Refueling the future with Alcohol Fuels

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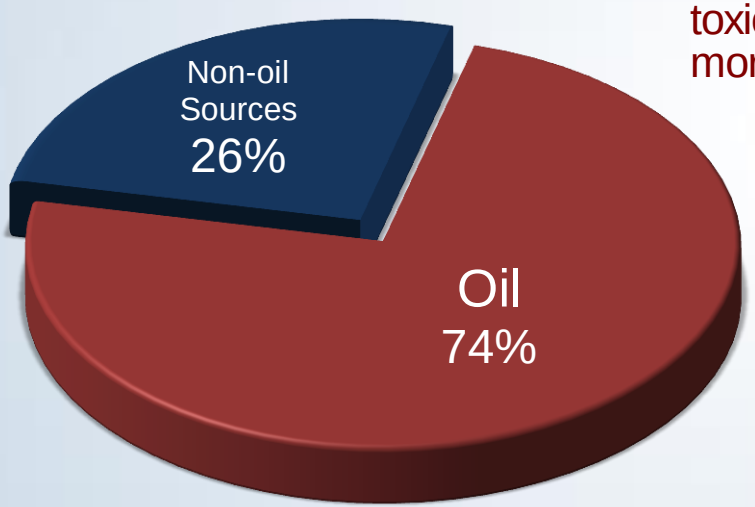
TEDx Chapman University

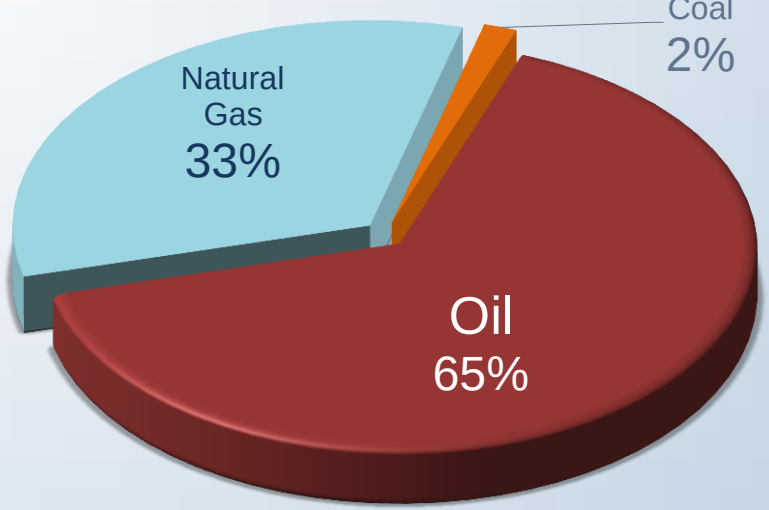
Oil's Impact on California

California Emissions



3/4 of California's emissions (including CO_2, toxic pollutants, ozone forming emissions and more) come from petroleum

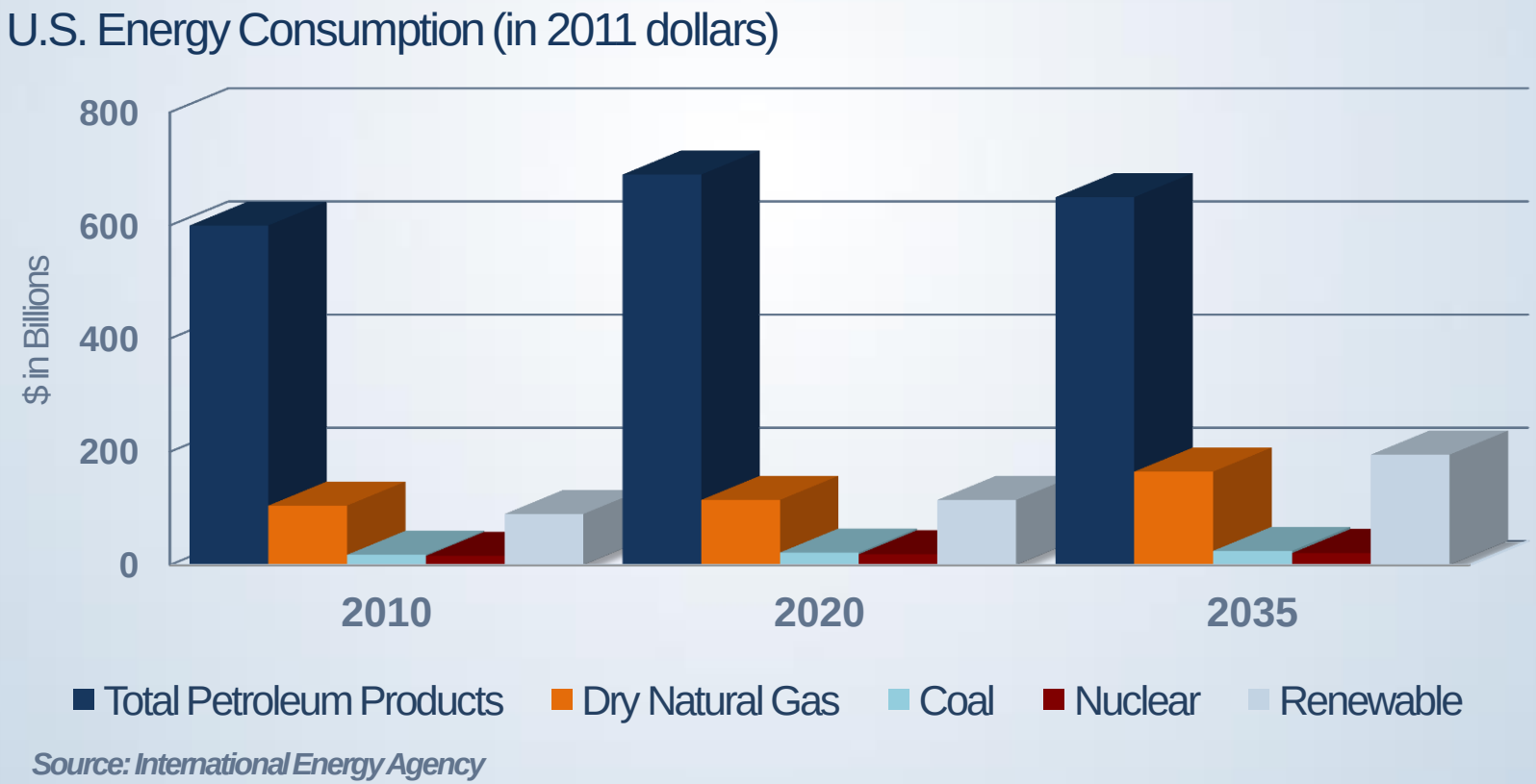
California CO_2 Emissions



Nearly two-thirds of California's CO_2 emissions come from petroleum

Source: International Energy Agency

Oil is also 6x more expensive



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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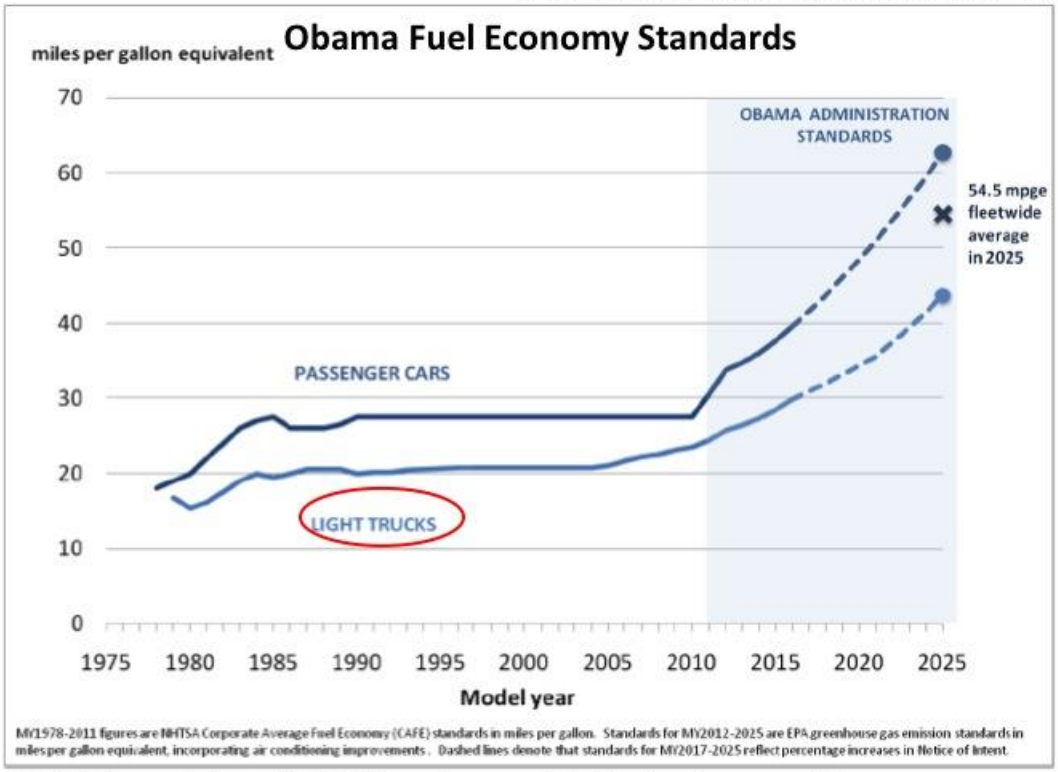
54.5 Fuel Economy Standard

http://www.whitehouse.gov/sites/default/files/fuel_economy_report.pdf



- 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?

Source: EIA and USDA

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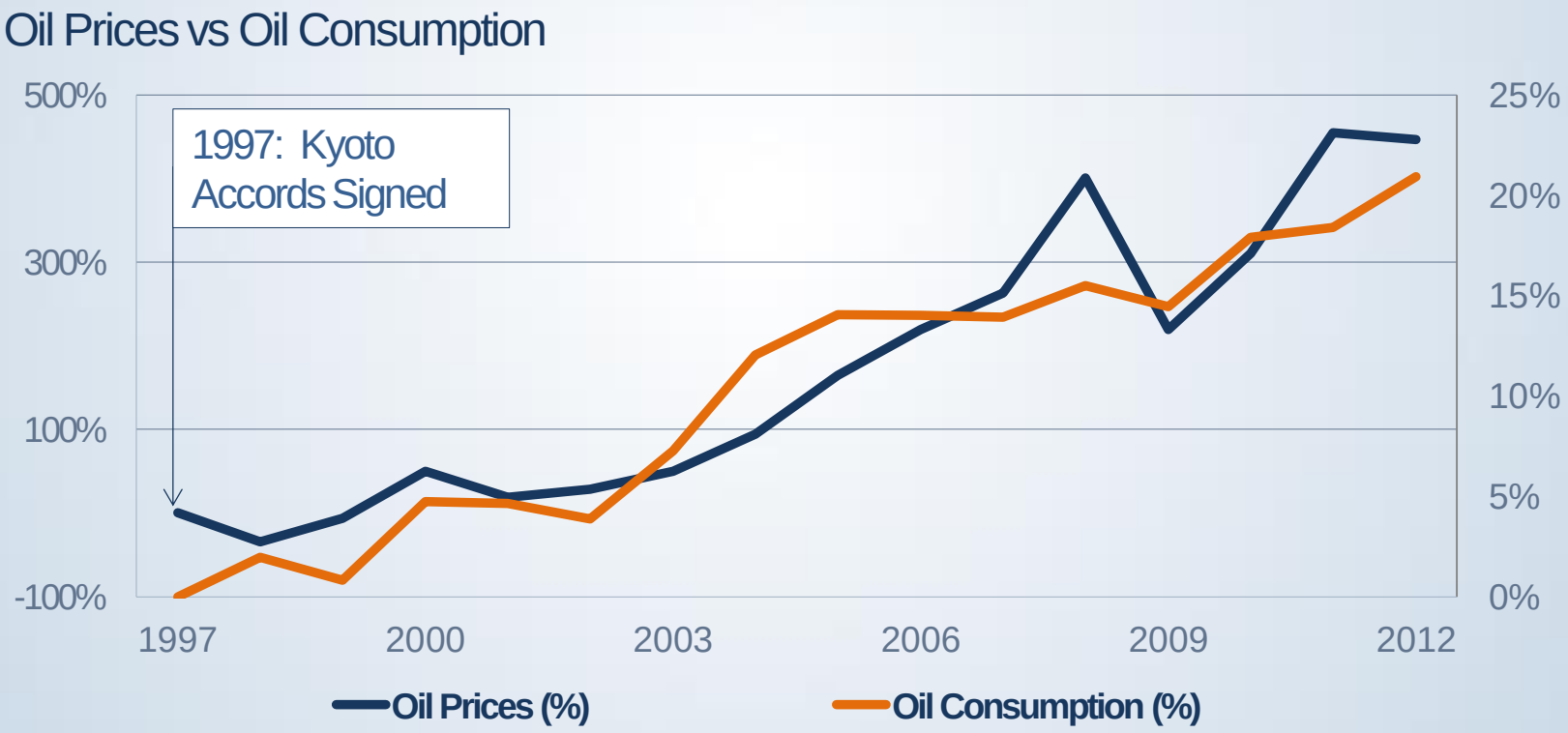

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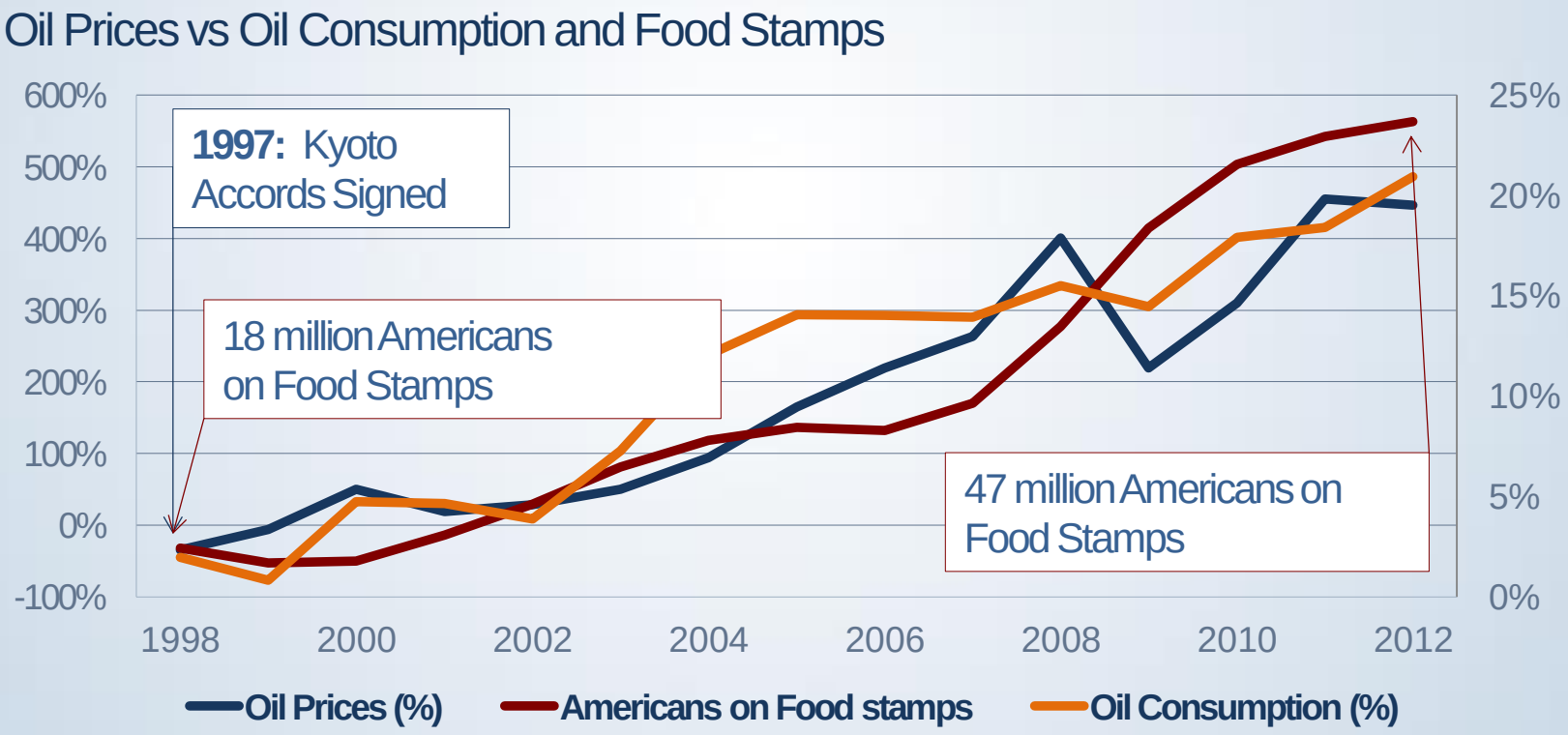

Source: EIA and USDA

Average Margin of Victory in a Presidential Election

6.3

MILLION VOTES

Source: Wikipedia

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OFF GAS

What about Electrification?

Electric cars as a portion of the U.S. vehicle fleet

(Assuming optimistic 33% annual compounding growth rate)

Source: Source: EIA Annual Energy Outlook 2014

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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

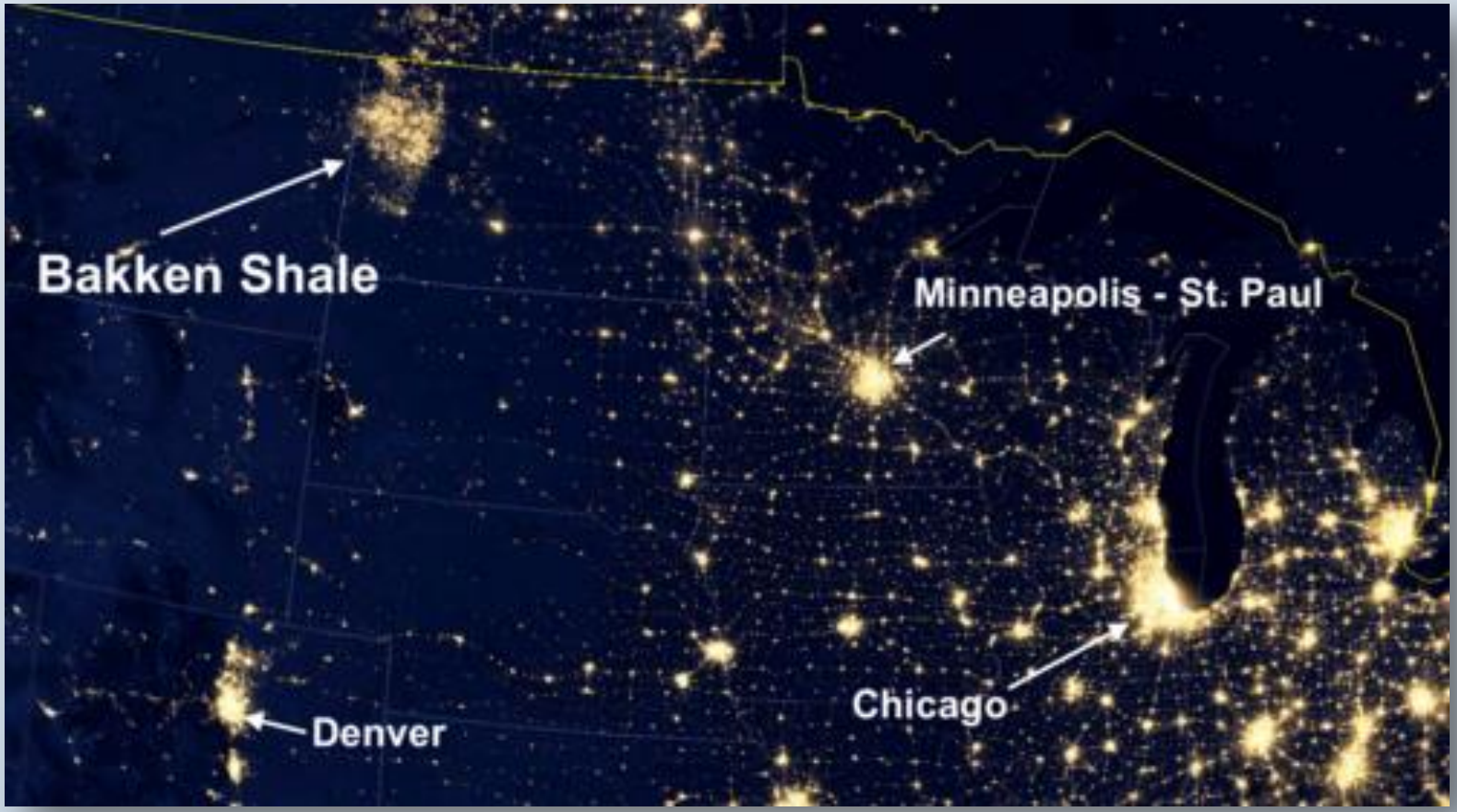
Choosing to do nothing is

choosing oil

and choosing oil is choosing

fracking

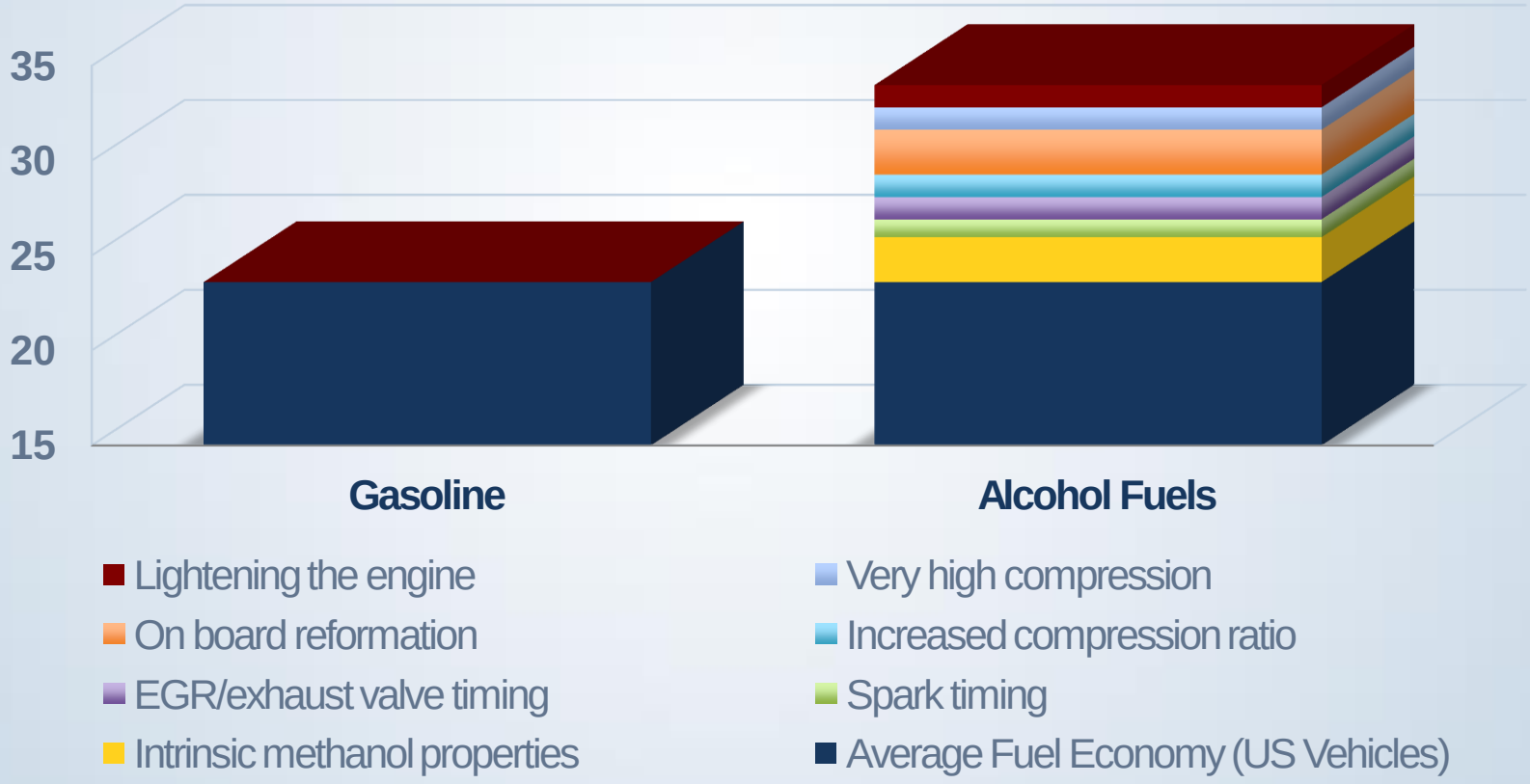
Natural gas is a byproduct of oil fracking



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

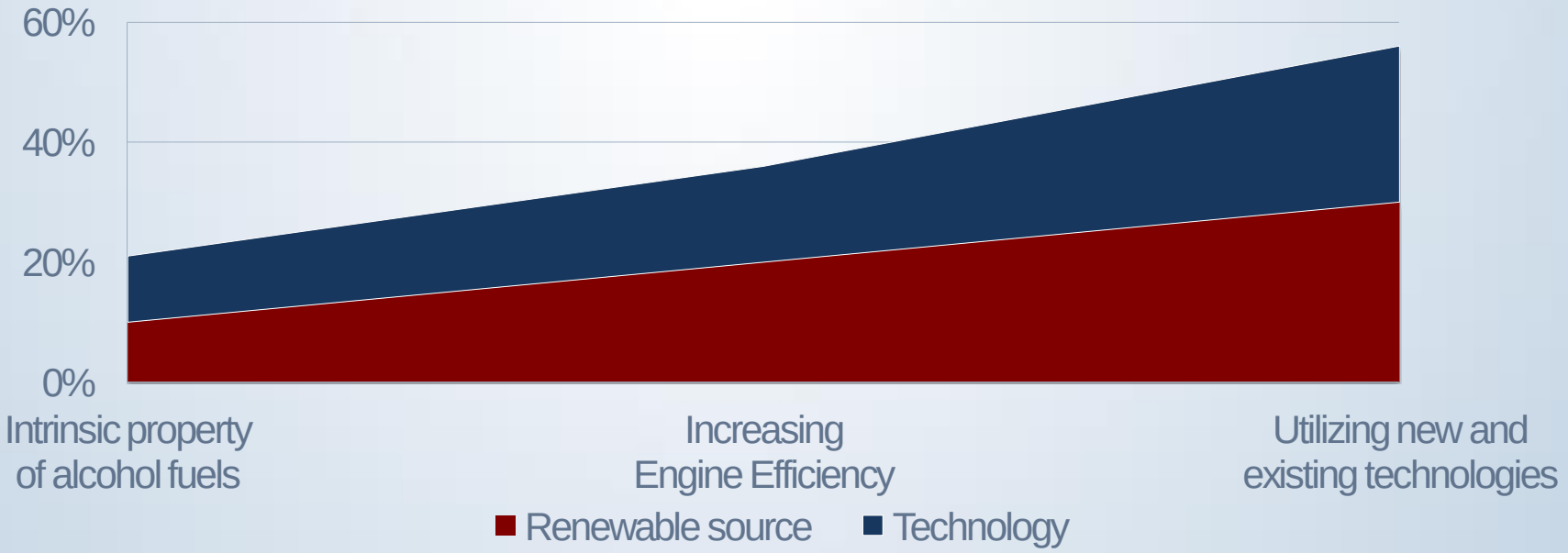
Alcohol Fuels: Engine Advantages



Source:: MIT and EPA

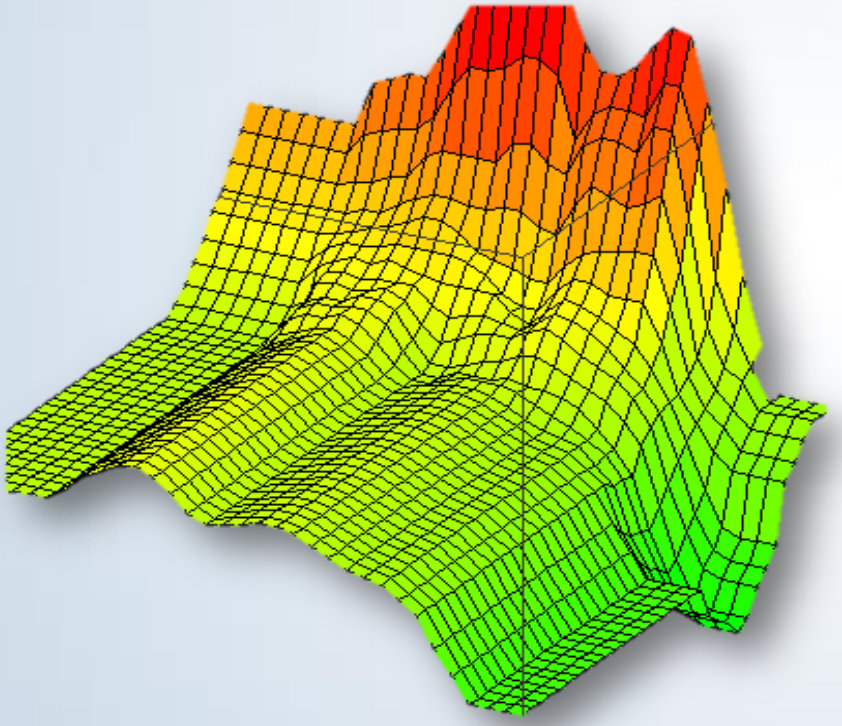
Alcohol Fuels: GHG Advantages

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

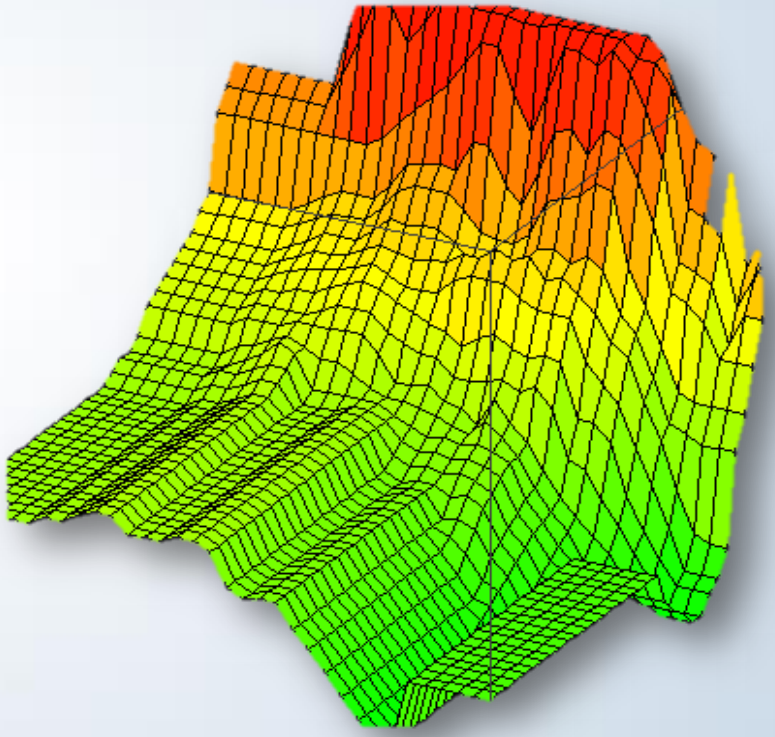


Source: Argonne MIT and Fuel Freedom Study

So how come driving on E85 is so lousy?

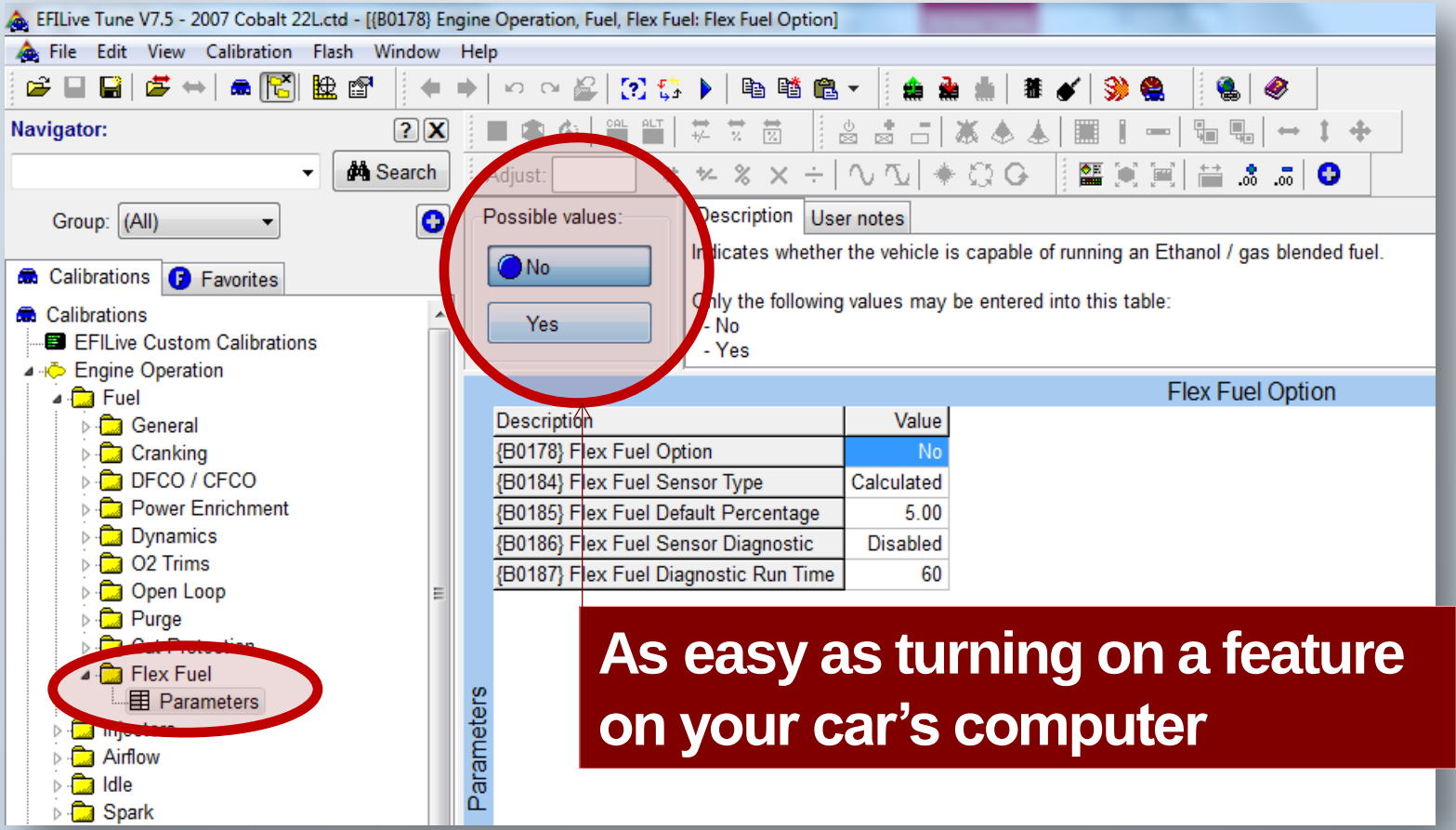


Stock engine optimization sucks, because it is only optimized for gasoline



We achieved a 20% increased fuel economy after optimizing for both alcohol and gasoline

Getting there is easier than you think



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 The Movie.com

VISIT OUR WEBSITE:
www.fuelfreedom.org

FUEL FREEDOM FOUNDATION™