Carbon Cap and Trade
What will it do to Ag and forest

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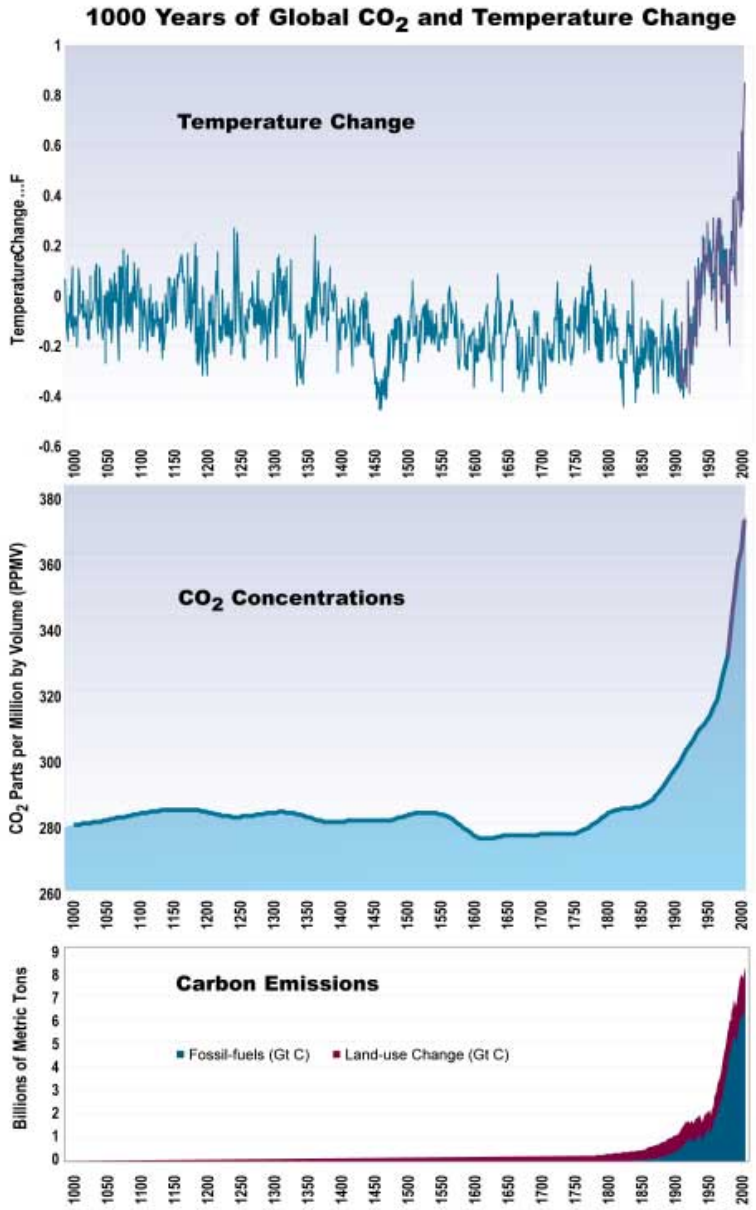
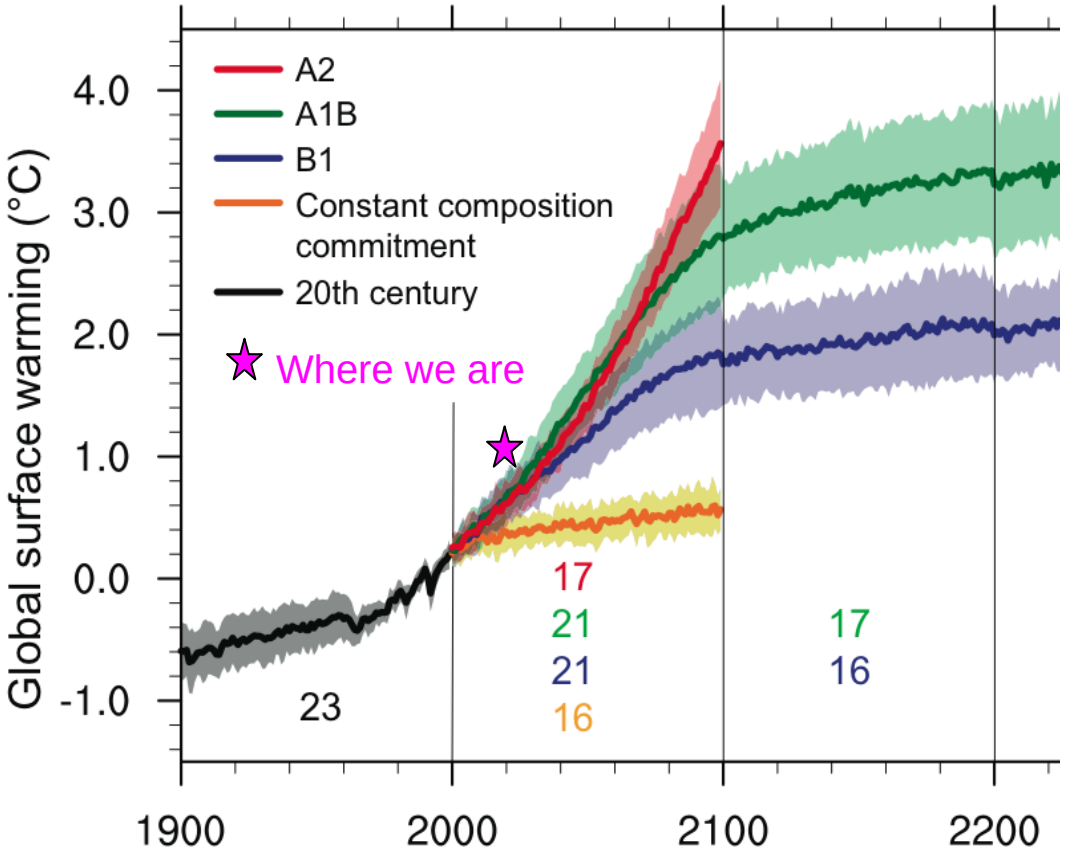
Why Care About GHGs

Greenhouse Gasses



Source : U.S. National Assessment

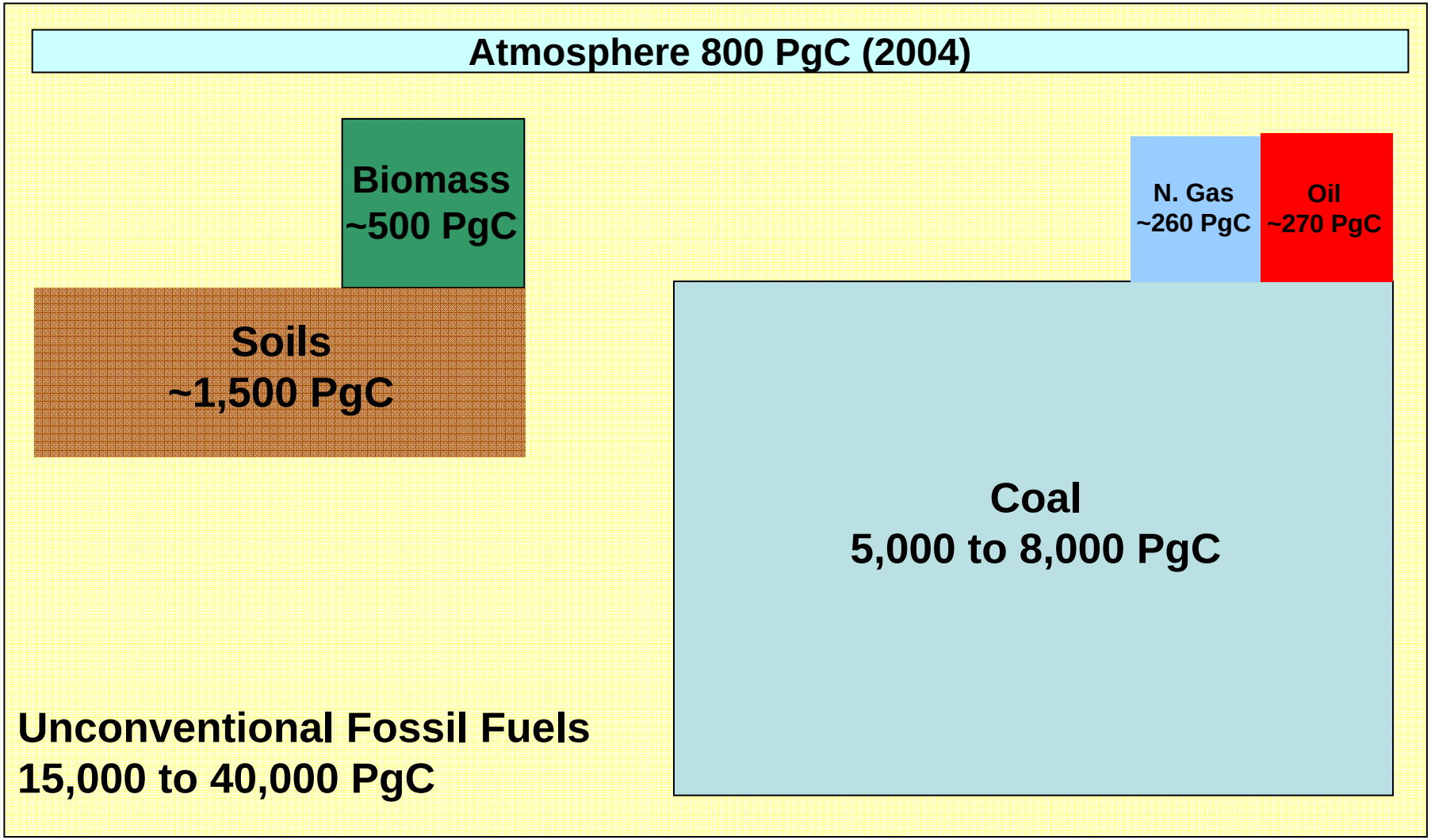


Source http://ssca.usask.ca/2002conference/Bennett.htm

Carbon Dioxide highly associated with climate change

Policy around world working to limit emissions

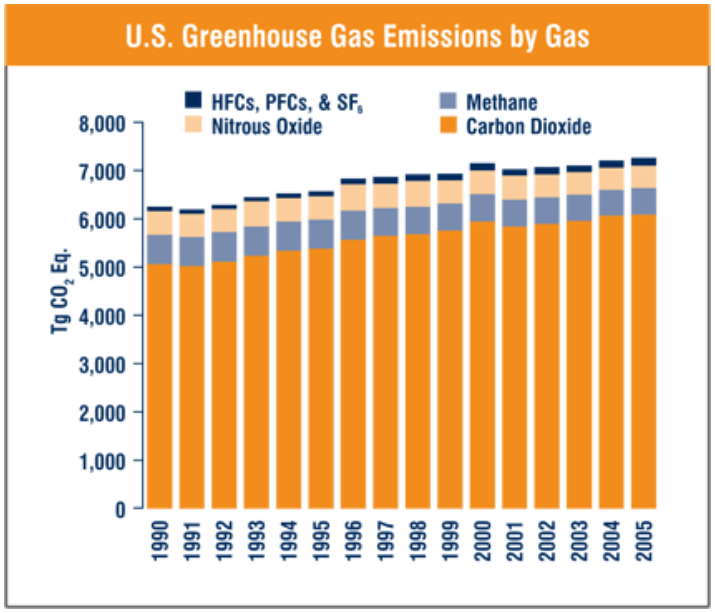
Where we could go
Size of Potential Emissions

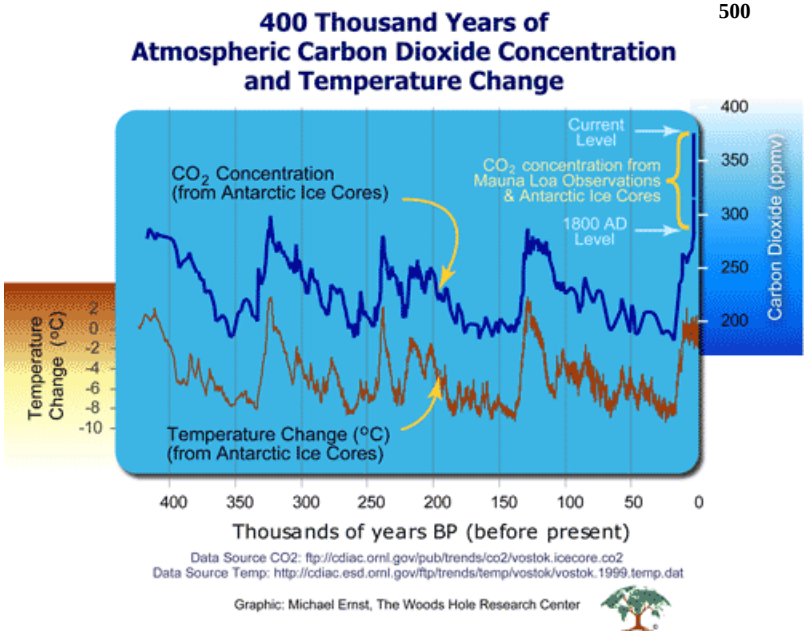


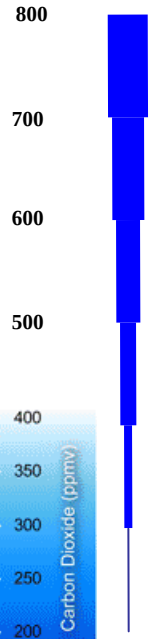
Source Jae Edmonds, Joint Global Change Research Institute at the University of Maryland

Why Adapt - Inevitability

Stabilization level (ppm CO_2-eq)	Global mean temp. increase at equilibrium (°C)	Year CO2 needs to peak	Year CO2 emissions back at 2000 level	Reduction in 2050 CO2 emissions compared to 2000
445 – 490	2.0 – 2.4	2000 - 2015	2000- 2030	-85 to -50
490 – 535	2.4 – 2.8	2000 - 2020	2000- 2040	-60 to -30
535 – 590	2.8 – 3.2	2010 - 2030	2020- 2060	-30 to +5
590 – 710	3.2 – 4.0	2020 - 2060	2050- 2100	+10 to +60
710 – 855	4.0 – 4.9	2050 - 2080		+25 to +85
855 – 1130	4.9 – 6.1	2060 - 2090		+90 to +140

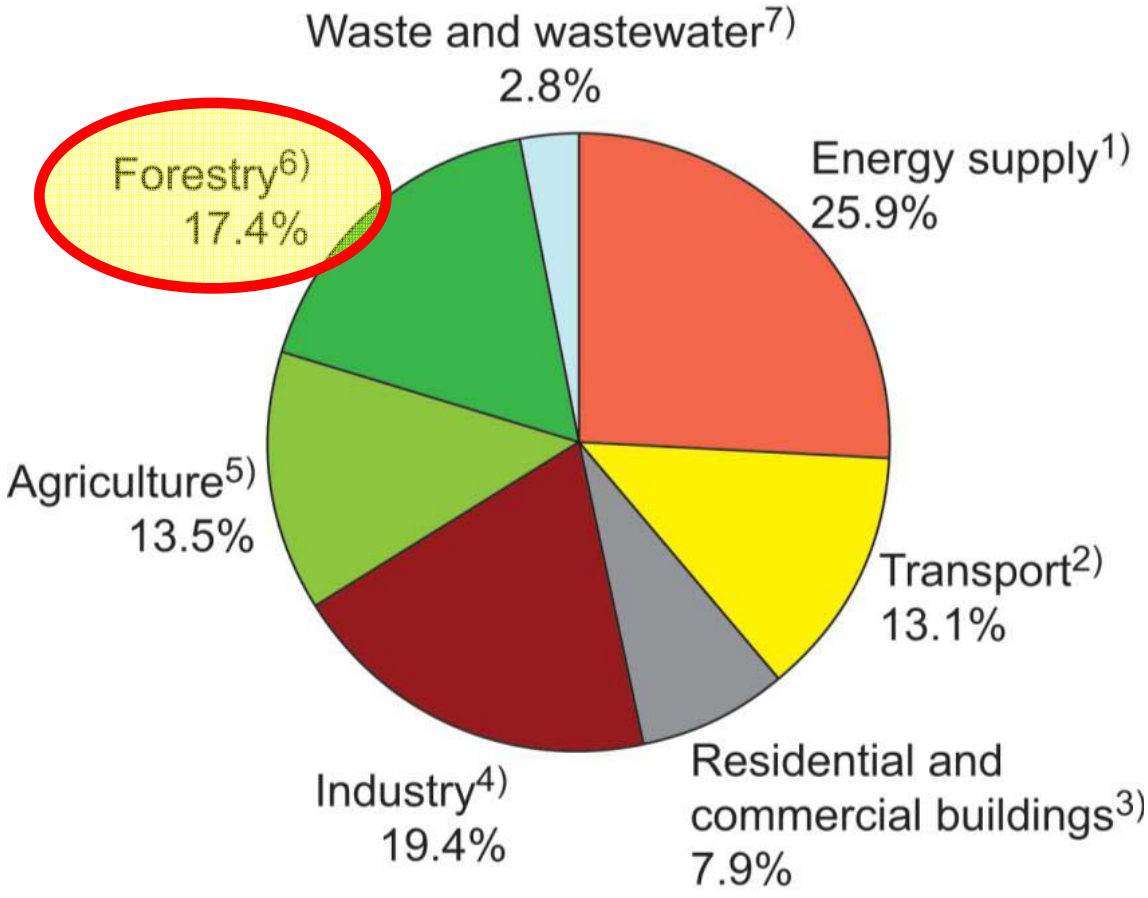




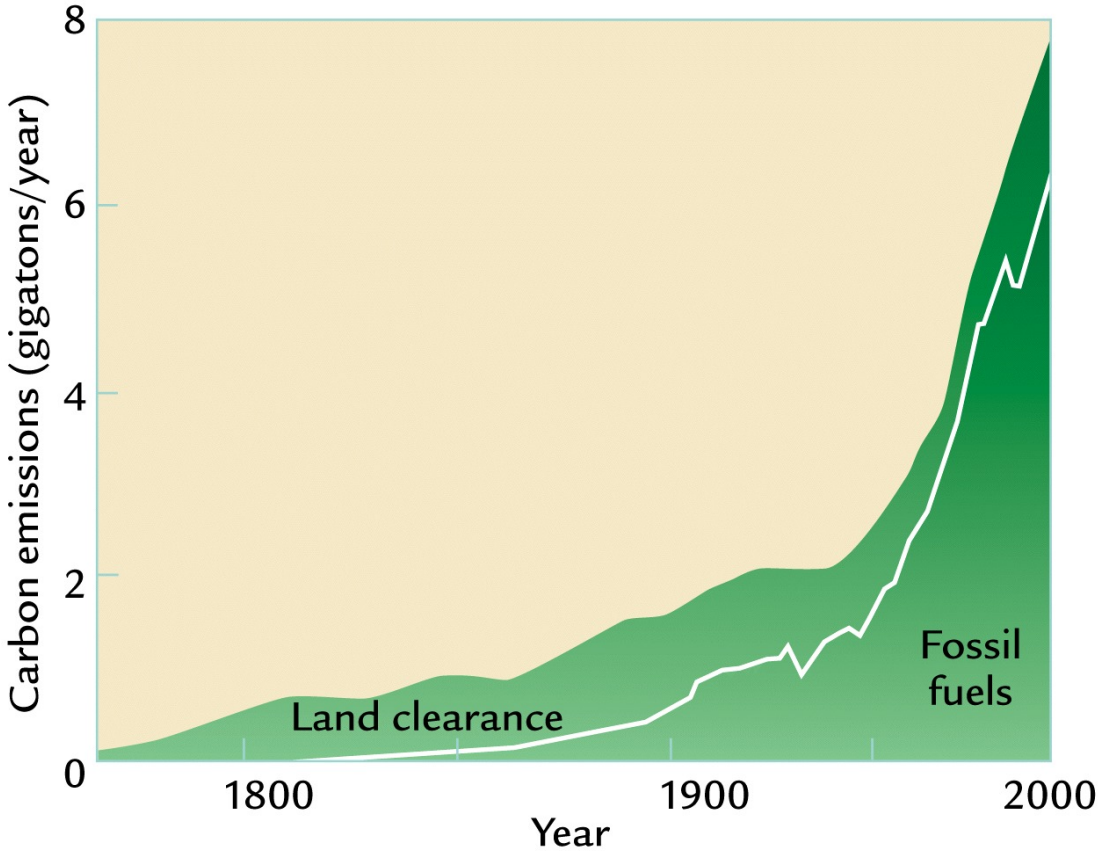


Why Agriculture and Forestry

Greenhouse Gas Emissions Sources



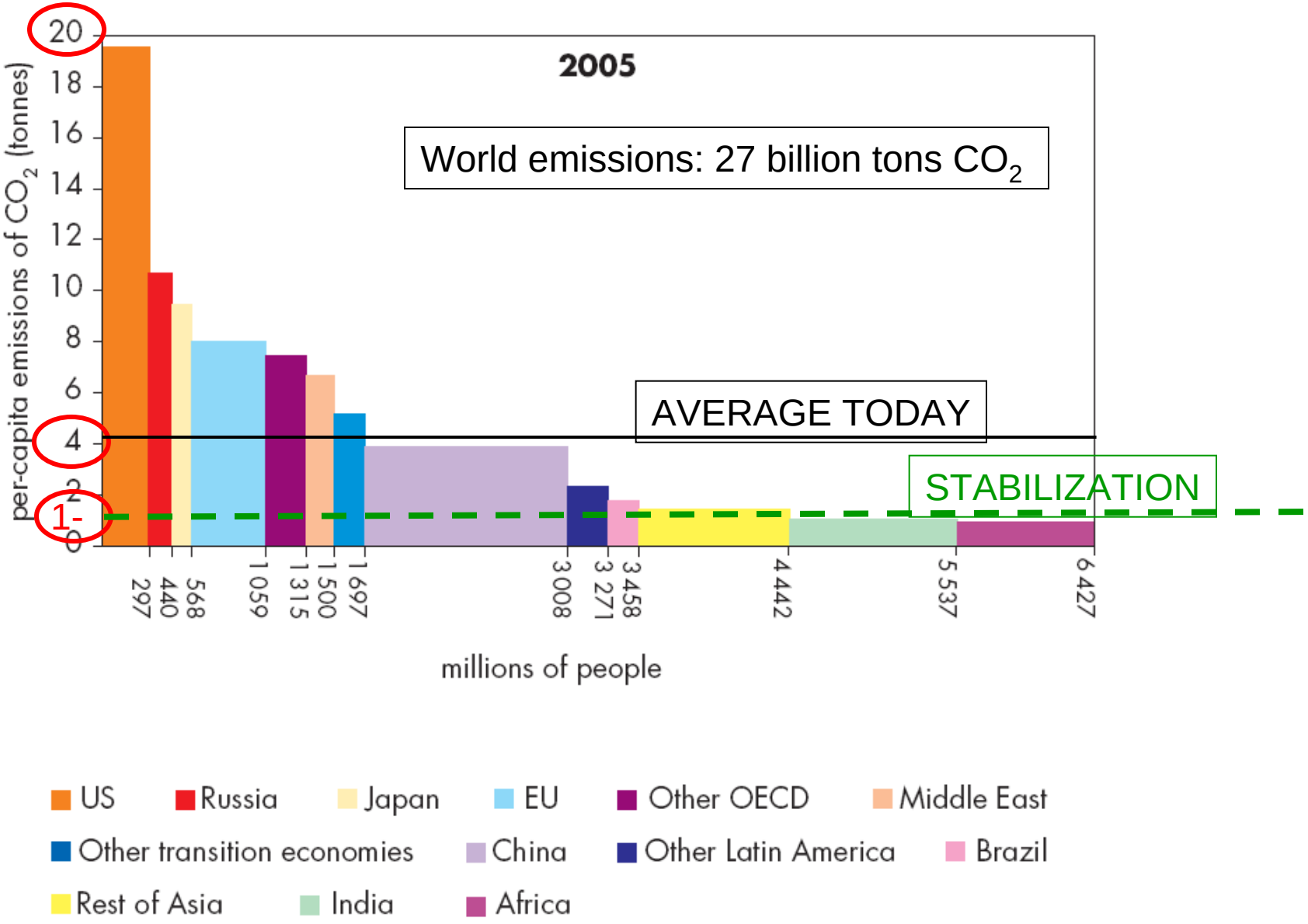
Historical Emissions Estimates



Sequestration may have the potential to alleviate somewhere in the neighborhood of 25% of the historical atmospheric greenhouse gas accumulation.

Source: Apparently this was drawn from W. F. Ruddiman, 2001. Earth's Climate: Past and Future. W. H. Freeman and Sons, New York

Per-capita fossil-fuel CO_2 emissions, 2005



Source: IEA WEO 2007 and Socolow presentation at Americas Climate Choices

Cap and Trade
Effects and Responses

AG and FOREST MITIGATION OPTIONS

Strategy	Basic Nature	CO2	CH4	N2O
Crop Mix Alteration	Emis, Seq	X		X
Crop Fertilization Alteration	Emis, Seq	X		X
**Crop Input Alteration	Emission	X		X
Crop Tillage Alteration	Emission	X		X
Grassland Conversion	Sequestration	X		
Irrigated /Dry land Mix	Emission	X		X
Biofuel Production	Offset	X	X	X
Stocker/Feedlot mix	Emission		X	
Enteric fermentation	Emission		X	
Livestock Herd Size	Emission		X	X
Livestock System Change	Emission		X	X
Manure Management	Emission		X	X
Rice Acreage	Emission	X	X	X
Afforestation (not today)	Sequestration	X		
Existing timberland Management	Sequestration	X		
Deforestation	Emission	X		

“The Effects of Low-Carbon Policies on Net Farm Income”

Duke/TAMU et al Modeling Effort

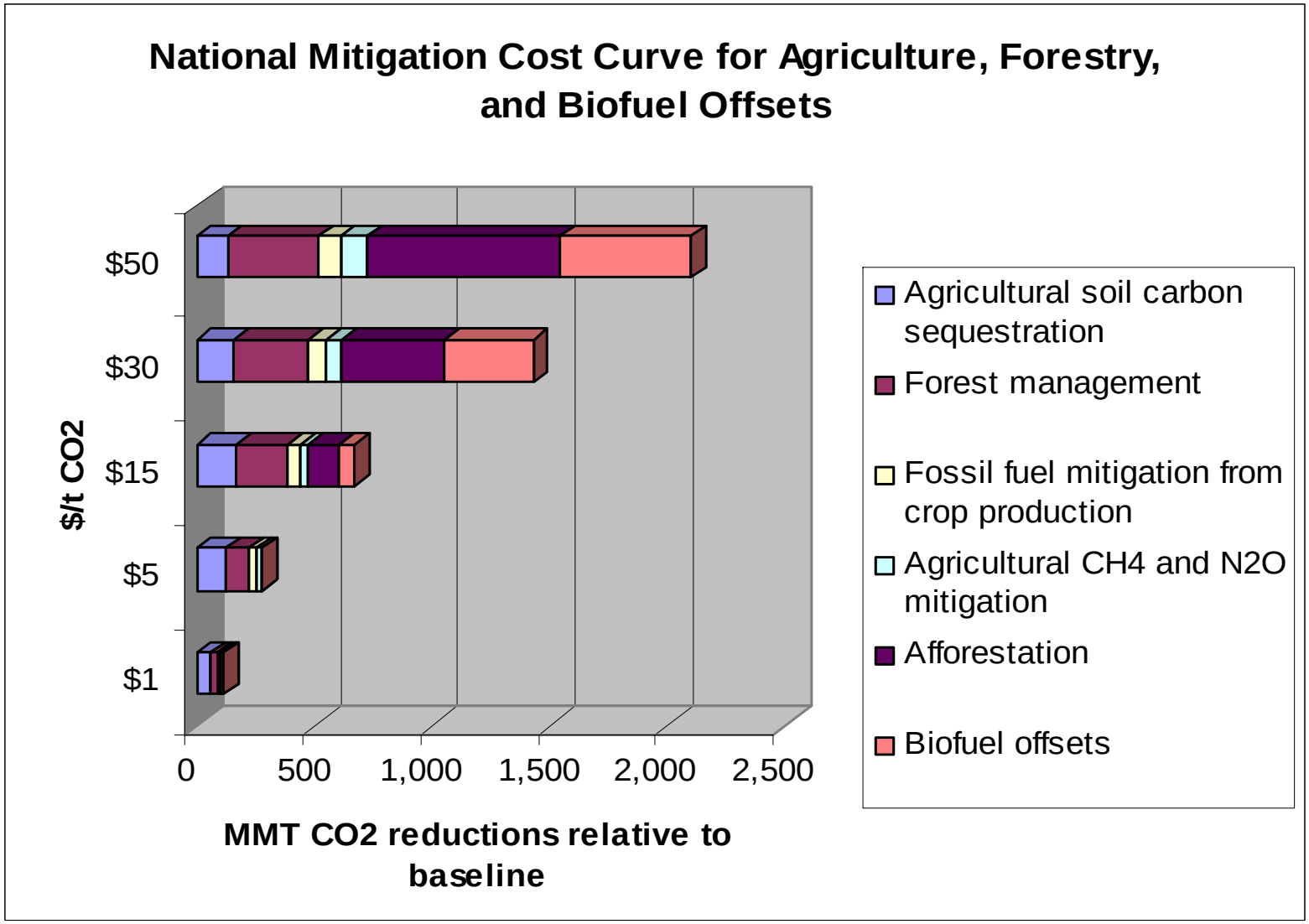
WORKING PAPER*

Justin S. Baker
Bruce A. McCarl
Brian C. Murray
Steven K. Rose
Ralph J. Alig
Darius Adams
Greg Latta
Robert Beach
Adam Daigneault

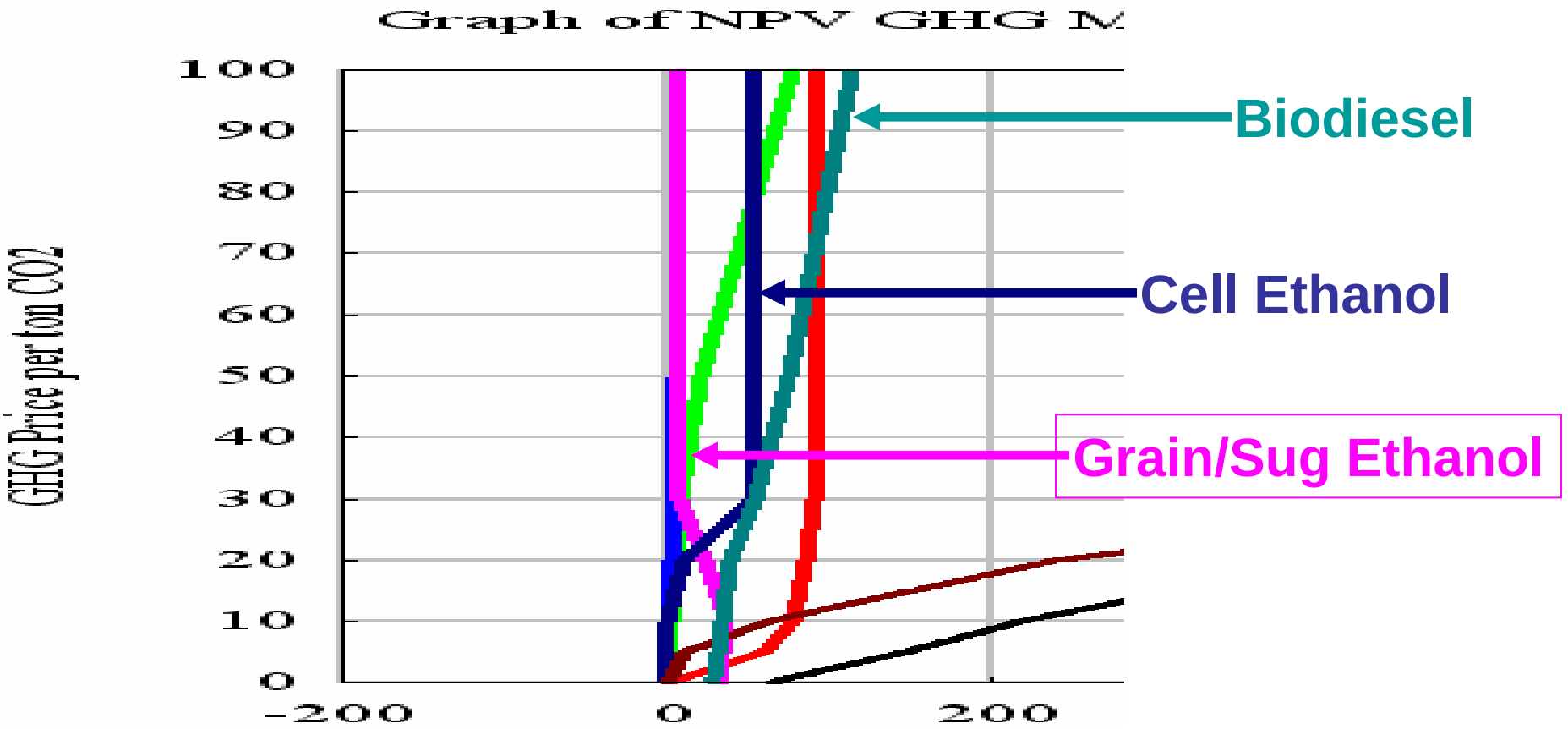
*Results under review, please do not cite at this time.

*Some results shared today are not included in this working paper

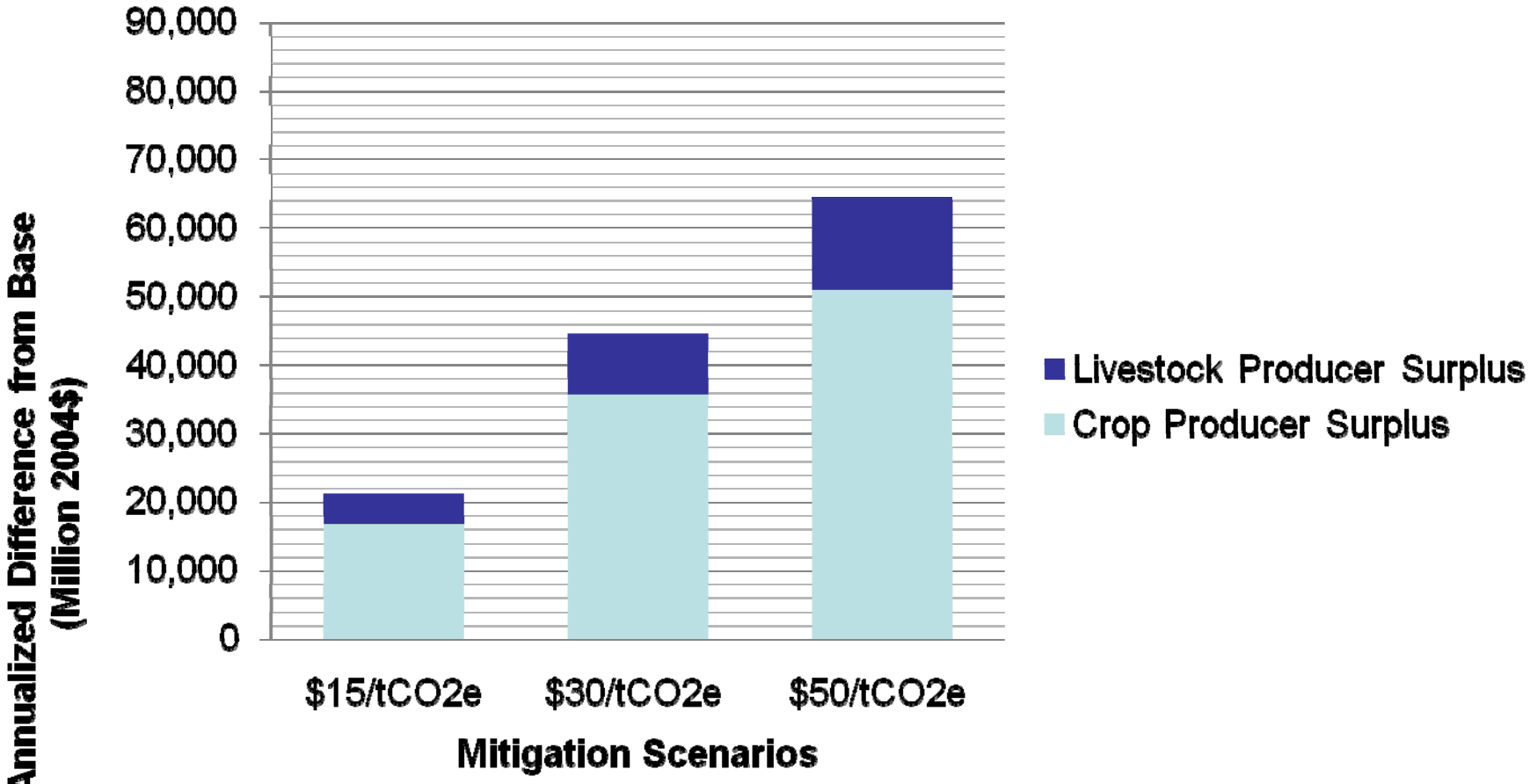
FROM EPA (2005) GREENHOUSE GAS MITIGATION POTENTIAL IN U.S. FORESTRY AND AGRICULTURE



Liquid Portfolio Composition Ag Only

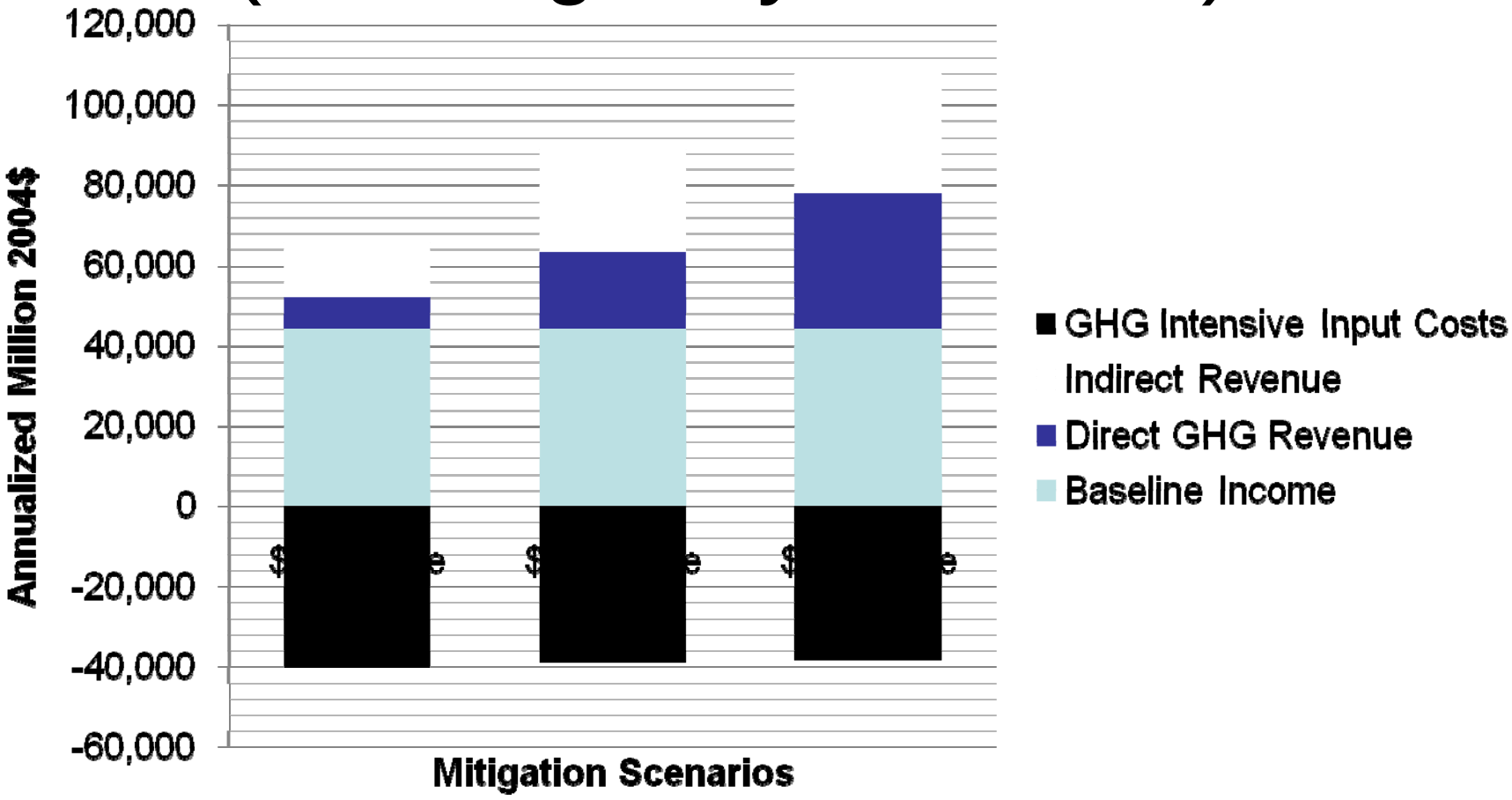


Dissecting Welfare Gains Further (Full Eligibility Scenario)



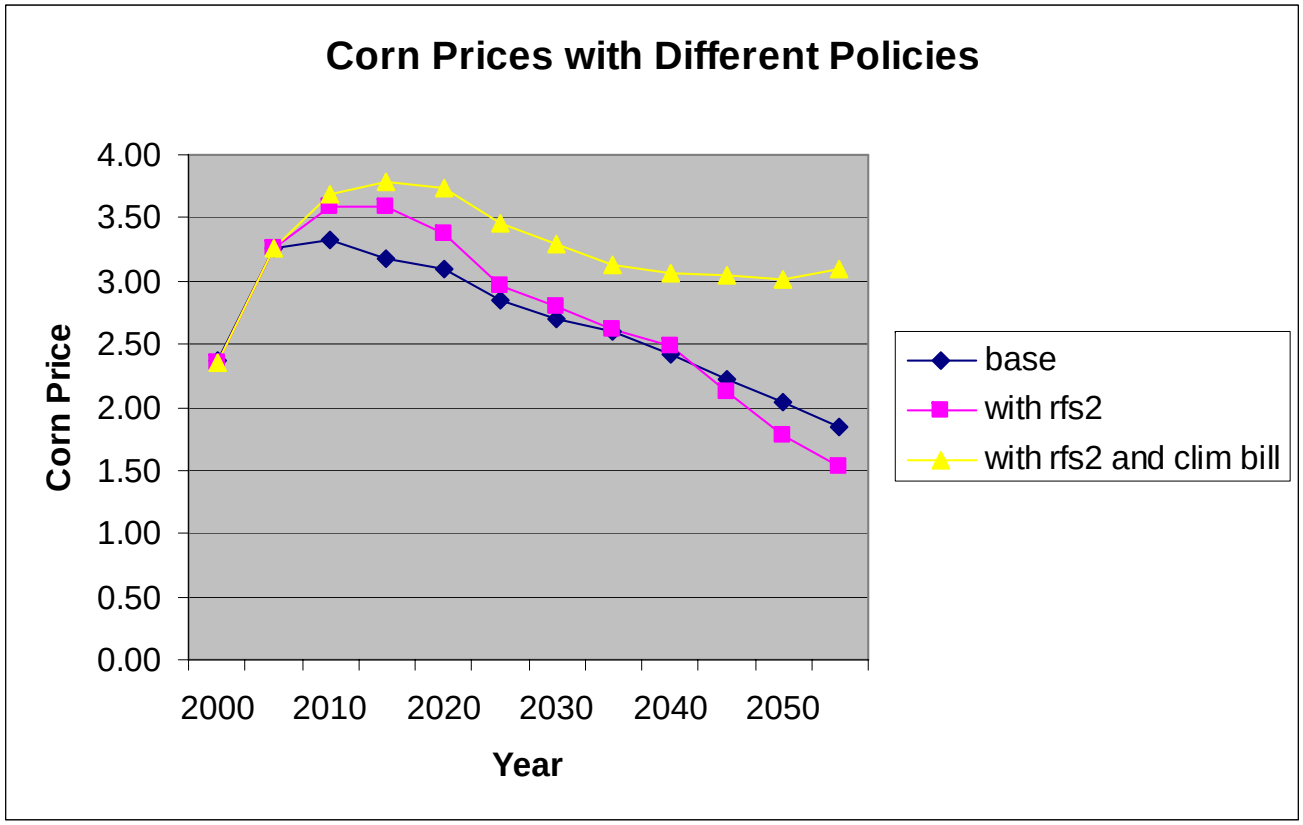
Preliminary results. Subject to change.

Direct and Indirect Revenue Flows (Full Eligibility Scenario)



- Energy Input Cost Increases:
  - 1.4%, 2.30%, and 4.10% per acre

Will RFS make Land Use Change Happen



Prices in $2004 dollars
Base shows diminishing prices as yield growth exceeds demand
RFS2 Holds prices up until it hits max Q then overtaken by Yield growth
Climate Bill holds up prices

Food Competition

Figure 1: Ethanol Production and Capacity plus new construction 2001-2008

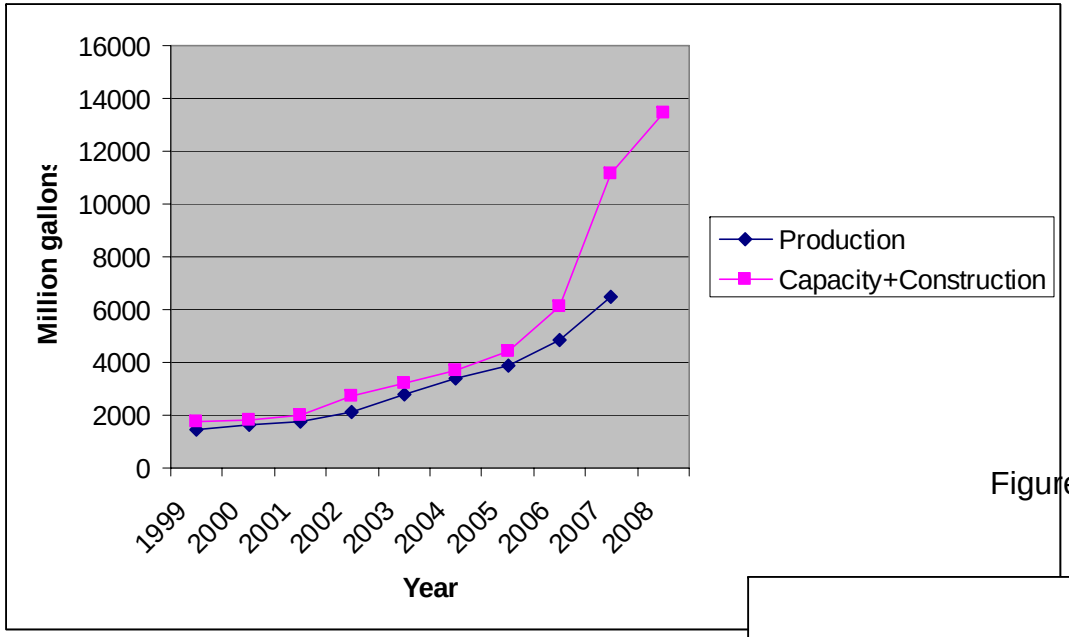
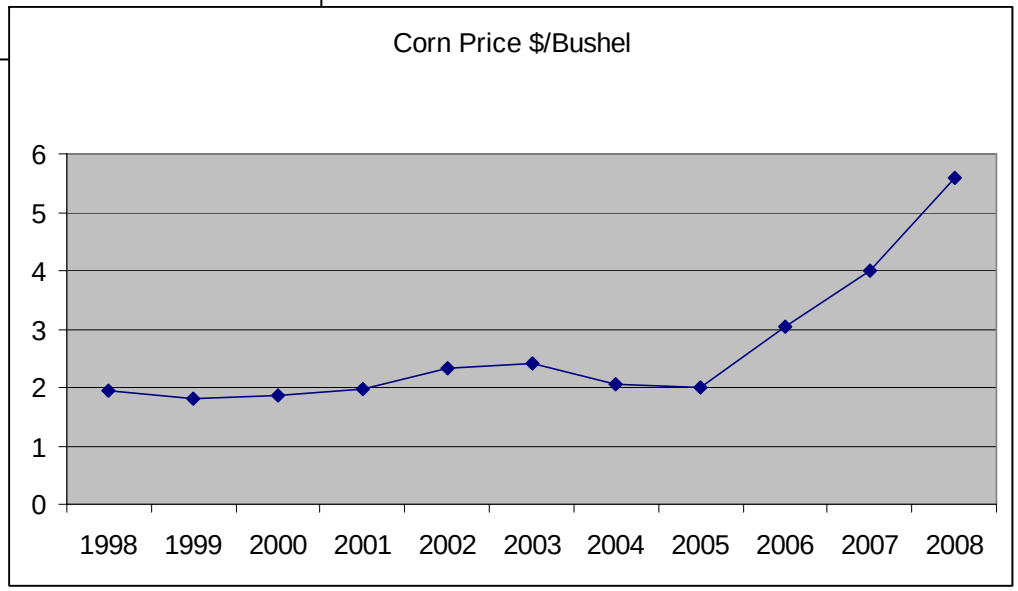


Figure 4 US Average Corn Price in $ per Bushel



Similarly soybean oil prices have changed

Effects of Policies on the Table

		NO RFS2	RFS2	RFS2+Climate bill
*	Crop to Forest	5252	5220	27131
*	Forest to Crop	11162	11528	7517
Land	CRP to Crop	4554	4583	4522
Use	Pasture to Crop	11716	15209	15844
Changes	Pasture to Forest	5525	5516	9760
*	Crop to Pasture	3934	3768	5073
*	Forest to Pasture	1590	1654	1
Export Q	Index	100	94	76
	Corn	2.56	2.48	2.01

Ordinarily

Red items regarded as carbon sequestration reducing

Blue items regarded as carbon sequestration increasing

Colors for numbers are relative to NO RFS2

Findings

- GHG mitigation competitive with Current Production
- Price implications are substantial
- Ag and forest income will increase
- Consumers will pay
- Big opportunities Afforestation, Bio electricity, Ag soil management, Forest management, Fossil fuel use
- Leakage/indirect land use is a factor need global accounting and more than what lifecycle does
- GHG prices move us away from current ethanols