



## Fuels of the Future

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### Disclaimer

- This presentation does not represent the official views of anyone other than David.
- Everyone's forecasts of future events are subject to problems and errors unforeseeable at the current time.
- I could remain impossibly vague so that I may later claim to be a remarkable "visionary" regardless of what happens.
- *Even tax attorneys can make mistakes:*

## Payments to Prostitutes Denied as Medical Expense Deduction



A taxpayer was denied a medical expense deduction for amounts paid to prostitutes and for medical text and pornographic materials. Citing several books and magazine articles, the taxpayer argued of the positive health effects of sex therapy. However, Reg. §1.213-1(e)(1)(ii) specifically provides that a taxpayer is not entitled to a medical expense deduction for any illegal operation or treatment. (NV?) Moreover, since his doctor did not prescribe a treatment for any medical condition, the taxpayer's payments were nondeductible personal expenses. Because the taxpayer was a tax attorney for 40 years, he had no reasonable basis to claim the deduction and was liable for the accuracy-related penalty for substantial understatement of tax.

W.H. Halby, TC Memo. 2009-204, Dec. 57,930(M)

## George Jetson – The Future of 2062





## What Were George's Problems

1. Jane, his wife
2. Daughter Judy
3. His boy Elroy
4. Independent minded Rosie, the late model robot
5. Cosmo Spacely and his job at Spacely Space Sprockets.
6. Astro, his talking dog

**Apparently, the adverse effects of global warming were addressed by putting all buildings and humans high in the sky on long pillars?**



## What's fueling George Jetson's flying vehicle?



Admittedly, a bit unclear from the available evidence.

Most likely?

Suspending the law of gravity...



## Ours and George Jetson's Worlds?

1. Many alternative answers;
2. Not everything makes sense; and
3. Application to "real world" problems perhaps questionable.



## Fuels of the Future -

1. Reality is that in the near term petroleum products will remain the primary transportation fuels.
2. Growing list of emerging "alternative fuels" options.
3. Near term options give consumers choices and have some risks?
4. Unlike the past, there will not be universal access to fuel supplies for specific vehicles. "Auto diesel" supply limitations, for example.

## Current and Near Term Consumer Options -



1. Renewable fuels and renewable fuel blends.
2. Gasoline / electric hybrids
3. Plug-in hybrids
4. Home fueling CNG
5. Hydrogen
6. Electric Only
7. Fuel Cell
8. Solar

## Renewable Fuels and Petroleum Blends



1. Here today.
2. FlexFuel© Options
3. Banks of future cleaner, cheaper, non-food sources

### Risks:

1. Economic (E85 now has 40cpg discount)
2. Technology
3. Political (End of tax incentives?)



## Gasoline / Electric Hybrid

1. Proven technology, Toyota Prius
2. Additional models and manufacturing coming on-line. 2010 Ford Fusion and Mercedes version coming soon.
3. Not a product for every use...
  - Designed primarily for urban commuters
  - Long haul or heavy loads – “out”



## Plug – in Hybrids

### **Chevy Volt® Example:**

- Extended Range Electric Vehicle.
- 230 miles per gallon city driving.
- 75% of daily U.S. commuters could use this vehicle.
- Cost of electricity to go 100 miles ranges from \$0.75 and \$2.25.
- \$44,000 sticker price, available in 2010.

*How “green” is this?*

*Shifting emission sources?*



## Home Fueling CNG

- Uses compressed natural gas to fuel conventional internal combustion engines. Honda makes a production line CNG fueled vehicle. Conversion kits also available for existing gasoline fueled fleet.
- Traditionally, had to fuel at designated CNG fueling locations, typically "fleet" garages.
- Allows consumer to use CNG at relatively low cost.
- Requires new equipment to compress CNG overnight for fueling. Phill©, the CNG home appliance.
- Few CNG refilling locations on the highway, limits range and application.



## Hydrogen

*Yes, its in use today.*

BMW 760i dual fuel hydrogen / gasoline engine. Bridges the gap between hydrogen fueling locations with a flick of a switch between hydrogen and gasoline. Hydrogen range is 175 miles and gasoline is 300 miles. \$150,000 price tag.

***Port Authority will not permit this vehicle in the Holland Tunnel, GW Bridge among other sensitive locations.***

Current drivers of the BMW hydrogen: [Leonardo DiCaprio](#), [Brad Pitt](#), [Will Ferrell](#) and [Edward Norton](#).



## Electric Plug-in

"Return to the future" of sorts.

- Tesla Motors – 120 to 300 miles per charge.
- Wow Factor! More than 700 sold.
- Sticker Shock Factor - \$50,000 to \$110,000



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## Fuel Cells – A Variation on Hydrogen

1. Estimated cost per vehicle today - \$1 Million.
2. Needs technological break through to make economic.
3. Definitely a fuel of the future, but not any time soon. Fuel still needed, too!
4. Honda, Mercedes, GM and others continue to work on development.

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## Solar

They are working on it, but a long way to go in the technology area.



## Solar – Part 2

1. Prius has option for solar roof panel to run ventilation and A/C for the car.
2. Some work in the area of solar panel to assist in charging batteries.
3. Solar carports.





## Near Term Fuels of the Future - Taxes

1. Greater miles per gallon on conventional fuels will erode revenue consistently over time.
2. VMT may have to become the "tax of the future"?
3. Federal VMT? How to implement?
4. Greater tolling by states?
5. Shifting public policy / tax incentives?
6. No current leading model to address fuel source related revenue gap at current time.
7. Current economic climate makes revenue modeling difficult.



## Fuels "To Infinity and Beyond!" - Buzz Lightyear 1995

# Cold Fusion

- Free clean energy from sea water!
- Still theory, but much research continues in this area.
- This promise of "free" electricity.

## Where did this come from?



### **dilithium crystal articulation frame -**

Component of the warp drive system of a starship that holds the dilithium crystals suspended in the drive's matter/antimatter stream, where the crystals can regulate the matter/antimatter reaction.

## Fuels of the Future -



### ***Star Trek***

Matter and Anti-matter -  
the power source of the future  
at least *in science fiction?*

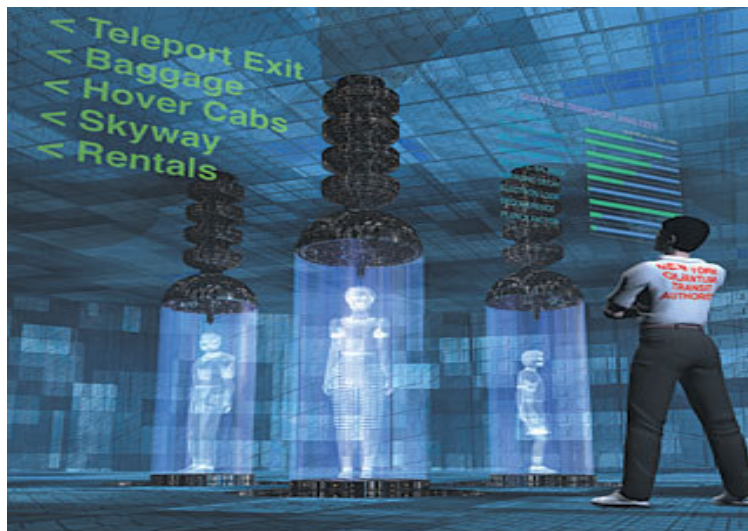
## Matter / Anti Matter The Ultimate Future Fuel?



*"NASA has identified anti-matter as the ultimate energy source for exploration of the outer reaches, and outside, of the solar system. This work is all theory to date, but we are moving quickly to the experimental stage."*

- Gerald Jackson, a physicist and the president of Hbar Technologies in West Chicago, Ill. March, 2009

## Quantum Teleportation





## Quantum Teleportation

*A few years ago [in 2004] a group led by David J. Wineland at the National Institute of Standards and Technology in Boulder, Colo.—and simultaneously with that, a group led by Rainer Blatt in Innsbruck, Austria—teleported the internal spin of a trapped ion. It's the first time teleportation had been done with the state of a massive particle. H. Jeff Kimble of the California Institute of Technology, Scientific American, March 2008*

*So, "Beam me up Scotty" is more than just sci-fi, but far from "beam me to work" applications today.*



## "Fuels of the Future" - Wrap-up

1. Near term "fuels of the future" utilize existing technologies of internal combustion or electricity.
2. "Fuels of the future" will continue to challenge current motor fuel tax revenue models.
3. Dramatic new technologies are "out there" and perhaps someday will alter life as we know it.

## May The Force Be With You!



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