

Technology Development & Commercialization – Gate 3 Deliverable

General Project Information

Project Title: 3.7L V6 Dedicated Propane Autogas Ford Transit Fuel System

Docket Number: 18165 **Gate Date:** June 26, 2012

Project Summary:

Develop, certify and launch a dedicated propane autogas fuel system for the all-new 3.7L V6 Ford Transit, Ford's highly anticipated replacement for the E-series vans, wagons and cutaways.

Start Date:	October, 2012	Total Project Cost:	\$3.35 M
End Date:	January, 2014	Funding Requested:	\$1.675 M
Launch Date:	January, 2014	Co-funding(y/n):	Y

Co-funding Partner:	Contribution:
ROUSH CleanTech	\$1.675 M

Team Leader: Michael Taylor, PERC

Team Members: Derrick Stam Joe Thompson Ron Poland Todd Mouw John Thomson Brian Carney

Lead Vendor: Roush **Contact:** Brian Carney

Additional Vendor(s): **Contact(s):**

Detailed Business Case

Project Summary

- Provide a high-level statement of what the product will entail.
- Describe the problems and needs that will be solved by the product.
- Summarize the product/service's features, attributes, performance requirements, and specifications (detail on the specifics should be provided below)
- Explicitly highlight the areas where PERC would be directly involved, both through funding and through project support.

With funding assistance provided by the Propane Education and Research Council, ROUSH CleanTech will develop, certify, and launch a dedicated liquid propane autogas fuel system for the 3.7L V6 Ford Transit cargo and passenger vans, for sale to commercial and municipal fleets.

The system will be certified and approved for new (pre-title) installation, as well as aftermarket retrofit installation, by both EPA and CARB. Vehicles purchased through the Ford ship-through program, ordered with the gaseous-prep engine package, and installed by ROUSH CleanTech, will retain all Ford warranties; ROUSH CleanTech provides equivalent warranty coverage for the propane specific items.

Project Scope

ROUSH CleanTech will develop products according to the following assumptions:

- Ford Transit to be launched for the 2014 models in early 2014 calendar year.
- Multiple propane autogas fuel tank configurations will be considered for final product offering. A mid-ship under body tank and an in-cab extended range tank will be considered (see customer survey, attached).
- Specific deliverables from ROUSH CleanTech required to complete the project:
 - Certification letter(s) from EPA and executive order from CARB approving the product for new vehicle sale.
 - Post-launch executive order from CARB approving the product for conversion in the aftermarket (this is not as critical at the time of launch, as no existing fleet of Ford Transits exist in the market today).
 - Technical reports using a format suitable for SAE publication describing implementation of bi-fuel propane autogas, including required implementation for diagnostics and emissions. This document will not include proprietary Ford or ROUSH CleanTech information (specific control strategy, design features unrelated to bi-fuel, etc.) or commercially sensitive ROUSH CleanTech information (cost, key suppliers, volumes, etc.). PERC may choose to publish this report on the PERC website, and may request presentation in appropriate SAE or other forum.

Integrated Risk Assessment

- List the three to five most significant risks associated with the successful delivery of the project

- Include:
 - A description of the risk.
 - Likelihood of occurrence (low, medium, high).
 - Severity of the risk (low, medium, high).
 - Plans for mitigation.

Key Project Risks

The following key risks have been identified during preparation of this proposal, and may affect ability to complete the project and/or to develop required market acceptance for successful launch of the product:

1. Acceptable product pricing.

We anticipate that the Ford Transit propane autogas fuel systems will require a lower retail price point due to the lower fuel usage (more miles to break-even). If this program is approved, ROUSH CleanTech will pursue reduced cost designs for our common unique components development and validation costs are not included here as they will be in-kind contribution.

Likelihood of Occurrence – medium
Severity of Risk – high

2. Ability to meet aggressive timing based on the fact that this product is not in the market place today. In order to meet this timing, ROUSH CleanTech will require advanced CAD releases and engineering support from Ford Motor Company.

Likelihood of Occurrence – medium
Severity of Risk – low

3. Low early adoption volumes. Adoption volumes initially will not be comparable to other mature product line launches, and this investment will grow with the volume of the product line. The timing of this release is targeted at fulfilling a product gap and showing solidarity with Ford product line managers to our customers.

Likelihood of Occurrence – high
Severity of Risk – low

Strategic Fit and Importance (to be completed by both applicant and PERC staff)

- How does the product concept align with PERC’s strategy?
- Describe the project’s role in relation to the market area strategy and priorities.
- How does the product align with the strategic plan of the contractor/manufacturer?
- Describe the urgency of this project.
- *Staff: Explain how this project fits relative to other projects in your mission area and into the strategy for the market it serves.*

The propane industry wants to maintain their first-to-market status with the best propane autogas solution for passenger and cargo vans in the market place. This investment helps accomplish that.

This project will further bond the propane industry with Ford Motor Company’s fleet strategy, and position it as the most progressive fuel/system solution for fleets.

The “near” Job #1 availability is a huge win for Ford Motor Company, as their market share is

currently under attack from Chrysler, who is trying to use CNG as a calling card to conquest Ford accounts. Ford is supportive of this ROUSH CleanTech / propane autogas initiative, as result.

Aside from quality and price, speed to market is the most important variable in helping Ford protect key accounts. In order to offer this product so close to Ford's Job #1 timing, program kick-off must happen immediately.

Product and Competitive Advantage

- How is this product concept superior to what is currently on the market?
- How does the customer perceive value in relation to the product?
- How will the cost of the product compare to current options?
- What feedback has the end user given regarding product concept?

Currently, propane autogas systems exist on the marketplace for Ford-based E-series cargo and passenger van configurations. However, with the changeover from the Ford E-series to the new Ford Transit, this would be the first fuel system to fill this alternative fuel product gap in the market place.

Ford's new Transit will offer superior fuel economy and weight reductions, as well as more complex and flexible configuration options (roof heights, wheelbases, etc.)

With gasoline prices increasing, customers will see propane autogas combined with moving from a V8 to a V6 as a significant opportunity to reduce operating costs. ROUSH CleanTech has been in serious discussions with about two dozen of the top Ford fleets accounts, many of which are already demonstrating pre-production Ford Transit properties. The feedback about long-term intent to stick with Ford to satisfy former E-Series, and now Ford Transit, needs has been significant.

See attached Ford Transit Customer Product Advisory Survey.

Market Attractiveness

- Describe: (cite source of market information)
 - The size of the market.
 - The rate of growth for the market.
 - Ability to penetrate the market.
 - The degree of competition in the market.
 - Main competitors
- Is propane currently present in this market? With what applications? How will this product affect sales on the existing propane offerings?

As gasoline prices continue to climb, fleets will look to replace their older V6 and V8 Ford E-series with the more fuel-efficient Ford Transit. Therefore, we agree with Ford's projection of 100,000 units per year once the transition is complete. Currently, there are no Ford Transit alternative fuel options that have been announced in the United States.

Given our collective position in the marketplace and the success ROUSH CleanTech has had in implementing Ford E-series fuel systems into customer fleets, the following estimates are also conservative.

2014: 1,500 units
2015: 3,000 units
2016: 4,000 units

These vehicles will likely achieve ~ 15 mpg running on propane autogas. If we assume 50,000 miles per year, each vehicle will consume 3,300 gallons per year, which would translate into the following incremental gallon sales:

2014: 5 million gallons
2015: 15 million gallons
2016: 28 million gallons

Please note: gallon volume estimates are cumulative.

Leveraging Core Competencies

- Describe the applicant's relevant experience.
- Highlight the applicant's familiarity with this particular type of project.
- What resource (skills, capabilities, and experience) gaps exist? What plans are in place to address these gaps?
- *Staff: Add information addressing PERC/Propane Industry competencies and gaps.*

ROUSH CleanTech has executed 10 propane autogas fuel system product platform launches in the past five years.

These launches include broad fuel system development, as well as specific product development for key strategic accounts such as Blue Bird, Frito Lay, Super Shuttle, National Bus, DirecTV and ARS / Rescue Rooter.

All the required core competencies for bringing this product to market are in place: testing (lab and over the road), prototyping, manufacturability, OEM access and support, channel management, brand reputation, customer access and market leadership.

It is worth pointing out that, although all of these competencies are in place, this will be ROUSH CleanTech's first 3.7L V6 project. ROUSH CleanTech believes that any gaps in these competencies would be minimal.

Synergies

- Will this product have uses beyond those intended?
- Are there any potential project spin-offs?
- Will this project potentially lead to additional products or partnerships?
- *Staff: Also include PERC specific synergies.*

This product is the future of Ford Motor Company's light-duty fleet vehicle offering, likely filling the role as its volume flagship product for the next 20 years.

Like the E-Series, it is expected that once the initial liquid propane autogas fuel system is developed, ROUSH CleanTech will be able to customize applications to meet various fleet needs.

Past examples of this type of customer-based customization for E-series include:

- Certifying and retrofitting previous model year applications for Frito-Lay.
- Developing an extended range passenger van application for SuperShuttle.
- Developing an extended range cargo van application for ThyssenKrupp Elevator.
- Developing an extended range chassis cab application for ARS / Rescue Rooter.

<p>ROUSH CleanTech was recently awarded “approved vendor” status by DHL for supplying over 150 propane autogas vehicles into their fleet. We will leverage this fact to enable have a cascading effect into other package delivery companies, such as UPS, FedEx, etc.</p>
<p>Technical Feasibility</p> <ul style="list-style-type: none"> • Describe the size of the technical gap in developing a commercial-ready product. • Will new technology be required? If so, describe the contractor’s ability to attain the new technology.
<p>The chief challenge is going to be developing a product in advance of Ford Motor Company’s deployment. This challenge will require added discipline and communication with Ford, as there are changes that take place to all of the vehicle’s components and configurations up until Job #1, and then after job #1.</p> <p>We have managed this level of advanced product planning with the launch of each new ROUSH Performance Mustang product offering for multiple generations over the past 20 years.</p> <p>One common issue that we have learned to manage is that the initial CAD release that all base design and development assumptions are based on changes over time. Change control and change management process will be required in our product development plan, adding a new layer of discipline for this project to ensure success.</p> <p>No new technology outside of what has previously been developed for our other dedicated liquid propane autogas fuel systems will be required for this project.</p>
<p>Impact vs. Risk</p> <ul style="list-style-type: none"> • What is the estimated impact? (i.e. new propane gallons, units sold) How were these impact projections determined? (cite data sources) <ul style="list-style-type: none"> ○ Provide five year estimated sales projections for the product (if applicable) and a list of factors that may influence the estimates ○ How many gallons of propane does the product use per unit per year? • What are the most significant risks to achieving the impact (market risks)? Are these risks manageable? If so, what contingencies are in place to address them? • <i>Staff: Address impact relative to goals and risks from a PERC/Propane Industry perspective.</i>
<p>IMPACT</p> <p>As gasoline prices continue to climb, fleets will look to replace their older V6 and V8 Ford E-series with the more fuel-efficient Ford Transit. Therefore, we agree with Ford’s projection of 100,000 units per year once the transition is complete. Given our collective position in the marketplace and the success ROUSH CleanTech has had in implementing Ford E-series fuel systems into customer fleets, the following estimates are also conservative.</p> <p>2014: 1,500 units 2015: 3,000 units 2016: 4,000 units</p> <p>These vehicles will likely achieve ~ 15 mpg running on propane autogas. If we assume 50,000 miles per year, each vehicle will consume 3,300 gallons per year, which would translate into the following incremental gallon sales:</p> <p>2014: 5 million gallons 2015: 15 million gallons</p>

2016: 28 million gallons

Please note: gallon volume estimates are cumulative.

RISK

The biggest risk that exists with this project is a lack of adoption of the new Ford Transit from current Ford E-series customers. Some factors that could play into this include:

- MSRP for Ford Transit is too high.
- Customers decide to front-load next two years of E-series purchases, in order to delay transition to Transit.
- Lack of communication from Ford about benefits / reasons to buy Ford Transit to replace E-series.

ROUSH CleanTech views these factors as low-risk. In each case, we have talked to customers and seen evidence from Ford that these shouldn't be serious concerns. The biggest question that exists today is around the base vehicle price at launch, but it is widely expected that the Ford Transit will be priced very similarly to the Ford E-series.

Budget

ROUSH CleanTech estimates the following costs for the program:

Function	Amount
Engineering Program Management	\$ 180,000
Design & Release Engineering	\$ 240,000
CAD Packaging, Design, and Detail	\$ 450,000
Calibration and Controls Engineering	\$ 970,000
Certification Engineering	\$ 110,000
TOTAL ENGINEERING LABOR	\$ 1,950,000
 Services / Materials	
Testing	
Engine Mapping	\$ 135,000
Emissions Testing	\$ 145,000
Component Testing	\$ 55,000
Thermal Testing	\$ 135,000
Test Facilities / Travel	\$ 60,000
Vehicles (12)	\$ 300,000
Prototype Components	\$ 80,000
High Mileage Testing	\$ 175,000
Development Components	\$ 110,000
Instrumentation Components	\$ 105,000
Vehicle Builds & Maintenance	\$ 100,000
TOTAL SERVICES / MATERIAL	\$ 1,400,000
 TOTAL PROGRAM	 \$ 3,350,000

In-Kind Contributions

ROUSH CleanTech to provide the following services as in-kind contributions to the project:

- Development of reduced-cost common ROUSH CleanTech components (supply valve, return valve, FRPCM) \$135,000
- Contribution to engineering costs:
 - Design & Release Engineering \$90,000
 - CAD Packaging, Design and Detail \$125,000
 - Calibration and Controls Engineering \$355,000
 - Vehicles (7) \$175,000
 - Prototype Components \$50,000
 - High Mileage Testing \$80,000
 - Instrumentation Components \$105,000
 - Vehicle Builds & Maintenance \$100,000
- Production tooling and launch expenses \$85,000
- Preparation of service manuals and training. \$60,000
- Marketing and sales support. \$315,000

TOTAL IN-KIND CONTRIBUTION: \$1,675,000

Stage 3-5 Project Plan

Guidance: Contractor project plans can be useful to help build your summary plan. If tools such as Microsoft Project are being used within the project, pull key summary elements from those plans for executive review. If you have no predefined method for your specific project, the following template is a reasonable starting point for consideration. Sample:	Most Responsible Person	Start Date	Targeted Completion Date	Dependency on other tasks
<ul style="list-style-type: none"> Phase One – Program Kick-Off 	Derrick Stam	10/1/2012	11/30/2012	Yes*
<ul style="list-style-type: none"> Phase Two – Strategic Intent / AP Design Freeze 	Derrick Stam	12/1/2012	1/31/2013	Yes*
<ul style="list-style-type: none"> Phase Three – AP Dynamometer Testing 	Derrick Stam	2/1/2013	5/31/2013	Yes*
<ul style="list-style-type: none"> Phase Four – AP Vehicle Testing 	Derrick Stam	6/1/2013	9/30/2013	Yes*
<ul style="list-style-type: none"> Phase Five – Data Judgment #1 	Derrick Stam	10/1/2013	11/30/2013	Yes*
<ul style="list-style-type: none"> Phase Six – Data Judgment #2 	Derrick Stam	12/1/2013	12/31/2013	Yes*
<ul style="list-style-type: none"> Phase Seven – Final Data Judgment 	Derrick Stam	1/1/2014	-	Yes*

* = See “Scope & Objectives for Development” section below.

Development & Testing Plan

Product Development Insight

- Outline the specific requirements to be designed into the product based on customer feedback following the idea submission form.

1) Fuel tank configurations:

- a. Mid-ship / under-body fuel tank:
 - i. Minimum 250 mile range.
 - ii. Must be available for all wheel base / roof configurations.
- b. Internal fuel tank:
 - i. Minimum 450 mile range.
 - ii. Compatible with all wheelbase / roof height configurations.
 - iii. Compatible with cargo and passenger configurations:
 1. Cargo – behind bulkhead / front seats.
 2. Cargo – parallel to van, along driver's side, between wheel wells.
 3. Passenger – behind rear seat, like current E-series shuttle.

2) Certifications, to be met at launch:

- a. Ford QVM.
- b. FMVSS.
- c. CARB:
 - i. Pre-title installation.
 - ii. Retrofit.
 - iii. Explore cleanest emissions classification opportunity (SULEV), present cost associated with achieving.
- d. EPA.
- e. Texas Railroad Commission.
- f. Altoona.
- g. CMVSS.
- h. Others

3) Operating temperatures:

- a. Temperatures ranging from -20 F to 120 F

4) Calibration options:

- a. Primary – offers same hp and torque as standard Ford Transit.
- b. Secondary – better fuel economy / range (customers willing to sacrifice 10% to 15% performance.)
 - i. Calibration option would have to be optional – not all customers desire the trade-off, especially with the smaller 3.7L engine replacing the 5.4L.

5) Proof-of-concept system:

- a. Delivered and installed by February 6, 2013 for NTEA Work Truck Show.
- b. Requires test vehicle from Ford. Desired specs:
 - i. Cargo van.
 - ii. Low roof.

- iii. Short wheelbase.
- iv. Interior aft of bulkhead fuel tank.

6) Weight impact:

- a. Less than 50 lbs weight impact, comparing fully fueled gasoline Ford Transit to fully fueled propane autogas Ford Transit (equipped with mid-ship tank).

7) Product launch timing:

- a. Fuel system availability: January, 2014

8) Vehicle badge:

- a. Integration of new ROUSH CleanTech vehicle badge on exterior of vehicle.

Scope and objectives for development

- Define the schedule for key development activities, milestone reviews, and critical design reviews. Provide detail on the work involved with each task with clearly defined goals, objectives, and tactics
- Identify information to be derived from previous, similar designs or projects.
- Outline the plans to qualify and select any new suppliers that are required, if appropriate.

Program Kickoff

Month 1

- Program funding in place.
- Agreement to high-level objectives, timing.
- Notify Ford of program intent, request approval for CAD and cycle plan information.
- Place orders for dynamometer engines and support hardware (induction, exhaust, control modules, wiring, etc.).

Strategic Intent / AP Design Freeze

Month 3

- Feasibility confirmation:
 - First meetings with CARB and EPA complete to discuss emissions and diagnostic assumptions.
 - Tank package concepts prepared; range estimate provided to marketing.
 - First pass of engine compartment packaging (including injection locations in intake) complete and confirmed feasible.
- Initial (AP) Design:
 - Intake manifold modifications for fuel injection and rail mounting finalized.
 - Fuel rail, engine fuel lines, FRPCM designed and packaged:
 - Basic package and mounting for FRPCM established if needed.
 - Place orders for dynamometer rails, spacers, and lines.
 - Chassis fuel line package space identified and confirmed feasible.
 - Tank size, configuration (appurtenance location), and mounting points identified.
 - Wiring components and schematic finalized.
- Preliminary BOM prepared and reconciled to KO cost assumptions.
- KO assumptions verified, work plans updated, budget confirmed.
- AP vehicles specified and BOM's complete ready-to-order.

AP Dynamometer Testing (Start)	Month 5
Start 3.7L V6 engine mapping on LPG	
<ul style="list-style-type: none">• Begin catalyst aging for emissions and diagnostics testing.• Order initial set of threshold (diagnostic) catalysts.	
AP Vehicle Testing (Start)	Month 9
<ul style="list-style-type: none">• AP vehicles built and 4k mileage complete.• Vehicles ready to begin tailpipe emissions (1 vehicle), road testing (1 vehicle).• Initial crash test vehicle in build, if required.	
Data Judgment #1 – Proceed to Confirmation	Month 12
<ul style="list-style-type: none">• First pass DV testing complete (analytic, bench, or vehicle).• Designs updated after completion of AP build.• Service, assembly, manufacturing, purchasing initial design approvals complete.• OK to order Confirmation Prototype (CP) components.• Tailpipe emissions demonstrated on all cycles with 4k and full useful life catalysts.• Evaporative emissions demonstrated and assumptions finalized.• Start final data collection to support certification application.	
Data Judgment #2 – Proceed to Certification	Month 14
<ul style="list-style-type: none">• CP vehicles built (2014MY build-from) to preliminary production process and tools.• All tailpipe, evaporative, and diagnostic testing completed.• Certification applications ready for submission.• R05 calibration released in Ford system.• Submit OBD application to CARB• Begin long-lead part reviews for OK-to-purchase.	
Final Data Judgment – Proceed to Production	Month 16
<ul style="list-style-type: none">• All CP build issues closed and designs updated.• CP Crash Test complete.• DV testing complete.• Final service, assembly, manufacturing, and purchasing design approvals.• OK to purchase production components.	
Plan for in-house alpha or prototype product testing	
Outline the test plan and define parameters for testing for alpha and beta units	
<ul style="list-style-type: none">• If applicable, list established quality, safety, and regulatory requirements for the product. Describe plans to evaluate compliance with of the product.• Describe how the modified product will be measured and tested and define acceptance criteria. Describe data to be collected.• List customers that will participate in the product testing and describe plans to enact	

confidentiality agreements with them, if applicable
<p>One of the key deliverables during Phase 3 – Confirmation is the collection and submission of emissions certification data. During this phase we complete emissions diagnostics and engine certifications as required, submit results to EPA and CARB and we begin mileage accumulation. It also includes the confirmation of the build and development of installation, service and production procedures to satisfy Ford QVM and Texas Railroad Commission.</p> <p>Field demonstration fleets will be rolled out as part of our mileage accumulation process. Mileage accumulation is intended to flush out operating capability in a variety of climates; hot weather, cold weather, high altitude, etc.</p> <p>Note: none of our customers will be involved in Phase 3 – Confirmation, this is all testing and validation that is conducted in-house at ROUSH CleanTech.</p>
Preliminary Plan for beta or field demonstration tests Outline demonstration (field trials) plan
<ul style="list-style-type: none">• Describe data to be collected.• Describe which customers can give results representative of the target market.• Describe which locations are representative of where the target market will purchase or use the product.
<p>Data collected from the vehicle during our test procedure includes emissions (NOX, CO, CO2) at start-up, during idle and in the Shed Test, as required by CARB and EPA; average start times after varying hot-weather soak times; mileage accumulation; fuel fill rates; fuel economy; calibration and hardware issues; MIL lights; seal and leak checks; component-level testing.</p> <p>All of our testing is intended to satisfy CARB, EPA, Texas Railroad Commission, Altoona, FMVSS and Ford QVM requirements.</p> <p>Testing will be conducted in Colorado, Arizona, Minnesota and Michigan.</p>
Contingencies to handle key technical risks and potential roadblocks (specific to testing) Identify contingency plan to handle these issues
Key Risks – contingency plan. CARB – include key members of CARB in the development of the test plan. Tank Availability – involvement of new suppliers, suppliers engaged in the up-front engineering trials. We have conducted supplier capability prove-outs on three suppliers already, as a part of our previous product development projects.

Market Launch Plan

Positioning strategy

- Outline a possible positioning strategy for the commercial launch of the new product.

ROUSH CleanTech will be positioning the new Ford Transit liquid propane autogas fuel system as an OEM-approved alternative fuel solution to combat:

- Rising fuel costs.
- Dependence on foreign oil.
- Companies' carbon footprints.

We will capitalize on the positioning that Ford is using for the new Ford Transit; it is a capable replacement to the best-selling Ford E-series van; a best-seller in Europe for over 50 years; achieves 25% better fuel economy than the Ford E-series; and is much more customizable and capable than the previous generation of Ford vans.

Ford plans to use the 2013 NTEA Work Truck Show as the launch-point for their new Ford Transit. ROUSH CleanTech intends to use our relationship with Ford to have a demonstration / proof of concept unit on-hand at the show (possibly in Ford's booth) for the major unveiling event.

This will be a major product launch, with strategy development around the launch and marketing of the product to match the scope of the vehicle's importance to the fleet industry.

Potential distribution and channel approach(es)

- State the possible challenges in reaching the market.
- Describe the distribution channels of partners/manufacturers.
- Identify opportunities to leverage existing marketing/outreach channel(s).

The major challenge for upfitters with the upcoming release of the Ford Transit is that the equipment which has been developed for use in the Ford E-series will no longer be relevant. While the upfitters are going through major retooling to make sure rack and bin packages will work for the new Transit, we will be in development on the most well designed ROUSH CleanTech liquid propane autogas fuel system to date, surveying customers to determine their exact needs in tank placement, range, fuel capacity, and more.

ROUSH CleanTech will continue distributing through our growing network of Ford dealers and QVM authorized upfitters, including Knapheide, Monroe Truck Equipment, Utilimaster, Adrian Steel, Dejana, National Fleet Services of Ohio, and more. Our standards for determining who a quality upfit partner will be, as well as our training program requirements, will only continue to strengthen as this product comes to market. This will ensure a quality product reaches our customers hands every time, whether the fuel system is installed by ROUSH CleanTech or any one of our partners.

Ford Motor Company will continue to push their customers towards ordering the gaseous fuel prepped engine package from the factory, making the vehicle eligible for alternative fuel conversion. ROUSH CleanTech has demonstrated over the past five years to be one of the best quality QVM partners with Ford, and has been featured in their Alternative Fuel Buyers Guide. This partnership will only continue to strengthen, opening up more opportunities in the future for partnership in leveraging existing marketing and outreach channels.

Propane industry support needs (to be completed by both staff and applicant)

- How familiar is the propane industry with this market or product?
- What additional education will be needed?
- How will this be addressed?

The propane industry has become much more familiar with ROUSH CleanTech and our liquid propane autogas product offerings over the past five years. That said, there is still a major opportunity to engage smaller regional and local propane marketers, to help them diversify their sales beyond heating fuel by offering propane autogas to fleets within their service areas.

We will continue reaching out to the propane industry to show how vehicle applications beyond their own immediate fleet's needs can result in additional bottom-line revenue. Engaging with state-level Propane Gas Associations, continued public relations outreach to propane industry publications, and co-sponsoring locally based events and road shows are keys to this strategy.

We also plan to expand our demonstration vehicle fleet with the introduction of the Ford Transit, making propane autogas powered versions of the vehicles available for use throughout the country.

Potential marketing, communications and promotional requirements

- Describe how the message(s) should be conveyed to the market.
- State the internal communications that will be needed to generate enthusiasm, within both propane industry and the partner channels.
- Identify opportunities to leverage existing channel(s). (i.e. ongoing outreach programs in other markets)
- Outline the marketing collateral that likely will be required.
- List any external agencies that will be utilized and identify the purpose for which they will be needed.
- Describe the timeline for the activities above.

ROUSH CleanTech will convey our new Ford Transit marketing message through a variety of methods:

- Major launch event at NTEA.
- Display vehicles at major industry trade shows.
- Press release development and distribution.
- Demonstration vehicle fleet.
- Website features / updates.
- Editorial outreach .
- Webinar / trade show presentations.

With our expanding marketing group, we are now differentiating messaging and outreach between end-user customers and our channel partners. Communication plans for both groups of customers will be developed ahead of launch, and executed to meet timing milestones set by our team.

We will leverage the partnerships and relationships we've built with our upfitter partners and members of the media over the years, to ensure quality coverage of our product development and availability. We will update existing marketing collateral to reflect the development of the new Ford Transit, and develop new collateral specific to the application. New collateral will include a specific savings calculator application for that vehicle line, iPad app development, videos, fuel system CAD data imagery, and more.

Most of the development of collateral materials will be handled in-house. PR outreach and

writing will be done by TheSales.Network. Artwork development will be handled by Birch Studios.

Timing will be determined by product development progress, but the first major announcement will come in March of 2013 when ROUSH CleanTech unveils the new propane autogas powered Ford Transit.

From there, collateral material and basic pieces will be developed. As fuel system specifics are identified, more material will be developed leading up to the January, 2014 "ready to ship" date.

Preliminary training needs (both internal and external)

- Identify which groups will require training (for example, propane marketers, customer service staff, maintenance, and channel and distribution partners).
- What type of training is required? (i.e. marketer, safety, user training)

ROUSH CleanTech will train a number of groups on the new Ford Transit, both internally and externally.

INTERNALLY:

- Customer service
- Warranty
- Technical Service
- Sales team

EXTERNALLY:

- Upfitters
- Dealers
- Service centers

Training will be conducted in the form of conference calls, webinar presentations, hands-on installation training, updated manuals and summaries, videos, and website content development.

The types of training that will be developed to support this product will include sales training for our internal and external sales staff / partners, technical training for service centers, warranty training, and troubleshooting training for our customer service staff.

Customer service and support needs

- Identify the potential customer service and ongoing commercialization support requirements.
- List the resource that will likely be required for sustained support

Customer service requirements to help ensure a successful launch of the new Ford Transit will include development of installation instructions, maintenance and warranty program development, service parts program development, and talking point development for customer service representatives and sales team members.

Resources required for this support are all found internally at ROUSH CleanTech and will be leveraged to ensure a successful launch of the Ford Transit.

Expected launch date

- State the target launch date/outreach kickoff

First, a formal announcement that ROUSH CleanTech is in development of a Ford Transit liquid propane autogas fuel system will take place, most likely 3 to 6 months before the NTEA Work Truck Show.

The first major launch date / outreach kickoff will be at the NTEA Work Truck Show in March, 2013 when ROUSH CleanTech officially unveils the first Ford Transit equipped with the liquid propane autogas fuel system (prototype.)

Ford Motor Company is using the annual event as the first debut of the new Ford Transit. Previously, ROUSH CleanTech has used space in Ford's booth to display propane autogas vehicles and host an unveiling event. We are already working to secure space in the booth to do the same in 2013 with the Ford Transit.

Post Launch Review Plan/Measurement & Evaluation Plan

Business Performance Metrics	Gate 3 Target
Number of Vehicles Sold (Annual Report)	<i>1,300 vehicles sold in 2014 calendar year.</i> <i>2,500 vehicles sold in 2015 calendar year.</i>
Number of Gallons of Fuel Consumed – Top 15 Customers (Annual Report)	<i>4,000 gallons of fuel per vehicle per year (average).</i> <i>4,000 gallons of fuel per vehicle per year (average).</i>
Project Specific Metrics (Partner/Grantee)	Gate 3 Target
Customer Satisfaction Surveys (Annual Report)	<i>80% or more of respondents report "Excellent" experience with the vehicle 30 days after purchase.</i>