Refueling the future with Alcohol Fuels

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Oil’s Impact on California

3/4 of California’s emissions (including CO₂, toxic pollutants, ozone forming emissions and more) come from petroleum.

Nearly two-thirds of California’s CO₂ emissions come from petroleum.

Source: International Energy Agency
Oil is also 6x more expensive

U.S. Energy Consumption (in 2011 dollars)

Source: International Energy Agency
So how do we solve this?

Popular solutions include:

- Increased efficiency
- Public transportation
- Taxation
- Electrification
- Alternative fuels
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54.5 Fuel Economy Standard

- Standards shown are industry-wide. Individual manufacturer standards will vary based on average vehicle “footprint” (wheelbase x average track width), weighted by model volumes.
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Will Taxation do it?

Oil Prices

1997: Kyoto Accords Signed

Source: EIA and USDA
Will Taxation do it?

Oil Prices vs Oil Consumption

1997: Kyoto Accords Signed

Source: EIA and USDA
Will Taxation do it?

Oil Prices vs Oil Consumption and Food Stamps

- **1997**: Kyoto Accords Signed
- 18 million Americans on Food Stamps
- 47 million Americans on Food Stamps

Source: EIA and USDA
Average Margin of Victory in a Presidential Election

6.3 MILLION VOTES

So how do we solve this?

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- Public transportation
- Taxation
- **Electrification**
- Alternative fuels
What about Electrification?

Electric cars as a portion of the U.S. vehicle fleet
(Assuming optimistic 33% annual compounding growth rate)

Source: EIA Annual Energy Outlook 2014
So how do we solve this?

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• Electrification
• Alternative fuels
Fuel Replacement

• Can we make replacement fuels that are better than oil for the environment?
• Can these fuels compete with oil in the marketplace?
• How long will it take them to make a real impact?
The key is fuels that work with your existing car
Alcohol fuels are high octane, liquid fuels used today for racing cars and...

Can work on YOUR car
Natural Gas? doesn’t that mean Fracking?

- Fracking is no longer only a gas thing
- 90% of all new OIL wells use fracking
Choosing to do nothing is choosing oil and choosing oil is choosing fracking.
Natural gas is a byproduct of oil fracking.
Alcohol Fuels: Environmental Advantages

- Dissolve in water, biodegradable
- Reduce smog
- Replace toxic aromatics in gasoline
- High octane means even higher efficiency engines
- Fewer GHG emissions
- Many possibilities for renewable sources
Alcohol Fuels: Engine Advantages

- Lightening the engine
- On board reformation
- EGR/exhaust valve timing
- Intrinsic methanol properties

Gasoline

- Very high compression
- Increased compression ratio
- Spark timing
- Average Fuel Economy (US Vehicles)

Source: MIT and EPA
Alcohol Fuels: GHG Advantages

Assuming 30% of fuel is made from renewable, waste or methane by-product sources.

Source: Argonne MIT and Fuel Freedom Study
So how come driving on E85 is so lousy?

Stock engine optimization sucks, because it is only optimized for gasoline.

We achieved a 20% increased fuel economy after optimizing for both alcohol and gasoline.
Getting there is easier than you think

As easy as turning on a feature on your car’s computer
So what about the economy of this transition?
The Spread

• In the last 3 years we consumed about $400 billion in gasoline a year

• All of that could be replaced with $80 billion of natural gas

• Converted to alcohol (methanol) with 50% efficiency say, $160 billion

• That is a $240 billion arbitrage opportunity!
COMING SOON

In iTune/NetFlix

January, 2015:

PUMP

TheMovie.com

VISIT OUR WEBSITE:
www.fuelfreedom.org