



WHAT STARTS HERE CHANGES THE WORLD

THE UNIVERSITY OF TEXAS AT AUSTIN

2007-2008 Marketing Strategy

'Diesel hybrid technology is the solution to a more enjoyable driving experience'

November 13, 2007



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1.0 Executive Summary

Today's automobile produces significantly less pollution due to federal regulations that aim to increase fuel economy and decrease vehicle emissions. Leaded gasoline has been phased out, and government mandated manufacturing improvements such as the catalytic converter have significantly reduced tailpipe emissions. However, the benefits of these improvements have been largely offset by three main factors:

- A rapid expansion in the number of cars and trucks on the roads
- An increase in the number of miles driven each day with the rise of suburban living
- An increase in consumer acceptability and market demand of trucks & sports utility vehicles (SUVs)

There is not much that industry can do to address a rapidly increasing population, nor would it be in the best interest to promote a decrease in mileage driven each day. Moreover, domestic auto producers rely heavily on the profit made from SUVs and trucks knowing that the sacrifices made for utility, comfort and performance, are poor fuel economy and high vehicle emissions. As a result, the Environmental Protection Agency has raised the bar for automotive manufacturers to produce more fuel efficient, cleaner burning vehicles. In response, automotive manufacturers and industry partners have taken the challenge seriously, and joined forces with academia to design the next generation, cleaner burning, more full-efficient SUV. The purpose is to integrate the smartest students and professionals in the automotive field to design and build a prototype that addresses current vehicle shortcomings.

The diesel mild hybrid design is a great solution for addressing the shortcomings of low fuel economy and high vehicle emissions associated with the larger truck fleet. The major focus for the final year of ChallengeX is to market the technology to a carefully selected target audience by executing a strategic marketing plan.

2.0 Marketing the Diesel Mild Hybrid

In order for automotive manufacturers to buy into producing diesel hybrids, evidence must show that an interested market of potential buyers does exist. Fortunately, a great market of SUV/ large truck enthusiasts has developed in recent years. The challenge is to teach potential buyers that integrating hybrid technology and alternative fuels into a truck is a viable alternative to the conventional architecture, and is a great solution to poor fuel economy and high vehicle emissions.

For decades now, domestic automakers have done an excellent job of portraying the SUV as the solution for those audiences seeking maximum comfort, utility and performance. Recently, General Motors has taken that strong customer base, and begun planting the 'need to go green' message into the mind set of large truck enthusiasts by making commercials featuring hybrids and Flex Fuel vehicles. In several new commercials, using the Equinox FCV or Tahoe Hybrid as a backdrop, a passionate instructor teaches children about hybrid technology and alternative fuels. The underlying message is that incorporating alternative fuels is an easy change to accept into everyday life. If these grade school kids can understand the instructor's message of alternative fuels and hybrid technology, then certainly adults can understand it too. This is a perfect example of a carefully thought out way of integrating hybrid technology & alternative fuels into an already established truck market, and will serve as a stepping stone for our marketing efforts.

2.1 Marketing Goals

The UT Austin marketing strategy begins by identifying the goals to be met by the end of this year's competition. The goals set forth are the following:

- Increase awareness about current energy limitations related to fuels
- Promote hybrid technology as a great choice and not as a compromise
- Introduce the biodiesel powered diesel mild hybrid as the solution

The execution of the marketing strategy is based on these underlying goals to sell the diesel hybrid as the solution that addresses fuel economy, vehicle emissions, and performance. The

diesel hybrid message will be similar to GM's recent TV commercials: 'Diesel hybrid technology is the solution to a more enjoyable driving experience.'

2.2 Marketing Strategy

The strategy continues by addressing the shortcoming associated with the current fleet of full-size vehicles produced. These two main issues are:

- Petroleum is a limited domestic resource
- Vehicle emissions contribute to poor environmental health

The diesel hybrid is a no excuses solution that addresses these issues in the following ways:

- Biodiesel is a home-grown fuel that is cleaner burning than gasoline
- The diesel powered hybrid is fun, economical and efficient

2.3 Market Analysis

Any successful marketing strategy is always preceded by an assessment of the markets available. Selection of the proper target market is essential and integral to the marketing strategy. Once the proper market is selected, the specific marketing message must be established. This includes recognizing market concerns about the product, eliminating false stigma about the product, addressing weaknesses, and highlighting strengths.

2.4 Market Scan

The nature of selling the diesel hybrid in America creates the unique marketing challenge of having to showcase a vehicle that is different in two respects: the fuel it uses, and the hybrid strategy it implements. This property of our vehicle suggests that the initial buyers may come from a somewhat niche segment of the market.

The potential niche customer is a young and outgoing nature enthusiast with a need for a crossover vehicle with mild off-road capabilities that is also interested in alleviating energy and emissions concerns. This person is interested in alternative vehicles to the point where they are willing to spend a little more up front. This segment will be referred to as segment A.

The profile of a customer from a more broad market segment, one that would be established as a more long term goal, might go as follows: This individual comprises a new generation of recent college graduates that have entered the work force in the past 5 years, and may have started a family. They have recently become financially stable, enjoy larger vehicles, but are still economically minded. This new generation has a passive interest in the environment and global economy of energy, but is not willing to pay a premium on a vehicle that is neutral or inferior regarding performance, comfort and utility when compared to a conventional vehicle. This segment will be referred to as segment B.

Finally, segment C consist of corporate investors who are ready to jump on the coattails of green technology to make a profit. These companies include but are not limited to: diesel after-treatment investors, bio-diesel manufacturers, vehicle rental companies and moving companies.

To conclude, the team will execute a marketing strategy through outreach activities to the following target audiences:

- Segment A: The Nature Enthusiast
- Segment B: The New Generation
- Segment C: Corporate Investors

2.5 Product Concerns

As with any new vehicle technology, concerns surrounding bio-diesel and hybrid technology will arise. Based on previous years of outreach activity at local alternative fuel conferences and renewable technology expositions, a trend of similar concerns regarding bio-diesel powered vehicles was noted. These concerns can be categorized into the following categories: reliability, vehicle noise, vibration and harshness (NVH), drivability, and safety.

Segments A and B constitute different reactions compared to the business oriented minds that make up segment C. These common reactions have been organized in Tables 1 to demonstrate the typical reactions presented to the team regarding the bio-diesel and hybrid technology. .

Table 1: Common target audience reactions from all segments.

Type	Concern	Segment A & B: Customer Reaction
Diesel	Startability	"Don't diesels have difficulty starting when it's cold?"
	Emissions	"Diesels blow black smoke and smell funny. They pollute more."
	NVH	"My diesel work truck is loud and harsh, especially under load. I would not want that in my daily commuter vehicle."
Hybrid	Batteries	"Are the batteries safe? I've heard that if I get in a crash batteries can explode."
	Reliability	"All this new technology is untested, shouldn't I wait for the third or fourth generation before I buy?"
	Drivability	"I don't want to have a vehicle that requires me to re-learn how to drive. I need my teenager to be able to get in my vehicle and drive it in case of an emergency without instructions."
	Maintenance	"When the warranty is up, do I have to go to a 'hybrid only' shop?"
	Power	"I want to save the environment just as much as the next guy, but my SUV needs to be able to tow a medium sized trailer."
Type	Concern	Segment C: Customer Reaction
Bio-Diesel	Infrastructure	"Will there be a developed infrastructure if the demand for bio-diesel hybrids grows?"
	Emissions	"Bio-diesel does not address NOx emissions. How will the hybrid take care of NOx?"
	Shelf-Life	"I hear bio-diesel smells rancid after a while. Would I be investing in a fuel with a limited shelf-life?"
Hybrid	Batteries	"Battery technology is still being developed. I hear that NiMH batteries need to be replaced in 5 years. Would this be a profit loss?"
	Reliability	"What will happen to the vehicle if the battery dies? Where do the used batteries go?"
	Drivability	"If I invest in a diesel hybrid, will my customers enjoy the ride compared to the conventional product?"
	Maintenance	"Will I have to take my investment to be fixed at a specialty shop? Do mechanics know how to work on a diesel hybrid?"
	Power	"My company will need to move furniture and large heavy products daily. Is the diesel hybrid powerful enough to handle this?" "When my customers rent a vehicle, we want them to have a enjoyable experience and be content with the product upon return. Will the diesel hybrid meet such expectations?"

2.5.1 Weaknesses to Opportunities

One common criticism is that the diesel hybrid is not potentially 100% oil independent. While other alternative architectures such as fuel cell vehicles and fully electric vehicles can (but do not necessarily) operate fully without using crude oil, the diesel engine does require diesel. However, the Equinox diesel hybrid can operate fully using bio-diesel. The demand for bio-diesel is growing, and it is on this basis that the hybrid can be marketed as petroleum independent.

Celebrities like Willy Nelson proudly support developing the bio-diesel infrastructure because of the potential benefit to the American agriculture economy. Supporting local farmers by encouraging the growth of more organic material to produce bio-diesel will alleviate the need to seek petroleum resources from other countries while strengthening the US agriculture economy.

Another criticism that has been presented is associated with the current high cost for diesel exhaust after-treatment to address NO_x and particulate matter. The after-treatment is necessary to help the diesel engine achieve stringent emissions set forth by the EPA. This is an inevitable and acceptable reality for corporate investors. The proposal addresses costs and benefits associated with diesel after-treatment in a later section.

In retort to these criticisms, the diesel hybrid implements technology that is already in place, low in cost, and proven in reliability. Hybrids of this type could be sold immediately if mass produced, we feel it puts them in a different category to zero local emissions vehicles such as FCVs. The diesel hybrid can be part of the solution right now, not ten years from now, and requires no significant local infrastructure changes to support it.

2.5.2 Strengths

Some of the criticisms listed above are actually diesel powered strengths. Highlighting how the diesel hybrid architecture makes use of the latest diesel technology, will set the technology apart from the conventional gasoline powered vehicles currently available. There are numerous benefits the diesel engine offers when compared to the gasoline engine. These benefits include:

- **More Power:** The engine naturally produces more torque which makes for a more pleasant driving experience, also offsetting the extra weight of the hybrid equipment.
- **Better Fuel Economy:** Diesel engines are more fuel efficient than gasoline engines. Therefore, the diesel hybrid is more fuel efficient than the gasoline alternative.
- **Equivalent or Better Emissions:** Recently optimized diesel emissions after-treatment means that the diesel of today is not the polluter it once was.

While the diesel engine is the heart of our architecture, the hybrid addition is also important. A summary of the hybrid benefits are shown below.

- **Mild Hybrid:** The mild hybrid architecture increases fuel economy numbers by integrating a small battery bank when compared to the conventional vehicle. This battery bank is not as large a battery bank for a fully electric hybrid. Therefore, the high cost associated with battery technology only contributes to a small fraction of the total cost of the diesel hybrid.
- **Simplicity:** The mild hybrid a simple way of implementing technologies that already exist in a smart way to increase fuel economy and decrease emissions without requiring specially trained service technicians to maintain the vehicle.
- **No Excuses:** The simple nature of this hybrid strategy means that the driver knows they are driving a more fuel efficient vehicle because they visit the pump less often. All the optimization happens behind the scenes.

3.0 Executing the Marketing Strategy

Now, that the target audience has been identified, and the opportunities and strengths of the diesel hybrid have been outlined, it a matter of tactfully educating the public and selling the vehicle to these potential buyers. The execution begins by first educating the target audience about the consequences of vehicle emissions and its' contribution to poor environmental health. Next, a thorough explanation of the diesel hybrid architecture will assist the consumer in feeling comfortable with the vehicle while dispelling any distrust in the technology. Finally, a cost analysis associated with the diesel hybrid technology is broken down to further dispel this distrust.

3.1 Vehicle Emissions & Air Quality

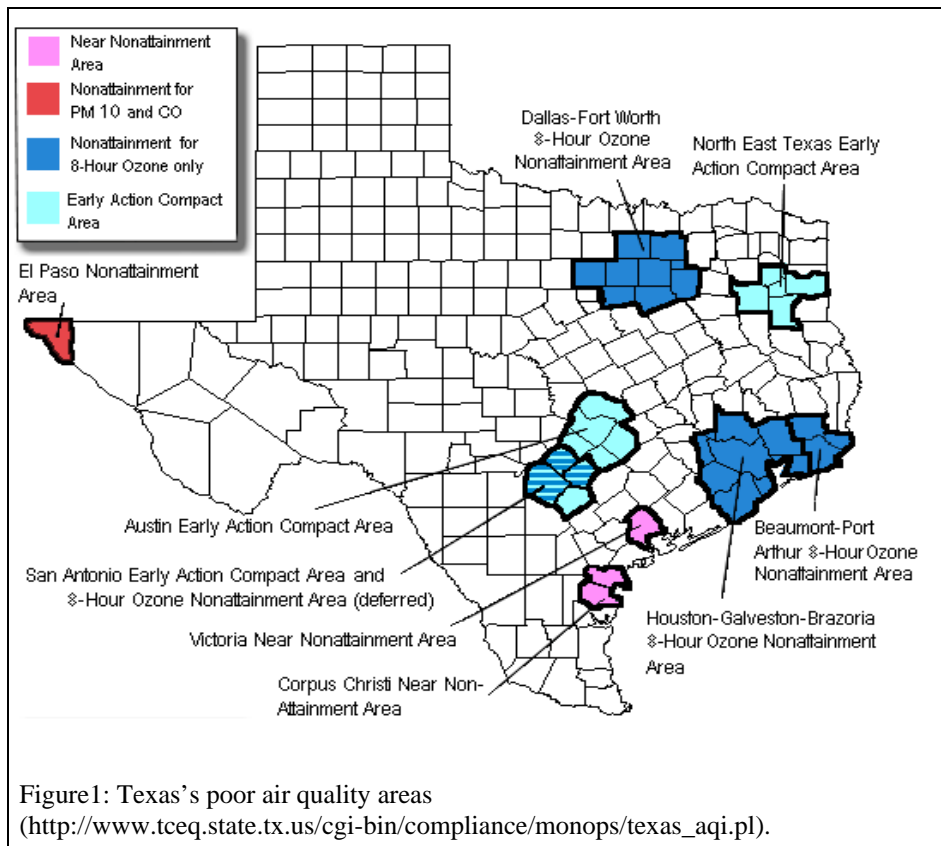
The quality of the air we breathe is of utmost concern to Texans. With over 20 million cars on its' roads, 437 electric utility generators using gas, oil, coal, and other sources of fuel, 60 percent of the nation's petrochemical production; 26 percent of the nation's refining capacity; and a population of approximately 21 million people, Texas must grapple with a full range of clean air issues (Air, 2007).

The Clean Air Act directs the EPA to develop and enforce standards for ambient air quality adequate to protect public health. Ground-level ozone, the pollutant of concern in Central Texas, is one of the pollutants for which standards have been promulgated. Ozone is a photochemical oxidant and, at ground-level, is the main component of smog (Ozone, 2007). Ozone is not emitted directly into the air, but is formed through chemical reactions between natural and man-made emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the presence of sunlight (Ozone, 2007). Reducing ozone levels requires reductions in ozone precursors, predominantly VOCs and NO_x. Vehicle tailpipe emissions contribute greatly to VOCs and NO_x. With an ever increasing number of vehicles on the roads, it is imperative to reduce tailpipe emission to improve air quality.

3.1.1 Texas Air Quality Data

In 1990, the Clean Air Act set forth for the continuous monitoring of six pollutants: ozone (O₃), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and particulate matter (PM). The Clean Air Act requires the EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. Those areas that exceed these standards are referred to as 'Non-Attainment' or non-compliant. Federal enforcement require those counties that are non-compliant to generate a State Implementation Plan that details how the area will improve air quality dependent on the pollutant to which the county is non-compliant. If the county is still delinquent by a set deadline, then possible federal assisted funding is removed, and the city/county is fined heavily. Texas has a number of regions that are either in non-attainment status or close to reaching non-attainment (Figure 1). These areas

include: El Paso, Dallas/Fort Worth, Houston/Beaumont and the Central Texas region (Austin/San Antonio).



3.1.2 Local Air Quality & 2010 Emission Standards

In the Austin/San Antonio area, on-road vehicles are the single largest source of emissions producing ground-level ozone (Air Quality, 2007). Although significant improvements in vehicle emission control technology have been made and are expected in the future, this region is a prime example of consequences associated with an ever increasing population growth. Implementing programs which encourage the use of alternatives fuels and more efficient powertrain technology is a key strategy, and the diesel hybrid is the solution.

Tier 2 emission standards are the current standards that automotive manufacturers are required to meet by 2009-2010. The same emission limits apply to all vehicles regardless of the fuel they use. Since light-duty emission standards are expressed in grams of pollutants per mile, vehicles with large engines (such light trucks and SUVs) have to use more advanced emission control

technologies than vehicles with smaller engines in order to meet the standards. The diesel hybrid has incorporated advanced emission control strategies to meet these stringent standards. Again, the diesel hybrid is the solution.

3.2 The Diesel Mild Hybrid

While the state must do its part to create and enforce regulations on emissions in order to stimulate change, the response by automobile manufacturers is equally important. The goal of designing a powertrain that meets customer demands for power and fuel economy, yet conforms to increasingly strict emissions standards can be difficult. While diesel engines inherently have more torque and use less fuel, they have historically suffered from poor emissions characteristics. Advancements in the diesel engine and exhaust aftertreatment alone have progressed to the point where diesel engines can now compete with their gasoline counterparts on emissions. The addition electric hybridization offers even more drastic fuel economy and emissions savings. The diesel mild hybrid concept shows tremendous promise in the struggle to meet these lofty goals, and is the next step to encouraging Americans to use alternative fuels and more efficient power trains.

3.2.1 Vehicle Architecture and Technical Strategy

The Chevy Equinox diesel mild hybrid concept uses a 1.9L turbo-charged diesel engine with an integrated 36V alternator/starter system. The 1.9L diesel engine and hybrid system is calibrated to run with a 20% blend of bio-diesel (B20), to make a potent 150 horsepower and 236 ft-lbs of torque. The engine controller is also calibrated to make use of the latest in fuel injection strategy, exhaust gas recirculation, and the alternator/starter to make a seamless and synergistic efficient powertrain.

A diesel engine was chosen because of its many advantages over an spark ignition, or SI, engine, including: better fuel economy, improved cycle efficiency, better performance in terms of engine output, and lower CO₂ emissions.

Although the energy density of diesel fuel is roughly the same as gasoline, diesel engines have been known to get better cruising fuel economy because of the higher density of diesel fuel and the more efficient combustion cycle. Theoretically, based on fuel properties alone, diesel engines achieve approximately 16% better fuel economy over gasoline. Furthermore, due to the more efficient combustion cycle, diesel engines can get up to twice the efficiency of gasoline (Matthews, 2007).

Unlike conventional spark ignition engines which are limited to lower compression ratios, the diesel engine can work at much higher compression ratios that produce more torque and power at a higher efficiency. This allows for drivers to use a smaller engine without sacrificing performance and utility.

While early diesel engines were well known to be difficult to start and noisy, this was primarily due to the fact that early diesels were gasoline converts and had no sophisticated way to control fuel injection. Today, diesel engines are purpose built and therefore more reliable and efficient. Furthermore, computerized engine control technology, high pressure fuel delivery systems, and split injection techniques all work together to not only optimize engine performance, fuel economy, and emissions, but also minimize combustion noise and improve startability.

The heart of the hybrid system is a cutting-edge 36V alternator/starter system known as the belt-driven alternator/starter system (BAS). This hybrid system was recently introduced in the 2007 Saturn Vue Greenline SUV and Aura Greenline sedan. The BAS allows the engine controller to shut the engine off when it would otherwise be idling, and turn it back on nearly instantaneously when the controller senses the driver is ready to start moving again. Having the engine off at traffic lights means no fuel wasted and no emissions produced during those times. The 36V source for the alternator/starter will also be used to power auxiliary components while the engine not running. The consequence is that energy usually wasted keeping the engine idling is saved, and all the accessories, including the A/C, remain functional.

For many years, diesel engines have been considered “dirty” by the American public in general. The primary reason diesels were considered dirtier than SI engines was because of the visible

soot emitted from the tailpipe. The use of relatively new diesel particulate filters (DPF) trap nearly all of this particulate matter in the exhaust stream. The result is a diesel engine with no visible black smoke coming from the tailpipe.

While their CO₂ production is much lower, diesels produce much higher NO_x than their gasoline counterparts. This issue has long been the Achilles heel of the diesel engine in the United States. However, the strict emission standards mentioned earlier have prompted those on the forefront of diesel technology to push for standalone aftertreatment systems that reduce NO_x. The Equinox hybrid makes use of a lean NO_x trap (LNT). The trap adsorbs NO_x until the catalyst has reached its limit, and then engine control triggers a regeneration event. The use of this technology allows the diesel hybrid to achieve extremely low NO_x emissions without the need for a secondary catalyzing agent.

3.3 Diesel Benefits and Cost Analysis

It is a well known fact that the consumer pays a significant additional upfront cost for a vehicle with a diesel engine. As a general rule, there are two reasons for this. The first is that the diesel engine, by virtue of the manner in which it operates, must be made in with heavier duty components than a similarly sized gasoline engine. Therefore there are inherent additional costs for both materials and engineering associated with this. The second reason, attributed to increasingly stringent emissions standards, is the added cost to incorporate an effective aftertreatment design. In order to gain accurate data in terms of what these costs would be for the diesel mild hybrid, research was done surrounding the cost of an Opel Vectra, equipped with a 1.8L gasoline engine versus the cost of the same car with the 1.9L Fiat Diesel engine. Table 1 below depicts the cost differences.

Table 1: Cost comparison for a diesel engine versus a gasoline engine (www.opel.com)

2007 Opel Vectra Sedan	1.8 Liter Gasoline Engine	1.9 Liter Diesel Engine	Cost Difference
Base Price	\$31,372.00	\$33,733.50	\$2,870.39
6 Speed Manual Trans	Included	Included	\$0
5 Speed Auto Trans	\$1,935.00	\$1,935.00	\$0
Fuel Economy	23MPG/32.4MPG 27.7 MPG combined	31.9MPG/49.3MPG 40.6 MPG average	
Gas at \$2.73/gallon Diesel \$2.93/gallon 15,000 miles per year	541.5 gallons per year \$1487.34 per year fuel	369.45 gallons per year \$1082.51 per year fuel	\$404.83 saved annually with diesel

Table 2: Cost comparison of a Saturn Vue with and without the BAS hybrid system (www.saturn.com)

Cost Comparison for BAS Hybrid Architecture	2007 Saturn Vue	2007 Saturn Vue Greenline Hybrid
Base Price	\$21,450	\$24,795
Fuel Economy (combined mpg)	22.5	28.5
Annual Fuel Cost (based on 15,000 miles driven per year)	\$1,820	\$1,542

Table 3: Added diesel aftertreatment cost (estimates)

1.9 Liter Diesel Engine System Components	Component Price (est.)
1.9 Liter Turbo diesel Engine	\$1,600
Ox Catalyst	\$200
Diesel Particulate Filter	\$570
Lean NOx Trap	\$500

Noting Tables 1 and 3, the initial cost increase for a diesel engine, and the associated cost for diesel aftertreatment is significant. However, the consumer must realize that there are several inherent benefits to a diesel engine and weigh these benefits as well as consider the life cycle cost when choosing the diesel option. The following analysis will show that the benefits of the diesel powertrain far outweigh the costs when considering the environmental impact. In addition, when considering global automotive markets, nearly 50% of the cars sold outside the continental United States are powered by diesel engines (US Emission Standards, 2007).

The first benefit of the diesel option is the increased fuel economy that the vehicle delivers. In analyzing the cost of fuel for the diesel option, an average diesel price of \$2.93 per gallon was used. For Austin, Texas, this is a reasonable average price. Currently in the US, diesel is consistently on par with premium unleaded in price per gallon. The most significant reason for this current situation is the supply and demand function of the market. Diesel sales in the US are increasing year to year, and the effect is that the refining capacity for diesel fuel in the US is not as large as it needs to be to meet the rising demand. In terms of production costs, diesel fuel, even Ultra Low Sulfur Diesel Fuel, which is required for sale now, is less expensive to produce than gasoline on a per gallon basis. Consequently, as demand rises, refining capacity should also rise to meet it in the coming years, driving the price down. For the purposes of a contemporary analysis, current prices were used. Even with this arguably artificially high cost, the fuel savings per year of the diesel vehicle is more than \$400 as compared to the gasoline vehicle, assuming the gasoline customer uses the cheapest grade gasoline. In addition to savings at the pump, the diesel's superior fuel economy allows for much greater driving range in the diesel car. In addition, the annual fuel savings for the BAS hybridization amounts to \$300 per year (Table 2), increasing the total fuel savings for the diesel hybrid to \$700 per year.

Initially this seems like a tough sale to consumers, as based on fuel savings alone, it would take just over eight years of vehicle ownership to realize an overall savings in terms of total cost of ownership of our diesel hybrid. However, this is not a realistic way to view the cost differential of the vehicles. Currently, the government is offering significant tax savings for purchasers of hybrid vehicles, as high as \$4000 incentive for a Honda Civic Hybrid. Estimating the diesel hybrid to be in the price range of the most expensive Civic, tax incentives bring the cost of the

hybrid to just \$2000 more than the standard non hybrid equivalent. This additional cost will be returned within 3years when considering annual fuel savings. This number is well within the normal ownership period for new cars in America. Also, as the volume of the vehicles increases, the cost differential will decrease due to economies of scale. It is reasonable to assume that if hybrid vehicles reach a level of production of 30-50% of the market share, they will no longer have any significant initial cost difference from non-hybrid vehicles. The recognition of this by the government is the reason for the current incentives to defray the higher cost of these vehicles; support the market now so it can grow into the future.

In conclusion, while there remains an initial cost difference for the hybrid option today, the total after incentives is relatively nominal (on a typical car loan, \$1000 borrowed equates to an additional \$20 per month in the payment), so an increase of \$2000 after incentives will result in less additional cost for the monthly payment than the driver saves in their fuel bill, making the purchase worthwhile both from a financial and environmental standpoint.

3.4 Additional Equinox Diesel Hybrid Marketing Benefits

The Equinox is a crossover vehicle, meaning that it is mainly intended for on road use, but it retains the capability to handle minor off-road driving, and is suitable for family camping trips, fishing trips to the lake, and other unpaved road use. Consequently, the added range that a same sized fuel tank gives the consumer who purchases the diesel engine is significant.

The second benefit of the diesel is the inherently greater low end torque compared to the gasoline engine. This will provide the consumer with two benefits compared to the gasoline engine. First, the Equinox, which is a relatively heavy vehicle, will be more responsive for acceleration in urban driving, and as a result will fare well for handling city traffic. Second, as the Equinox is a crossover vehicle, it has a need to be able to tow a decent load. The diesel engine is much better suited for towing, allowing the consumer to easily tow a small trailer, small camping trailer, or a boat behind their vehicle. Increasing the overall utility of the vehicle is certainly a benefit, as it will market to a body of consumers who might be in need of more towing capacity than a standard gasoline Equinox. Therefore, forced to choose the much larger Trailblazer or

Tahoe type vehicle when the smaller diesel hybrid crossover vehicle could easily handle daily travel needs would be a better overall purchase.

Lastly, the diesel engine is well suited for supporting future use of alternative fuels. As home grown bio-diesel becomes more readily available due to market demand, the consumer can take advantage of purchasing a fuel that reduces American dependence on foreign oil. In these times of global political uncertainty, and general instability of governments that control the vast majority of the World's oil resources, it is a definite positive to support domestic fuels.

Without question, the consumer will pay a greater cost for the diesel powered Equinox at the dealer, but for reasons of economy, durability, and increased flexibility that the diesel engine offers, many consumers will be quickly convinced that the Equinox model of choice is the more efficient, fun to drive diesel powered one.

4.0 Reaching out to the Target Audience

Outreach activities planned for year 4 have been carefully selected and organized to efficiently reach out to all target audience segments. Figure 2 demonstrates the seven different outreach methods and the underlying accomplishments associated with each. These methods include:

- Making a high quality diesel hybrid commercial and advertising brochure
- Showcasing the vehicle at renewable fuels conferences and expos
- Creating both an educational and advertisement flyer
- Integrating a blog onto the team's website
- Show & Tell the vehicle at local schools
- Dealership Saturdays
- Invitation only Ride & Drives
- Online Evaluation Techniques
- Custom Diesel Hybrid Give-A-Ways



Figure 2: UT Austin’s Seven Methods to Outreach Effectively

4.1 Method 1: TV Commercial

The TV commercial will educate the public about energy issues, and explain how the diesel hybrid is a viable solution. This will be one of the first methods to execute as it would be beneficial to play the commercial wherever the vehicle is showcased. At The University of Texas, there are numerous TV screens around campus used to inform the students about

upcoming events, which could potentially be used as a medium for this short commercial advertisement.

4.2 Method 2: Targeting Corporate Investors

One of the most effective methods of getting our message out is to attend conferences and symposiums related to alternative energy. The 30th Annual Symposium on Biotechnology for Fuels and Chemicals will occur in New Orleans, Louisiana, May 4th – 7th. This symposium is sponsored by the US Department of Energy through the Office of Biomass Program. The vehicle could potentially be displayed in front of experts from around the world who are ready to discuss the latest research breakthroughs in the field of biotechnology for fuels and chemicals.

Additionally, the POWER-GEN Renewable Energy & Fuels 2008 conference is another viable candidate for showcasing the diesel hybrid on February 19-21 in Las Vegas, Nevada. This will be the 5th annual premier all-renewables conference and exhibition covering the most important trends and issues impacting the industry.

At these conferences brochures, diesel hybrid related give-a-ways and educational flyers will be given out to industry leaders from around the world. The diesel hybrid commercial will be playing in the background along with testimonials from sponsors who participated in the diesel hybrid driving experience. The underlying message in the commercial and printed on diesel hybrid give-a-ways will be “Diesel hybrid technology is the solution to a more enjoyable driving experience.”

4.3 Method 3: Periodical Advertisements

The team will build a relationship with local periodical companies such as The Austin American Statesmen and The Chronicle in order to work on a collaborative effort to educate their readers about energy issues and possible solutions. Diesel hybrid technology will be the focused solution. The teams’ slogan, website and contact information will be displayed on all flyers. A different flyer will be generated every month to be inserted into the periodical on a routine time frame.

4.4 Methods 4 & 5: Youth Outreach

Relationships already in place with local high school and middle schools in the Austin area will be used to teach kids about energy concerns, hybrid technology and alternative fuels. The team will arrive in the Equinox, give a short presentation about energy and the need for renewable sources, and show the technology incorporated into the diesel hybrid. A ride and drive will be given to the teacher and outstanding students for their support. Afterwards, both teachers and students will be asked to visit our website and leave messages on the team blog about their experience. The teacher will be asked to fill out the ride and drive evaluation survey on their own time.

4.5 Method 6: Dealership Saturdays

Local dealerships like Henna Chevrolet will be contacted regarding showcasing the diesel hybrid on Saturdays. This opportunity could be used to educate potential buyers about hybrid technology, as those actually in the market for cars are likely to be interested in the newest technology. The outreach team members will recruit potential target audiences from Segments A & B to participate in a ride and drive. Afterwards, the potential customer will be asked to fill out an online evaluation survey and given brochures and diesel hybrid paraphernalia.

4.7 Method 7: Invitation Only Ride and Drive

The team will generate high quality invitations that will be sent to team sponsors and distinguished academic leaders to cordially invite them to take part in a diesel hybrid ride and drive experience. A gift bag will be given to show thanks for the financial support. The diesel hybrid experience will be finalized by requesting the driver to take part in an online evaluation survey so that the team can track consumer acceptability.

5.0 Proposed Budget

The University of Texas Challenge X team is excited to implement these proposed outreach activities for year 4. With financial assistance from the organizers, local sponsors and the university, the message: “Diesel hybrid technology is the solution to a more enjoyable driving experience” will be heard by all market target audiences.

Table 5: Estimated proposed budget for 2007-2008

Item	Method(s)	Est. Cost (\$)	Description
Media Equip. For Commercial	1	1500	Media equipment will be required to make a short commercial: camera, accessories and movie editing software
Advertisement Material (flyers/brochures)	All	200	Printing costs associated with brochures & flyers to be used in all methods
Quality Invitations	7	200	Invitations to be sent to all sponsors in the area and to academic leaders
Large Displays	2,5,6,7	500	Costs for poster boards & printing to be used at conferences
Small Events	2	250	Transportation cost for small events such as school visits
Large Events	5,7	1400	Transportation, food, accommodations & miscellaneous costs for large events such as conference in Las Vegas, Nevada
Team Uniforms for events	All	500	Material and labor costs for each member of the team to have matching team dress shirts for distinguished events (ie. Conferences & Invitation Only ride and drive)
Give-A-Ways: Key-chains, Mugs, Hats & Shirts.	2,5,6,7	500	Material and labor costs associated with a moderate amount (30 - 50) t-shirts and hats to be given away at events

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