

Phasing Out Other Greenhouse Forcings

Throughout this book we have concentrated on phasing out fossil fuels. But between a quarter and a third of human caused global warming is due to other greenhouse gases and the destruction of sinks. When examined closely we will see that most of either can be controlled by actions required to control fossil fuels or fit naturally with that actions we are taking to do so:

- 1) Methane. A great deal of methane is released into the atmosphere by coal mining which this book proposes phasing out or reducing drastically. (To the extent we continue to mine coal we can burn most of the methane released - reducing its impact.) Obviously natural gas production releases methane as well, since natural gas is methane. Much of the remaining methane is due to agriculture; no-till rotational cropping can reduce this in row cropping. Intensively managed rotational grazing provides some reduction on the livestock side; carbon sequestration from soil building more than makes up for methane emissions; both livestock raising and row cropping become modest greenhouse gas sinks, rather than significant sources.
- 2) Nitrous oxide (N₂O) – mostly a product of artificial nitrogen fertilizer – whose use we propose eliminating (without lowering food or fiber production).
- 3) SF₆ - probably the highest impact greenhouse gas per gram of material; we described how to deal with it in the material impact subsection on computer monitors.
- 4) Perfluoro Compounds – can be dealt with an a manner similar to SF₆ the use of substitutes where possible, the capture and recycling where they must be used, and the development of replacements in the long run to let them be phased out.
- 5) Hydrofluorocarbons - used in refrigeration and air conditioning. They are being phased out in any case for the sake of the ozone layer. Although many advanced substitutes have been developed, probably ammonia and carbon dioxide are the best gases to use for these purposes in the long run. (Yes both greenhouse gases, but in the small quantity used in refrigeration and air conditioning will not be a problem compared to other refrigerants. Yes ammonia is poisonous – but ammonia water refrigerators contained it safely for decades; using ammonia safely as a refrigerant is a mature technology.)
- 6) NO_x – not a greenhouse gas, but a sometime precursor of greenhouse gases. Produced from any type of combustion in the presence of nitrogen. Production of electricity completely from non-combustion sources, along with reductions in material intensity and greater industrial efficiency will reduce this a great deal. Methods specific to reducing NO_x are dealt with to some extent in the pollution prevention section of the material intensity chapter.
- 7) Deforestation – we dealt with reducing this by ~60% overall in various sections of the material intensity chapter (Paper, “green” chemistry and biomass energy).
- 8) Cement production – we dealt with that in the material intensity chapter subsection on buildings.

- 9) Soil erosion – a fair amount of carbon is stored in healthy soil. No-till agriculture, and soil conservation tillage, can help turn agriculture from a carbon source to a carbon sink. We dealt with that in the material intensity section on food.