

CO₂ Is All Over - Where Can We Reduce?

POUNDS OF CO ₂ RELEASED BY . . .		
Long distance bus	0.2 lb CO ₂ per passenger mile	Routes designed so buses are full
Train	0.4 lb CO ₂ per passenger mile	Same for local & long distance trains
Local bus	0.7 lb CO ₂ per passenger mile	Bus empty much of route; many stops
Car	1.2 lb CO ₂ per mile at 28 mpg	Website shows how 52mph saves CO ₂ ! 52 Saves CO ₂ !
	1.8 lb CO ₂ per mile at 17 mpg	
Airplane	1.2 + 230÷miles per passenger mile	Plane, car, bus & train include making vehicle, fuel, roads, rails, airports, etc.
Telecommunication	0.6 lb CO ₂	Based on fuel & other inputs for each sector in the economy
Hotel, restaurant	1 lb CO ₂ per dollar spent	
Construction	1.3 lb CO ₂	

POUNDS OF CO ₂ RELEASED WHEN THEY MAKE & DELIVER . . .		
Computers	0.3 lb CO ₂ per dollar spent	
12 oz. bottle	0.38 lb CO ₂ for glass bottle, 0.15 for plastic, 0.28 for alum. can	
Red meat	22 lb CO ₂ per lb of product	Recycling saves 90% of CO ₂ in plastic & aluminum, 40% in paper, glass, steel
Dairy, eggs, chicken	4-6	
Veg, oil, carb	2-3	
Plastic, paper, etc	1-2	

For all sources: Please link to: CO2List.org

CO₂ Dividend: A \$1,300 annual dividend paid to every citizen, funded by 3¢ fee per pound of CO₂ could reduce CO₂ enough (UN Development Program). We can stop extinction of 35% of bird species, 52% of amphibian species and 72% of coral species (IUCN). 09Dec11

For a perspective on CO₂, each of the following releases one ton (2,000 pounds) of CO₂:

- 90 lb of **red meat** (methane from cows, N₂O from nitrogen-fixing bacteria on feed)
- 300 lb of **chicken, fish or eggs** (N₂O from growing grain they eat)
- 500 lb of **dairy** (methane, N₂O, farm equipment)
- 700 lb of **cereal or carbohydrate** (N₂O & farm equipment)
- 1,200 lb of **fruit or vegetables** (N₂O & farm equipment)
- 1,000 lb of **paper or plastic**
- 1 year of **electricity** at constant 100 watts
- 26 square feet of **living & working space** (building it)
- 100 square feet of **solar collectors** (manufacture)
- 20,000 gallons of **hot water** (heated 55°F with gas; solar would allow far more)
- 700,000 disposable **plastic bags**, recycled
- 1,600 passenger miles in a **plane** All include making vehicle, road, rails, airports, etc.
- 1,600 miles in a **28 mpg car**
- 2,000 miles in a **40 mpg car** Most efficient car speed is 46-53 mph. 52 saves CO₂!
- 3,000 passenger miles in a **local bus** (bus empty much of route)
- 3,000 miles **walking** (producing food, shoes & sidewalk)
- 5,000 passenger miles in a **train**
- 8,000 miles **bicycling** (producing bike, bike lanes & food, or electricity for e-bike)
- 12,000 passenger miles in a **long distance bus** (routes designed so buses are full)
- \$1,700** of spending. On average, **\$1,700 spent in the US** releases a ton of CO₂. So does:
- \$1,500** of spending on **construction** (energy, making concrete, other materials)
- \$2,000** spent on **hotels or restaurants** This card: 1 oz CO₂
- \$3,000** spent on **education, health, telephone, internet** Mailing it: 1 oz CO₂
- \$7,000** spent on **computers** For all sources please link to: CO2List.org

POUNDS OF CO₂

Gallon of Gas or Equal Energy (=37 Kilowatt Hours)

- Electricity** ██████████ 66 lb CO₂ USA average
- Hydroelectric** ██████████ 35-400 lb CO₂ from flooded plants
- Ethanol** ██████████ 35 lb CO₂ to grow crops, clear land
- Coal** ██████████ 30 lb CO₂ when used for heating
- Gasoline** ██████████ 24 lb CO₂
- Natural Gas** ██████████ 19 lb CO₂
- Nuclear** ██████████ 10 lb CO₂ mine, process, defend waste
- Wind** ██████████ 4 lb CO₂ from construction & land clearing
- Solar** ██████████ 2 lb CO₂ from manufacture

USA 44,000 pounds CO₂ per person per year

Earth Average 11,000 pounds CO₂

China 7,000 pounds CO₂

Goal 2,800 pounds CO₂ (will still warm Earth 2°)

India 2,400 pounds CO₂

One way to encourage cuts in CO₂ is to give every citizen a \$1,300 annual dividend, paid for by a 3¢ fee per pound of CO₂. The dividend brings all money from the fee back to the public, while the fee makes people look for cuts in CO₂.

UN Development Program says 3-5¢ per pound of CO₂ will cut enough. International Energy Agency says 9¢.

Each 1¢ fee raises prices \$20 per ton of CO₂: 90lb of red meat will cost \$20 more, so will driving or flying 1,600 miles.

Reasonable, and enough to encourage conservation.

COOLING THE EARTH

To hold climate change to 2°, we would have to reach a goal of 2,800 lbs CO₂ per person per year (44,000 lbs now in US, 11,000 lbs worldwide). If we cannot cut that far, we have to cool the earth. A study by Lenton+Vaughan compares cooling proposals. All have **huge side effects**. They make these four points:

"By 2050, only stratospheric **aerosol injections or sunshades in space** have the potential to cool the climate back toward its pre-industrial state..."

"[L]arge **reductions** in CO₂ emissions, combined with global-scale air capture and **storage, afforestation, and bio-char** production, i.e. enhanced CO₂ sinks, might be able to bring CO₂ back to its pre-industrial level by 2100,

"[S]tabilising CO₂ at **500 ppm**, combined with **[more reflective]**... clouds, grasslands, croplands and human settlements might achieve a patchy cancellation..."

"**Ocean fertilisation** options are only worthwhile if sustained on a millennial timescale... Enhancing ocean upwelling or downwelling have trivial effects on any meaningful timescale."

Of all the options, **bio-char, reflective roofs, and reduced soot** seem to have the least harmful side effects.

Print 2 sides on card or cover stock. Cut four 2-sided postcards

To:

To: