of Which Energy are: Nuclear, Bio-fuels, Wind, Solar, Wastes, and Food & Energy.

Sustainable or Long Term Renewable

Wind to Electric: [Archer and Jacobson](#) "conclude that wind could generate power equivalent to 35 times current global electricity use. Good locations are far more common than previously thought", said Archer. [Recently](#), Stanford University's Jacobson explained, "In the US, we can replace all the gasoline and diesel vehicles on the road with between 72,000 and 120,000 large wind turbines, **requiring little space, especially compared to growing corn, sugar cane, or other crops for bio-fuels like ethanol. It's also a nice distributed energy source.** It's not like a nuclear power plant which could be a target for a terrorist attack. Wind turbines are geographically spread out, so it would be almost impossible to cause disruption." Jacobson explains that turbines do kill birds, but if all the world's power came from wind, the number killed would still be far less than the current US communication tower kill. More important, "if we did this conversion to wind turbines, you would save 800,000 human lives each year worldwide from outdoor air pollution." If there are twice the birds as humans, that's 1,600,000 birds saved each year.

Solar to Electric: "Solar cells even at a low 10 percent energy conversion efficiency could satisfy the world's energy needs with just over 0.1 percent of the earth's surface." See [page 7 of Which Energy](#) for possibilities.

Hydro or Battery storage for Wind and Solar electricity: Battery or Hydro are technologies that can be used to store wind or solar for calm days or night use. Electric power from wind or solar sources can be stored by pumping water up when the sun is bright or the wind is strong and there is extra electricity. Later at night time or when there is no wind, the water can flow down when the electricity is needed. Computers can control the systems according to demand.

Bio-gas from wastes: "Wastes may be the most important source of sustainable renewable energy in a post fossil fuel economy. Treating wastes to recover energy prevents them from polluting the environment, and harvesting energy from organic wastes saves carbon emissions twice over, by preventing carbon emissions that would otherwise have gone into the atmosphere, and by substituting for fossil fuels." See [page 8 of which-energy](#).

Geothermal in some areas should be the first choice for whole communities and cities.

Nuclear Fusion: (Not Fission. See below.)

Unsustainable or Long Term Non-Renewable

Bio-fuels (ethanol, bio-diesel): [Three research sources](#) show how **bio-fuels will increase CO₂ concentrations.** Stanford University's [Marc Jacobson](#), summarized in 'three research sources', has shown that bio-diesel and ethanol emit 50% more CO₂ than regular diesel and gasoline because of the whole chain of producing bio-diesel and ethanol. This analysis excludes consideration of wasting extra water and forest destruction, all for our short lived unsustainable pleasures. "Gasoline may be bad, but ethanol is worse." [Jay Ingram](#) Jacobson also found that if all the vehicles in the US were converted to ethanol (E85) by 2020, deaths in the US would increase from the 10 000 deaths per year now, from extra ozone we would then be breathing. This is also true for the ethanol content of biodiesel.

In Monbiot's brief article [A Lethal Solution](#) he calls for a 5 year stop of bio-fuels, to think through it more. It looks like the **growing love affair with bio-fuels could be our final and lethal blow to our planet**, if not stopped.

Fossil Fuels: gasoline, diesel, oil, natural gas, and coal: Because of their carbon content and their CO₂ emissions when used, these are a large part of the problem. Carbon Capture and Storage (CCS or Carbon Sequestration) is outlined in Note 2. Major negatives of CCS are given at [Which Energy](#).

Nuclear Fission: Like fossil fuels, the fuel uranium may last 100 years at current use rates at most, but waste storage or spillage is lethal now and for many generations to come. Short term, explosive proliferation issues are fatal for fission.

If you would like to leave the world, its people, and your children in a sustainable culture, then you will have left them in a better place than you found.

What Can I Suggest My Legislators Do?

All Legislators

- To review what a healthy organizational culture looks like** (Page 3).
- To identify sustainable energy sources** (Page 4), then encourage and discourage them legislatively.
- To promote awareness** of the well defined problems and solutions.
- To re-evaluate** priorities and policies in view of the newly uncovered realities.
- To re-evaluate** solution initiatives, with rapid feedback loops for learning and adaptation.

Local

- To inform** all residents of the importance of household **recycling of all organic and non-organic materials**.
- To initiate** an electronic car pool and other measures approaching the ideal: <http://www.ecocitybuilders.org/>
- To replace** the current wasteful public streetlight lights with CFL-like lights **now**, or do without until possible.
- To motivate** local innovative efforts with serious rewards for home-grown “cool” ideas, for each age group.

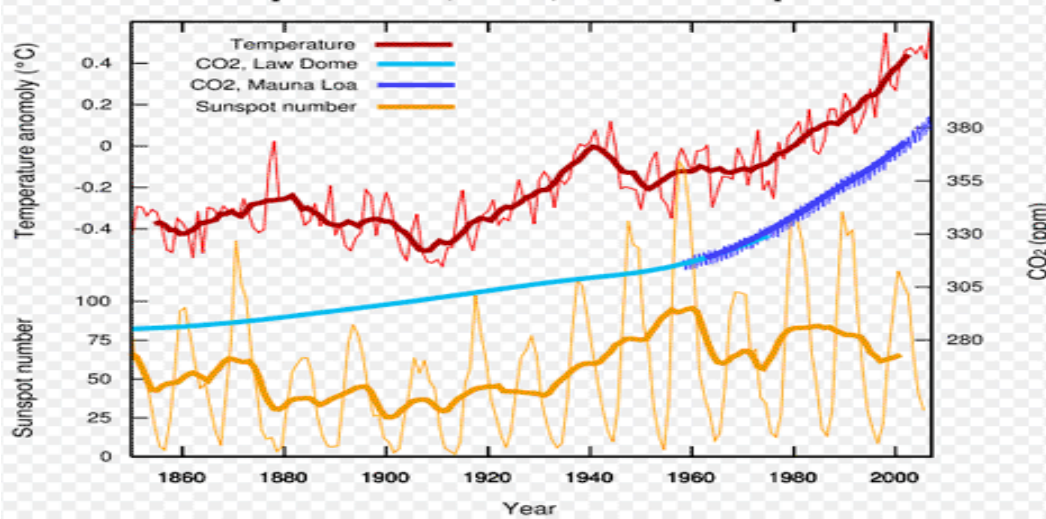
Provincial/State and National/Federal

- To ban incandescent lights** where there are Compact Florescent Lights (CFL) available.
- To tax** 20¢ per retail bag taken. Eliminates 90% of their production CO₂ and a lot of litter everywhere.
- To check** www.fiscallygreen.ca **for strategies**. No ‘feel good’ fantasy offset programs, real CO₂ reductions now.
- To require all** frozen and cooled food display cases to have doors of a minimal thermal resistance. A huge wastage of energy comes from the battling of heating and cooling systems. Retail wastes 5 times warehouse systems. Encourage the latter.
- To expedite recycling** with a view to wasting no material, by legislating that any sellers of any type of goods-including-packaging (GIPs) be required to accept back all used-up or unused portions of those GIPs and ensure they are recycled **completely**. The transport system that delivers the GIPs is used to remove to recycle locations beside supply houses.
- To rapidly lower** Green House Gas (GHG) emission maximums for all industries, by industry, and for all types of vehicles (cars, trucks, and airplanes), as well as all heating and cooling systems. Remove loopholes and ban low mileage/person vehicles.
- To introduce new** building and renovation specifications approaching the German Passive House standard. Before renting out, require landlords to meet the new standards. Owners with fewer means to upgrade need help.
- To decongest transport** congestion and stop unsustainable expansion of current GHG emitting methods by doing a **complete rethink** of transport systems, **not expanding** them. Include urban, inter-urban, roads, rails, air, and sea. Promote globally.
- To legislate** that **ethanol** must be made from inedible substances and that it must be shown to use less fossil fuels than ethanol produced. Flex Fuel Ethanol is a sad fad promoted by powerful interests. The real CO₂ costs of producing it are not advertised, costs from land use change, water use and fossil fuels to make and transport it. Rainforests converted to sugar cane or palm oil and edible crops like corn used for ethanol will be devastating to our currently alive planet. If all the corn in the US were used for ethanol, then about 5% of US gasoline is supplied. Spoiled business/political influences need recycling. Please see Which Energy Sources are Sustainable, Page 4.

National/Federal and Planetary

- To preserve** domestic natural plant and animal **habitats**, land and sea, **and aggressively promote expanded protections** for the critically important “Hot Spots” of the Planet. See E.O. Wilson references, Rose interview, Page 1..
- To RFP** (request for proposals) **immediately** for Planet-wide large scale renewable energy programs, such as massive wind farms, wherever constant strong winds are, and massive desert solar farms as close to the equator as possible, both of which could utilize the very efficient long distance DC lines. These renewable energy sources will replace our current high GHG emitting non-renewable energy sources, preserving non-renewables for longer term needs, Note 2.
- To facilitate** development of **hydrogen** technologies and hydrogen transport lines **for home heating and power**.
- To require gas stations** to exchange batteries and recharge them by the DC lines. See Monbiot references, page 1.
- To resolve**, with all other Nations, **to set and keep** strict Planet carbon cap reduction targets, approaching 90% by 2030. **With regional representatives, to distribute** the national apportionment, about 40% as personal carbon use caps, with some appropriate variations. The remaining 60% is auctioned off to companies, **creating very powerful incentives for low-carbon technologies**. This is fair and would **eliminate virtually all micro-regulation implied in above points**.
- To begin personal caps** a bit below current consumption and then lower personal caps rapidly, approaching 90% reductions in overall National and Planetary emissions by 2030.
- Please read Note 3.**

Temperature, CO₂, and Sunspots



For each color, the thick line is a moving average (mean) of the thin line. Each thin line is made from the most accurate data points available for that time.

Some questions are:

Is the sun or CO₂ causing temperature ups and downs and WHEN?

How do CO₂ levels of the graph at left compare with those of the much longer time period graph on page 1?

Can you see that the CO₂ in 1850 was already above 280 (ppm) and that 280

is already above the highest CO₂ of the past 650 000 years? Reasons for this? Some people have been burning lots of coal for at least a few hundred years and clearing land for agriculture for at least a few thousand years and the old fashioned ways for both of these human activities put lots of CO₂ and other GHGs into our atmosphere. Both coal use and land clearing continues at an increasing rate today, as well as oil uses. Another Question: What causes the quickened up trend of CO₂ since 1960?

[David](#) said, "Pick your conclusions to support your data, not vice versa. That's the difference between science and propaganda."

Note 2 CCS is a temporary non-renewable and non-sustainable solution. Solutions are either sustainable and renewable or not. Carbon Capture and Storage (CCS) is the same as Carbon Sequestration and is a solution applied to unsustainable and non-renewable resources and so is as temporary as those resources. CCS is for non-renewable fossil fuel resources like coal and oil. Today these are used in ways which waste NON-renewable resources which should be preserved for many longer term needs. CCS will extend this wasting of these non-renewable for things like transport, heat and lights. **By postponing a shift to sustainables through CCS, we waste our non-renewables at an accelerated rate. Alone, CCS gives a totally false sense of progress.**

Still, NRDC's David Hawkins says of CCS, "While the technology is promising, taxpayers' investment in clean coal (CCS) have come up short. This has been more of a success in terms of the industry getting subsidized, than it has been a success in terms of actually advancing the state of the art. **The real advances in pollution control have come from the adoption of laws requiring these power plants to clean up.** The technology is there to do it. The economics are entirely feasible if we have the policy support in the form of a mandatory global warming law." February 21, 2007/NBR/PBS [NRDC Research](#)

A cleaner implementation of CCS processes would occur with a simultaneous drive to increase sustainable energy capacity. China continues to rapidly build many huge coal fired generators with no CCS. They will need a CCS technology soon.

Note 3 Some 2,350 years ago, in The Republic, Plato identified the worst form of government as the one governed by the demons, democracy, mainly because of his underlying conclusion that correct action is the result of knowledge, and how could everyone get enough knowledge and quiet down the usual societal pressures (demons) to give correct guidance to the republic or nation?

Sir Winston Churchill said, "Democracy is the worst possible form of government...until you consider the alternatives." Few believed Churchill was right about Hitler until The UK was hit over the head by Hitler, easily focusing the minds of UK citizens. The US experienced an identical experience at Pearl Harbor and within weeks General Motors, Ford, and Chrysler had converted their production lines to whatever was needed to engage the 'well defined problems'. Today, we have 'well defined problems', but we have yet to convert our production lines to whatever is needed to engage un-sustain-ability. **But quick effective engagement has been shown as possible in past.**

Today, democracy faces a huge test. How can correct action be achieved by democracies when everyone needs to know and everyone needs to try to fend off the usual social demons, and only the 'poorest' are being hit over the head as yet? In our long history, we humans have survived because we primarily focus on the present, meaning scientific or imaginative thought comes second to escaping from being eaten by some animal. We remake the past and predict the future almost exclusively on the basis of only our present situation. When everything is pretty good, how can we see beyond that? If we are having problems, how can we see beyond a short term solution? Can democracies today overcome Platonic conclusions and spread the calm awareness and knowledge needed to get planet sustain-ability soon enough? If we all do our part, it is very likely. [Tyndall Research](#)