Effects of HR 2454 on US Agriculture

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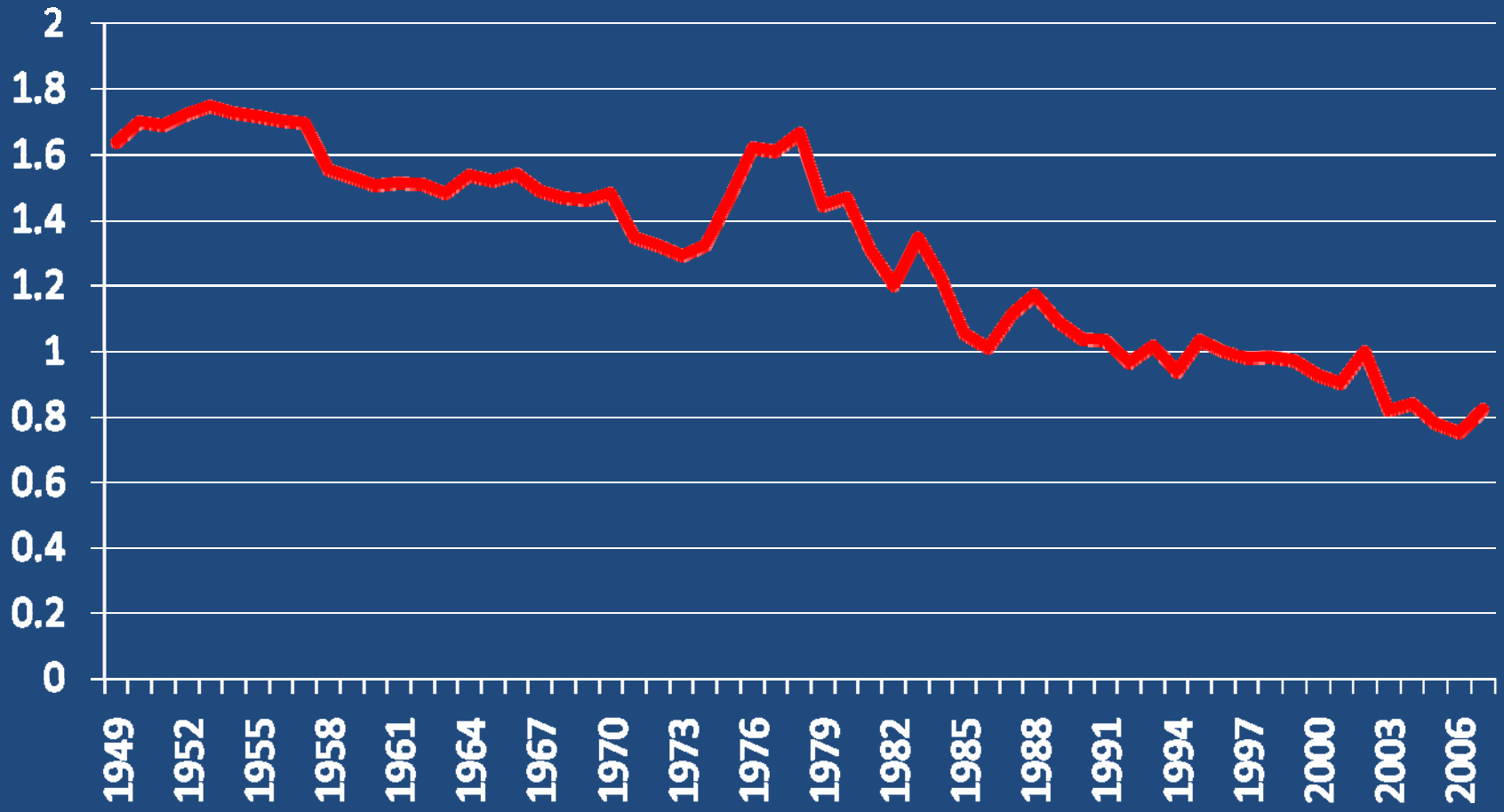
Energy Use and Agriculture

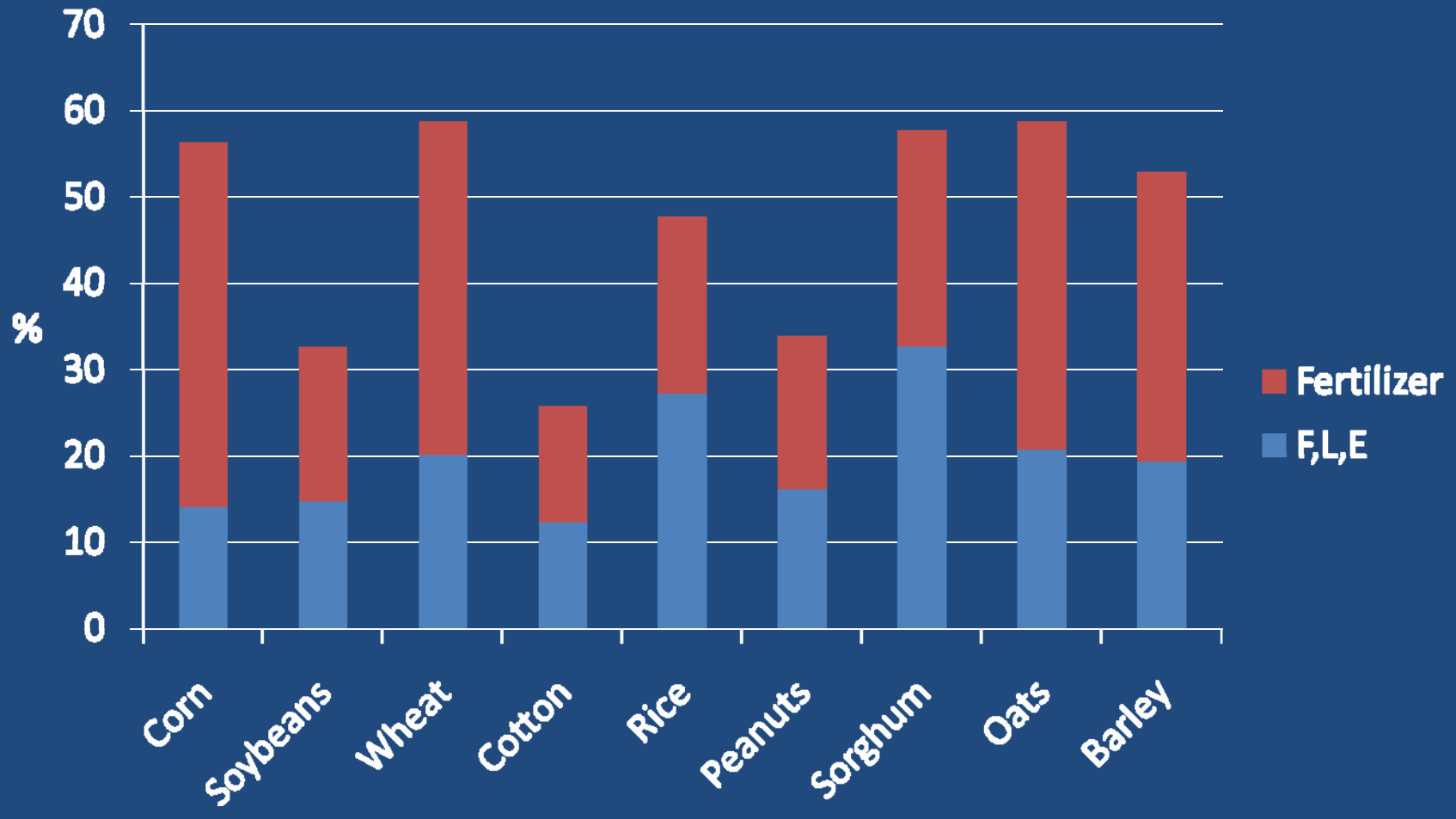
- Productivity growth has been impressive
- Fairly stable share of total production expenses over time
  - Higher energy prices
  - Greater output
- More important for some segments of agriculture
- And between regions even for the same crop.

Energy Use per Unit of Total Farm Output (1996 = 1)



Source: USDA, ERS

Energy Costs in US Agriculture (share of total operating costs)

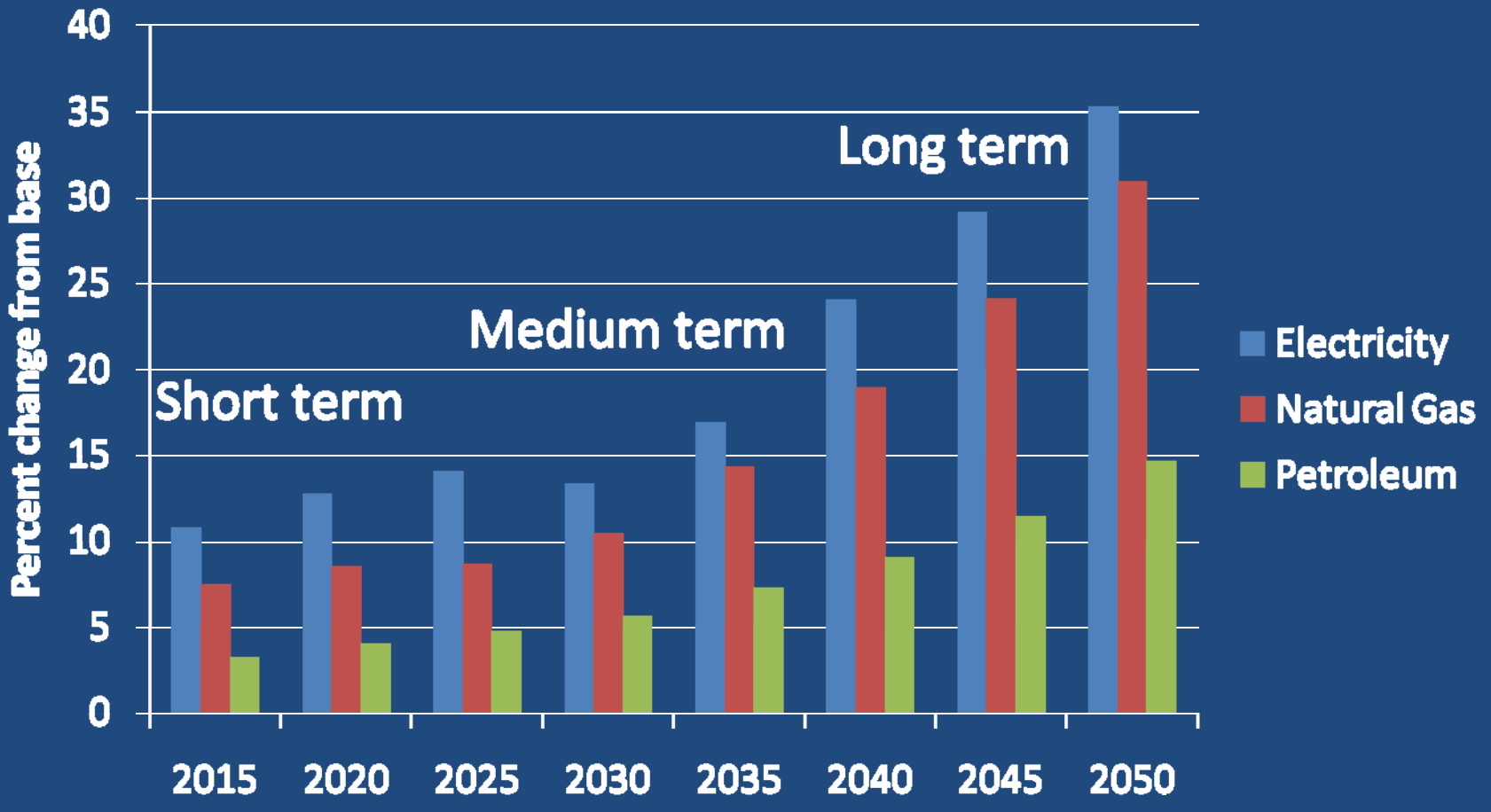


Source: USDA, ERS

Modeling Framework

- EPA estimated energy price impacts
- Adjust energy prices in an economic model of the agricultural sector (FAPSIM)
- FAPSIM
  - Econometric model of the US crop and livestock sectors
  - Includes cross commodity linkages
  - Three simulation periods
    - Short term (2012-18)
    - Medium term (2027-32)
    - Long term (2042-48)

EPA Assessment (energy price impacts)



Source: USEPA, June 23, 2009 Analysis of HR 2454

Energy-Intensive, Trade Exposed (EITE) Provision

- EITE grants allocations to industries would incur energy-related costs that foreign competitors would avoid
- EITE covers industrial sectors that have:
  - an energy or GHG intensity of at least 5% and a trade intensity of at least 15%;
  - an energy or GHG intensity of at least 20%
- Maximum amount of allowances that can be rebated to EITE industries at, 2% for 2012 and 2013, 15% in 2014, and then declining through 2025.
- Nitrogenous fertilizer manufacturing is an eligible EITE sectors.
- Should be enough allowances to cover the increased energy costs.

Cost of Production (near-term)

Crop	With allowance for fertilizer industry	No allowance for fertilizer industry	Value of allowance to producer
	$/acre, 2005$ (percent)		$/acre, 2005$
Corn	1.19 (0.4%)	6.01 (2.2%)	4.82
Sorghum	1.26 (0.9%)	2.81 (2.0%)	1.56
Barley	0.70 (0.6%)	2.52 (2.0%)	1.82
Oats	0.57 (0.6%)	2.09 (2.2%)	1.52
Wheat	0.66 (0.6%)	2.49 (2.2%)	1.83
Rice	3.09 (0.7%)	7.02 (1.6%)	3.93
Soybeans	0.45 (0.4%)	1.28 (1.1%)	0.83
Upland cotton	1.46 (0.3%)	4.03 (0.9%)	2.58

Expenses and Income (near-term)

Item	billion 2005$	% change from baseline
Total receipts	0.0	0.0%
Total expenses	0.7	0.3%
Net farm income	-0.6	-0.9%

Cost of Production (over time)

Crop	Near-term	Medium-term	Long-term
	$/acre, 2005$ (percent)		
Corn	1.19 (0.4%)	12.02 (4.6%)	25.19 (9.6%)
Sorghum	1.26 (0.9%)	5.45 (3.9%)	11.30 (8.0%)
Barley	0.70 (0.6%)	5.00 (4.1%)	10.44 (8.5%)
Oats	0.57 (0.6%)	4.12 (4.4%)	8.66 (9.2%)
Wheat	0.66 (0.6%)	4.94 (4.5%)	10.34 (9.5%)
Rice	3.09 (0.7%)	13.48 (3.1%)	28.08 (6.5%)
Soybeans	0.45 (0.4%)	2.50 (2.2%)	5.19 (4.6%)
Upland cotton	1.46 (0.3%)	7.90 (1.8%)	16.44 (3.7%)

Crop Prices (over time)

Crop	Near-term	Medium-term	Long-term
	% change from base		
Corn	0.1	1.2	2.5
Sorghum	0.2	1.2	2.4
Barley	0.1	0.9	1.9
Oats	0.1	1.1	2.4
Wheat	0.1	0.8	1.7
Rice	0.1	0.5	1.0
Soybeans	0.0	-0.1	-0.3
Upland cotton	0.1	0.5	0.9

Expenses and Income (over time)

Item	Near-term	Medium-term	Long-term
	billion 2005$ (percent)		
Total receipts	0.0 (0.0%)	0.4 (0.1%)	0.9 (0.3%)
Total expenses	0.7 (0.3%)	2.7 (1.1%)	5.6 (2.2%)
- Fuel, oil and electricity	0.7 (6.4%)	1.3 (11.1%)	2.6 (22.2%)
- Fertilizer and lime	< 0.1 (0.3%)	2.0 (9.5%)	4.3 (19.9%)
- Feed	0.0 (0.0)	<0.1 (0.2)	0.1 (0.3)
Net farm income	-0.6 (-0.9%)	-2.4 (-3.5%)	-4.9 (-7.2%)

Offsets

- Technical Potential
- Economic Potential
- Program Implementation
  - Baselines/Additionality
  - Permanence
  - Leakage

Offsets – Technical Potential

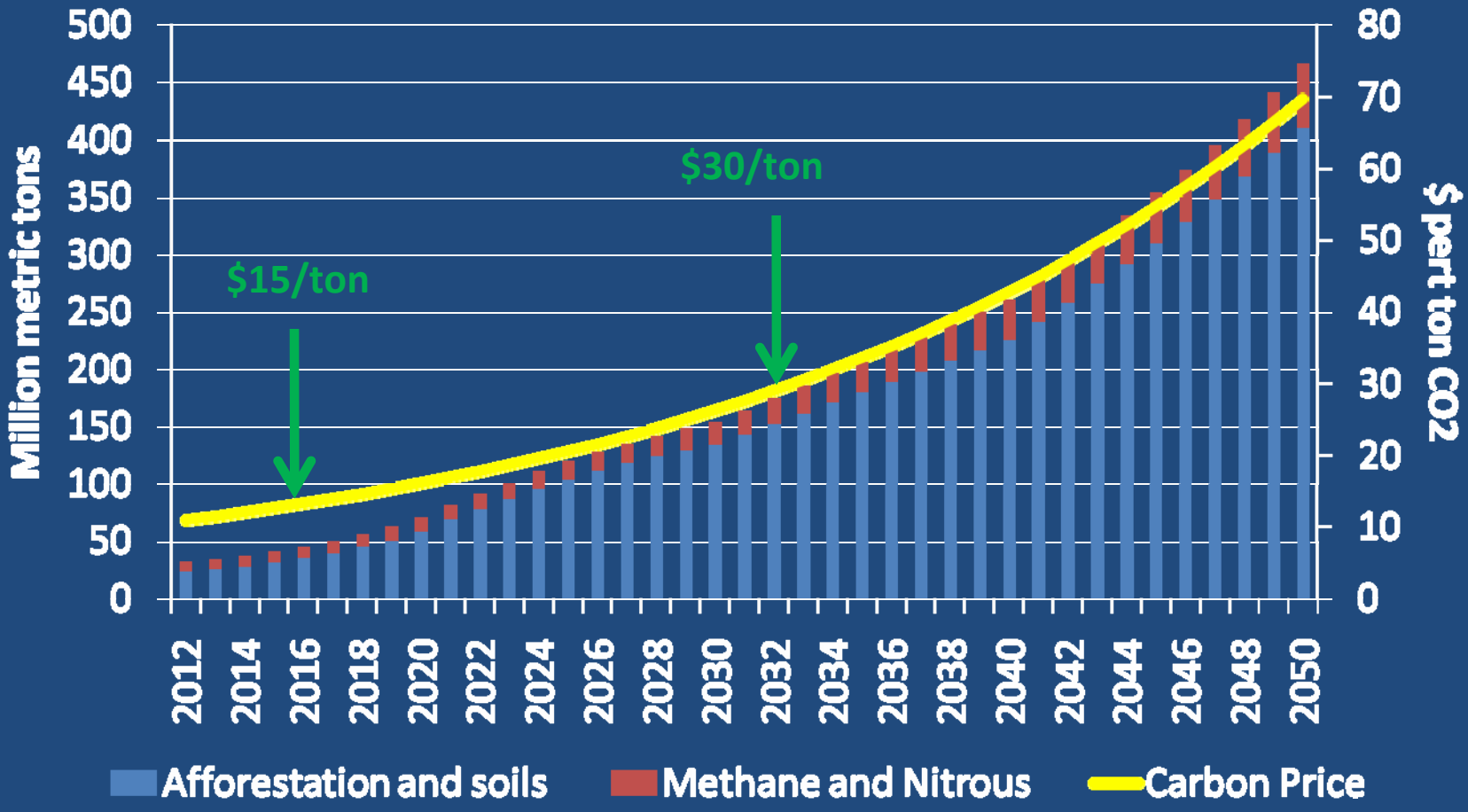
Land-use change or management practice	Potential Sequestration (million metric tons of CO2)
Afforestation of cropland	300 to 700
Shifting to perennial grasses	100 to 200
Conservation tillage and residue management	100 to 400
Improved crop rotations	20 to 55
Improved fertilizer management	20 to 70
Improved irrigation management	20 to 40
Afforestation of pasture	30 to 80
Rangeland management	20 to 60

Sources: USDA, ERS, EPA

Offsets – Economic Potential

- Carbon prices
- Costs associated with changing practices
- Land use implications
- Program implementation

Offsets – EPA Estimates



Offsets – Gross Revenues

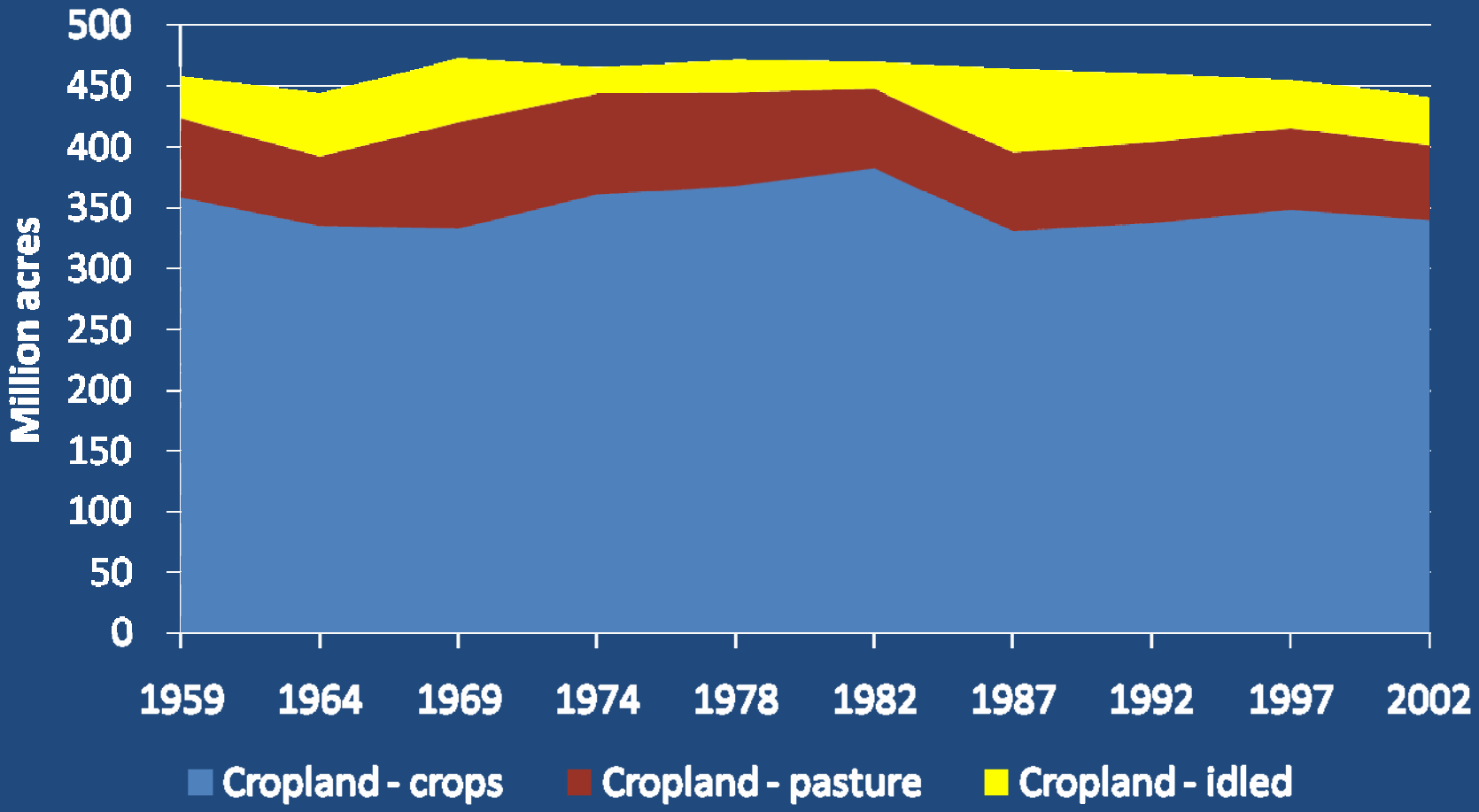
(excludes costs associated with change)

Item	Near-term	Medium-term	Long-term
	billion 2005$		
Afforestation and Soil Carbon	0.4	3.6	17.7
Methane and Nitrous Oxide Reductions	0.1	0.5	2.5
Forest Management	1.6	3.4	8.2
Total Offset	2.1	7.6	28.4
Total less Forest Management	0.5	4.2	20.2

Offsets

- Providing afforestation offsets will cause acres to move between uses.
- Movement will have price and production impacts.
- Policy Issues - Conservation Reserve Program

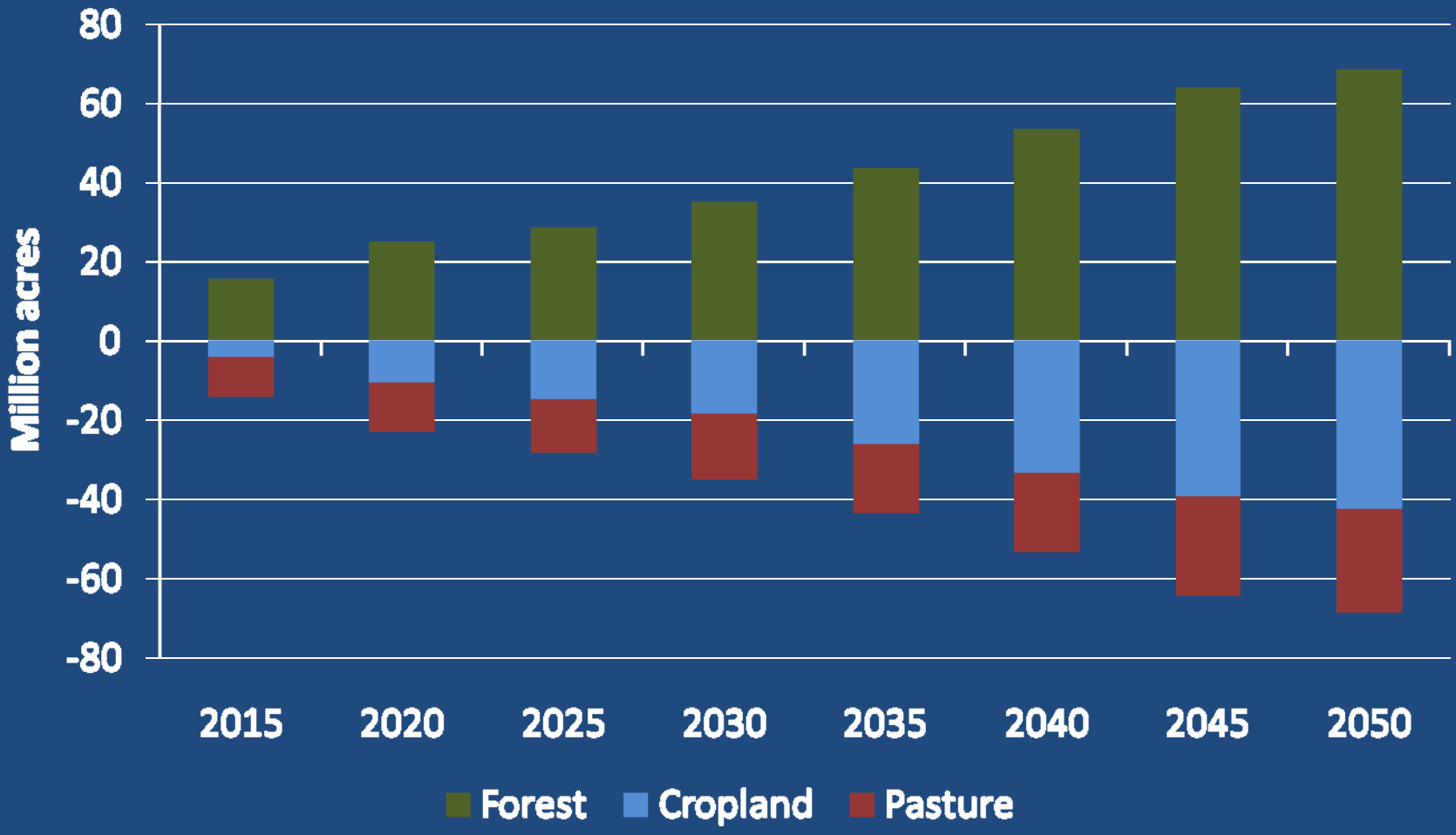
Total Cropland Uses Over Time



Source: USDA, ERS

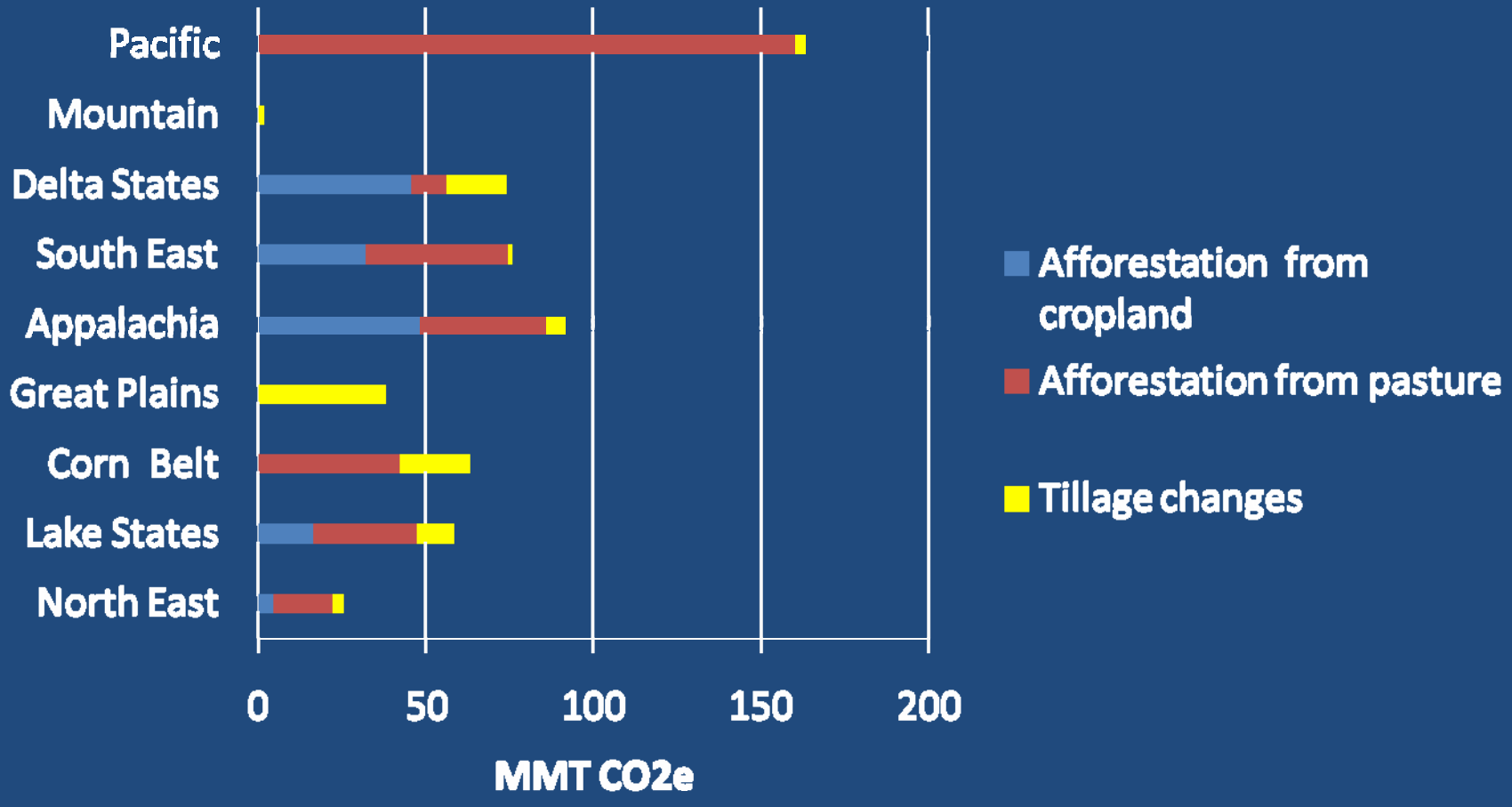
EPA – Land Use Change

(CRP maintained at 32 million acres)



Regional Potential

(carbon price of $34/MT CO2e)



Source: USDA, ERS. 2004

Offsets – Program Implementation

- Offsets are still a work in progress
- Not modeled as HR 2454 was written
- Other considerations
  - Baselines/Additionality
  - Permanence
  - Leakage

Summary

- There will be costs to agriculture due to higher energy prices. Likely to be moderate.
- There will also be significant opportunities for agriculture because of the ability to provide offsets.
- Offsets are still a work in progress as economic models become more refined.