

Ethanol: A Cautionary Tale

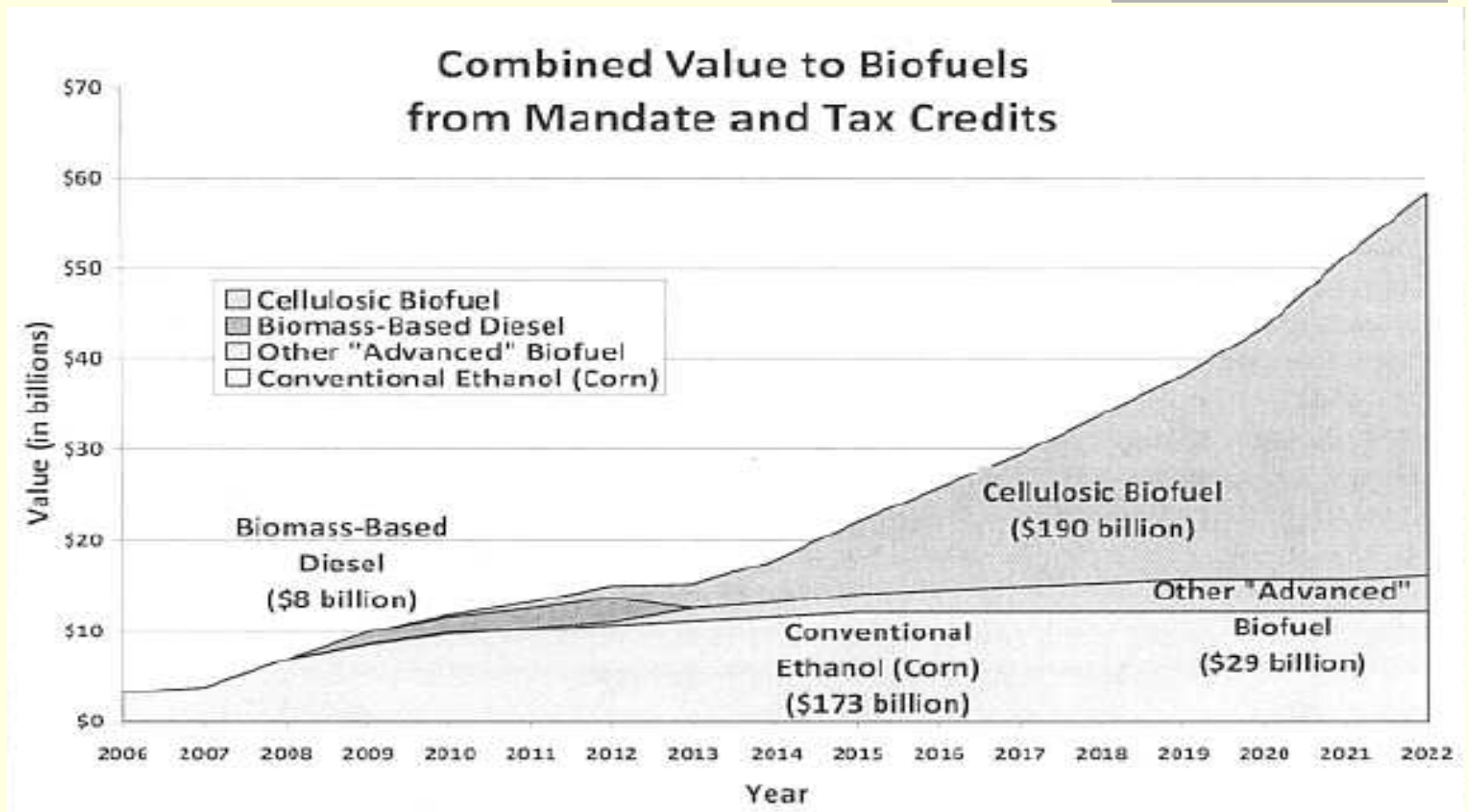
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U.S. Biofuels Policy

- 45¢/gallon “blenders credit” passed through to producers (reduced from 51¢/gallon to 45¢/gallon in 2008 Farm Bill)
- 54¢/gallon tariff on imported ethanol (extended from 2010 to 2012 in 2008 Farm Bill)
- Obama has proposed raising mandate to 60 billion gallons by 2030.
- 36 billion gallon mandate by 2022, of which 21 billion “cellulosic”
- 385 million dollars in subsidies to cellulosic pilot plants (more subsidies in 2008 Farm Bill)

U.S. Government Support in Dollars from Combined Subsidies to Biofuels



U.S. Subsidies to Biofuels

Summary of Subsidy to Biofuel Industry through the Tax Credits and RFS (in billions)

In Year 2008	\$10
In Year 2022	\$60
<i>Cumulative Between 2008 and 2022</i>	<i>\$420</i>

Summary of Subsidy to Biofuel Industry through the Tax Credits and RFS under “Obama Plan” (in billions)

In Year 2030	\$125
<i>Cumulative Between 2008 and 2030</i>	<i>>\$1,000</i>

Corn (C, CBOT)



Food Price Index (FAO)

2000	90.2		2006	126.5
2001	93.3		2007	158.6
2002	89.9		2008	199.6
2003	97.7		2009	156.8
2004	112.4		2010	185.1
2005	117.3		2011	232.7

Mortality and Morbidity

I.M. Goklany, “Could Biofuel Policies Increase Death and Disease in Developing Countries?”, *Journal of American Physicians and Surgeons* 16(1)(2011).

Increase in biofuels production since 2004 has pushed 35 million additional people into absolute poverty.

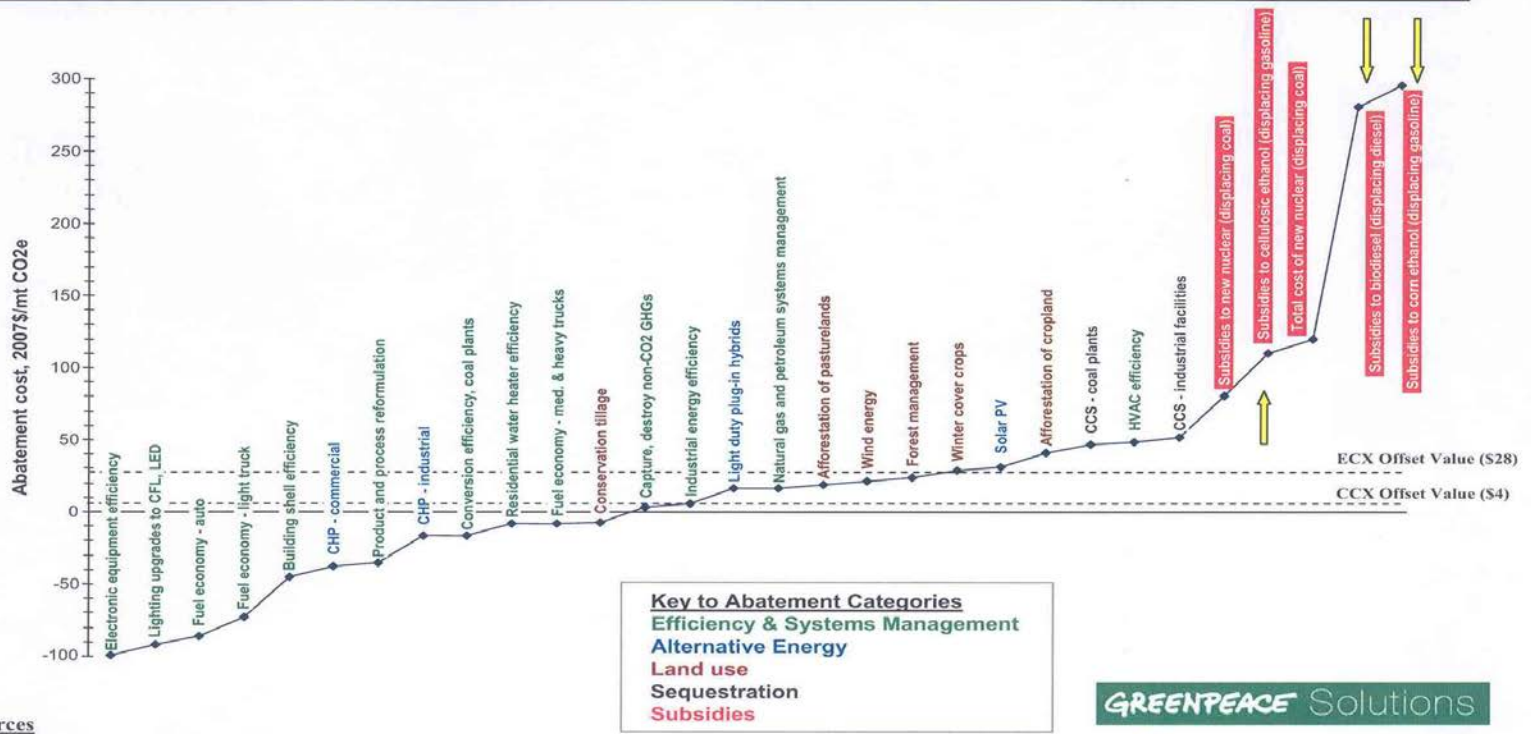
Goklany estimates this will cause 192,000 excess deaths per year from malnutrition-related disease and a loss of 6.7 million “disability-adjusted life-years” (DALY’s) per year.

Human Costs

Global warming is estimated to lead to 141,000 deaths and 5.4 million DALY's so biofuels – in theory which reduce CO₂ loadings, have human costs greater than those of global warming itself. (Goklany, 2011)

Relative Cost of CO₂ Abatement Options

Subsidizing Biofuels Among the Most Expensive GHG Reduction Options



Sources

Abatement technologies: McKinsey & Company, mid-range case.
 Offset prices: Average of contract values from CCX (2008-10) and ECX (2008-12).
 Subsidy data: Earth Track, Inc.

GREENPEACE Solutions

earth track
 www.earthtrack.net

Environmental and Ecological Impacts

Water Use

NAS (2007): Corn grown for ethanol consumes 200 times more water than to process it.

Processing requires 4 litres of H₂O per litre of ethanol, compared with 1.5 litres of H₂O per litre of gasoline.

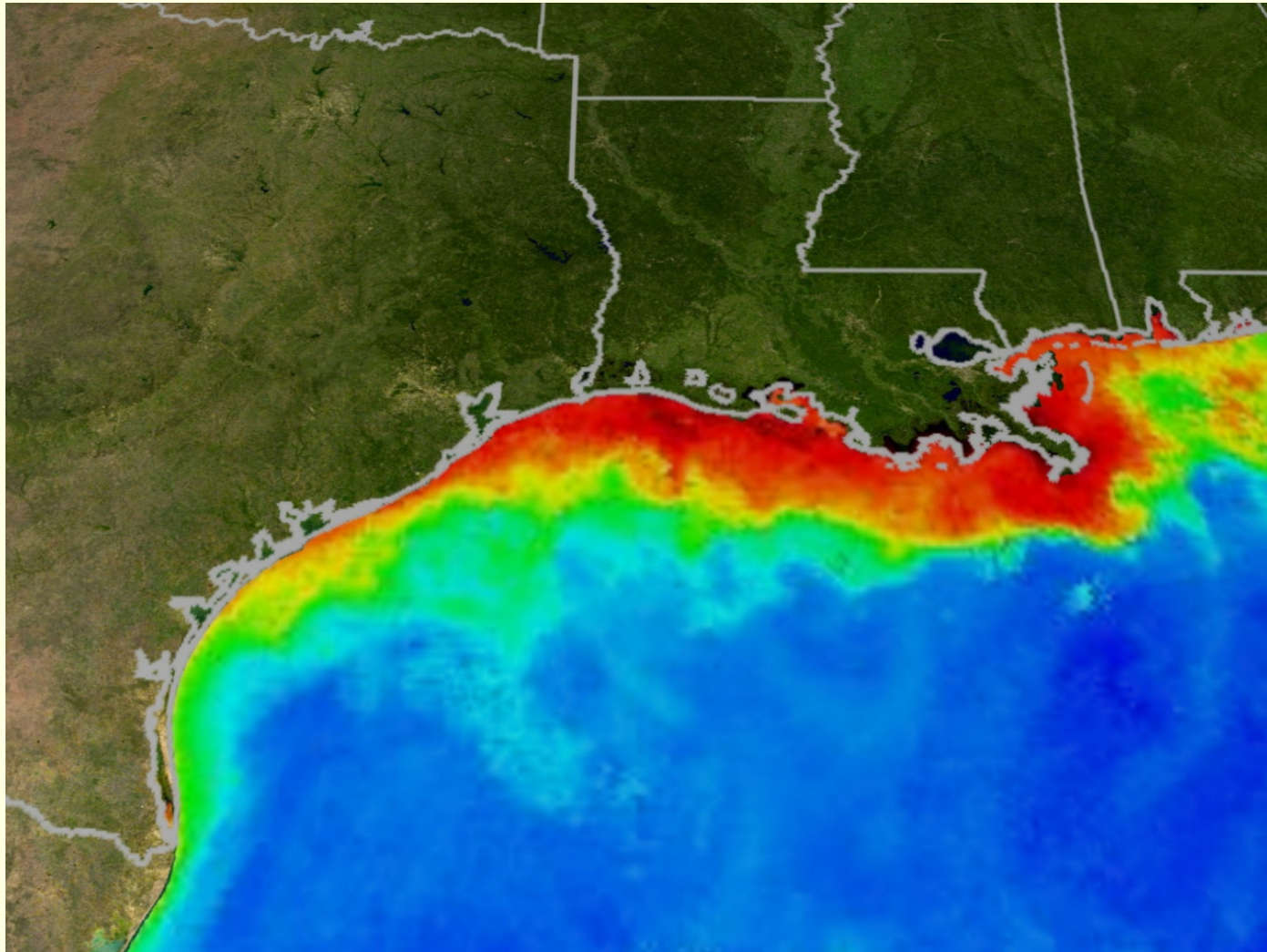
Environmental and Ecological Impacts (cont.)

Water Pollution

Nitrogen (N), Phosphorus (P) loadings into lakes, rivers, streams: Dead Zone in Gulf to rise in 2007-2008 to 22,127 km²: 25 percent above 2006-2007.

Likely to be exceeded in 2011 due to heavy flooding in Mississippi Basin.

The “Dead Zone”: 2010



Environmental and Ecological Impacts (cont.)

Land Use

Millions of acres leaving U.S. Conservation Reserve Program (CRP) for corn, and soybeans: both erosive row-crops.

10 percent substitution of ethanol and biodiesel for petroleum fuels will require 43 percent of U.S. crop and 38 percent of EU cropland

(Righelato and Spracklen, *Science*, 2007)

Environmental and Ecological Impacts (cont.)

Carbon Loadings and “Debt”

Fargione, et al. (*Science*, 2008): corn for ethanol on converted cropland creates 98 year carbon “debt”. Soybean biodiesel from rainforest 319 year debt; palm oil biodiesel from peatland rainforest 423 year debt.

Environmental and Ecological Impacts (cont.)

Searchinger, et al. (*Science*, 2008): land use changes worldwide for biofuels double GHG emissions over 30 years, increase GHG's for 167 years. Switchgrass based biofuels on corn lands increase GHG emissions by 50 percent.

Environmental and Ecological Impacts (cont.)

Crutzen, et al. (*Journal of Atmospheric Chemistry and Physics*, 2007): N₂O released from corn, rapeseed grown for biofuels 296 times more damaging than CO₂, net GHG *negative*.

Policy Responses

- (1) Replace fixed 45¢/gallon blender's credit with subsidy varying inversely with price of corn (e.g., at \$3.00/bushel, credit would be 45¢; at \$3.45, it would be zero).
- (2) Phase-out 54¢/gallon tariff on imported ethanol.
- (3) Impose 5 year moratorium on mandates, fix at 2010 level.

Policy Responses (cont.)

- (4) Introduce conservation-inducing “negative pollution taxes” and credits (e.g., rising taxes on horsepower, hybrid vehicle rebates, fees on housing spaces greater than 3,500 square feet).

- (5) Shift subsidies from cellulose plants to cellulosic R&D.