

Bioenergy, Deforestation, and the LCI Boundary

LCA 2008

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Certification proposals invoke LCA

RSB Version Zero: 3.b) [GHG] [e]missions shall be estimated via a consistent approach to lifecycle assessment, with system boundaries from land to tank.

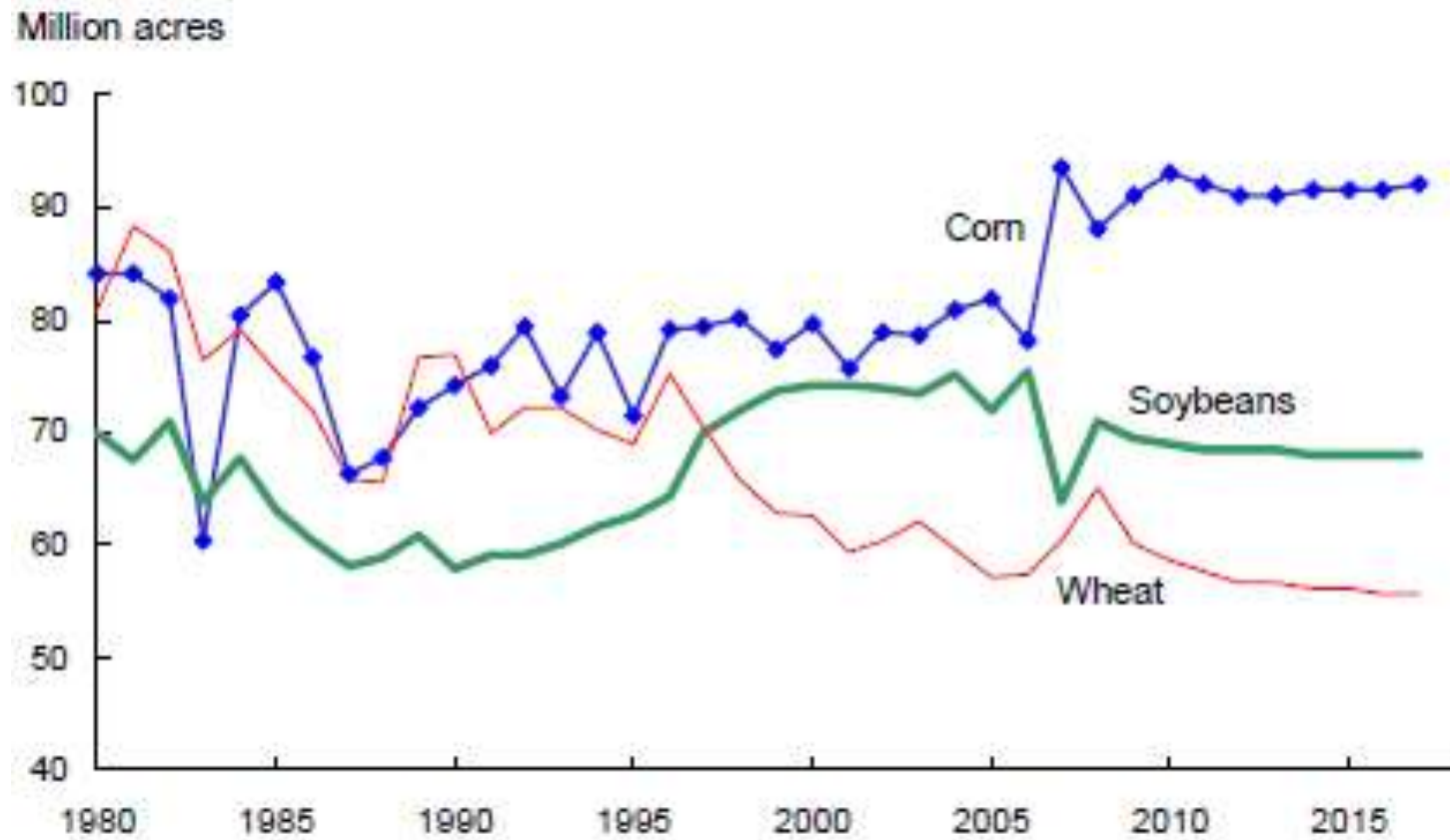
AB 1007: 43866 (a) The plan shall include an evaluation of alternative fuels on a full fuel-cycle assessment of emissions of criteria air pollutants, air toxics, greenhouse gases, water pollutants, and other substances that are known to damage human health, impacts on petroleum consumption, and other matters the state board deems necessary.

EU Proposed Directive:

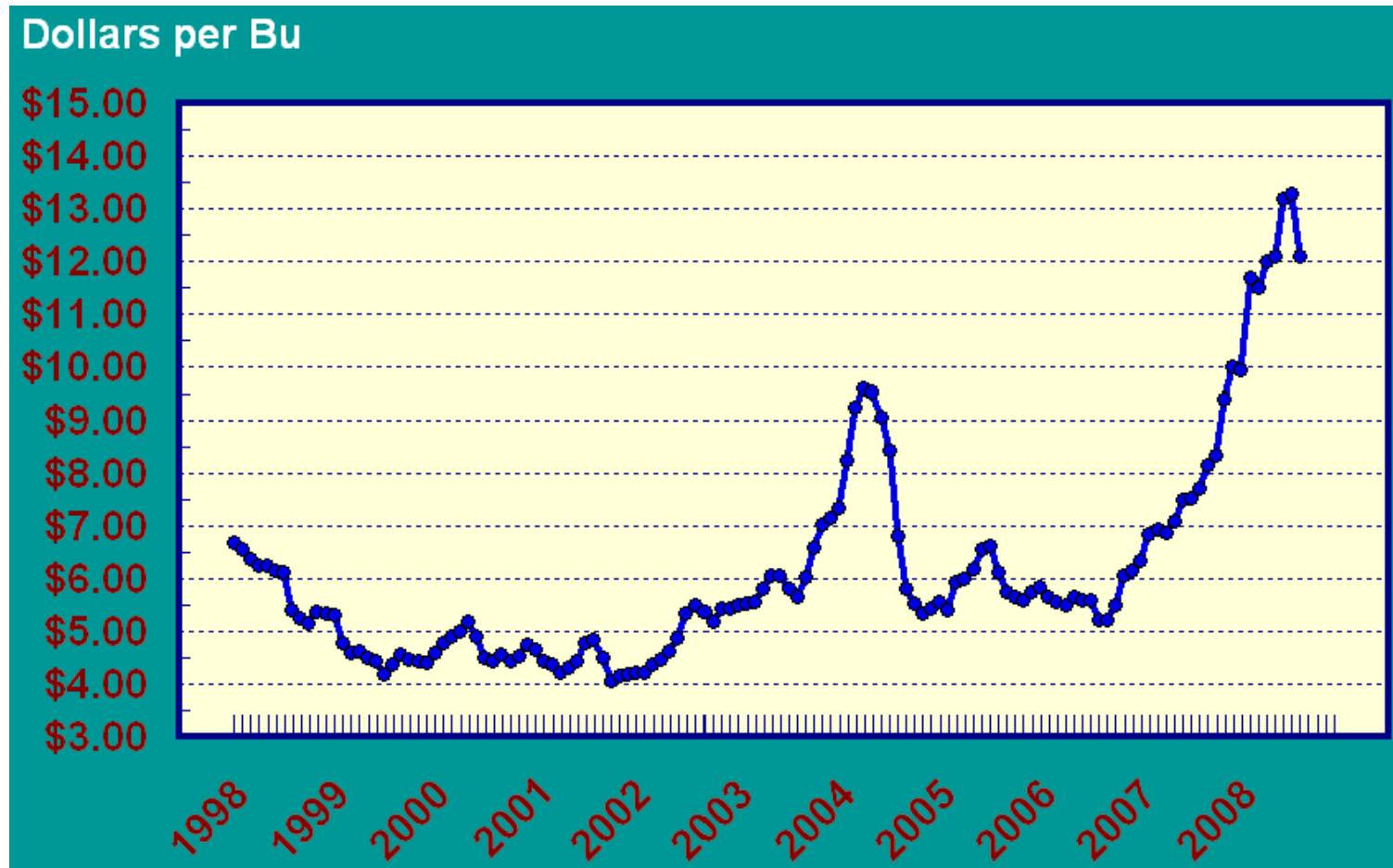
Annex VII: $E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{ccs} - e_{ccr} - e_{ee}$.

(3. Biofuels and other bioliquids taken into account for the purposes referred to in paragraph 1 shall not be made from raw material obtained from land with recognised high biodiversity value)

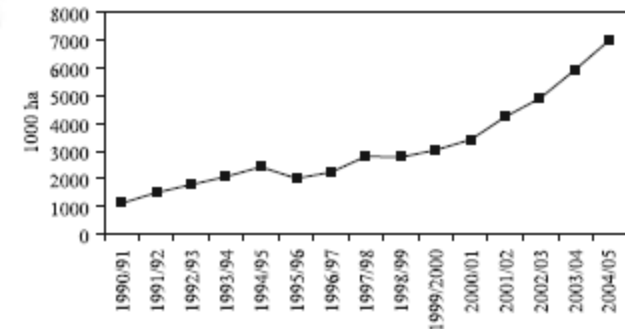
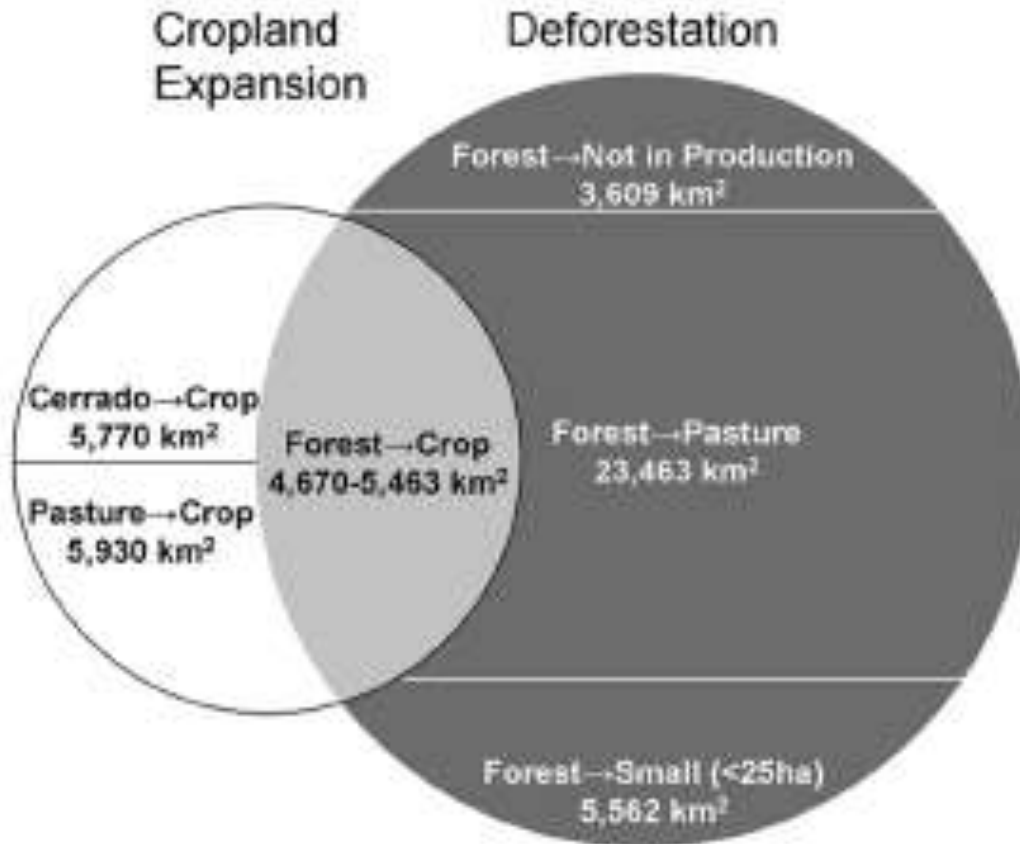
In the U.S., Corn is Displacing Soybeans



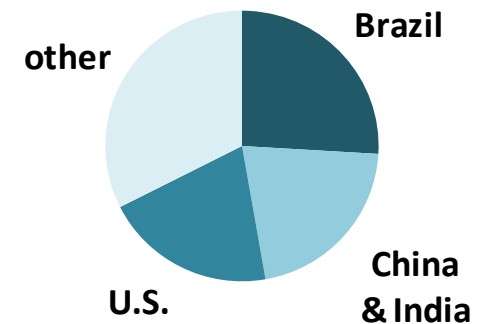
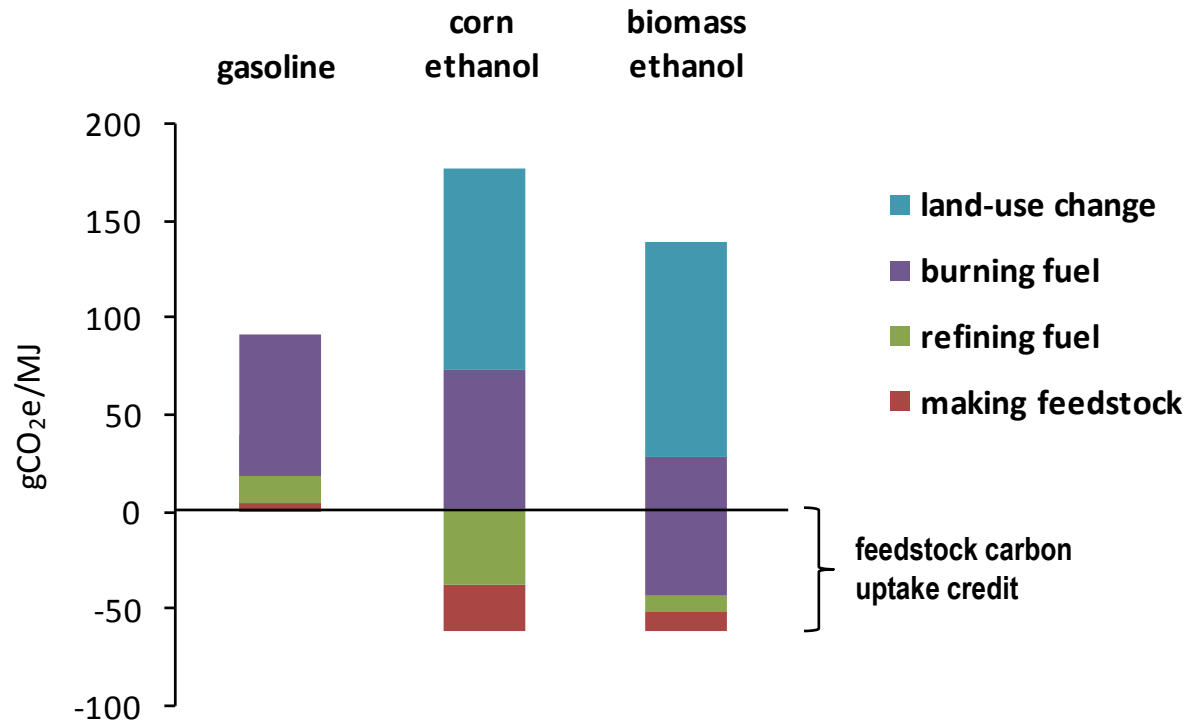
Soybean prices are increasing



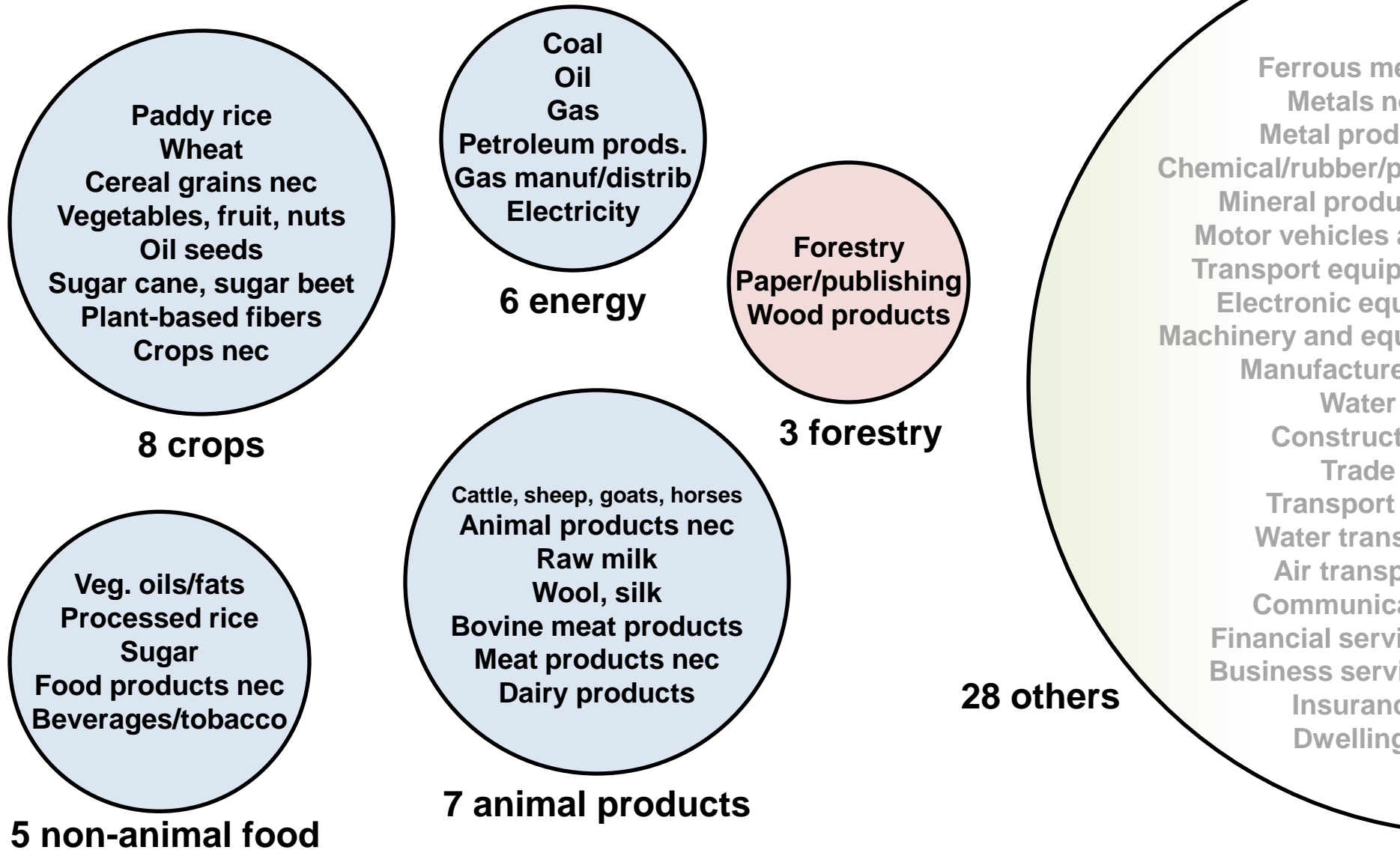
Deforestation in Mato Grosso



Searchinger *et al* make the first try



GTAP: modeling the global economy



GTAP: modeling the global economy

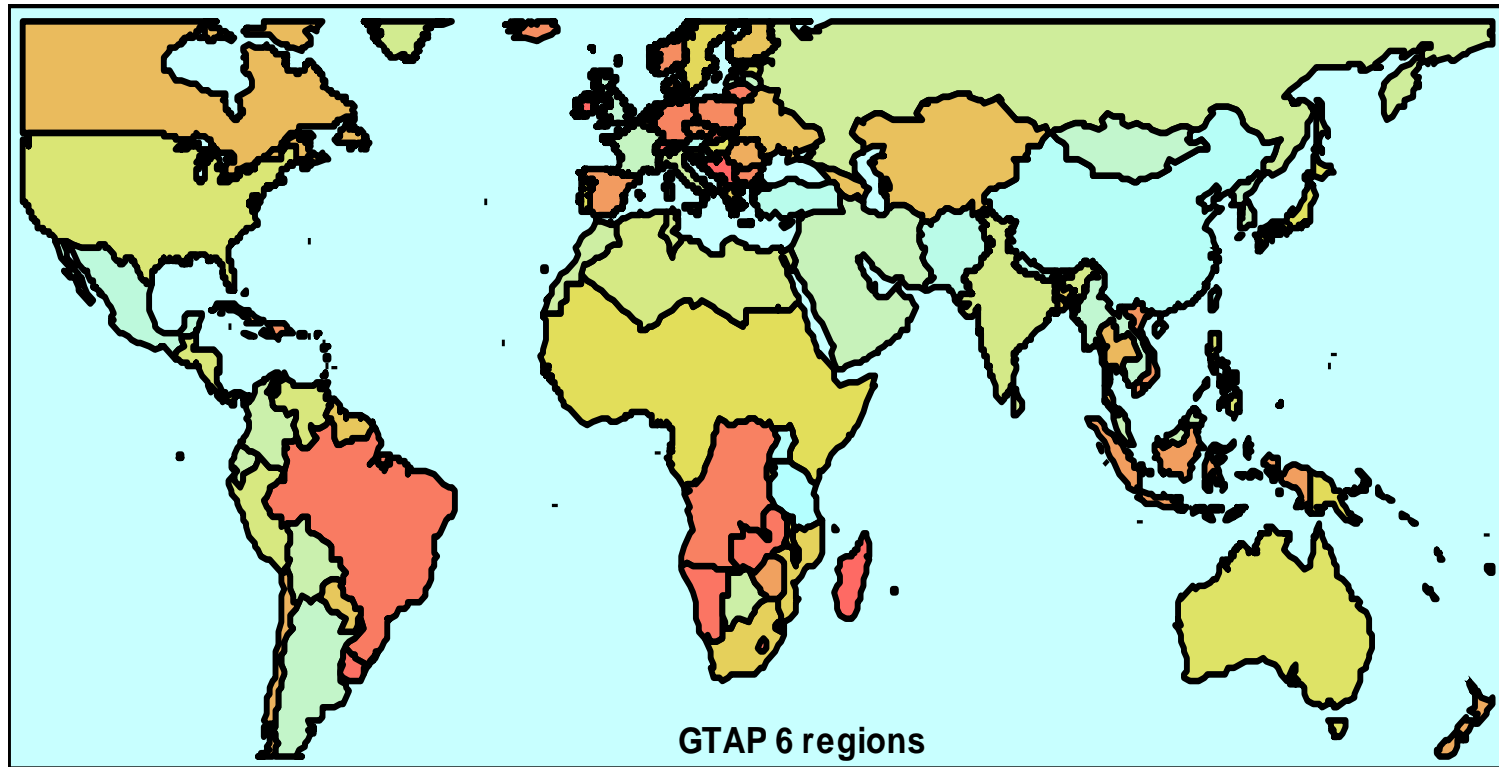


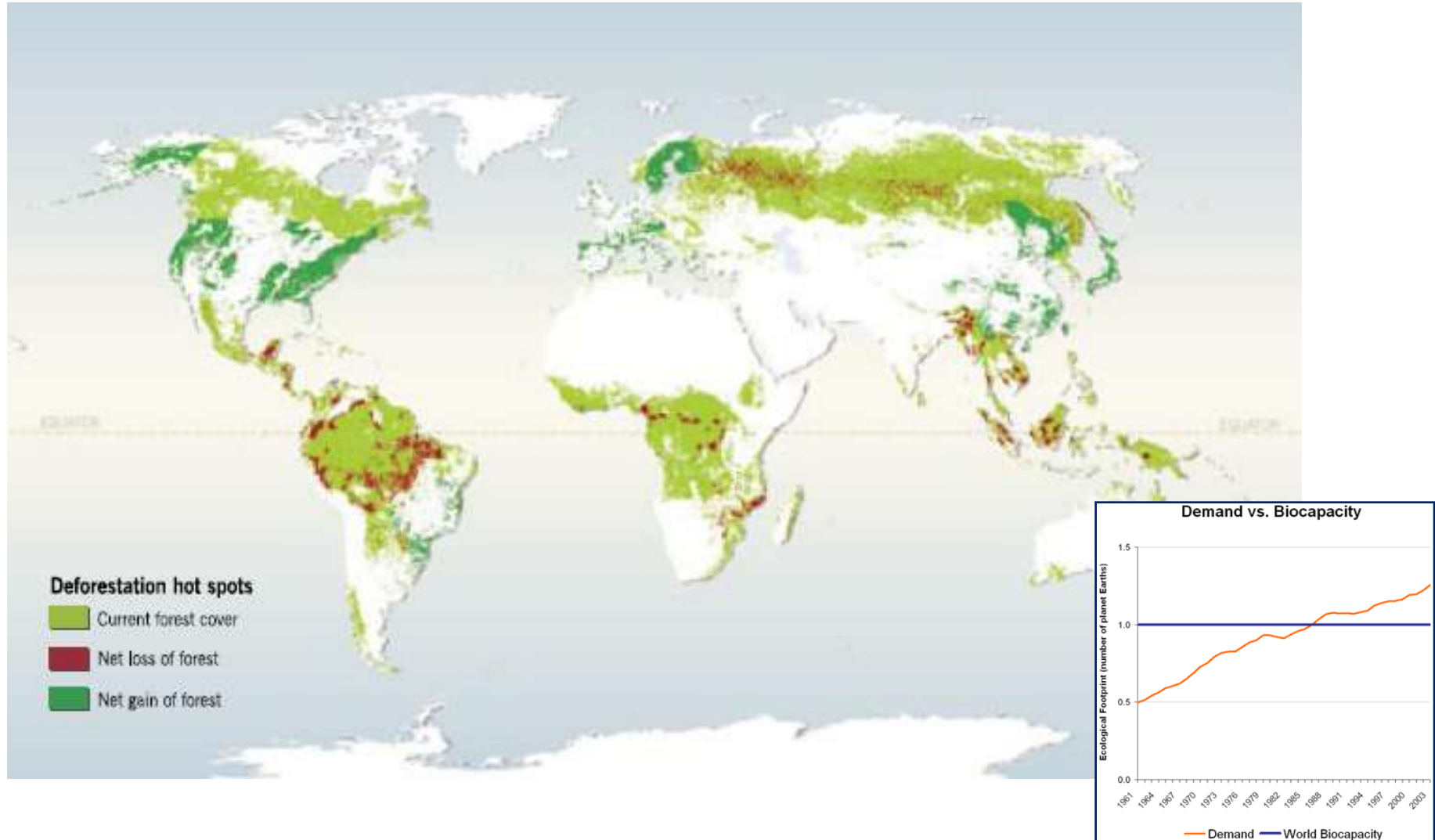
IMAGE offers gridded land-use modeling



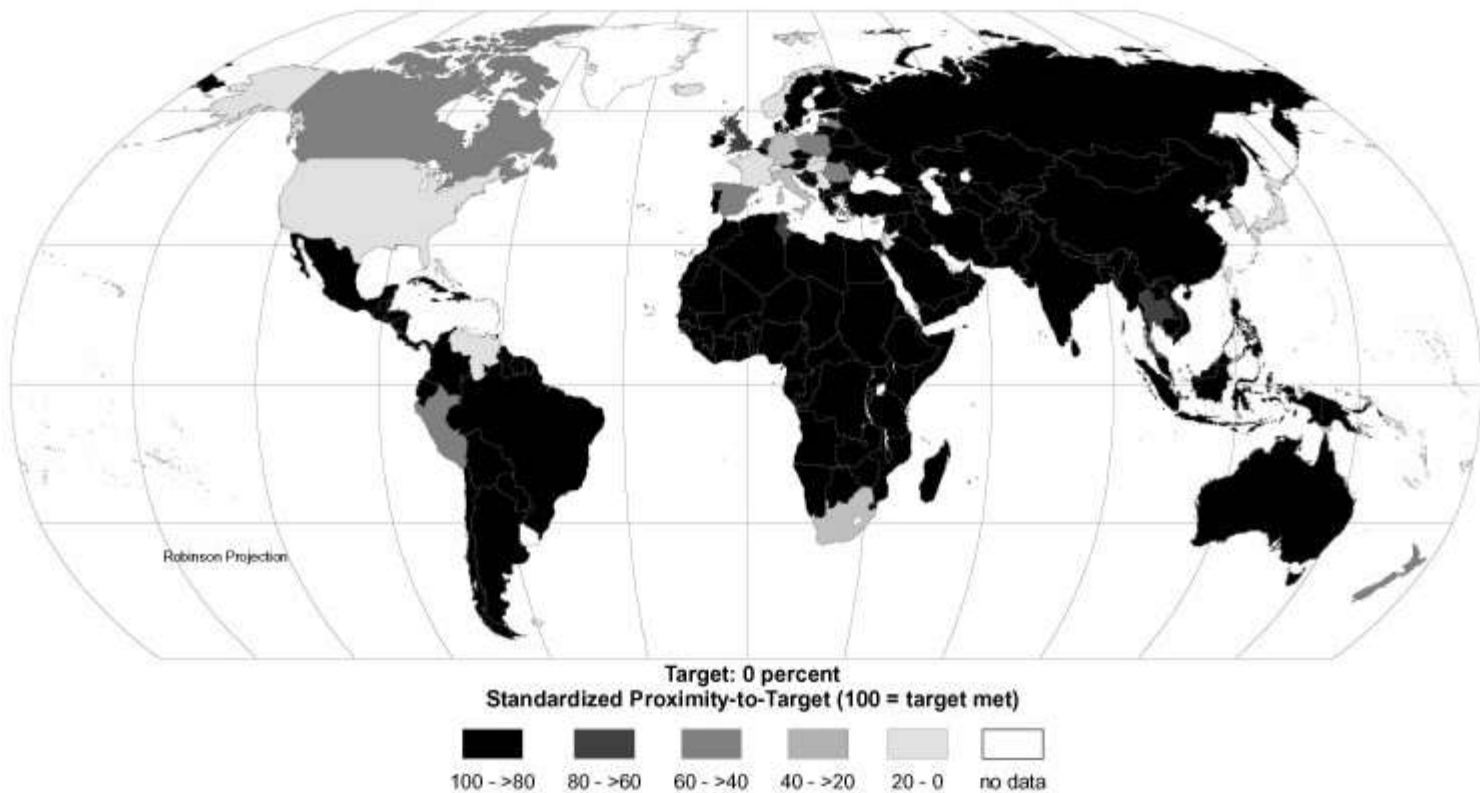
the end

extras

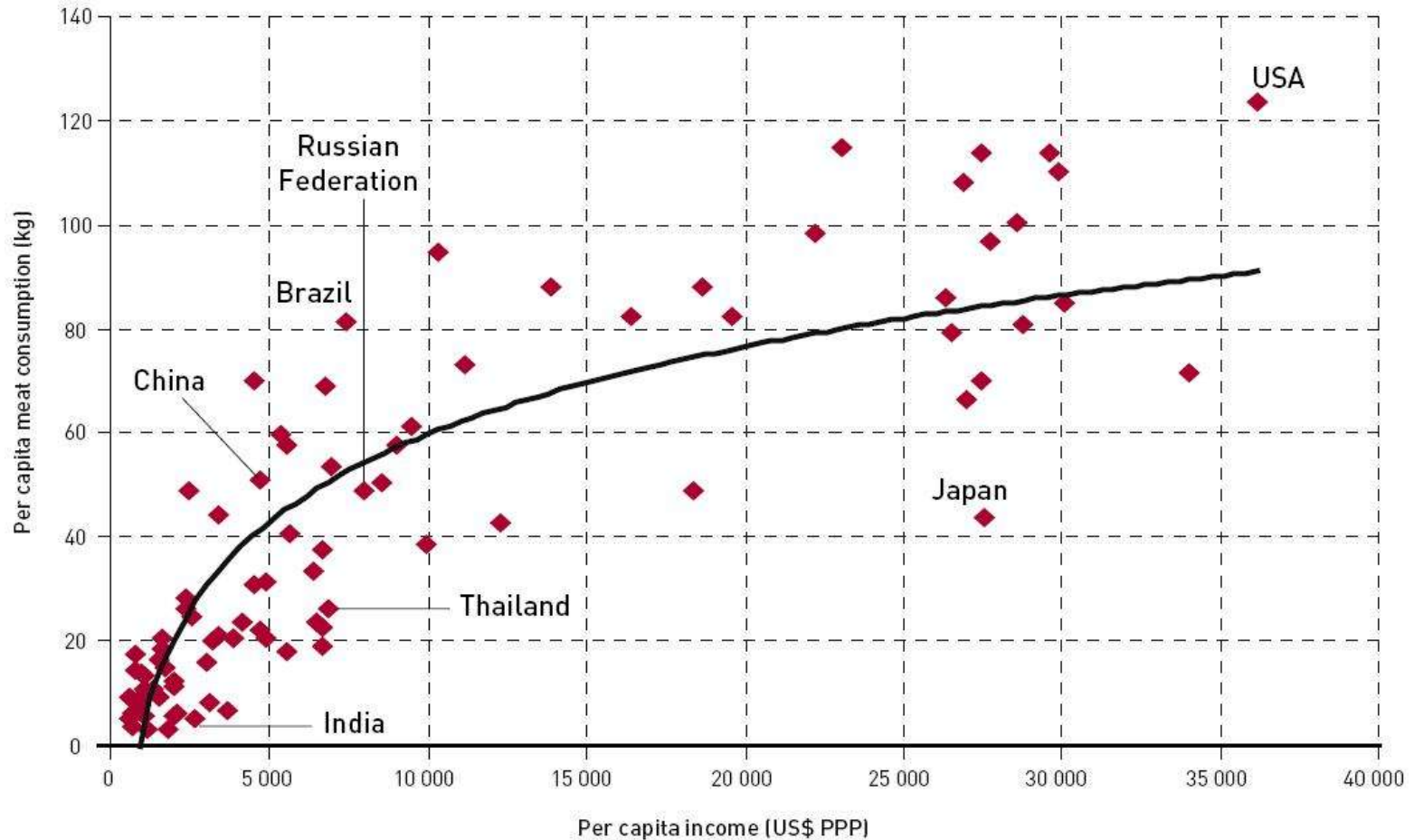
Deforestation pressure



Agricultural subsidies



Global changes in diet



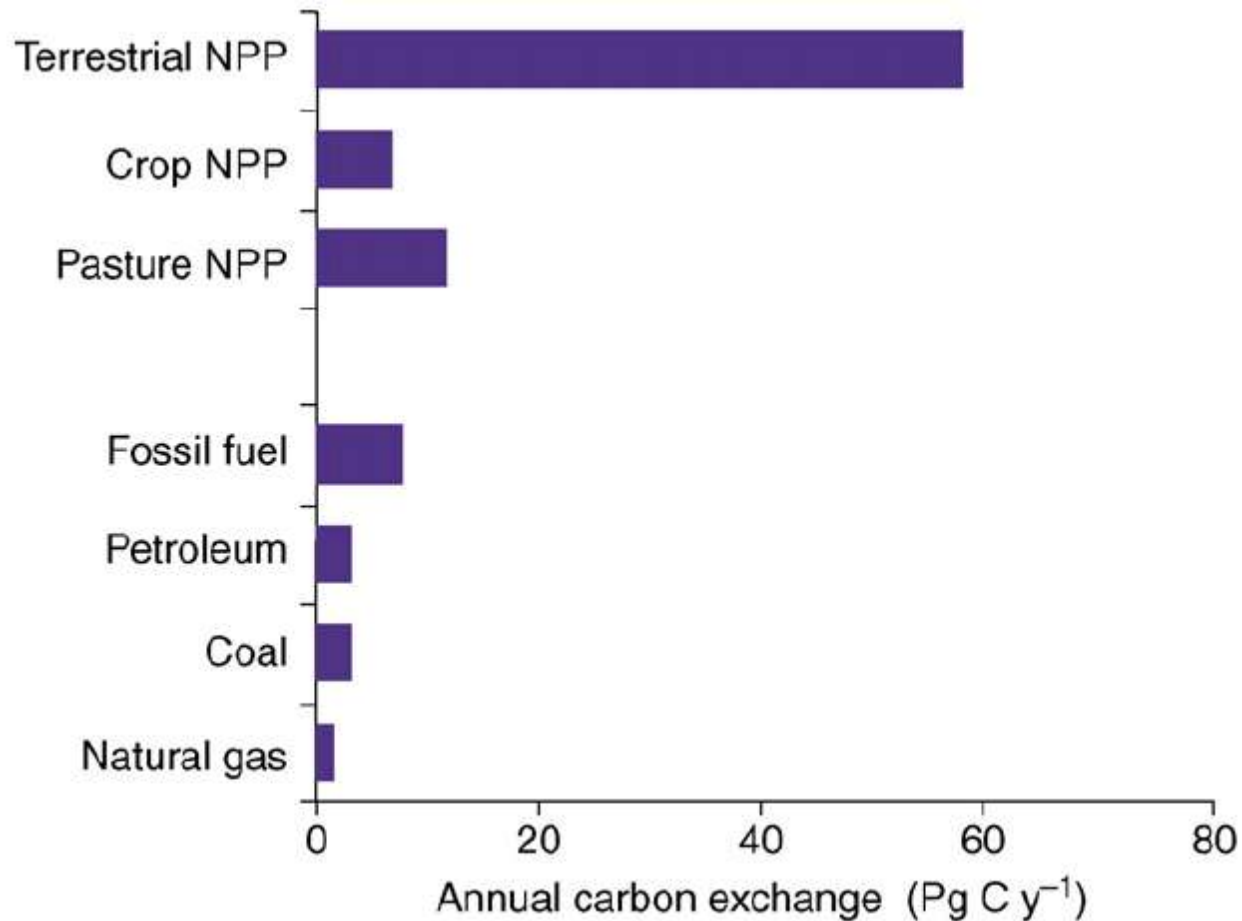
Factors contributing to food price elevation

- a. Increasing consumption of meat in the global diet (which creates new demands for livestock feed and pasture);
- b. Increasing consumption of refined foods in the global diet;
- c. High fossil fuel prices (which increase the costs of fertilizer derived from them, and increase the direct fuel costs of farms);
- d. Increasing demand for biofuels;
- e. Financial speculation in agricultural products and biofuels;
- f. A weak U.S. dollar;
- g. Export bans;
- h. Recent crop failures in Australia; and
- i. Unusually low stocks, especially in grains.

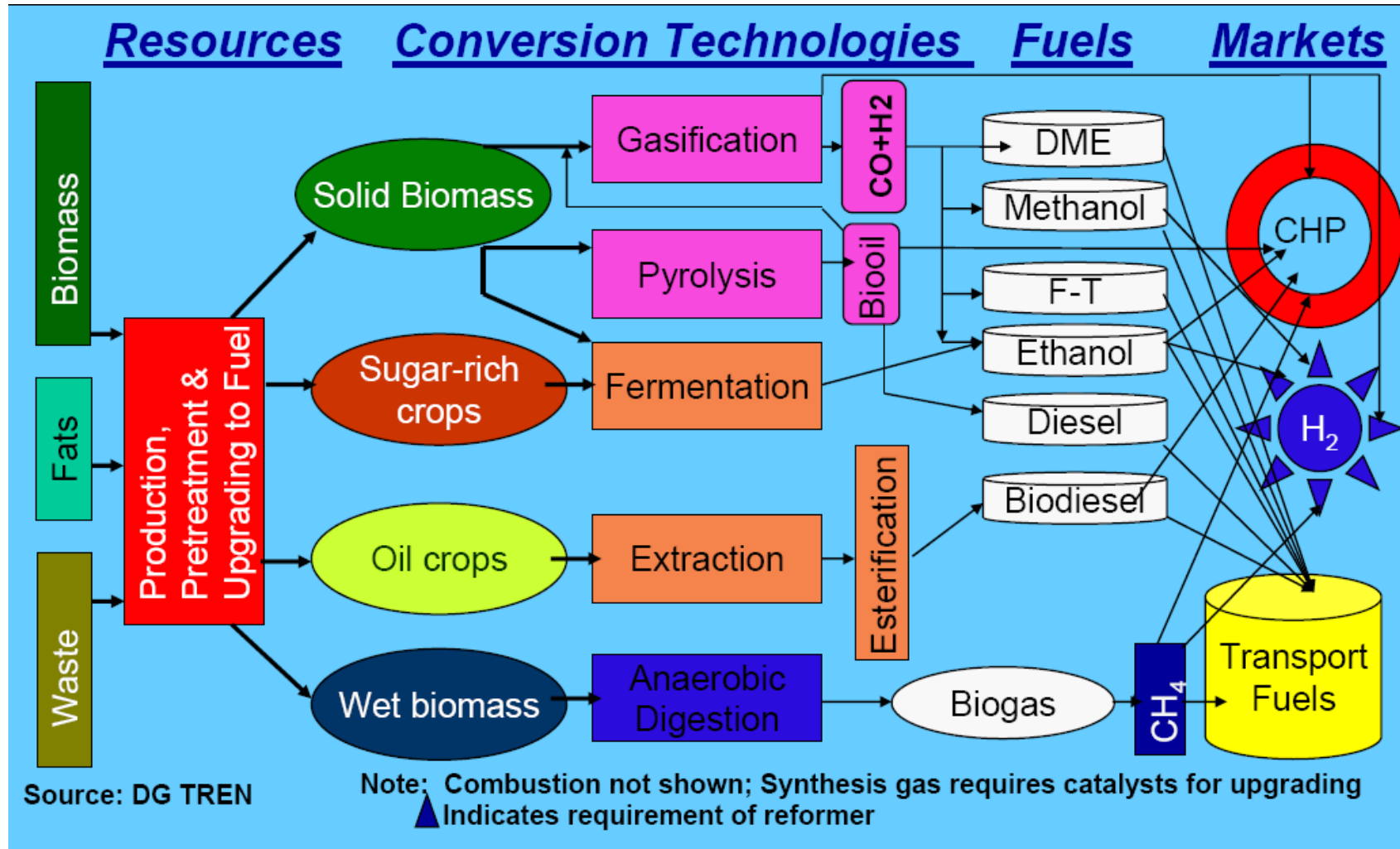
Biofuels are *in theory* climate-neutral



The scale of the global resource



Biomass energy technologies



Energy balance of corn ethanol

