

Understanding the Environmental Potential of a Billion Ton Bioeconomy

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EESI

Environmental and
Energy Study Institute



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Energy Study Institute

- Founded in 1984 by a bipartisan Congressional caucus as an independent non-profit organization (but receives no Congressional funding)
- Source of non-partisan information on energy and environment policy development for Congress and other policymakers
- [Climate change](#) is one of the most serious problems facing civilization today — impacting infrastructure, water supply, agriculture, public health and natural ecosystems

Outline:

- Existing policy drivers
- Biomass supply chain sustainability – beyond GHGs
- How can we move the needle?

Renewable Fuel Standard: EPA Fuel Categories

Fuel	GHG threshold reduction (%)	RFS 2022 Volumes
Conventional biofuel	20	15 bgal
Advanced biofuels	50	21 bgal
Biomass based-diesel	50	
Cellulosic biofuel	60	

Renewable Fuel Standard: 2018 RVOs

Renewable Fuel Volume Requirements for 2014-2019

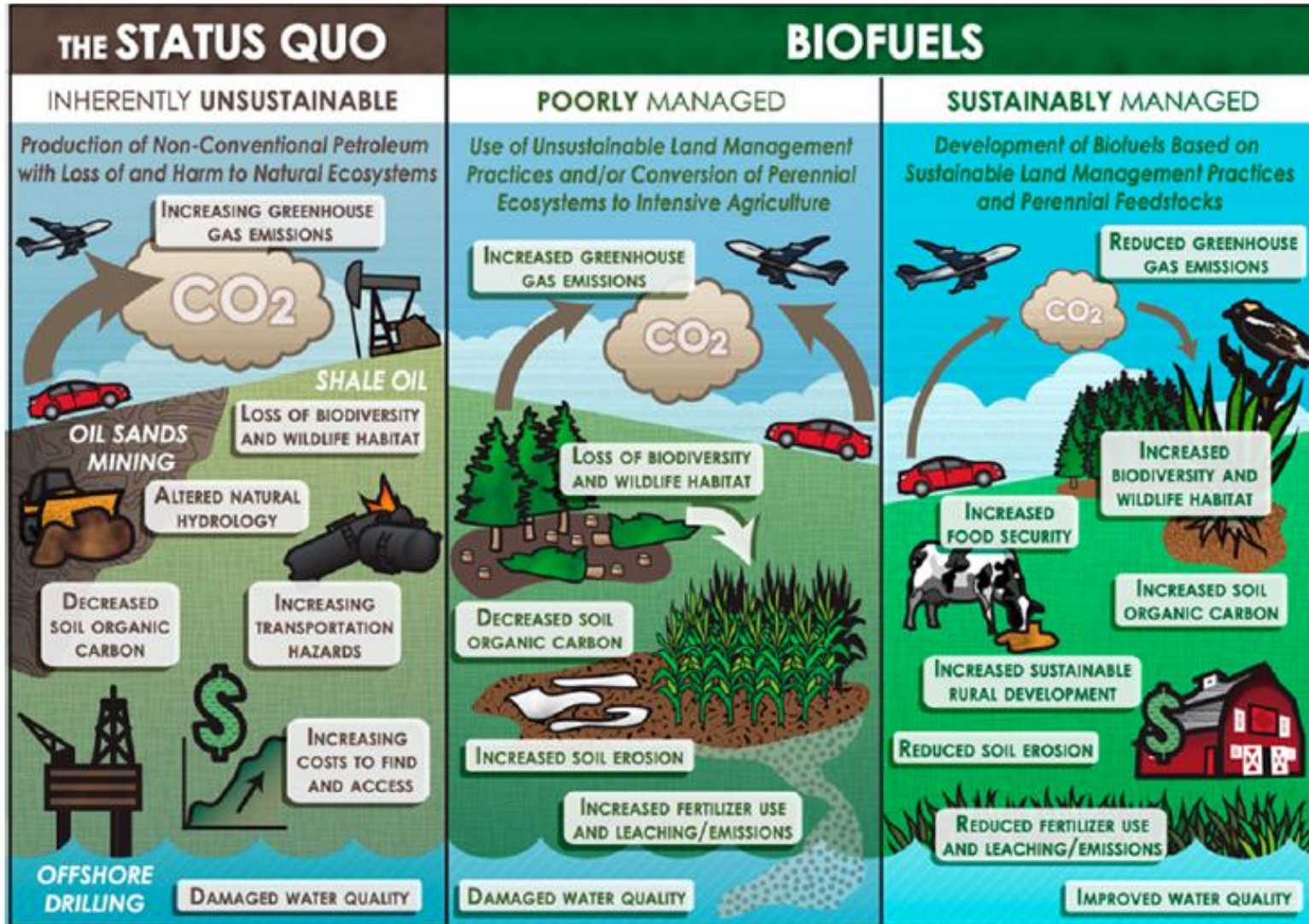
	2014	2015	2016	2017	2018*	2019*
Cellulosic biofuel (million gallons)	33	123	230	311	238	n/a
Biomass-based diesel (billion gallons)	1.63	1.73	1.9	2	2.1	2.1
Advanced biofuel (billion gallons)	2.67	2.88	3.61	4.28	4.24	n/a
Renewable fuel (billion gallons)	16.28	16.93	18.11	19.28	19.24	n/a

2014 Farm Bill Energy Title

Title IX of the Agriculture Act of 2014 (H.R. 2642)				Mandatory Funding			
				Discretionary Funding			
				Total appropriations (mandatory & discretionary)			
(Dollars in thousands)				House Appropriations language			
	Section	Total	2014	2015	2016	2017	2018
9003	Biorefinery Assistance	200,000	100,000	50,000	50,000		
		375,000	75,000	75,000	75,000	75,000	75,000
			100,000	30,000	27,000	0	31,000
9007	Rural Energy for America Program	250,000	50,000	50,000	50,000	50,000	50,000
		100,000	20,000	20,000	20,000	20,000	20,000
			54,000	47,000	48,000	50,352	9,291
9010	Biomass Crop Assistance Program	125,000	25,000	25,000	25,000	25,000	25,000
			7,000	7,000	3,000 ^b	3,000 ^b	0

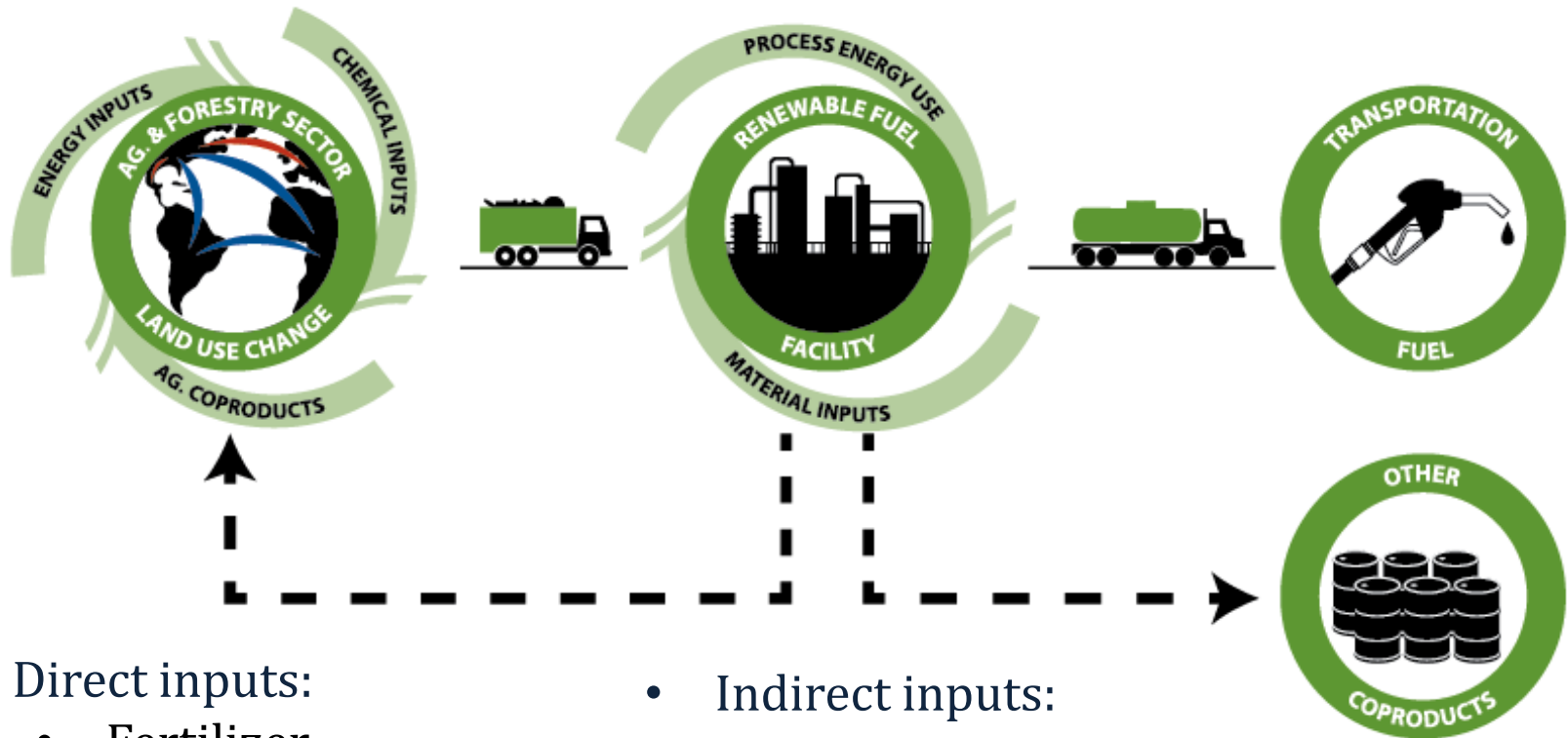
House Appropriators move to “permanently cancel” funds in 9003, 9010

Biofuels & Sustainability



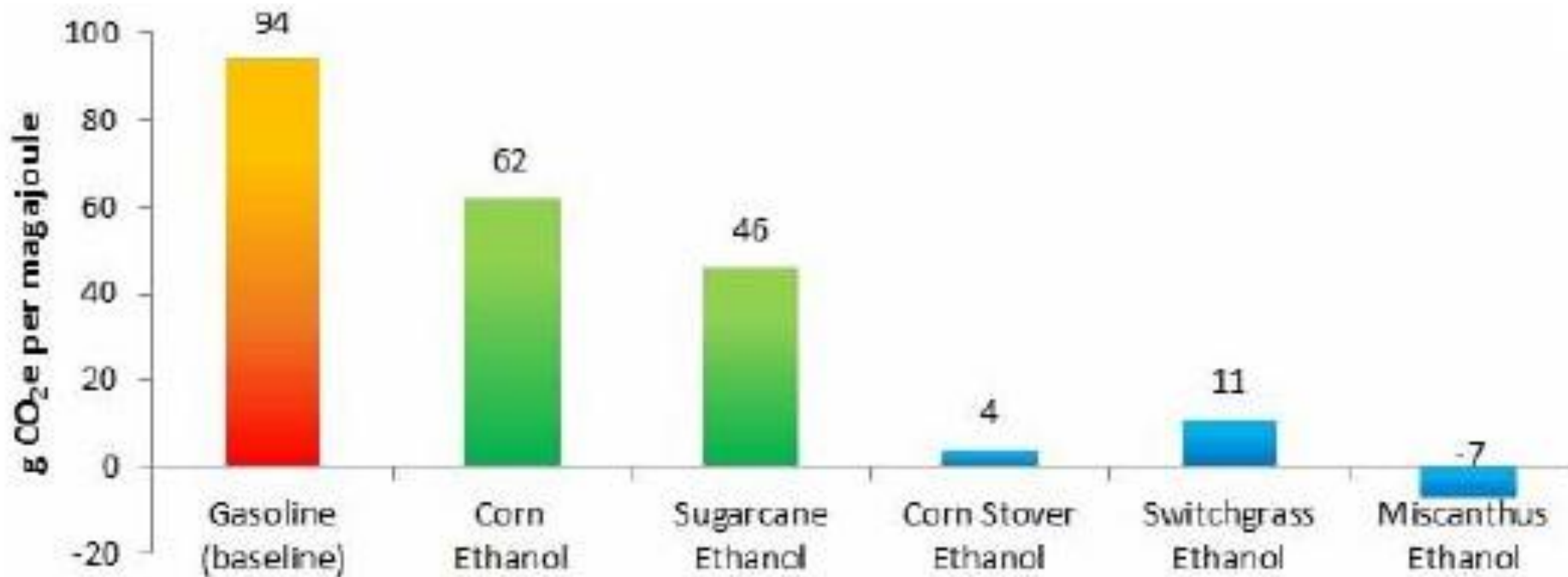
B. Dale et al., Take a Closer Look: Biofuels Can Support Environmental, Economic & Social Goals, Enviro. Sci & Tech., 2014.

Well to Wheels GHG Accounting



- Direct inputs:
 - Fertilizer
 - Energy
- Indirect inputs:
 - Land use change
- Outputs:
 - Main: fuel
 - Co-products: electricity, high protein animal feed, oils.

Well to Wheels GHG Accounting for Fuel Feedstocks – g CO₂/mj



M. Wang et. al., “Well-to-Wheels Energy Use and Greenhouse Gas Emissions of Ethanol from Corn, Sugarcane, and Cellulosic Biomass for US Use.” *Enviro. Research Letters*, 2012.

Other Sustainability Indicators: Going Beyond GHGs

- Water quality/water use
- Air quality
- Soil quality
- Wildlife habitat
- Land use
- Economic sustainability



Barriers to Sustainable Biomass Supply Chain

- Growing global calorie deficit & global shifting diets
- Climate change
- Water availability & water quality
- Conservation measures are voluntary
- Creating pull for sustainable practices
 - Market, consumer, regulatory, etc.
- Public perception – drives policy maker perception

Water Quality

Americans' Worry About Environmental Problems

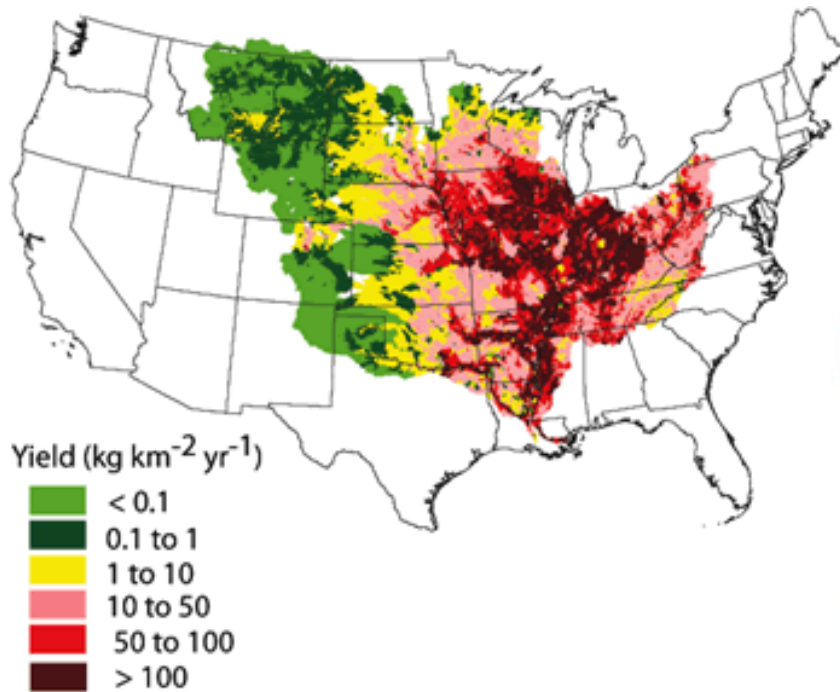
I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about -- [RANDOM ORDER]?

	% Great deal, 2014	% Great deal, 2015
Pollution of drinking water	60	55
Pollution of rivers, lakes and reservoirs	53	47
Air pollution	46	38
Extinction of plant and animal species	41	36
The loss of tropical rain forests	41	33
Global warming or climate change	34	32

GALLUP®

Gallup Poll, 2014

Water Quality



Differences in Phosphorous and Nitrogen Delivery to the Gulf of Mexico, USGS

FEDERAL LAWSUIT

WATER WORKS VOTES TO SUE 3 COUNTIES

FARM RUNOFF FOULING IOWA RIVERS, UTILITY SAYS

Farmers: We feel unfairly targeted

Some frustrated producers threaten to boycott Des Moines

By Timothy Meinch
tmeinch@dmreg.com

Des Moines Water Works will file a federal suit against three rural counties in northwest Iowa, an action that could trigger far-reaching effects on how states approach water quality regulation.

The action follows a 60-day warning that sparked little promise for solving water quality concerns at Water Works, according to utility trustees. The board voted unanimously during a special meeting Tuesday to

TILES ON TRIAL

Des Moines Water Works claims drainage tiles in farm fields from northwest Iowa are contributing to high nitrate levels in central Iowa. The utility claims that water, nitrogen and other nutrients that enter intakes like this are eventually carried underground by drainage lines to streams and rivers that feed the Des Moines and Raccoon rivers, the source of water for 500,000 central Iowa customers.

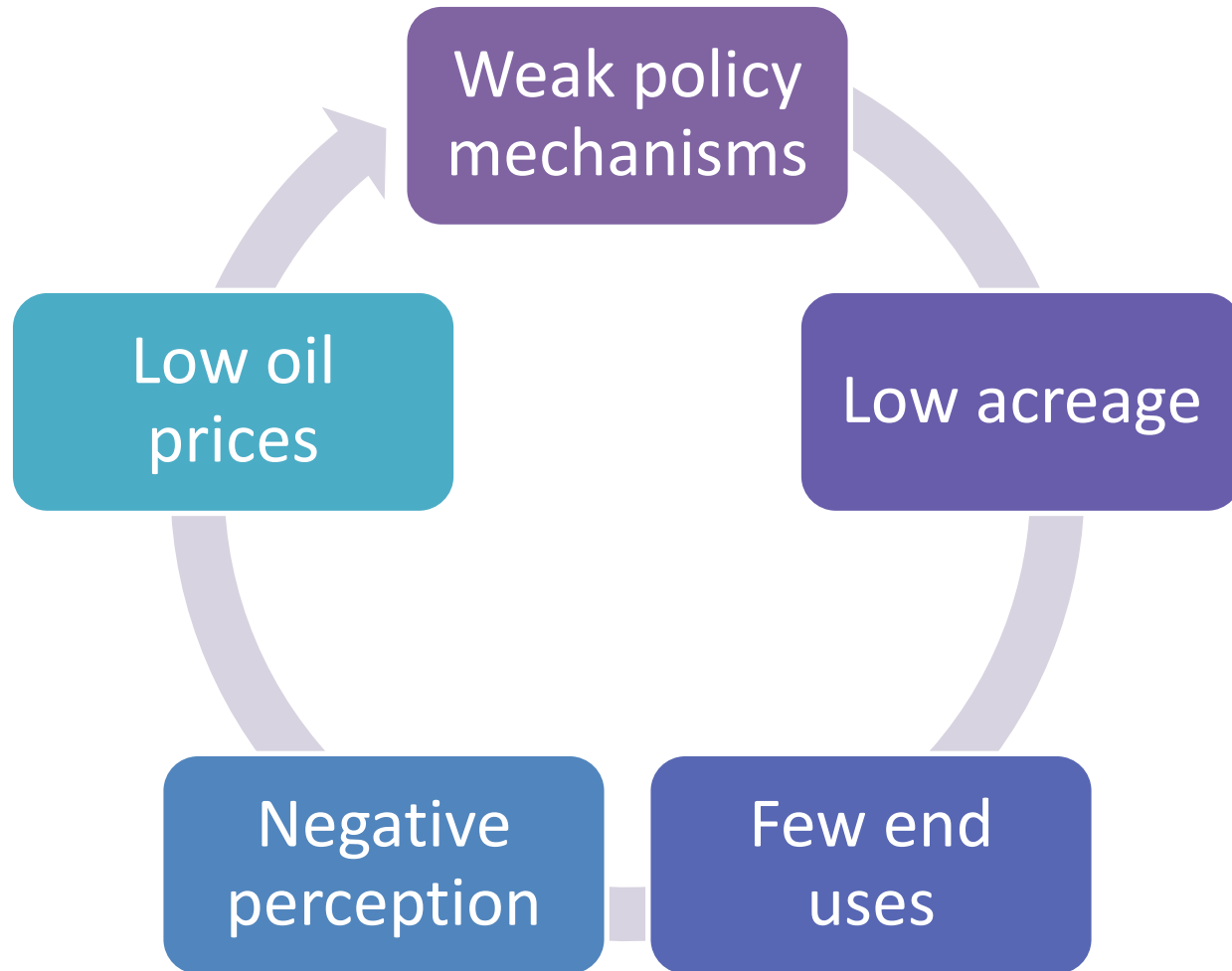
By Donnelle Eller
deller@dmreg.com

LAKE CITY, Ia. — With decades of conservation farming under his belt, Dwight Dial has a hard time understanding why Des Moines Water Works is so intent on suing three northwest Iowa counties for contributing to high nitrates in the Raccoon River, a source of drinking water for roughly 500,000 residents in central Iowa.

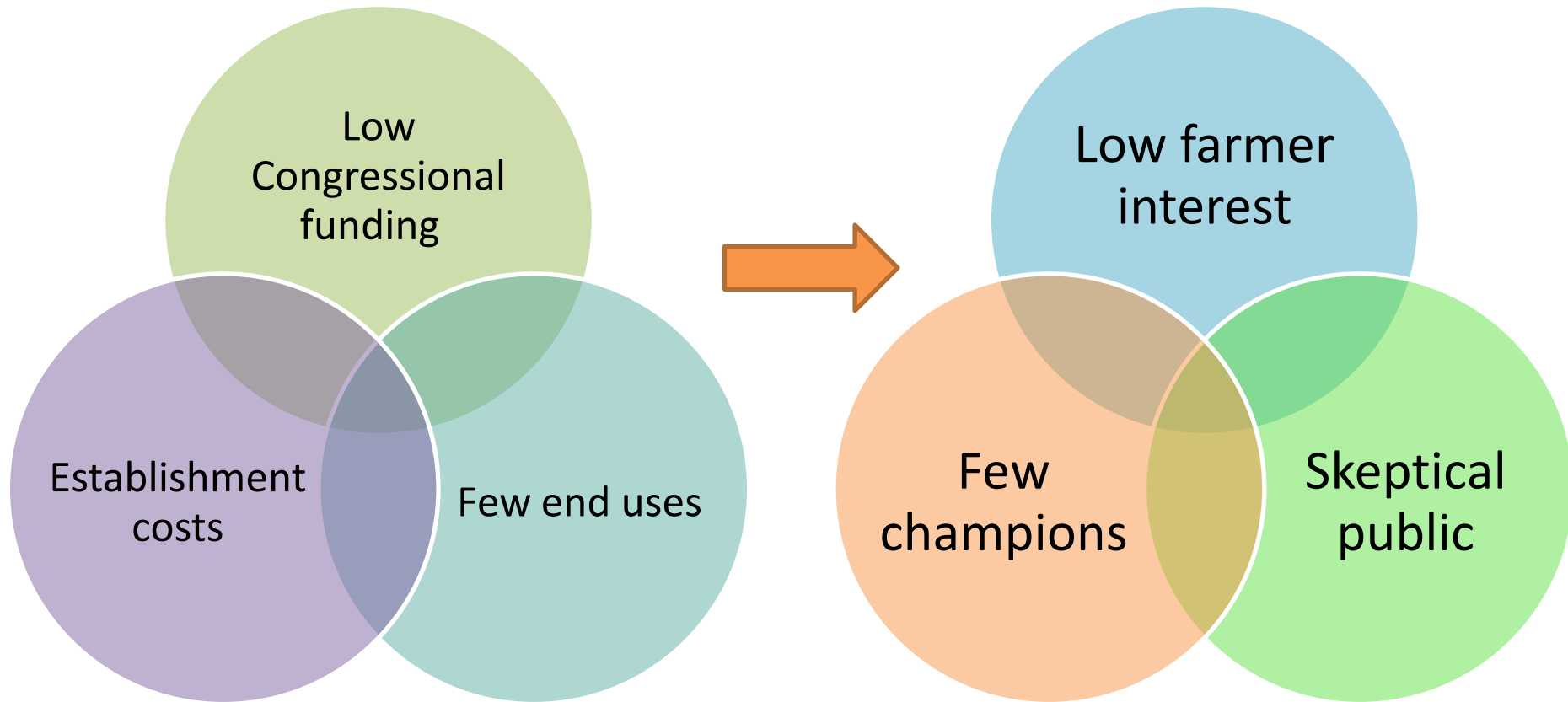
"We're not deliberately dumping our nitrogen into the Raccoon or Des Moines river systems," said Dial, who raises corn, soybeans and pigs near Lake City in Calhoun County, a target of

Des Moines Register, March 11, 2015

Energy Crops: Chicken & Egg Problem



Biomass Crop Assistance Program



Solution?



Climate Solutions Need a Voice in Congress

“Around Congress, the bullying menace of the fossil fuel industry is a constant. If the good guys cede the field to them, the result is predictable: members of Congress frozen in place, often against their better judgment. It doesn’t have to be this way. I’m in Congress, and I’m writing here to say: we need you guys to show up.”

- Senator Sheldon Whitehouse, D-RI

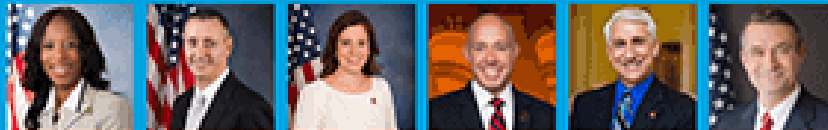


The House Climate Solutions Caucus

Republican Members



Carlos Curbelo (FL-26) Beema Ross-Lehtinen (FL-27) Ryan Costello (PA-06) Patrick Meenan (PA-07) Lee Zeldin (NY-01) Mark Amodei (NV-02)



Mia Love (UT-04) Brian Fitzpatrick (PA-08) Elise Stefanik (NY-21) Brian Mast (FL-18) Dave Reichert (WA-08) Don Bacon (NE-02)

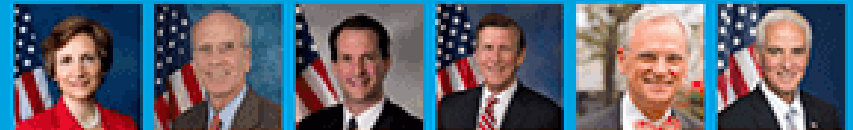


Darrell Issa (CA-49) Rodney Davis (IL-13) John Faso (NY-19) Peter King (NY-02) Tom Reed (NY-23)

Democratic Members



Ted Deutch (FL-22) Alan Lowenthal (CA-47) Brendan Boyle (PA-13) John Delaney (MD-06) Seth Moulton (MA-06) Scott Peters (CA-52)



Suzanne Bonamici (OR-01) Peter Welch (VT-00) Jim Himes (CT-04) Don Beyer (VA-08) Earl Blumenauer (OR-03) Charlie Crist (FL-13)



Juan Vargas (CA-51) Jerry McNerney (CA-09) Anna Escobedo Cabral (CA-18) Daniel Lipinski (IL-03) Thomas Suozzi (NY-03)

- Noah's Ark Caucus – 24 Rs, 24 Ds
- Republican Climate Resolution – 14 Rs

Takeaways:

- Great challenges ahead
- Biomass can be a solution
- YOU have more power than you think!

THANK YOU

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