

# The Future of Biofuels?

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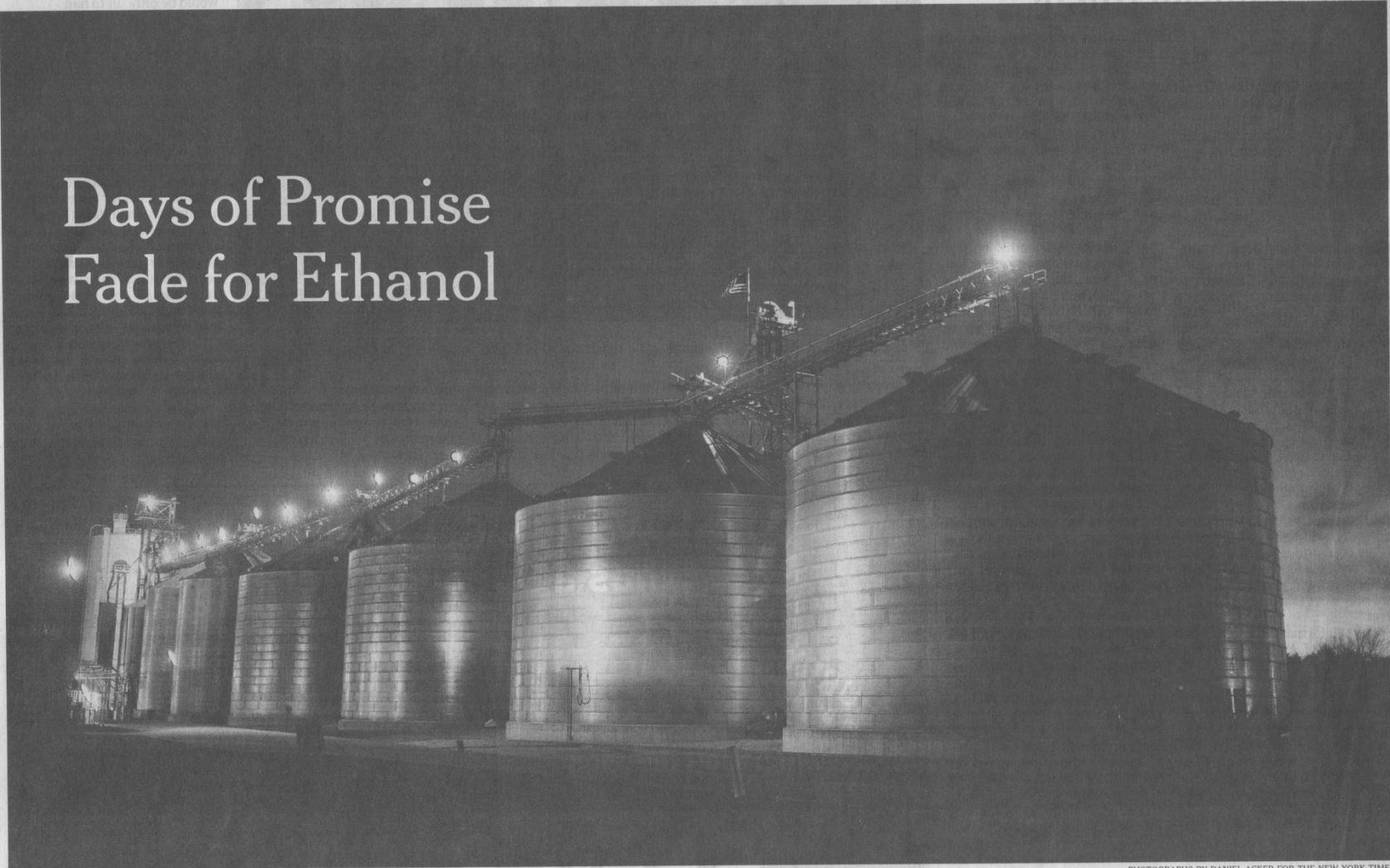
# Huge Uncertainty

- Future of biofuels is more uncertain today than at any time since I have been working in the area – 10 years.
- My plan is to discuss the major positive and negative drivers that exist today in the biofuels arena.

SUNDAY, MARCH 17, 2013

**National**  
The New York Times

Days of Promise  
Fade for Ethanol

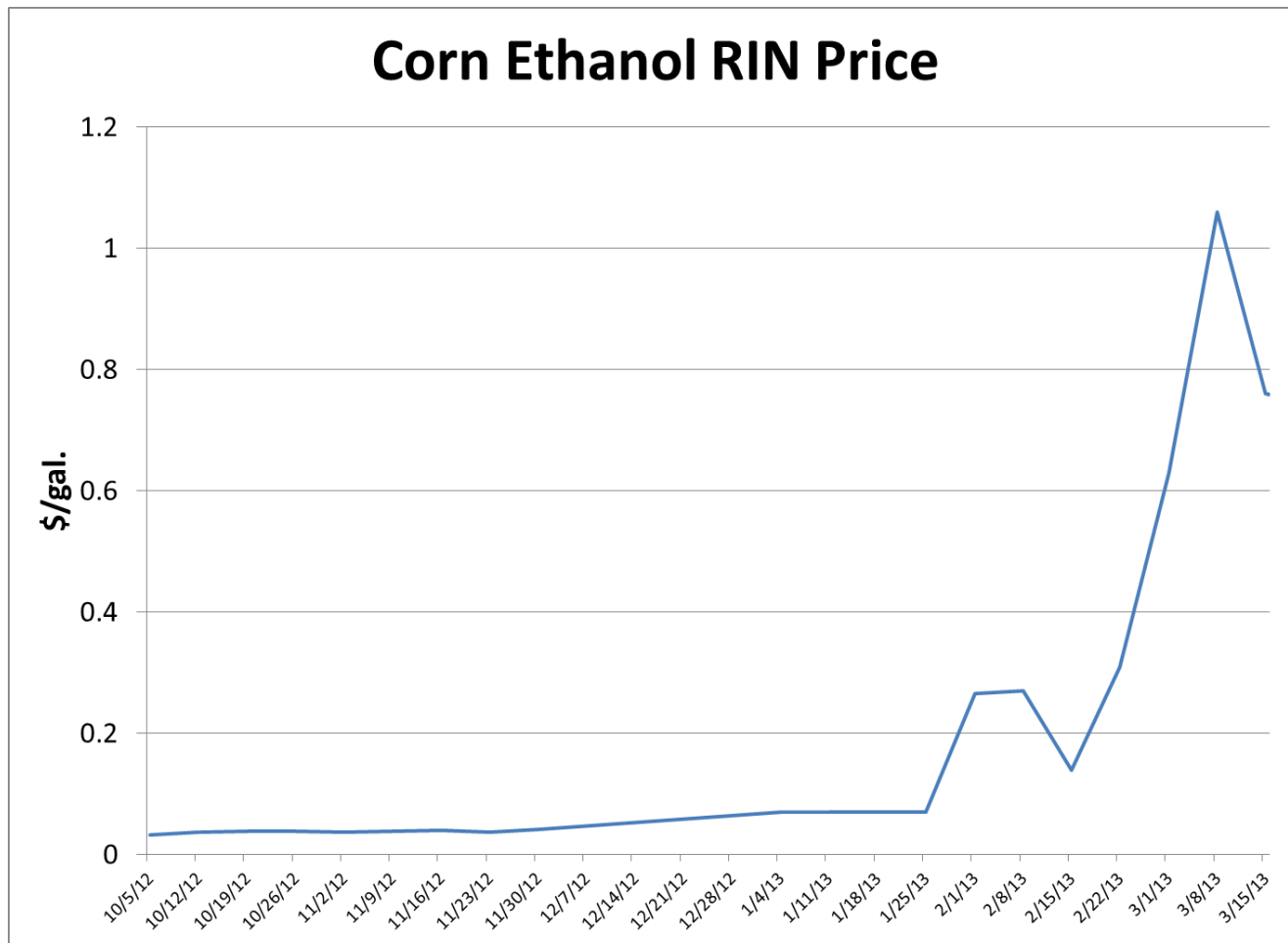


PHOTOGRAPHS BY DANIEL ACKER FOR THE NEW YORK TIMES

Corn storage at the ethanol plant in Macon, Mo., which stopped operating in January. Officials have vowed to reopen it, and it is undergoing renovations. More photos at [nytimes.com/national](http://nytimes.com/national).

# Negatives

- Blend wall is a huge issue for US ethanol



# Blend Wall

- Exports provided a relief valve for the blend wall in 2011.

Year	Exports	Imports	Net Exports
2010	0	9.7	-9.7
2011	1,195	141	1,054
2012	739	555	184

- RIN prices previously much higher for biodiesel and advanced biofuels

RIN code	Fuel	RIN price 21 Mar
D6	Corn ethanol	0.71
D4	Biodiesel	0.80
D5	Advanced	0.77

# Blend Wall and RFS

Year	Conventional	Advanced
2012	13.2	0.50
2013	13.8	0.75
2014	14.4	1.00
2015	15.0	1.50

- Blend wall is about 13.3 BG, but sugarcane ethanol is part of that.
- Advanced will be met with biodiesel and sugarcane ethanol, so ethanol imports put pressure on blend wall.
- Market perceives carry-forward RINs being used up in 2014, and no adjustment of RFS by EPA.
- Today, corn ethanol price is rising due to high value of corn ethanol RINs. Corn ethanol is profitable again.

# Negatives

- Big oil and other opposition groups seem to be more aggressive in attacking biofuels and the RFS.

API, senators separately urge EPA to address rising RIN prices

WASHINGTON, DC, 03/21/2013, By Nick Snow, OGJ Washington Editor

The American Petroleum Institute and two Republican US senators separately asked the Environmental Protection Agency to address renewable identification number (RIN) costs, which have jumped by 1,400% since the beginning of 2012.

**And from the RFA:**

"So, the oil industry is howling about 'billions' in fictitious 'compliance costs,' when if they would just invest two one-hundredths of a penny of profit per gallon in infrastructure, no one would be talking about the 'blend wall' or high RIN prices today. And, more importantly, consumers would be enjoying greater choice and lower prices at the pump."

# Negatives

- Federal and state budget issues may limit use of subsidies and biofuels research expenditures.
- Food/fuel issue attracting more attention.
- The EU is backing away from conventional biofuels and has provisionally capped the food crop component at 5% - half the renewable fuel target.
- With more US oil production and cheap natural gas, less interest in renewables.



# Negatives

- EPA will be forced to waive some part of the cellulosic part of the RFS every year.
  - The RFS out clause automatically comes into play.
  - In that out clause, blenders can buy out of their blending obligation by purchasing a credit from EPA plus buying an advanced biofuel RIN.
  - The 2013 price for the credit is \$0.42, and an advanced RIN currently is about \$0.77.
  - The buy-out cost is about \$1.19/gal.
  - With wholesale gasoline at \$3.10, the cap on cellulosic is \$4.29, less than current cost.

# Negatives

- The private sector seems less interested in biofuels today – projects being cancelled.
- Obtaining financing for advanced biofuels plants is very difficult.
- Changes in the RFS
  - There are legislative proposals to eliminate the RFS.
  - Other changes could weaken it further, but not eliminate it.

# Positives

- Ethanol is now an important part of the US and Brazilian fuel systems
- This past summer, there were calls to suspend or reduce the RFS because of the drought.
  - However, ethanol is so well integrated in the fuel system, that a RFS change would have done little to change blending.
  - Ethanol is now less expensive than gasoline.

# Positives

- Some advanced biofuel technologies are getting much closer to being economic
  - Envergent Technologies – RTP (pyrolysis)
  - CRI Catalyst –  $\text{IH}_2$  – uses catalysts,  $\text{H}_2$ , and low heat and pressure to make drop-in fuels
  - Both project being commercial within 5 years.

# Positives

- The ethanol blend wall mainly affects the US and not other regions
- Climate change and GHG emissions seem to be getting more attention
- Aviation biofuels provide the best prospects for biofuels, and both the military and civil aviation are quite interested in biofuels.

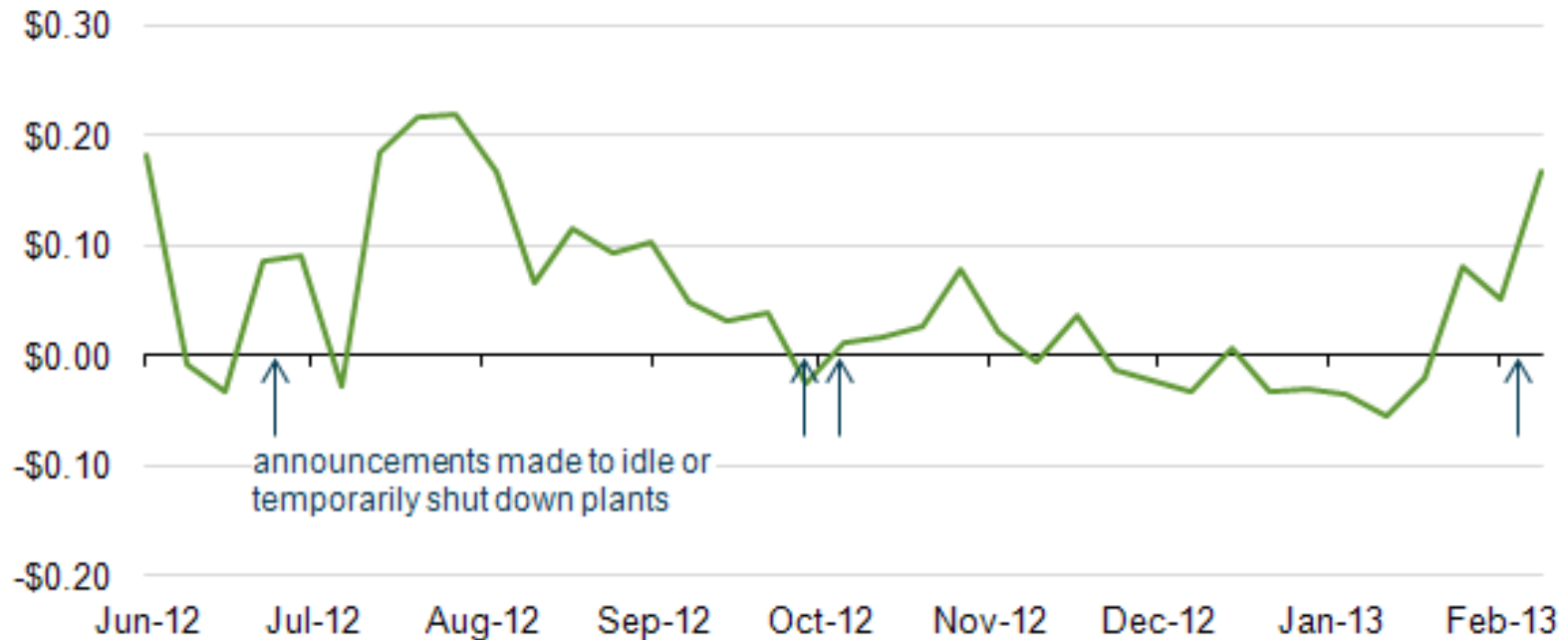
## Positives (continued)

- Changes in the RFS might help develop biofuels – removal of the out clause would benefit cellulosic biofuels.
- There is expansion in ethanol production in parts of Asia.
- Surge in RIN prices has pulled up corn ethanol price and increased profitability.

# Positives (continued)

- Corn oil extraction is improving the profitability (or reducing the loss) of corn ethanol.

Estimated average margins (revenue minus cost) of ethanol plants without corn oil recovery dollars per gallon



# Positives

- Military remains interested in biofuels, and the DPA provisions could get 1-3 advanced biofuels plants built.
  - However, it appears the sequester, at least for now, has eliminated some of that funding.
- Reverse auction could get plants built, but no authority to implement today.



# Conclusions

- Very difficult to go beyond identifying the key drivers
- There will be a big push to modify or end the RFS, given the blend wall, food/fuel issue, and other factors.
- Cellulosic biofuel seems closer than ever, but it is unlikely to be developed commercially in the current environment.

*Thank you!*  
Questions and Comments

For more information:

<http://www.agecon.purdue.edu>

Click on faculty directory and then Tyner