Seven Ways to Reduce Carbon[1]

To the tune of *Fifty Ways to Leave Your Lover*, by Paul Simon

Viewable on YouTube at
http://www.youtube.com/watch?v=-wcDHZ7Z-hQ

Lyrics by Glenn Wolkenfeld
Based on the work of S. Pacala and R. Socolow

The climate forecast it seems grim, she said to me
If parts per million CO_2 gets much past 350[2]
In 1800 it was only 280[3]
We must find, seven ways to reduce carbon

Seven billion tons of carbon we put out last year, [4]
Without reductions, the outcome is so clear,
More than 500 ppm, it fills me up with fear[5]
We must find seven ways to reduce carbon,
Seven ways to reduce carbon

CHORUS
Boost fuel economy, Dee[6]
Drive our cars less, Bess
Turn down the watts, Scott
In your buildings and homes
Raise coal efficiency, Lee
When making electricity[7]
Burn gas not coal, Lowell
To get carbon control.

Start CCS, Jess[8]
Make H_2 for cars, Lars
Don't cut those trees, Louise
They absorb CO_2
Increase wind 80 fold, Joel
Main thing's to burn less coal,
Get past fossil fuels, Jules
And keep the Earth cool.

She said there's one idea which might work like a charm,
It's carbon stabilization, with a triangular form,[9]
Stabilization means we might not over warm,
It's part of seven ways to reduce carbon.

A stabilization wedge is carbon not released
Twenty five billion tons of carbon makes one piece.
Twenty five billion over half a century
Amounts to one fine way to reduce carbon,
And we need seven wedges of cut carbon

CHORUS

Some other ways, she said, will help us earn this prize,
Human population quickly needs to stabilize,[10]
Past another billion souls there should be no more rise,
If we want any way to reduce carbon

Reduction policies, they should be on fast tracks
We need carbon fees and rebates, or a carbon tax[11]
It's time to move it's time for all to face the facts
We must find seven ways to reduce carbon,
Seven ways to reduce carbon.

CHORUS

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[1] Why seven? Seven refers to seven *carbon wedges*, each representing a 25 billion ton reduction in carbon emissions over the next 50 years. Cumulatively, that would amount to 140 billion tons of carbon not emitted into the atmosphere, which would stabilize carbon emissions at its current level of 400 ppm (parts per million: see note 2 below). Read *A Plan to Keep Carbon in Check*; September 2006; Scientific American Magazine; by Robert H. Socolow and Stephen W. Pacala. These ideas, along with other resources, are also accessible at the Carbon Mitigation Initiative website, http://cmi.princeton.edu/.

[2] 350 parts of CO_2 (carbon dioxide) per million parts of other atmospheric gases (mostly nitrogen and oxygen). Climate scientist James Hansen regards this as the maximum safe limit of carbon dioxide to avoid catastrophic climate disruption. See *Storms of My Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity,* James Hansen, 2009. See also www.350.org

[3] http://www.noaanews.noaa.gov/stories2008/20080423_methane.html

[4] See note 1 above.

[5] 400 ppm also fills me with fear, but it's hard to imagine that CO_2 concentrations will stabilize much below 500 ppm, unless immediate, sustained and effective measures are taken. "**Carbon dioxide** concentrations … in the atmosphere will increase throughout the 21st century according to all IPCC scenarios. The scenarios project CO2 concentrations ranging from 535 to 983 parts per million (ppm) by 2100, which is 41 to 158 percent higher than current levels." U.S. Environmental Protection Agency, http://www.epa.gov/climatechange/science/futureac.html.

[6] See note 1 above. Socolow and Pacala list fifteen potential ways to produce a carbon wedge. Other methods not explicitly listed (or alluded to) in the song include expanding conservation tilling (because plowing releases CO_2 from the soil) and using nuclear power to displace coal-generated electricity. You can easily drop in "Don't plow that dirt, Burt," and "Build a few nukes, Luke," into your own version of the song.

[7] See above, Socolow and Pacala. Coal plants are typically about 40% efficient. Improving efficiency to 60% at 1600 large (one gigawatt) plants would amount to one carbon wedge.

[8] Carbon Capture and Storage. I'm skeptical about it (the scale of carbon dioxide from coal burning is enormous) but if it were feasible, CCS could amount to as many as three wedges. See above, p. 53.

[9] See above, Socolow and Pacala. The Carbon Mitigation Institute has developed this into a game. See http://cmi.princeton.edu/wedges/game.php

[10] See above. Socolow and Pacala, p. 55.

[11] See above. Socolow and Pacala, p. 55-6, for a brief discussion of carbon pricing. A more in-depth discussion by Ralph Nader and Toby Heaps is available at the Wall Street Journal Online, http://online.wsj.com/article/NA_WSJ_PUB:SB122826696217574539.html