

Checklist for Transition to New Highway Fuel(s)

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OVERVIEW

Encouragement and Caution
Perspective

Critical Participants

- Consumer
- Government
- Fuel Industry
- Automotive Industry

Summary

Source document: *Checklist for Transition to New Highway Fuel(s)*



Fuel Transitions are Successfully Achieved

- Agricultural products (e.g. hay and oats) for animal drawn carriages to gasoline vehicles
- Gasoline to sugar cane based ethanol vehicles in Brazil, two waves:
 - 1970s and early 1980s;
 - Late 1990s to the present
- Gasoline to diesel in heavy duty vehicles in the U.S., 1960s through present
- Gasoline to diesel in European vehicles through the 1980s and 1990s.
- U.S. switch from leaded to unleaded gasoline vehicles 1970s and 1980s (and largely worldwide thereafter)
- Ongoing low sulfur diesel fuel in the U.S.

Intended Fuel Transitions Can Fail

- **Electric vehicles for horses in the U.S., 1895-1930 (gasoline won)**
- **Gasoline to methanol vehicles in the U.S. and Germany**
- **Gasoline to MTBE blended gasoline vehicles in the U.S.**
- **Gasoline to ethanol vehicles in the U.S.**
- **Gasoline to natural gas vehicles in the U.S.**
- **Gasoline to LPG vehicles in the U.S.**



Success Requires Satisfying the Needs of the Major “Players”

Consumers

Government

Fuel Industry

Automotive Industry



”ALL OF THESE PLAYERS MUST BE WILLING (BETTER YET, MOTIVATED) TO PLAY FOR THERE TO BE A GAME.”

These players each have their own ***considerations.***



New Fuel Reality Check

- Transition to new fuel(s) can affect our ability to compete in the world market
- While it is tempting to make quick decisions, analysis is needed to make best decisions
- Technology breakthroughs and major world events may cause reevaluations
- Transition will take years to complete
- Even a wildly successful new fuel will coexist with gasoline and diesel for decades while older vehicles are phased out



Consumer Categories

There are two consumer types:

1. Indirect interest-groups, particularly environmentalists and safety advocates. They are customers of government in the sense that they exert pressure to regulate design of vehicles, fuel infrastructure, and the highway network.
2. Direct customers for vehicles and fuels



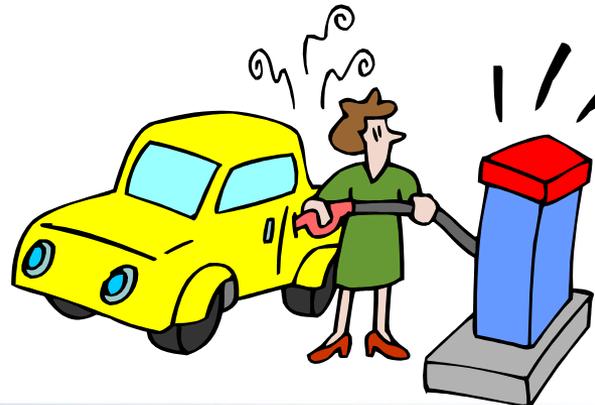
Consumer *Considerations* (cont.)

Direct customers expect that new products will have overall an advantage relative to the status quo:

- *Safety*
- *Cost of Ownership*
- *Vehicle Function*
- *Refueling*
- *Unique Purchase Incentives*



If I buy this newfangled vehicle and use the funny fuel, then I better be able to refuel and get parts when needed!



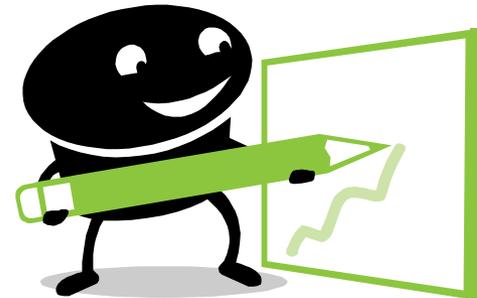
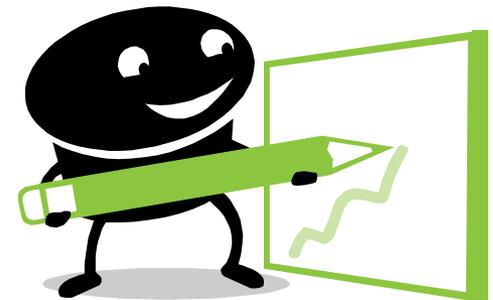
Government Considerations

- *Environment*
- *Energy Efficiency*
- *Energy Independence and Energy Security*
- *Feedstock Adequacy and Reliability*
- *Taxpayer Affordability*
- *Policy Continuity*
- *National Economic Impacts*
- *International Considerations*



Industry Considerations - Fuel/Auto

Our industry will invest in this concept when there is a viable business case.



Fuel Industry *Considerations*

Solid Business Plan with considerations of:

- ***Technical Feasibility including legal/regulatory compliance***
- ***Transition Plan***
- ***Infrastructure Investment***
- ***Operating Financial Implications***
- ***Competing Actions from Oil Industry***
- ***Multi-national Business Strategies***
- ***Corporate Image***
- ***Feedstock Adequacy and Reliability***
- ***Lead-Time***



Automotive Industry *Considerations*

Solid Business Plan with consideration of:

- *Technical Feasibility including legal/regulatory compliance*
- *Transition Plan*
- *Infrastructure Investment*
- *Operating Financial Implications*
- *Competing Actions from current auto and fuel industries*
- *Multi-national Business Strategies*
- *Corporate Image*
- *Feedstock Adequacy and Reliability*
- *Lead-Time*
- *Consumer Acceptance*



As expected, similar topics for both fuel and auto industries — but details are industry dependent

Selected Summary Points

- Alternative fuel source(s) must be pursued on a timely basis as any major transition will take many years.
- Fuel transition(s) must be as few as possible, because the infrastructure change-over expense may be huge.
- Realignment of ongoing fuel shifts may be necessitated by major changes in:
 - Technology
 - International affairs
 - World pricing and supply of fuels



THE BOTTOM LINE

The main players for transition to new highway transportation fuel(s) are:

Consumers

Government

Fuel Industry

Automotive Industry

**”ALL OF THE PLAYERS
MUST MAINTAIN A LONG-
TERM WILLINGNESS TO PLAY
TO WIN THE GAME.”**

This presentation is derived from
“Checklist for Transition to New Highway Fuel(s)”

By Chuck Risch and Dan Santini
which can be found online by searching

<http://www.transportation.anl.gov/pdfs/TA/772.PDF>

Or you can type the title.

