



Solutions in Search of Problems? A Bioeconomy Retrospective

Beau Hoffman
Technology Manager
Bioenergy Technologies Office

London, 1721

- Brewers were found guilty of conspiring to not brew small beer (~1% ABV)
 - Established the precedent of common law used in US re. gov't regulated monopolies (e.g utilities)
 - Further reading: *Munn v. Illinois*
- Small beer was in fact the only beverage that poor working women could afford
 - Water was not potable



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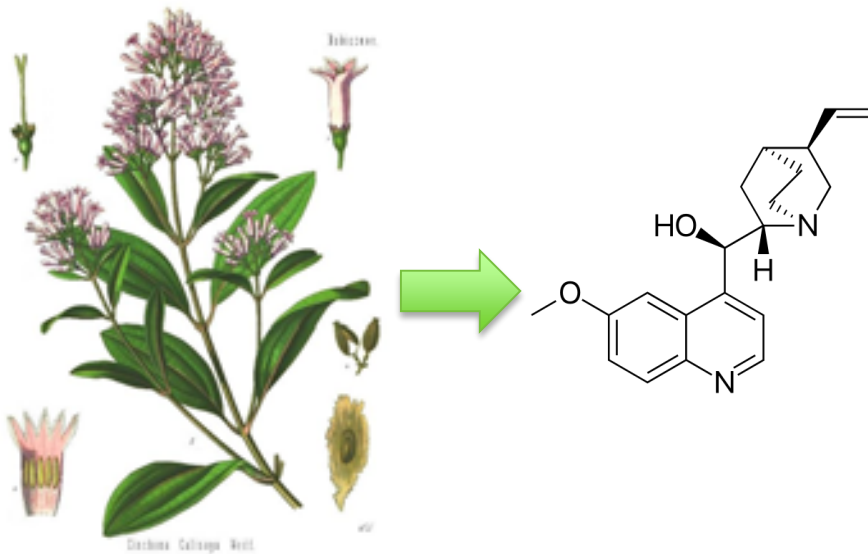


Piccadilly Circus

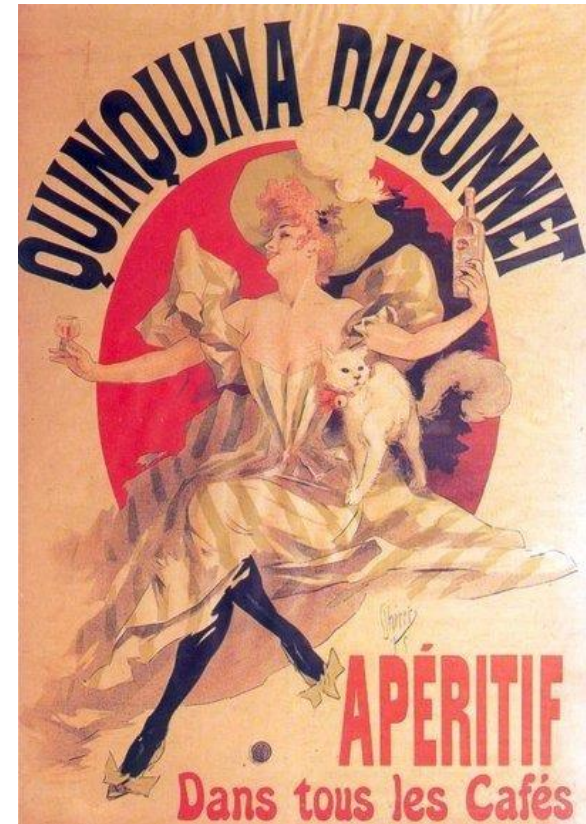
By John Snow - Published by C.F. Cheffins, Lith, Southampton Buildings, London, England, 1854 in Snow, John. On the Mode of Communication of Cholera, 2nd Ed, John Churchill, New Burlington Street, London, England, 1855. (This image was originally from en.wikipedia; description page is/was here. Image copied from http://matrix.msu.edu/~johnsnow/images/online_companion/chapter_images/fig12-5.jpg), Public Domain, <https://commons.wikimedia.org/w/index.php?curid=2278605>

Paris 1846

- French Government ran a competition to find a remedy to malaria for French Foreign Legions

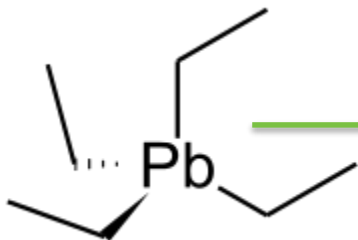


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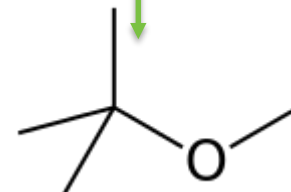
Tetraethyllead



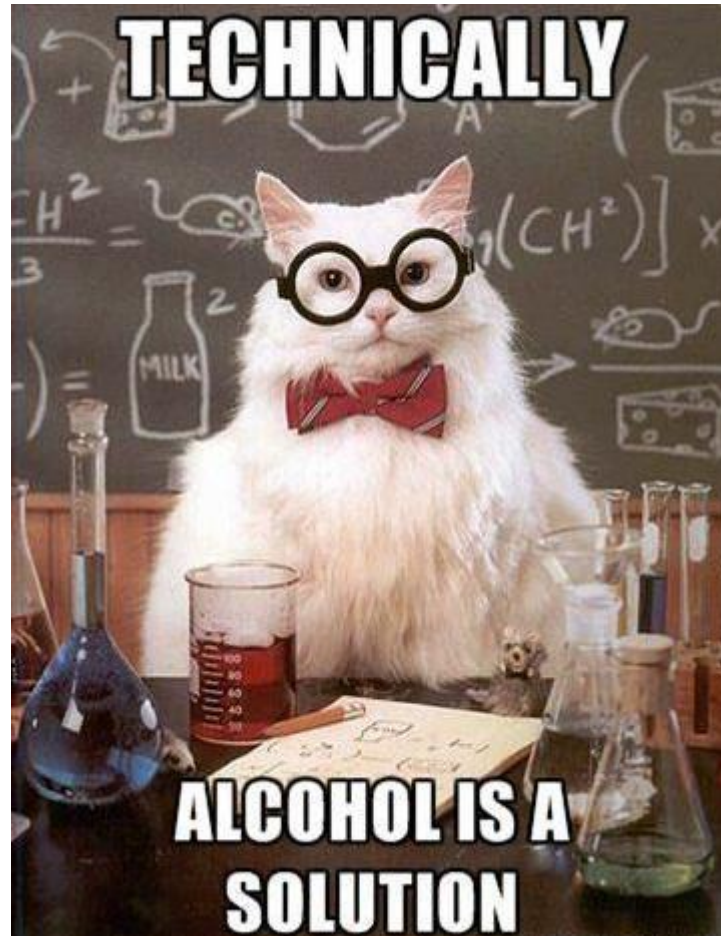
- First used as gasoline additive in 1920s
- Neurotoxicity issues, spark plug fouling
- Requirement of catalytic converters in 1975 began phaseout

Methyl tert-butyl ether (MTBE)

- Blending began in 1979
- Groundwater contamination issues
- Banned outright in some states as a fuel additive beginning in EPA Act 2005



In these examples...

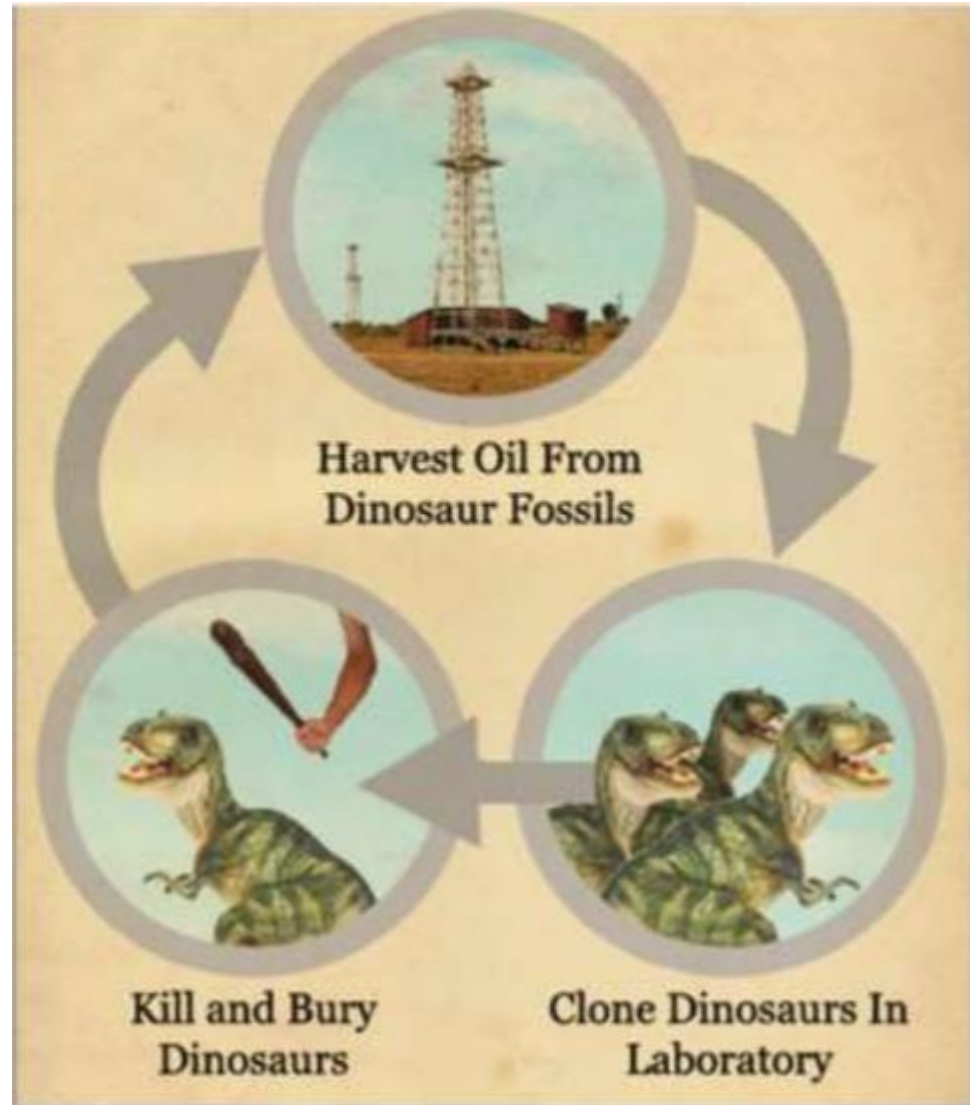


What other solutions do we have?

21st Century Breakthroughs:
Combinatorial Chemistry
Social Media
Hydraulic Fracturing
Wireless Connectivity
Synthetic Biology

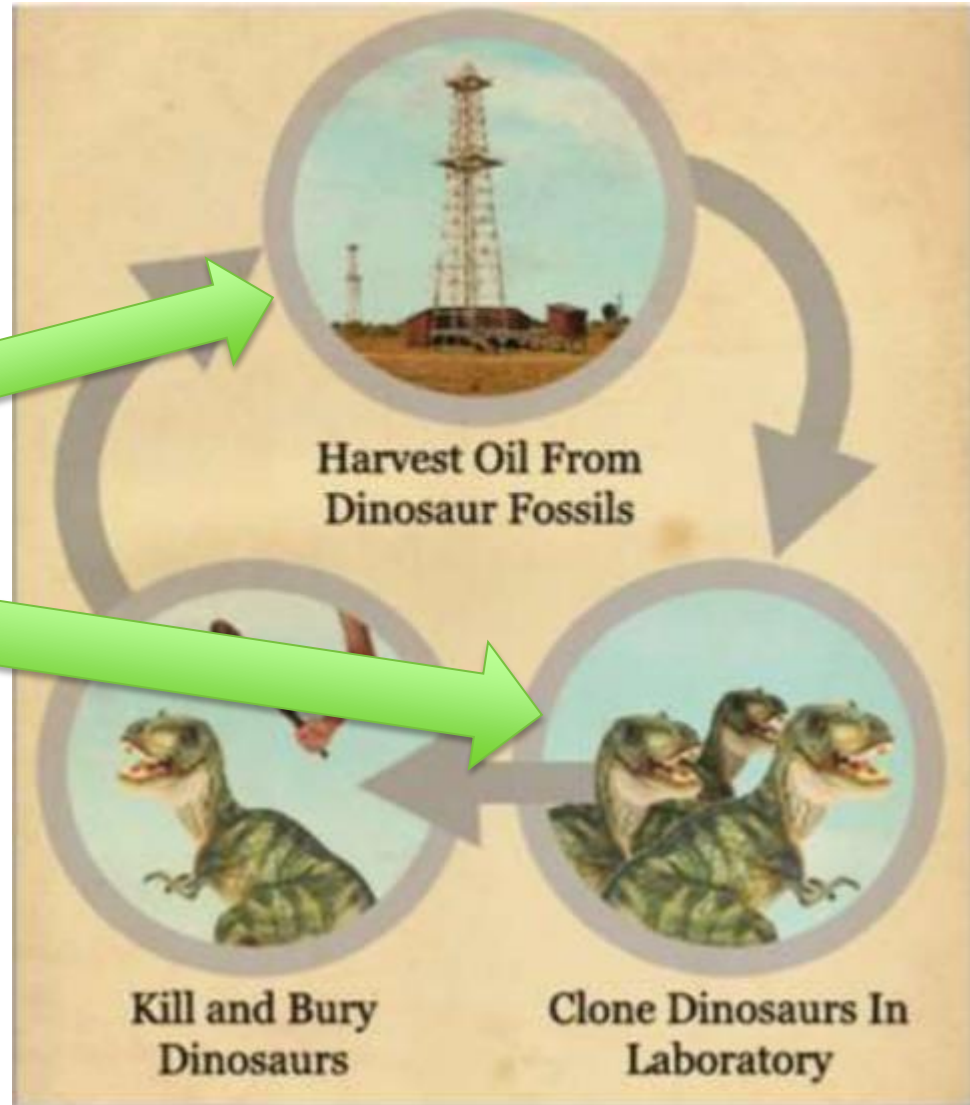
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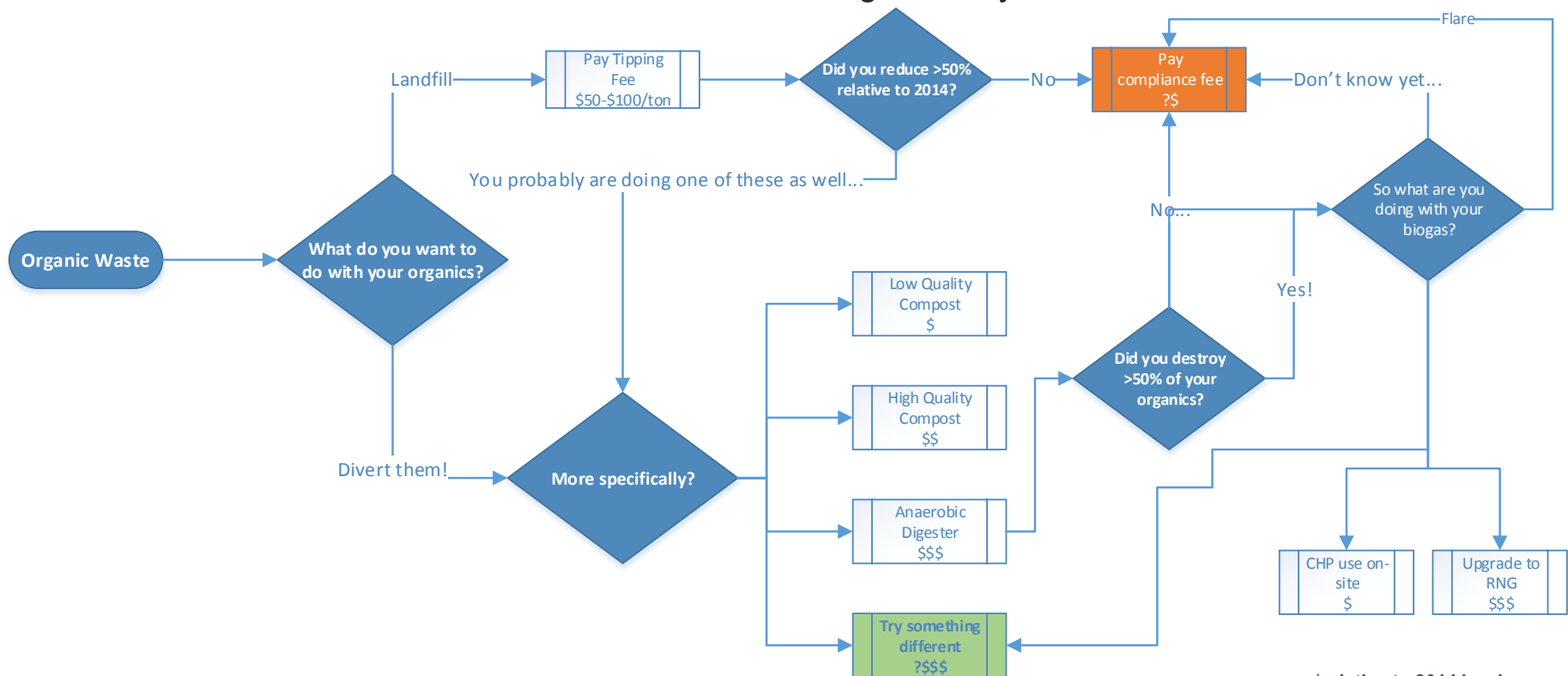
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Where do today's challenges intersect with the bioeconomy?

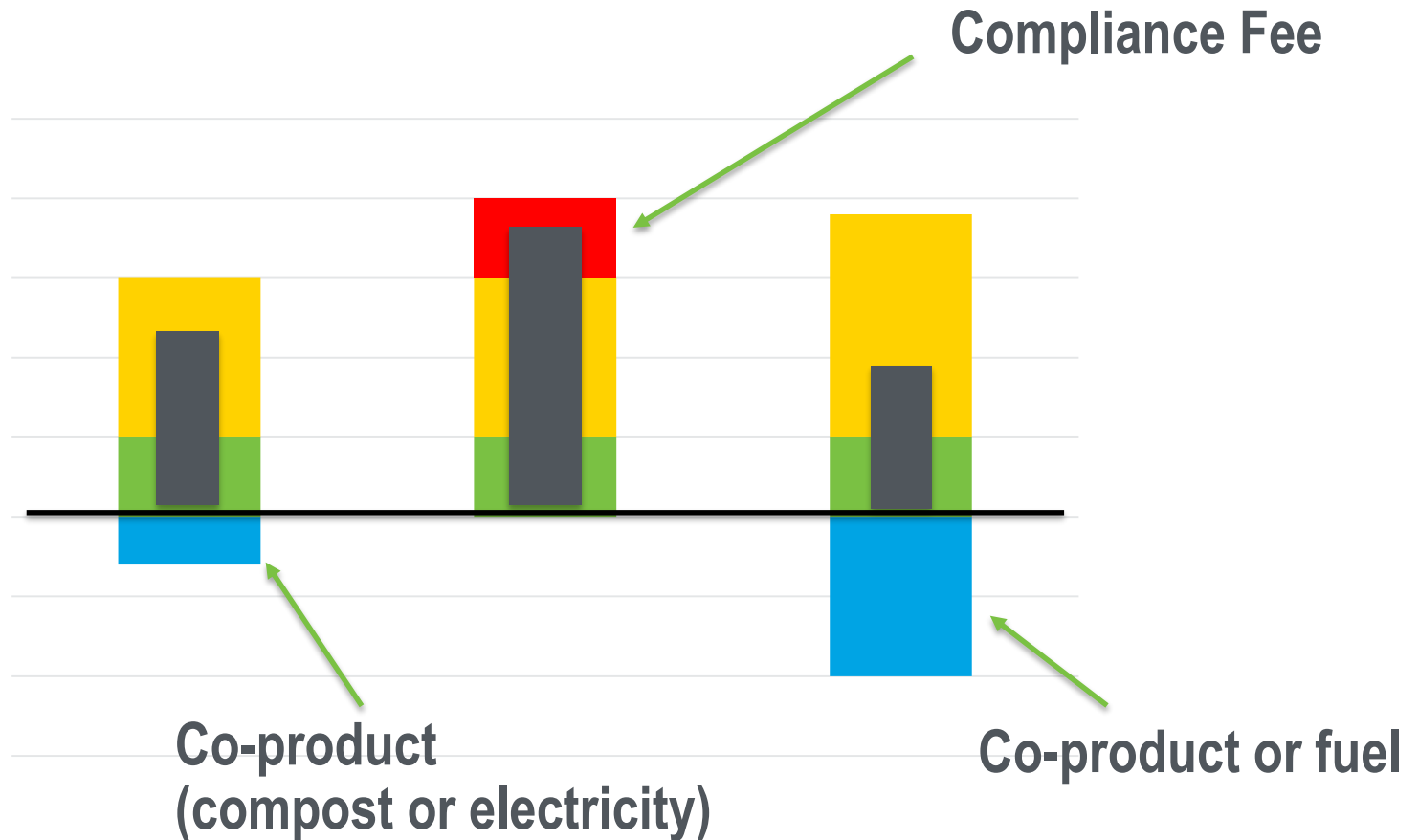
- Organics Disposal

- State and local regulations are curtailing landfilling of organics
- California SB 1383: 50% reduction in organics by 2020*



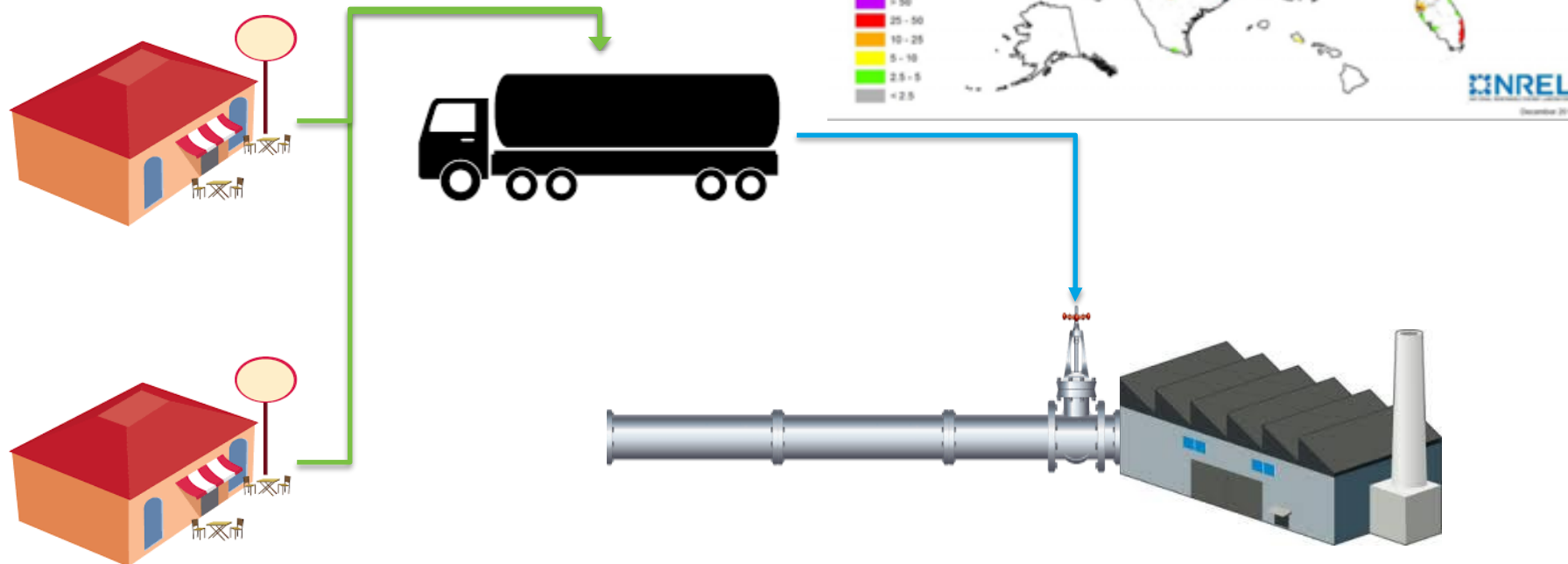
*relative to 2014 levels

What is the Cost of Doing Nothing



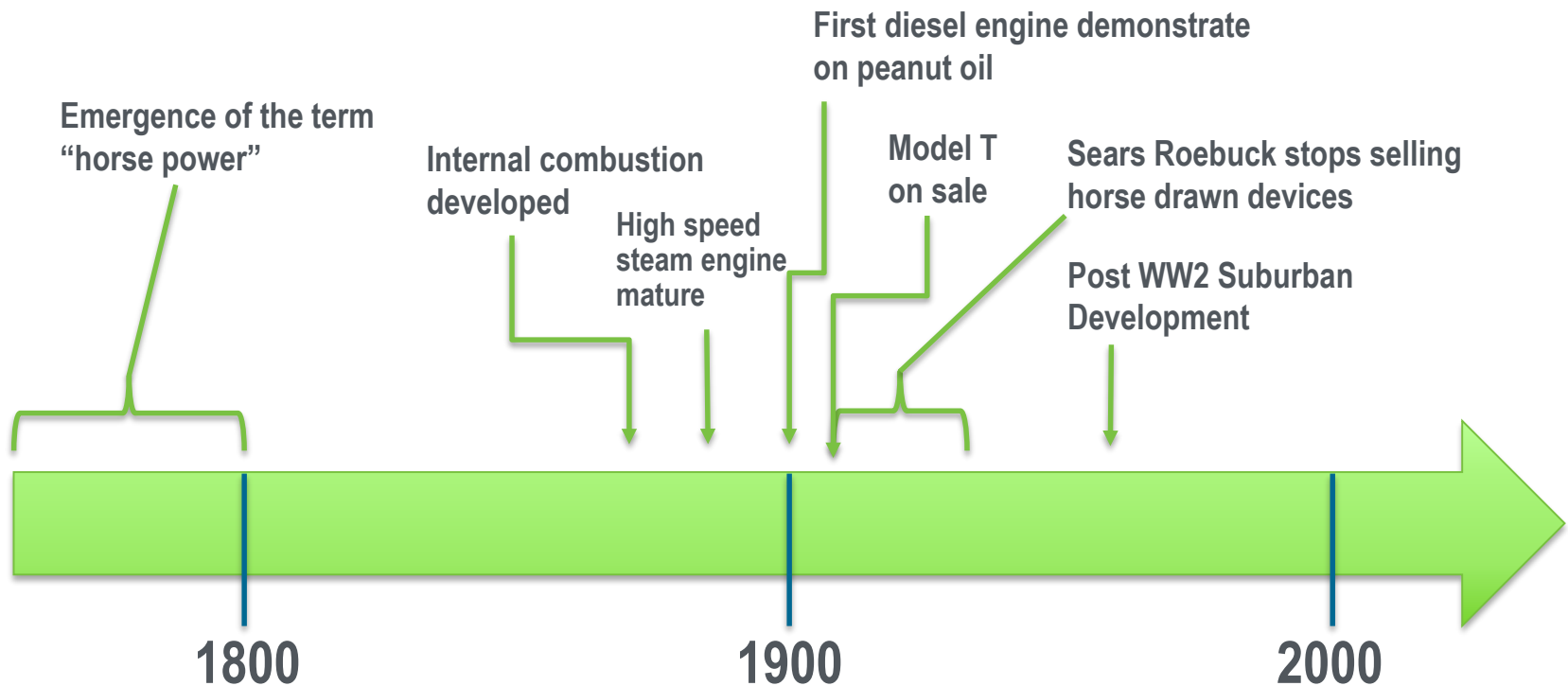
Let's find a problem! pt 2

- Brown grease is largely aggregated, but not valorized at all

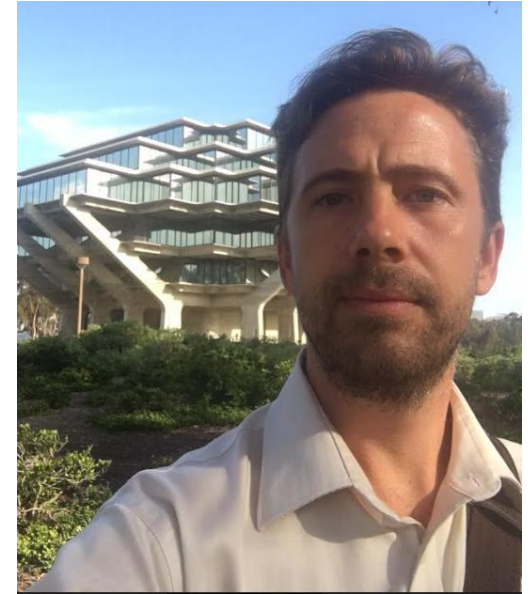


“Even if Americans develop a new energy system through legislation, taxation, and market decisions, however, the conversion will not be total or rapid. Just as the amount of coal being burned continued to increase when oil was surpassing coal, the shift toward alternative energies can only be gradual...”

- David Nye, *Consuming Power*



Brendan Scott
Project Engineer
Allegheny Science and Technology



***Waste to Energy:
A First Mover in Next Generation Biofuels***

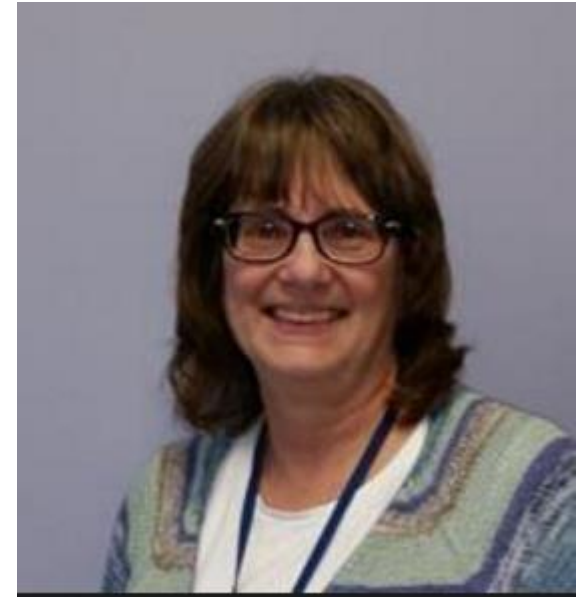
Mary Biddy
Senior Research Engineer
National Renewable Energy Laboratory



*A review of opportunities for lignocellulosic
biorefineries:*

Maximizing value by minimizing waste

Wendy Barrott
Manager, Research and Development
Great Lakes Water Authority



*Laying the Path from Disposal
Challenge to Opportunity*

- Three, 15-20 minute presentations
- ~20 minute facilitated Q&A session afterwards
 - Write down questions on the note cards provided