

How Does Agriculture Fare Under Cap and Trade Proposals?

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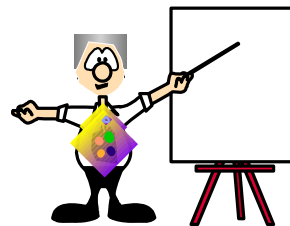
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Presentation Outline

- Background and Caveats
- Assumptions....
- Results
- Conclusions



To Understand All the Options in This Policy Debate – You Need to Know

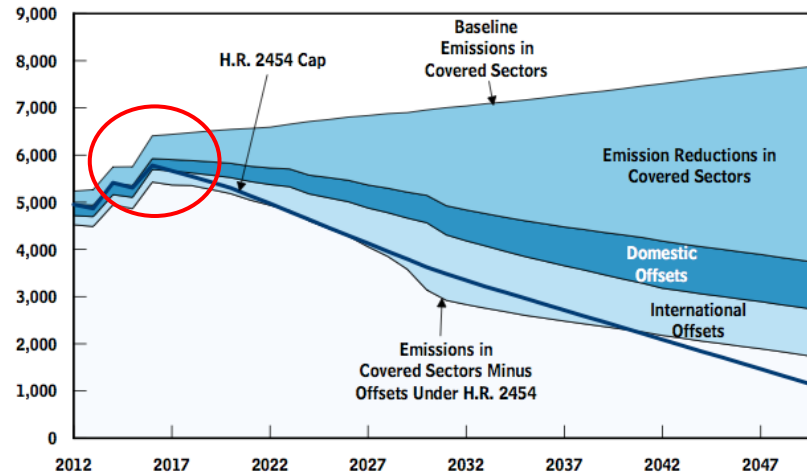
- Will Agriculture Be a Capped Sector?
- What is the Price of Carbon?
- What is the Impact on Energy Prices?
- Do you get to Sell Offsets?

A Few Analyses Have Been Conducted, But...

- Tremendous Difficulty at the Sector Level
 - Land use changes
 - Crop to crop
 - From one use to another
 - Impact on energy intensive industries
 - Fertilizer costs/special provisions
 - Long-term Impacts Should be Really Different than Short-term
- Because of the Above... Farm Level Results Unsettling

Estimated U.S. Emissions Under H.R. 2454, the American Clean Energy and Security Act of 2009

(Millions of metric tons of CO₂e)



Source: Congressional Budget Office.

Notes: CO₂e = carbon dioxide equivalent.

The figure includes both cap-and-trade programs specified under H.R. 2454: the one for hydrofluorocarbons and the one for all other greenhouse gases.

Climate Change Legislation

- Had Been Trying to Figure Out How to Do
 - Rep farms perfect for this
- Request From Senator Chambliss
- Very Difficult
- Hadn't Paid That Much Attention to CCX

Table 1—Estimated Impacts of HR 2454 on Energy Prices

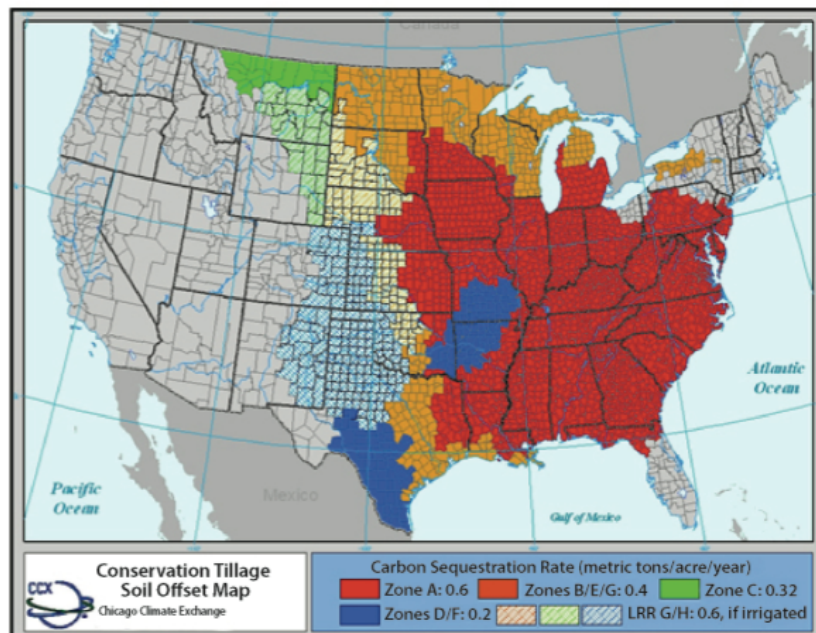
	2015	2020	2025	2030	2035	2040	2045	2050
	\$ per ton CO ₂ e (2005 \$)							
Allowance price	12.64	16.31	20.78	26.54	33.92	43.37	55.27	70.40
	<u>Percent change from baseline</u>							
Electricity price	10.7	12.7	14.0	13.3	16.9	24.0	29.1	35.2
Natural gas price	7.4	8.5	8.6	10.4	14.3	18.9	24.1	30.9
Petroleum price	3.2	4.0	4.7	5.6	7.2	9.0	11.4	14.6

Source: EPA, June 23, 2009.

Assumptions....

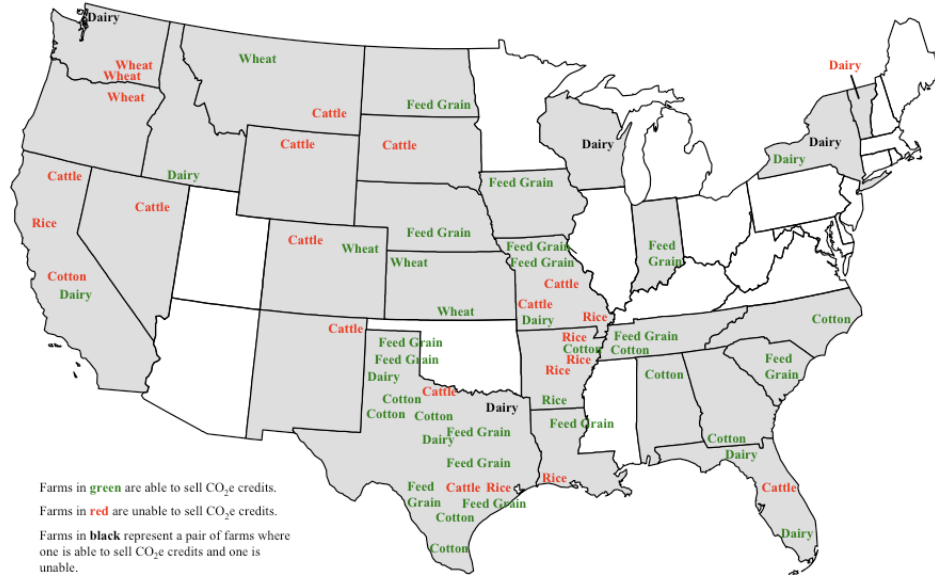
- Had to Make a lot of Assumptions
- EPA Had Their Own Baseline(s)
- Sequestration Map {would work like CCX}
- Crop Farms Converted to No-Till
 - Based on map some not able to participate
 - No rice farms
- Dairies > 500 Head Add Methane Digester
- Cattle Ranches Assumed Not to Participate

Figure 1. Conservation tillage soil offsets.



Source: Chicago Climate Exchange

Representative Farms, Dairies, and Ranches



Scenarios Analyzed

- **Baseline** – Projected prices, policy variables, and input inflation rates from the Food and Agricultural Policy Research Institute (FAPRI) January 2009 Baseline.
- **C&T without Ag Carbon Credits** – Assumes H.R. 2454 becomes effective in 2010. Imposes EPA commodity price forecasts along with estimated energy cost inflation on representative farm inputs.

Scenarios Analyzed (Continued)

- **C&T with Carbon Credits** – Assumes H.R. 2454 becomes effective in 2010. Imposes EPA commodity price forecasts along with estimated energy cost inflation on farm inputs, converts crop farms to no-till production (if applicable) and/or installs a methane digester on dairies over 500 head and sells carbon credits at EPA estimated prices.
- **C&T with Ag Carbon Credits and Saturation** – Assumes the farmland reaches carbon saturation in 2014. This scenario represents the loss of revenues that will be experienced by farms at some point due to carbon saturation of the soil. This scenario is not relevant for analysis of methane digesters on the dairies since saturation is not an issue.

Table 2. Crop Prices for the January 2009 FAPRI Baseline and the EPA Cap and Trade Scenarios.

		2010	2011	2012	2013	2014	2015	2016
Cotton (\$/lb.)	Baseline	0.5585	0.5709	0.5792	0.5912	0.6013	0.6069	0.6137
	EPA H.R. 2454	0.5699	0.5876	0.6022	0.6217	0.6403	0.6553	0.6632
Wheat (\$/bu.)	Baseline	5.26	5.41	5.51	5.65	5.78	5.86	5.88
	EPA H.R. 2454	5.30	5.46	5.57	5.71	5.85	5.94	5.91
Sorghum (\$/bu.)	Baseline	5.75	6.04	6.18	6.43	6.59	6.69	6.72
	EPA H.R. 2454	5.85	6.18	6.36	6.68	6.90	7.09	7.15
Corn (\$/bu.)	Baseline	3.69	3.85	3.88	4.02	4.09	4.14	4.11
	EPA H.R. 2454	3.78	3.97	4.03	4.22	4.33	4.41	4.42
Barley (\$/bu.)	Baseline	4.03	4.15	4.18	4.31	4.36	4.39	4.35
	EPA H.R. 2454	4.24	4.38	4.42	4.56	4.63	4.66	4.67
Oats (\$/bu.)	Baseline	2.54	2.58	2.60	2.67	2.72	2.75	2.76
	EPA H.R. 2454	2.61	2.66	2.69	2.77	2.82	2.87	2.93
Soybeans (\$/bu.)	Baseline	8.78	9.08	9.30	9.55	9.78	9.94	9.99
	EPA H.R. 2454	9.01	9.33	9.58	9.86	10.13	10.33	10.41
Rice (\$/cwt.)	Baseline	11.87	12.05	12.53	13.02	13.27	13.68	13.64
	EPA H.R. 2454	11.97	12.17	12.68	13.20	13.47	13.92	13.90
Soybean Meal (\$/ton)	Baseline	242.97	239.41	241.20	245.51	250.19	252.78	252.00
	EPA H.R. 2454	241.69	238.48	240.60	245.24	250.27	253.21	255.46
All Hay (\$/ton)	Baseline	130.94	128.88	128.46	129.58	131.30	133.84	136.05
	EPA H.R. 2454	134.12	133.77	135.40	138.98	143.61	149.57	151.75

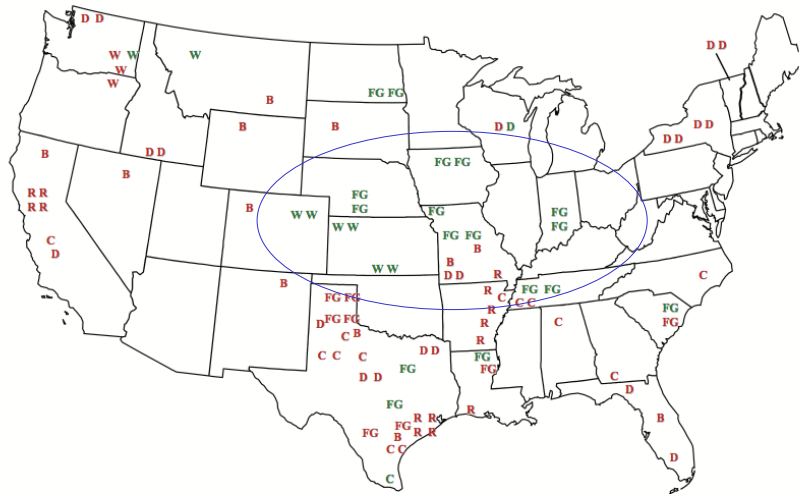
Table 3. Livestock and Milk Prices for the January 2009 FAPRI Baseline and the EPA Cap and Trade Scenarios.

		2010	2011	2012	2013	2014	2015	2016
Culled Cows (\$/cwt.)	Baseline	0.5736	0.5847	0.5928	0.5944	0.6093	0.6093	0.6096
	EPA H.R. 2454	0.5786	0.5907	0.5999	0.6025	0.6186	0.6196	0.6210
Feeder Cattle (\$/cwt.)	Baseline	1.1402	1.2240	1.2805	1.3127	1.3260	1.3255	1.3287
	EPA H.R. 2454	1.1091	1.1864	1.2361	1.2616	1.2683	1.2611	1.2536
Fed Cattle (\$/cwt.)	Baseline	0.9497	0.9848	1.0079	1.0175	1.0240	1.0239	1.0258
	EPA H.R. 2454	0.9176	0.9515	0.9739	0.9832	0.9895	0.9894	1.0001
Culled Sows (\$/cwt.)	Baseline	0.3991	0.4209	0.4344	0.4178	0.4055	0.3970	0.3873
	EPA H.R. 2454	0.4125	0.4363	0.4517	0.4358	0.4244	0.4169	0.4090
Market Hogs (\$/cwt.)	Baseline	0.5302	0.5502	0.5625	0.5477	0.5397	0.5368	0.5333
	EPA H.R. 2454	0.5443	0.5663	0.5804	0.5666	0.5598	0.5583	0.5571
All Milk (\$/cwt.)	Baseline	14.23	16.00	16.52	16.70	16.88	17.16	17.45
	EPA H.R. 2454	14.49	16.36	16.98	17.26	17.54	17.95	18.29

Bottom Line on Extra Income Generation

- Primarily from commodity price enhancement resulting from land shifts to trees
 - Carbon prices in the near term too low to make sequestration activities very profitable
- EPA study indicated 25 million acres of cropland and 24 million acres of pasture would be converted to trees
- University of Tennessee study completed for the 25x'25 Alliance indicated almost all would come from pasture??

Representative Farms, Dairies, and Ranches Analyzed Under the C&T with Ag Carbon Credits Scenario Showing Higher and Lower Ending Cash in 2016



Farms, dairies, and ranches are classified as "green" if their ending cash in 2016 is higher under the C&T with Ag Carbon Credits scenario compared to the Baseline. Similarly, those classified as "red" had lower ending cash in 2016 under the alternative versus the Baseline.

Legend	
FG: Feedgrain	D: Dairy
W: Wheat	B: Beef Cattle
C: Cotton	R: Rice

Representative Farms by Type That Have Higher or Lower Ending Cash Reserves For the C&T with Ag Carbon Credits Scenario Relative to the Baseline

Farm Type	Higher	Lower	Total
Feedgrain/ Oilseed	17	8	25
Wheat	8	3	11
Cotton	1	13	14
Rice	0	14	14
Dairy	1	21	22
Cattle Ranches	0	12	12
Total	27	71	98

Climate Change Summary

- EPA's Analysis Assumes
 - Energy prices go up but... assumes some commodity prices offset those increases
 - If EPA's Analysis is right – not the end of the world – just not fun for everyone
- This isn't the final answer...

Thanks!!!!

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**Gross and Net-to-Farmer Carbon Prices
Utilized in Representative Farm Analysis,
2010 to 2016**

Year	2010	2011	2012	2013	2014	2015	2016
Gross (\$/ton)	8.97	9.704	10.438	11.172	11.906	12.64	13.374
Net-to- farmer (\$/ton)	7.75	8.41	9.07	9.73	10.40	11.06	11.72